

Final

Phase I RCRA Facility Investigation Report

SWMU 68

Naval Activity Puerto Rico
EPA ID No. PR2170027203
Ceiba, Puerto Rico



Prepared for

Department of the Navy
Atlantic Division
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Norfolk, Virginia

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FINAL

**PHASE I RCRA FACILITY INVESTIGATION REPORT
SWMU 68 – FORMER SOUTHERN FIRE TRAINING AREA**

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

CONTRACT TASK ORDER 0121

FEBRUARY 29, 2008

Prepared for:

**DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
ATLANTIC DIVISION
*Norfolk, Virginia***

Under the:

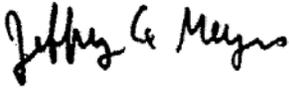
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I certify under penalty of law that I have examined and am familiar with the information submitted in this document and all attachments and that this document and its attachments were prepared either by me personally or under my direction or supervision in a manner designed to ensure that qualified and knowledgeable personnel properly gather and present the information contained therein. I further certify, based on my personal knowledge or on my inquiry of those individuals immediately responsible for obtaining the information, that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowingly and willfully submitting a materially false statement.

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LIST OF ACRONYMS AND ABBREVIATIONS

AFWTF	Atlantic Fleet Weapons Training Facility
AOC	Areas of Concern
APA	Aerial Photography Analysis
AQUIRE	Aquatic Toxicity Information Retrieval
AUF	Area Use Factor
B _v	Soil-to-Plant Bioconcentration Factor
Baker	Baker Environmental, Inc.
BAF	Bioaccumulation Factor
BAF _i	Surface soil-to-biota bioaccumulation factor for food item i
BCF	Bioconcentration Factor
BCF _i	Surface soil-to-biota bioconcentration factor for food item i
bgs	below ground surface
BW	Body Weight
CAO	Corrective Action Objective
CAO _x	Corrective Action Objective for chemical x
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy Program
CNO	Chief of Naval Operations
CRQL	Contract Required Quantification Limit
COPC	Chemical of Potential Concern
CSF	Cancer Slope Factor
CTO	Contract Task Order
DDT	dichlorodiphenyltrichloroethane
DI _x	Dietary intake for chemical x
DPT	Direct Push Technology
DRMO	Defense Reutilization and Marketing Office
DRO	Diesel Range Organics
Eco-SSL	Ecological Soil Screening Level
EC ₅₀	Median Effective Concentration
ECP	Environmental Condition of Property
EPC	Exposure Point Concentration
ERA	Ecological Risk Assessment
F	Fahrenheit
FC _{xi}	Concentration of chemical x in food item i
FCV	Final Chronic Value
FID	Flame Ionization Detector
FIR	Food Ingestion Rate
GPS	Global Positioning System
GRO	Gasoline Range Organics

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

HSWA	Hazardous and Solid Waste Amendments (to RCRA)
HI	Hazard Index
HQ	Hazard Quotient
IAS	Initial Assessment Study
ILCR	Incremental Lifetime Cancer Risk
Inc.	Incorporated
IR	Installation Restoration
kg	kilograms
k _{ow}	Octanol-Water Partition Coefficient
LANTDIV	Department of the Navy, Atlantic Division
LC ₅₀	Medial Lethal Concentration
LD ₅₀	Median Lethal Dose
LNAPL	light, non-aqueous phase liquid
LOAEL	Lowest Observed Adverse Effect Level
LOEC	Lowest Observed Effect Concentration
LOEL	Lowest Observed Effects Level
MATC	Maximum Acceptable Toxicant Concentration
MCL	Maximum Contaminant Level
mg	milligrams
mgd	Million Gallons per Day
mg/kg-BW/day	milligram per kilogram-body weight/day
mg/L	milligrams per liter
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NAPR	Naval Activity Puerto Rico
NAVFAC	Naval Facilities Engineering Command Atlantic Division
NAWQC	National Ambient Water Quality Criteria
NEESA	Navel Energy and Environmental Support Activity
NOAA	National Oceanic and Atmospheric Administration
NOAEL	No Observed Adverse Effect Levels
NOEC	No Observed Effect Concentration
NSRR	Naval Station Roosevelt Roads
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PID	Photoionization Detector
PDF _i	Proportion of diet composed of food item i
PDS	Proportion of diet composed of soil
PI	Photo Identified
PRG	Preliminary Remediation Goal
QA/QC	Quality Assurance/Quality Control
RAG	Risk Assessment Guidelines
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

RFI	RCRA Facility Investigation
SC _x	Concentration of chemical x in surface soil
SCV	Secondary Chronic Value
SDG	Sample Delivery Group
SQUIRT	Screening Quick Reference Table
SSSV _x	Surface soil screening value for chemical x
SV	Ingestion-based screening value
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit
TPH	Total Petroleum Hydrocarbons
UCL	Upper Confidence Limit
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

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) 68 - Former Southern Fire Training Area 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 and to consolidate this information with data generated during a 2004 Phase I/II Environmental Condition of Property (ECP) investigation (NAVFAC, 2004). The recently collected 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 former fire training area, to the extent practical, from the completion of field activities (surface soil, subsurface soil and groundwater sampling) as described in the 2006 RFI Work Plan (Baker, 2006a).

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

- Surface soil sampling at ten locations; three locations from the north side of the former roadway (now a dirt road) and seven locations south of the former roadway;
- Subsurface soil sampling collected at two depths from ten locations; three locations from the north side of the former roadway and seven locations south of the former roadway;
- The installation of nine temporary wells at nine of the ten subsurface soil sampling locations; and
- Groundwater sampling at the nine temporary monitoring wells.

Additional sampling to delineate the extent of arsenic in surface soil from 68SB02-00 to address EPA concerns in their comment letter dated September 24, 2007. This additional sampling included:

- Surface soil sampling at five locations to determine the level of arsenic in the surface soils located in the northeast area of the site.

Additional sampling was required to delineate the extent of lead and zinc in surface soil from one location (14E-01) and copper, lead, and zinc from another location (14E-03) collected during the ECP investigation in excess of ecological screening criteria. This additional sampling included:

- Surface soil sampling at 16 locations to investigate the extent of copper, lead, and zinc around two locations (14E-01 and 14E-03) in the central portion of the site where elevated concentrations of these metals above ecological screening criteria were discovered during a review of the ECP investigation data.

1.3 Organization of the RFI Report

This report is organized into seven sections. Section 1.0 of this document discusses the purpose and objectives of this RFI. Section 2.0 provides a description of the current conditions of the site, including the history of SWMU 68, 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 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 analytical results is reported in Section 5.0, and includes the surface and subsurface soil sampling data collected in 2004 and a preliminary evaluation of human health and ecological criteria. Section 6.0 presents the conclusions and recommendations from the RFI, while Section 7.0 lists relevant report references.

2.0 FACILITY BACKGROUND

This section provides the history and description of NAPR and SWMU 68, as well as the current conditions at SWMU 68.

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.

A Phase I/II Environmental Condition of Property (ECP) investigation were performed in 2004 and was referred to as ECP Site 14. This investigation indicated the site contained levels higher than background metals concentrations and a small amount of total petroleum hydrocarbons (TPH) diesel range organics (DRO).

The USEPA issued a RCRA 7003 Administrative Order (EPA Docket No. RCRA-02-2007-7301), which identifies SWMU 68 (formerly referred to as ECP 14) having documented releases of solid and/or hazardous waste and hazardous constituents and requires additional investigation equivalent of a Phase I RFI investigation. Following a public comment period the Consent Order became effective on January 29, 2007. Figure 2-2 shows all 77 SWMUs and 6 AOCs currently listed under the RCRA 7003 Administrative Order on Consent.

2.2 SWMU 68 Description and History

SWMU 68 (also known as ECP Site 14) is located at the southwest end of the Off-Site Airfield within a flat lying open area surrounded by secondary growth vegetation as shown on Figure 2-3. The Aerial Photography Analysis (APA) identified this area as photo identified (PI) Site 19, due

to the observation of a circular, graded area with an aircraft fuselage and two stained areas consistent with a fire training area from 1961-1964 (see Figure 2-4). The records review did not identify a fire training area at this location. Interviews confirmed former use as a fire training area; dates of usage and fuel used unknown but were suspected to be in the 1950s and 1960s. The physical site inspection conducted during the ECP observed a disturbed circular area consistent with that of a fire training area, but no stressed vegetation or stained soils.

2.3 Current Conditions/Usage

The former southern fire training area is currently not utilized, and the operational closure of Naval Station Roosevelt Roads occurred on March 31, 2004. The area consists of a limited vegetation circular area formerly bisected by a road running generally east to west. Many depressed areas can be found at the site containing differing vegetation.

2.4 Previous Investigations

The Phase I/II ECP investigation performed in 2004 noted several depressed areas at this site containing different types of vegetation than the remaining portions of the site (NAVFAC, 2004). The depressed areas contained vegetation that appeared in vines, rather than the remaining areas that contained mostly dense tall grass. Also noted within the area were trees around the perimeter of the site.

Three soil borings were advanced at SWMU 68 during the ECP investigation to profile surface and subsurface conditions. Three surface soil and three subsurface soil samples were collected and analyzed for Appendix IX volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, and TPH gasoline range organics (GRO) and DRO. Groundwater samples were not collected at SWMU 68 during the ECP investigation based on the photoionization detector (PID)/flame ionization detector (FID) levels. The levels did not indicate any potential impact to groundwater (NAVFAC Atlantic, 2005).

Results indicated SWMU 68 has locations with higher than background metals concentrations, consistent with a fire training area and a small amount of DRO.

On November 10, 2006 the Phase I RFI Work Plans (Baker, 2006a) were submitted with verbal approval from USEPA and later approved in writing by the USEPA on December 13, 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 68 area. In 2004, Baker conducted a series of Phase II Environmental Condition of Property (ECP) investigations across NAPR (NAVFAC, 2004). Subsection 3.3.4 discusses hydrogeologic information most relevant to SWMU 68 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 by 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 68 is located within the upland area. A moderately consistent stratigraphic sequence was observed during the 2006 RFI. Most borings drilled in the SWMU 68 area encountered a silty or sandy clay initially below a thin layer of topsoil or clay loam. This silty/sandy clay layer did contain many rock fragments and is most likely the fill material overlying the residuum. In the northern portion of the site, silty/sandy clay then transitioned into a leaner clay which was extremely plastic and had a distinct red and white color. The red and white clay was found in the following borings; 68SB01, 68SB02, 68SB03, 68SB04, and 68SB05. Borings in the southern area SWMU 68 transitioned into coarser grained sandy clays, some with significant gravel. Borings 68SB06 and 68SB08 contained zones of sand and gravel. These coarser grained zones would produce limited groundwater. Borings 68SB07 and 68SB09 were adjacent to the drainage ditch located at the extremely southern limits of the investigation area for SWMU 68.

Groundwater yields at SWMU 68 were not measured quantitatively, but were observed to be very low to and estimated at 1 gallon per minute. Static water levels were not observed prior to sampling. Due to the accelerated schedule of the field activities, in combination with the high clay and silt content in most of the borings, adequate time for the groundwater elevations to stabilize was not practical. Most borings with the exception of 68SB06 and 68SB08 contained no groundwater upon completion of direct push sampling. Groundwater began to be observed only after several hours following well completion.

Based on professional experience and the literature, surficial clays typically exhibit common features. Upper portions of surficial clays tend to be fractured due to weathering (Parker, 1999). These fractures are predominantly vertical and exhibit varying degrees of interconnectivity. Fracture frequency tends to decrease with depth. Because of the parallel orientation of the fractures and typical soil bore holes, fractures are often not observed.

4.0 RCRA FACILITY INVESTIGATION ACTIVITIES

The areas around the former fire training area were investigated at SWMU 68 during November 2006. Section 4.1 discusses soil boring advancement and temporary monitoring well installation. Section 4.2 discusses the sampling and analysis program and Section 4.3 presents a discussion of the soil, groundwater and QA/QC sampling programs involved with the 2006 RFI. Analytical results are discussed in detail in Section 5.0. Figure 4-1 depicts sampling locations at SWMU 68.

Some minor deviations to the approved work plan were decided in the field due to conditions encountered. The first deviation was the elimination of a temporary well at 68SB03 due to a lack of water because of the lean clay observed in the boring samples. Therefore a groundwater sample was not collected at this location. Additionally, slow water production/available groundwater volume at temporary wells 68TW01, 68TW02, and 68TW09 resulted in the elimination of some of the parameters to be analyzed. Care was taken not to eliminate the same parameters from these wells. SVOCs and polycyclic aromatic hydrocarbons (PAHs) were not collected at 68TW01; SVOCs, polychlorinated biphenyls (PCBs), metals, sulfide, and cyanide were not collected from 68TW02; and metals, sulfide, and cyanide were not collected at 68TW09.

EPA comments were received stating a concern regarding potentially elevated arsenic concentrations in surface soil not being delineated in the northeastern portion of the site. The area in the northeast of the site was investigated to address EPA concerns regarding elevated concentrations of arsenic exceeding its human health screening level at several locations and NAPR base-wide background at one location. Therefore, Navy decided to collect additional samples from this area of the site in September 2007 to be included in the Phase I RFI.

Based on a Navy initiative to delineate lead contamination at two locations indicated as a result of the review of ECP data, two additional areas were investigated in the central portion of the site. The areas investigated surround two ECP sample locations where Ecological Food-Web based cleanup goals for lead were exceeded in surface soil; and therefore, the Navy determined the need to estimate the extent of contamination to support a removal action. The samples from these two sample locations also contained copper and/or zinc exceeding their ecological screening levels or Ecological Food-Web based Cleanup Goals. Section 6.3 presents the derivation of the Ecological Food-Web based Cleanup Goals for these metals in surface soil at this site.

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® 6620 DT track-mounted rig. GeoEnviroTech of San Juan, Puerto Rico was the DPT contractor. As presented in the Final RFI Work Plan (Baker, 2006a), a total of ten soil borings (68SB01 through 68SB10) were advanced at SWMU 68 (Figure 4-1) during the November 2006 field event. Three soil borings were advanced from the north side of the former roadway and seven borings were advanced south of the former roadway as shown on Figure 2-4. 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.

Temporary monitoring wells were installed in nine of the ten borings. Soil boring 68SB03 was not used as a temporary monitoring well, as described earlier. As indicated on the boring log, a lean white and red clay was encountered in the bottom 18 feet of the borehole underlying a sandy

layer, which was washed down by rain during the time that the borehole was left open to allow the accumulation of groundwater.

Temporary monitoring well materials were installed by hand using 10-foot long screens. This is a deviation from the work plan (which specified 5-foot long screens) which was necessary to increase the recovery of groundwater in the monitoring wells, given the observations of a limited presence of groundwater during the borehole advancement. 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 the removal of well materials. The remaining borehole annulus was grouted to ground surface with bentonite grout.

No Investigation Derived Waste (IDW) other than solid waste were generated because excess soil from drilling was placed back into the open boreholes, and liquid wastes were not generated because of the use of dedicated, disposable equipment. The dedicated/disposal sampling equipment (GeoProbe liners, stainless steel spoons, and peristaltic pump tubing) did not require decontamination, and therefore, liquid decontamination fluids were not generated.

4.2 Surface Soil Sampling

Surface soil samples were collected using stainless steel spoons at five locations in the northeast portion of the site to address concerns regarding the elevated levels of arsenic. These samples were collected in September 2007 at five locations (68SS01 through 68SS05), as shown on Figure 4-1.

Surface soil samples were also collected using stainless steel spoons at sixteen locations in the central portion of the site in October 2007. The samples were collected at locations shown on Figure 4-1 to obtain information to delineate the extent of copper, lead and zinc contamination exceeding their respective ecological screening levels and background levels. These samples were collected around two ECP sample locations. An inner ring of four locations (68SS06 through 68SS09) were sampled at 25-foot distances towards the north, south, east and west of ECP sample location 14E-01. An additional outer ring of four samples were collected at locations (68SS14 through 68SS17) at additional 25-foot distances going outward towards the north, south, east and west of the inner ring locations. Similarly surface soil samples were collected at eight locations around ECP sample location 14E-03 (68SS10 through 68SS13 in an inner ring and 68SS18 through 68SS21 in an outer ring).

4.3 Environmental Sampling and Analysis Program

Table 4-1 provides a summary of the soil and groundwater sampling and analytical program performed for the 2006 and 2007 RFI program at SWMU 68. 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 Limits (CRQL) are presented in Table 4-3.

4.3.1 Surface and Subsurface Soils

Surface soil samples were collected at soil borings 68SB01 through 68SB10 from a depth of 0 to 1-foot below ground surface (bgs). In addition, subsurface soil samples were collected at the soil borings from two-foot intervals (e.g., 1 to 3 feet bgs, 3 to 5 feet bgs, etc). A total of two

subsurface soil samples were collected from each boring. One sample was collected in the zone ranging from 1 to 7 feet and one sample was collected from the zone just above observed water bearing zones. This ranged from 9 to 15 feet in the borings, with the exception of 68SB03. Soil boring 68SB03 contained a significant amount of lean clay and no significant wet zones were encountered to 20 feet below ground surface. The second sample at 68SB03 was collected from 17 to 19 feet below ground surface.

Each of the surface and subsurface soil samples were screened in the field using a PID; screening results were recorded in a field logbook and are presented on the Test Boring Records in Appendix A. 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 sampling kits.

Ten surface soil samples and twenty subsurface soil primary environmental samples were submitted to Severn Trent Laboratory in Savannah, Georgia for analysis of Appendix IX VOCs, SVOCs, PCBs, and metals, as well as low level PAHs, TPH GRO and DRO, sulfide and cyanide.

Surface soil samples 68SS01 through 68SS05 (five primary environmental samples) were collected from a depth of 0 to 1-foot bgs and submitted to Test America Savannah (formerly Severn Trent Laboratory) in Savannah, Georgia for analysis of arsenic. Table 4-1 lists the samples that were collected for analysis of arsenic.

Surface soil samples 68SS06 through 68SS21 (16 primary environmental samples) were collected from a depth of 0 to 1-foot bgs and submitted to Test America Savannah in Savannah, Georgia for analysis of copper, lead, and zinc. Among these 16 samples, eight samples (68SS14 through 68SS21) from the outer rings of samples surrounding ECP samples 14E-01 and 14E-03 were placed on hold at the laboratory until the results from the inner rings of samples (68SS06 through 68SS13) were obtained. Table 4-1 shows the samples that were collected including the comments indicating the samples that were not selected for analysis.

Based on a scrutiny of data from the inner ring of samples around 14E-01, a decision was made to analyze the additional samples 68SS15 and 68SS17 in the outer ring because the lead concentrations exceeded its ecological cleanup goal and background level at 68SS07 and 68SS09. A decision was made not to analyze samples 68SS14 and 68SS16 because the lead, copper, and zinc concentrations in the nearest two samples in the inner ring (68SS06 and 68SS08) were below their ecological cleanup goal and its background level.

Based on a scrutiny of the data from the inner rings of samples surrounding 14E-03, a decision was made not to analyze samples 68SS18 through 68SS21 because the concentrations of copper, lead and zinc from the corresponding inner ring of samples (68SS10 through 68SS13) were below their ecological screening levels or cleanup goals. The data from samples 68SS10 through 68SS13 were deemed adequate to indicate that the extent of contamination for these metals had been adequately determined around ECP sample 14E-03.

4.3.2 Groundwater

Nine groundwater samples were collected, one from each of the temporary wells installed. Samples 68TW04, 68TW05, 68TW07, 68TW08 and 68TW09 were submitted to the analytical laboratory for Appendix IX VOCs, SVOCs, PCBs, and total and dissolved metals, as well as low level PAHs, TPH GRO and DRO, sulfide and cyanide. Due to low well yields, the analyte list was reduced for samples 68TW01, 68TW02 and 68TW09. Because of the proximity of 68TW01 and 68TW02 to each other, the analytical groups were selected to complement each other in an

attempt to complete the analytical program between these two locations. The analytical groups were prioritized in the order of those analyses that would most likely represent contamination related to fuel- and fire-training activities. Appendix IX SVOCs and low level PAHs were eliminated for sample 68TW01, and Appendix IX SVOCs, PCBs, dissolved metals, sulfide and cyanide were eliminated for sample 68TW02. Adequate volume of groundwater was available from both temporary wells to analyze Appendix IX VOCs, TPH-GRO and TPH-DRO. The next analytical fraction selected in the order of priority was low-level PAHs (rather than SVOCs), because these represent the more toxic constituents of SVOCs, and therefore, the data was expected to be more useful for risk evaluation. The need for the analysis of PCBs was also recognized because of the potential for waste transformer oil to have been used as fuel; however because of the limited volume of groundwater available at these two locations, only one of the two locations could be selected for analysis of low-level PAHs while the other was selected for the analysis of PCBs, thereby providing a full complement of organic analytes between the two. Sulfide and cyanide were selected as the lowest priority because they were considered least likely to be related to fuel- or fire-training activities.

Similarly because of limited groundwater sample volume at 68TW09, certain analytical fractions were selected in priority over others because of their greater likelihood of representing contamination related to fuel- and fire-training activities. Sulfide and cyanide were considered less important and eliminated. Dissolved metals (filtered samples) were selected instead of total metals (unfiltered samples) because of the turbidity of the sample from the temporary well.

As discussed in Section 4.1, a temporary well was not installed in soil boring 68SB03 due to the lithology and lack of water and therefore a groundwater sample was not collected from this location. Overall, groundwater samples were collected over a period of three days, due to the slow recovery rate for some of the monitoring wells.

4.3.3 Water Levels

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

4.4 Quality Assurance/Quality Control Sampling and Analysis Program

4.4.1 Field Duplicates

A total of 30 soil samples were collected as part of the 2006 RFI field sampling activity at SWMU 68. The RFI Work Plan specifies one duplicate sample to be collected for every ten primary soil samples collected. Thus, three field duplicate samples (68SB10-00D, 68SB05-01D, and 68SB10-01D) were collected concurrently during the 2006 sampling event. One sample, 68SB10-00D was associated with the surface soil samples and the latter two were associated with the subsurface soil samples. Each was analyzed for Appendix IX VOCs, SVOCs, PCBs and total metals, as well as low level PAHs, TPH GRO and DRO, and sulfide and cyanide. One

groundwater duplicate sample was collected at 68TW05 for the nine total groundwater samples collected. Duplicate samples are useful in evaluating the field sampling methodology.

An additional 21 soil samples were collected as part of the 2007 sampling event. Based on the same RFI work plan protocol, one field duplicate samples (68SS01D) was collected with the five surface soil samples in September 2007 for analysis of arsenic, and two field duplicates (68SS09D and 68SS17D) were collected with the sixteen surface soil samples during the October 2007 analysis of copper, lead and zinc. It should be noted that duplicate sample 68SS17D was not needed and therefore not analyzed due to only ten of the sixteen samples that were collected required analysis.

4.4.2 Matrix Spike/Matrix Spike Duplicates

A total of 30 soil samples were collected as part of the 2006 RFI field sampling activity. The RFI Work Plan specifies one matrix spike/matrix spike duplicate sample be collected for every 20 primary samples collected (for each matrix). Therefore, two QA/QC soil samples, 68SB10-00MS/MSD, was collected from the surface soil and 68SB10-02MS/MSD was collected from the subsurface soil to evaluate the matrix effect upon the analytical methodology for the 2006 field event. Separate MS and MSD samples of groundwater were collected at groundwater temporary well sample location 68TW05.

An additional 21 soil samples were collected during 2007 RFI field sampling activity. Based on the RFI work plan protocol, one QA/QC sample (68SS01MS/MSD) was collected during the September 2007 sampling event and another QA/QC sample (68SS09MS/MSD) was collected during the October 2007 sampling event.

4.4.3 Trip Blanks

One trip blank sample accompanied each cooler containing the samples for Appendix IX VOC and/or TPH GRO analysis. A total of four trip blank samples were prepared: 68TB01 was submitted on November 14, 2006; 68TB02 and 68TB03 were submitted on November 15, 2006; 27TB01 was submitted on November 16, 2006. Trip blank samples 68TB01 and 68TB02 were submitted with soil samples and 68TB03 and 27TB01 were submitted with groundwater samples. Trip blank sample results are used to determine whether cross-contamination occurred during sampling and/or shipping. Trip blank samples were not required during the 2007 sampling event since those samples were only analyzed for select metals.

4.4.4 Field Blanks

Field blank samples were collected from two different source waters encountered during the 2006 field event. One field blank sample (2006FB01) was collected from lab grade deionized water used as the source water for the soil sampling equipment rinsates. The other field blank sample (2006FB02) was from an NAPR potable water source used for soil and groundwater 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 collected during the 2006 field event 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.

One field blank sample (68PbFB01) was collected from lab-grade deionized water used as the source water for soil sampling equipment rinsates during the 2007 sampling event.

4.4.5 Equipment Rinsates

Three equipment rinsate samples were collected, submitted, and analyzed as part of the QA/QC program for the 2006 field event. These corresponded to dedicated (disposable) sampling equipment only. No equipment required decontamination; therefore rinsates from decontaminated equipment were not generated. 2006ER01 is rinsate of the stainless steel spoon associated with the soil sampling activities. In addition, 2006ER02 is a rinsate from the Macrocore[®] Acetate liner used during soil sampling. Finally, 2006ER04 is a rinsate from silicon/polyethylene tubing associated with groundwater sampling. Laboratory-supplied analyte-free water was used to generate the rinsates.

Equipment rinsate samples are always analyzed for the same parameters as the related environmental samples. As a result, 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.

Two equipment rinsate samples were collected and analyzed as part of the QA/QC program during the 2007 field events as described earlier for the 2006 field event. Sample 68ER01 was generated from a stainless-steel spoon batch that was used during the September 2007 sampling event, and analyzed for arsenic. Sample 68PbER01 was generated from a stainless-steel spoon batch that was used during the October 2007 sampling event.

5.0 NATURE AND EXTENT OF CONTAMINATION

This section discusses the nature of SWMU 68 contamination determined from chemical analysis of environmental samples from the Phase I RFI investigation. All of the laboratory analytical data went through a formal data validation process. Complete validated data tables for the Phase I RFI field effort are included in Appendix B; in addition, relevant portions of the data validation reports for the Phase I RFI Sample Delivery Groups (SDGs) are provided in Appendix C; a summary discussion of the necessary laboratory level data adjustments to the data is presented in Section 5.5.

The PID field screening results are presented on the Test Boring Records in Appendix A (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 SWMU 68 investigation were all below background levels, as noted on the boring logs provided in Appendix A.

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 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 1×10^{-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, it should be noted that 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 clay soil type (most prevalent soil type at SWMU 68) 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 68, no samples were collected between 1- 2 feet (see Table 4-1), so only the surface soil table contains ecological screening of soil.

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, 2002) were selected for use as surface water screening values. Updates to these NAWQC can be found at

(<http://www.epa.gov/waterscience/criteria/wqcriteria.html>), and the updated concentrations for inorganic compounds were used as screening values in the RFI tables below. 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, 2002). 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 (NOEC, Lowest Observed Effect Concentration [LOEC], median lethal concentration [LC₅₀], and median effective concentration [EC₅₀] values) for saltwater species contained in the ECOTOX Database System (AQUIRE database) (USEPA, 2003).
- LC₅₀ values for saltwater species contained in Superfund Chemical Matrix (USEPA, 1996b)

Chronic-based screening values were extrapolated from acute NOEC, LOEC, LOEL, LC₅₀, and EC₅₀ 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 EC₅₀ or LC₅₀ 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 LC₅₀ and EC₅₀ values, and EC₅₀ values were given preference over LC₅₀ 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

Thirty one surface soil samples were collected and twenty five of these samples were analyzed during the Phase I RFI. Ten surface soil samples were analyzed for Appendix IX VOCs, SVOCs, PCBs, as well as low level PAHs, TPH DRO and GRO, and Appendix IX metals. Additionally, five surface soil samples were analyzed for arsenic only; and ten surface soil samples were analyzed for copper, lead, and zinc only. A detected results table for the combined surface soil data set is presented in Table 5-1. Results are compared to appropriate media specific criteria as described in Section 5.1.

Five VOCs were detected in the surface soil. Four of them were only detected at low, estimated concentrations, and all were well below the listed criteria. Acetone, detected in all surface soil samples, is believed to be non-site related. No SVOCs or PCBs were detected in the surface soil. Four PAHs were found at one location, 68SB02-00, and all were estimated concentrations. Very low, estimated GRO concentrations were noted at various locations. Fifteen inorganic compounds were detected in the surface soil at SWMU 68, and most of these were found at all locations. Thallium was only found at 68SB02-00.

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

- Arsenic
- Barium
- Chromium
- Cobalt
- Copper
- Lead
- Selenium
- Vanadium

Concentrations of arsenic exceeded its residential PRG at 14 locations, and industrial PRG at five locations. However, it exceeded the industrial PRG and background only at one location (68SB02). None of the arsenic concentrations exceeded its ecological screening level at any of the 15 locations.

The concentration of barium exceeded its background and cobalt marginally exceeded its background at one location (68SB02). However, none of the barium concentrations exceeded its human health and ecological screening levels at any of the 10 locations and cobalt concentrations exceeded its ecological screening level at six locations five of which were below background.

Concentrations of chromium, selenium, and vanadium exceeded one or more screening levels. However, none of their concentrations exceeded their background levels at any location.

Concentrations of copper exceeded its ecological screening level (70 mg/kg) only at 68SS07. However, its concentrations did not exceed its background level at any of the 20 locations. Based on these findings, the extent of its contamination around ECP sample locations 14E-01 and 14E-03 has been defined.

Concentrations of lead exceeded its background level at five locations (68SB08, 68SS07, 68SS09, 68SS10, and 68SS15). Lead concentrations did not exceed its ecological screening level (120 mg/kg), but they did exceed the cleanup goal (87 mg/kg) at two locations (68SS07 and 68SS09) flanking the ECP sample 14E-01. However, based on the concentrations at 68SS15 and 68SS17 being below its cleanup goal and background level, the extent of its contamination around ECP sample 14E-01 has been defined. Furthermore, based on the concentrations at 68SS10 through 68SS13 being below its cleanup goal, the extent of its contamination around ECP sample 14E-03 has also been defined.

Although the concentrations of zinc exceeded its ecological screening level at ECP sample locations 14E-01 and 14E-03, the ten samples surrounding these two locations contained zinc concentrations below its screening level. Therefore, the extent of its contamination around the ECP sample locations has been defined.

It is likely that the lead contamination at the site is due to Navy activities because its concentration is more than twice the NAPR background screening value for lead in surface soil at 68SB08, 68SS07, 68SS09, and 68SS10. The arsenic exceedance of background at 68SB02 does not appear to be due to Navy activities, since it is only slightly above the NAPR background concentration. However, arsenic was also found in the subsurface soil at somewhat elevated levels.

Additionally, potential human exposure to arsenic concentrations in soil were evaluated due to the exceedences of both the PRG and background. However, to present a complete exposure scenario, arsenic concentrations in surface and subsurface soil were evaluated together by combining surface and subsurface soil analytical data to form a total soil data set. The results of this evaluation are presented in Section 5.3 with the discussion of subsurface soil results.

5.2.1 Evaluation of Upper Trophic Level Terrestrial Food Web Exposures

The ecological surface soil screening values used in the comparison to the SWMU 68 surface soil analytical data are literature-based toxicological thresholds designed to be protective of terrestrial plants and/or invertebrates. As such, they do not take into consideration potential risks to upper trophic level receptors from dietary exposures to chemicals in surface soil. To address potential exposures to upper trophic level receptors, dietary intakes were estimated and risk estimates were derived for a terrestrial avian herbivore, omnivore, and carnivore (mourning dove [*Zenaida macroura*], American robin [*Turdus migratorius*], and red-tailed hawk [*Buteo jamaicensis*], respectively) using the procedures presented in the sections that follow. These procedures have previously been used in EPA-approved ecological risk assessments (ERAs) conducted at NAPR for SWMUs 1, 2, and 45 (Baker, 2006c and 2006d).

As a measure of conservatism, upper trophic level risk estimates were derived for each Appendix IX metal detected in one or more of the RFI surface soil samples (see Table 5-1) and ECP surface soil samples (see Appendix D) at concentrations greater than NAPR background surface soil screening values presented in the document entitled Revised Final Summary Report for Environmental Background Concentrations of Inorganic Compounds (Baker, 2006b). Upper trophic level risk estimates also were derived for the bioaccumulative organic chemicals detected in one or more of the RFI and ECP surface soil samples (bioaccumulative organic chemicals are defined in Section 5.2.1.3). The specific chemicals evaluated for terrestrial food web exposures are listed below.

- Chlorobenzene
- Styrene
- Benzo(a)anthracene
- Chrysene
- Fluoranthene
- Pyrene
- Arsenic
- Barium
- Cobalt
- Copper
- Lead
- Tin
- Zinc

5.2.1.1 Selection of Receptors

Because of the complexity of natural systems, it is generally not possible to directly assess the potential impacts to all ecological receptors present within an area. Therefore, specific receptor species (e.g., mourning dove) or species groups (e.g., terrestrial plants) are often selected as surrogates to evaluate potential risks to larger components of the ecological community (e.g., avian herbivores) that are used to represent the assessment endpoints (e.g., survival, growth, and reproduction of avian herbivores). Selection criteria typically include those species that:

- Are known to occur, or are likely to occur, at the site;
- Have a particular ecological, economic, or aesthetic value;
- Are representative of taxonomic groups, life history traits, and/or trophic levels in the habitats present at the site for which complete exposure pathways are likely to exist;
- Can, because of toxicological sensitivity or potential exposure magnitude, be expected to represent potentially sensitive populations at the site; and
- Have sufficient ecotoxicological information available on which to base an evaluation.

As outlined in Section 5.2.1, the mourning dove, American robin, and red-tailed hawk were selected for upper trophic level receptor dietary exposure modeling. With the exception of the American robin, the upper trophic level receptors listed above are known to occur at NAPR (Raffaele, 1989). The American robin was selected as a surrogate species to represent birds reported from NAPR with similar feeding habits and dietary preferences (e.g., red-legged thrush).

A terrestrial mammal was not selected for evaluation as the species represented by potentially complete exposure pathways (black rat [*Rattus rattus*], Norway rat [*Rattus norvegicus*], and small Indian mongoose [*Herpestes javanicus*] are nonindigenous and have been implicated in the

decline of native bird and reptile populations (United States Geological Survey [USGS], 1999 and United States Fish and Wildlife Service [USFWS], 1996).

5.2.1.2 Ingestion-Based Screening Values

Ingestion-based screening values for dietary exposures were derived for each receptor species and chemical evaluated for food web exposures. Toxicological information from the literature for wildlife species most closely related to the receptor species was used if available. This information was supplemented by laboratory studies of non-wildlife species (e.g., laboratory mice) when necessary.

Chronic No Observed Adverse Effect Levels (NOAELs) based on growth or reproduction were preferentially used as ingestion-based screening values for upper trophic level receptors. NOAELs represent the highest dose of a chemical at which an effect being measured in a toxicity test does not occur. If several chronic toxicity studies were available from the literature, the most appropriate study was selected for each receptor species based on study design, study methodology, study duration, study endpoint and test species. When chronic NOAEL values were unavailable, estimates were derived or extrapolated from chronic Lowest Observed Adverse Effect Levels (LOAELs) or median lethal dose acute values (LD_{50}). LOAELs represent the lowest dose of a chemical at which an effect being measured in a toxicity test occurs, while an LD_{50} represents the dose of a chemical at which half of the organisms being tested die. An uncertainty factor of 10 was used to convert a reported chronic LOAEL to a chronic NOAEL, while an uncertainty factor of 100 was used to convert the acute LD_{50} to a chronic NOAEL (i.e., the LD_{50} was multiplied by 0.01 to obtain the chronic NOAEL).

Ingestion-based screening values for the bird species selected as ecological receptors (mourning dove, American robin, and red-tailed hawk, expressed as milligrams of the chemical per kilogram body weight of the receptor per day (mg/kg-BW/day), are summarized in Table 5-2. Sample et al. (1996) consider a scaling factor of 1.0 most appropriate for interspecies extrapolation between birds. Therefore, the NOAEL and LOAEL values summarized in Table 5-2 were not adjusted to reflect differences in body weights between avian test species and avian receptor species. Not all detected organic chemicals were evaluated for terrestrial food web exposures. The organic chemicals evaluated for food web exposures were limited to those listed in Table 5-3 with the potential to bioaccumulate to a significant extent. Bioaccumulative organic chemicals are defined as those with a maximum reported log octanol-water partition coefficient ($\log K_{ow}$) greater than or equal to 3.0. Rationale for using a $\log K_{ow}$ of 3.0 to define an organic chemical with the potential to bioaccumulate is included as Appendix E. This approach has been used in EPA-approved ERAs conducted at NAPR for SWMUs 1, 2, and 45 (Baker, 2006c and 2006d).

5.2.1.3 Exposure Estimation

As outlined in Section 5.2.1, dietary intakes and risk estimates were derived for chlorobenzene, styrene, benzo(a)anthracene, chrysene, fluoranthene, pyrene, arsenic, barium, cobalt, copper, lead, tin, and zinc. For arsenic, barium, cobalt, copper, lead, and zinc, 95 percent upper confidence limit (UCL) of the mean concentrations were used to estimate potential chemical exposures by the mourning dove, American robin, and red-tailed hawk. 95 percent UCL concentrations were derived using USEPA ProUCL Version 4.00.02 software available at <http://www.epa.gov/esd/tsc/form.htm> (see Appendix F). In some cases, duplicate samples were collected in the field. The maximum concentration of each chemical in the original or duplicate sample was used in the derivation of 95 percent UCL concentrations. If more than one 95 percent UCL was recommended by the ProUCL software, the maximum value was used in the estimation of dietary exposures. Based on a low frequency of detection or low number of data points,

maximum detected chlorobenzene, styrene, benzo(a)anthracene, chrysene, fluoranthene, pyrene, and tin concentrations were used to conservatively estimate potential chemical exposures by the avian receptors selected for evaluation.

Exposures for upper trophic level receptor species via the food web were determined by estimating chemical-specific concentrations in each dietary component using uptake and food web models. Incidental ingestion of soil also was included when calculating the total level of exposure. Tissue concentrations were modeled for terrestrial plants (food item for American robin and mourning dove), soil invertebrates (food item for American robin), and small mammals (food item for red-tailed hawk). Specific small mammal species were not selected as dietary items for the red-tailed hawk. Instead, a specific trophic level (omnivore) was used to represent the small mammals present in Puerto Rico that represent potential food items (e.g., Norway rat and black rat). Small mammal herbivores and insectivores were excluded as food items for the red-tailed hawk because they are not part of the Puerto Rican mammalian fauna.

5.2.1.3.1 Exposure Point Concentrations

The uptake of chemicals from the abiotic media into terrestrial food items is based (where available) on mean/median bioconcentration factors (BCFs) or bioaccumulation factors (BAFs) from the literature. A BCF indicates the degree to which a chemical may accumulate in organisms coincident with the concentration of the chemical in the surrounding media. They are calculated by dividing the concentration of a chemical in the tissue of organisms by the concentration in the surrounding media. BAF values consider both direct exposures to the surrounding media, as well as uptake from dietary exposures. As such, BAFs were given preference over BCFs when estimating prey item tissue concentrations. Default factors of 1.0 were used only when data are unavailable for chemicals in the literature. The methodology and models used to derive these estimates are described below.

Terrestrial Plants. Tissue concentrations in the aboveground vegetative portion of terrestrial plants were estimated by multiplying 95 percent UCL surface soil concentrations or, in the case of chlorobenzene, styrene, benzo(a)anthracene, chrysene, fluoranthene, pyrene, and tin, maximum detected surface soil concentrations by chemical-specific soil-to-plant BCFs obtained from the literature. The BCF values used were based on root uptake from soil and on the ratio between dry-weight soil and dry-weight plant tissue. Literature values based on the ratio between dry-weight soil and wet-weight plant tissue were converted to a dry-weight basis by dividing the wet-weight BCF by the estimated solids content for terrestrial plants (15 percent [0.15]; Sample et al., 1997).

BCFs for terrestrial plants are those reported in Baes et al. (1984) or Bechtel Jacobs (1998). For organic chemicals without literature based BCFs, soil-to-plant BCFs were estimated using the algorithm provided in Travis and Arms (1988):

$$\text{Log } B_v = 1.588 - (0.578) (\text{Log } K_{ow})$$

where:

$$\begin{aligned} \text{Log } B_v &= \text{Log soil-to-plant BCF (unitless; dry weight basis)} \\ \text{Log } K_{ow} &= \text{Log octanol-water partitioning coefficient (unitless)} \end{aligned}$$

The Log K_{ow} values used in the calculations were obtained primarily from the USEPA (1995 and 1996a) and are listed in Table 5-3. The soil-to-plant BCFs used in the derivation of mourning dove and American robin dietary intakes are summarized in Table 5-4.

Earthworms. Tissue concentrations in soil invertebrates (earthworms) were estimated by multiplying 95 percent UCL surface soil concentrations or, in the case of chlorobenzene, styrene, benzo(a)anthracene, chrysene, fluoranthene, pyrene, and tin, maximum detected surface soil concentrations by chemical-specific soil-to-earthworm BCFs or BAFs obtained from the literature. BCFs are calculated by dividing the concentration of a chemical in the tissues of an organism by the concentration of that same chemical in the surrounding environmental medium (in this case, surface soil) without accounting for uptake via the diet. BAFs consider both direct exposure to soil and exposure via the diet. Since earthworms consume soil, BAFs are more appropriate values and were used in the food web models when available. BAFs based on depurated analyses (soil was purged from the gut of the earthworm prior to analysis) were given preference over undepurated analyses when selecting BAF values since direct ingestion of surface soil is accounted for separately in the food web model.

The BCF/BAF values used (see Table 5-4) are based on the ratio between dry-weight soil and dry-weight earthworm tissue. Literature values based on the ratio between dry-weight soil and wet-weight earthworm tissue were converted to a dry-weight basis by dividing the wet-weight BCF/BAF by the estimated solids content for earthworms (16 percent [0.16]; USEPA, 1993). For inorganic chemicals without available measured BCFs/BAFs, an earthworm BAF of 1.0 was assumed.

Small Mammals. Whole-body tissue concentrations in small mammals (omnivores) were estimated using one of two methodologies. For chemicals with literature-based soil-to-small mammal BAFs, small mammal tissue concentrations were estimated by multiplying 95 percent UCL surface soil concentrations or, in the case of chlorobenzene, styrene, benzo(a)anthracene, chrysene, fluoranthene, pyrene, and tin, maximum detected surface soil concentrations by chemical-specific soil-to-small mammal BAFs. The BAF values used are based on the ratio between dry-weight soil and whole-body dry-weight tissue. Literature values based on the ratio between dry-weight soil and wet-weight tissue were converted to a dry-weight basis by dividing the wet-weight BAF by the estimated solids content for small mammals (32 percent [0.32]; USEPA, 1993). The soil-to-small mammal BAFs used in the screening-level ERA (see Table 5-5) are those reported in Sample et al. (1998) for omnivores (or for general small mammals if omnivore values were unavailable).

For those chemicals without soil-to-small mammal BAF values, an alternate approach was used to estimate whole-body tissue concentrations. Because most chemical exposure for small mammal species is via the diet, it was assumed that the concentration of each chemical in a small mammal's tissues is equal to the chemical concentration in its diet, that is, a diet to whole-body BAF (wet-weight basis) of one was assumed. Resulting tissue concentrations (wet-weight) were converted to dry weight using an estimated solids content of 32 percent (see above).

The use of a diet to whole-body BAF of one is likely to result in a conservative estimate of chemical concentrations for chemicals that are not known to biomagnify in terrestrial food chains (e.g., aluminum). For chemicals that are known to biomagnify (e.g., polychlorinated biphenyls [PCBs]), a diet to whole-body BAF value of one will likely result in a realistic estimate of tissue concentrations based on reported literature values. For example, a maximum BAF (wet weight) value of 1.0 was reported by Simmons and McKee (1992) for PCBs based on laboratory studies with white-footed mice. Menzie et al. (1992) reported BAF values (wet-weight) for dichlorodiphenyldichloroethane (DDT) of 0.3 for voles and 0.2 for short-tailed shrews. Reported BAF (wet-weight) values for dioxin are only slightly above one (1.4) for the deer mouse (USEPA, 1990).

5.2.1.3.2 Dietary Intakes

Dietary intakes for each upper trophic level avian receptor species were calculated using the following formula modified from USEPA (1993).

$$DI_x = \frac{[[\sum_i [(FIR)(FC_{xi})(PDF_i)] + [(FIR)(SC_x)(PDS)]] [AUF]}{BW}$$

where:

- DI_x = Dietary intake for chemical x (mg chemical/kg body weight/day)
- FIR = Food ingestion rate (kilograms per day [kg/day], dry-weight)
- FC_{xi} = Concentration of chemical x in food item i (mg/kg, dry weight)
- PDF_i = Proportion of diet composed of food item i (mg/kg, dry weight)
- SC_x = Concentration of chemical x in surface soil/subsurface soil (mg/kg, dry weight)
- PDS = Proportion of diet composed of soil (dry weight basis)
- BW = Body weight (kg, wet weight)
- AUF = Area Use Factor (unitless)

Receptor-specific exposure parameters (mean food ingestion rates and mean body weights) for the mourning dove, American robin, and red-tailed hawk are provided in Table 5-6. The food items selected for each receptor species and the percent contribution to their total diet is provided in Table 5-7. Table 5-6 contains exposure parameters and Table 5-7 contains a dietary composition for a small mammal omnivore. As discussed in Section 5.2.1.3, the diet of the red-tailed hawk (excluding surface soil) is assumed to be small mammal omnivores. This assumption is based on likely small mammal prey species present in Puerto Rico (rats). Identification of exposure parameters and food items was necessary when estimating small mammal whole body tissue concentrations for those chemicals that lack a literature-based soil-to-small mammal BAF (i.e., an exposure dose was necessary to estimate tissue concentrations). An assumed diet of 49 percent terrestrial vegetation, 49 percent terrestrial invertebrates, and 2 percent soil was selected as the diet for a small mammal omnivore.

For this evaluation, an AUF of 1.0 was assumed (i.e., each receptor is assumed to spend 100 percent of its time on the site). As such, receptor-specific home ranges were not considered in the estimation of dietary intakes.

5.2.1.4 Risk Calculation.

Ecological chemicals of potential concern (COPC) for terrestrial food web exposures were selected using the hazard Quotient (HQ) method. For a given chemical, an HQ was calculated by dividing the exposure dose by the corresponding ingestion-based screening value. HQs were calculated with NOAELs, LOAELs, and MATCs. The MATC is derived by taking the geometric mean of the NOAEL and LOAEL. Chemicals with NOAEL-based HQs greater than or equal to 1.0 were identified as ecological COPCs for terrestrial avian food web exposures. As evidenced by Table 5-8, NOAEL-based HQ values for benzo(a)anthracene, chrysene, fluoranthene, pyrene, arsenic, barium, cobalt, copper, tin, and zinc are less than 1.0. However, the lead HQ value for the American robin is greater than 1.0 (i.e., HQ = 1.15), indicating that this metal may present unacceptable risk to terrestrial avian omnivores feeding exclusively at SWMU 68. It is noted that HQ values for chlorobenzene and styrene could not be derived due to the lack of literature-based screening values (see Table 5-2). Styrene was detected in one of ten Phase I RFI surface soil

samples (2.8J ug/kg in 68SB03-00), while chlorobenzene was detected in each Phase II ECP surface soil sample at a maximum concentration of 5J ug/kg (14E-03D). Although the low magnitude of detections are not likely to impact avian receptor populations, the lack of ingestion-based screening values for chlorobenzene and styrene is a source of uncertainty.

5.3 Subsurface Soils

Twenty primary subsurface soil samples were collected and analyzed during the Phase I RFI. All twenty subsurface soil samples were analyzed for Appendix IX VOCs, SVOCs, PCBs, and metals, as well as low level PAHs, TPH DRO and GRO. A detected results table for the subsurface soil data set is presented in Table 5-9. Results are compared to USEPA Region IX Residential Soil PRGs, Industrial Soil PRGs, and NAPR Basewide Background (metals only) criteria.

Five VOCs were detected in the subsurface soil. Four of them were primarily detected at low, estimated concentrations, and all were below the listed criteria. Acetone, detected in most subsurface soil samples, is believed to be non-site related. No SVOCs, PCBs, or TPH compounds were detected in the subsurface soil. Five PAHs were found at one location, 68SB03-01, and all were at low, estimated concentrations. Fourteen inorganic compounds were detected in the subsurface soil at SWMU 68, and most of these were found at all locations.

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

- Arsenic
- Barium
- Chromium
- Selenium
- Vanadium

Vanadium exceeded the PRGs at all ten locations. However, vanadium exceeded its background screening level at only one location, and by only 1.5 percent. It is highly unlikely that vanadium contamination resulted from Navy activities. Arsenic exceeded the PRGs at all but one location, and its background screening level at three locations, 68SB01-01, 68SB02-02, and 68SB04-02. Barium, chromium, and selenium all exceeded their background screening levels at select locations, but not any PRGs.

It is probable that subsurface soils may have been slightly impacted by arsenic contamination. Only the exceedance at location at 68SB01-01 is significant, however, because the other two exceedances above background are at depths greater than 10 feet, and not part of any human health or ecological pathway.

As previously mentioned, potential human exposure to arsenic concentrations in soil at SWMU 68 were evaluated due to exceedences of both the PRG and background. Preliminary risk calculations were performed under a future residential exposure scenario in order to more fully evaluate potential human health risks from arsenic in soil. To present a complete exposure scenario, arsenic concentrations in surface and subsurface soil were evaluated together by combining surface and subsurface soil analytical data from the Phase II ECP Report and the Draft Phase I RFI Report to form a total soil data set. However, analytical results for samples collected from depths greater than 10 feet bgs were eliminated from this combined data set because residential exposures beyond this depth are not likely. USEPA ProUCL Version 4.00.02 software

was used to determine the distribution of the data set and calculate the exposure point concentration (EPC).

The results of the preliminary risk calculations are presented in Appendix G. The distribution and EPC (95 percent Upper Confidence Limit of the mean) for arsenic are presented in Table G-1, while exposure parameters used in the preliminary risk calculations are presented in Table G-2. The results of the preliminary risk calculations are presented in Tables G-3 (future adult resident) and G-4 (future child resident). As shown on Table G-3, the carcinogenic risk for the future adult resident is 1.2×10^{-06} , and the hazard index is less than 0.01. As shown on Table G-4, the carcinogenic risk for the future child resident is 2.6×10^{-06} , and the hazard index is 0.07. As evidenced by Tables G-3 and G-4, there are no unacceptable carcinogenic or noncarcinogenic risks calculated from potential exposure to arsenic in soil at SWMU 68. Furthermore, the low carcinogenic and noncarcinogenic risk levels calculated demonstrate that arsenic in soil would not be a risk driver if a baseline human health risk assessment was conducted.

5.4 Groundwater

A total of nine groundwater samples were collected and analyzed as part of the Phase I RFI field activities. All samples were analyzed for Appendix IX VOCs, SVOCs, PCBs and total metals, as well as low level PAHs, and TPH GRO and DRO, with the exception of 68TW01, 68TW02, and 68TW09, as shown in Table 4-1. Due to low well yields, the analyte list was reduced for samples from these wells. Appendix IX SVOC's and PCBs were eliminated for sample 68TW01. SVOC's and total metals were eliminated for sample 68TW02, and total metals were eliminated for sample 68TW09.

A detected results table for the groundwater data set is presented in Table 5-10. 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.

Two VOCs and two SVOCs were detected in the groundwater at very low, estimated concentrations, and only at locations 68TW07, 68TW08, and 68-TW09. None were above any criteria. No PAHs, PCBs, or TPH compounds were detected in the groundwater.

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

- Arsenic
- Chromium
- Lead
- Vanadium

However, none of these compounds exceeded any background screening levels for groundwater at NAPR, and they are unlikely to be present at SWMU 68 as a result of Navy activities.

Only arsenic and vanadium were present above PRGs in the dissolved analyses, and neither exceeded the background screening level for that particular compound.

5.5 Laboratory Data Validation Summary

More specific data validation findings, as they relate to each SDG, are discussed in Sections 5.5.2 through 5.5.6 below. Data validation reports are included in Appendix C. In addition, the Puerto Rican Chemist Certification for each STL SDG is presented in Appendix C.

5.5.1 Summary of Detected Compounds in Field QA/QC Samples

Field generated QA/QC samples for the Phase I RFI 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 metals, as well as low level PAHs, TPH DRO and GRO. Table 5-11 presents the detected compounds found in the trip blanks, equipment rinsates, and field blanks.

Small concentrations of bromoform and chlorodibromomethane were detected in trip blank 68TB02. All other trip blanks were non-detect for VOCs and GRO.

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

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 22001-1

This SDG (22001-1) is relevant to the analytical findings associated with the 2006 surface and subsurface 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:

VOCs

- The initial and continuing GC/MS calibration exhibited some compounds with unacceptable relative response factor and percent difference values, which resulted in qualifying non-detect results as estimated values for the following VOCs: acrolein, isobutanol, pentachloroethane, vinyl acetate, 1,1,1-trichloroethane, carbon tetrachloride, benzene, 1,2-dichloroethane, dibromomethane, dibromodichloromethane, cis-1,3-dichloropropene, iodomethane, 3-chloro-1-propene, 2-chloro-1,3-butadiene, 4-methyl-2-pentanone, chloromethane, and chloroethane. However, the non-detect results for isobutanol and acrolein in sample 68TB01 was rejected.

SVOCs

- The associated initial and continuing calibrations exhibited percent difference and relative response factor values outside of acceptable limits for several compounds, which resulted in qualifying their non-detect results in 13 samples as estimated. The SVOCs effected include: 4-nitroquinoline-1-oxide, 1,4-dioxane, 2,4-dinitrophenol, a,a-dimethylphenethylamine, 0,0,0-triethylphosphorothioate, phorate, dimethoate, 2-picoline,

n-nitrosodiethylamine, ethylmethanesulfonate, n-nitrosomorpholine, methapyriline, hexachlorophene, aramite, diallate, 2-picoline, diallate, and hexachloropropene.

- The initial calibration exhibited unacceptable percent relative standard deviation and mean relative response factor values for 4-nitroquinoline-1-oxide, which resulted in the non-detect results in 13 samples to be rejected.

PAHs

- Fluoranthene was detected in the field blank (2006FB02) which resulted in the detected value for this compound to be qualified as a non-detected in sample 68SB03-1.

DROs

- Diesel range organics (C10-C28) were found in the field blank (2006FB01) which resulted in the results to be considered non-detected in samples 68SB05-00, 68SB05-02, and 68SB05-01D.

Metals

- The CRDL standards associated with the samples exhibited a percent recovery outside the QC limits for tin which resulted in the non-detect results for tin in all of the samples to be qualified as estimated.
- The interference check sample exhibited percent recovery outside of acceptable limits, which resulted in the detected results for zinc, in all of the samples in this SDG, to be qualified as estimated and the detected results for cadmium in three samples to be qualified as estimated.
- The MS/MSD samples exhibited unacceptable percent recovery and relative percent difference values for antimony, chromium, lead and nickel which resulted in the qualification of their respective results as estimated in all of the samples except for sample 68SB01-01.
- The field duplicate results showed relative percent difference values outside the limits for two metals that resulted in the detected value for cobalt in sample 68SB05-01 to be qualified as rejected, while the detected value for vanadium in this sample to be qualified as estimated.
- The interference check serial dilution sample exhibited unacceptable percent difference for barium, vanadium and copper which resulted in the detected values in two samples to be considered estimated.
- The field blank QC sample detected copper at levels that resulted in the detected values for copper in two samples (68SB03-02 and 68SB03-02) to be rejected and the detected values in the remaining samples to be qualified as estimated values.

Data Validation Summary for SDG 22001-1

The majority of the data validation measures for this SDG involved the qualification of non-detected results as estimated values primarily due to issues identified during initial and continuing GC/MS calibration. One potentially important data validation issue noted in this SDG is with the field blanks. Fluoranthene was detected in one of the field blank samples (2006FB02), which resulted in the detected value for this PAH to be qualified as a non-detect in one sample.

However, the source of the water used in the field blank was tap water, which was used as the initial rinse of the field equipment. In addition, the results of contamination of DRO in field blank sample 2006FB01 resulted in the qualification of detected results in three samples to be changed to non-detects. Since this measure impacted only the DRO analysis in three of the 13 samples in this SDG the potential impact of this measure on the data quality objectives is not expected to be significant. The field duplicate result resulted in the detected concentration for cobalt in one sample to be rejected. This data validation measure impacted only one metal in one of 13 samples, thus the impact to the data validation program is minimal. Lastly, the field blank sample 2006FB02 had copper contamination, which resulted in the rejection of the detected copper results in two samples. As noted above, the source of the water used in the field blank was tap water, which was used as the initial rinse of the field equipment. In addition, this particular validation measure impacted only two of the thirteen samples in this SDG. Based on this analysis, the changes in the results due to the application of the data validation qualifies did not compromise the data quality objectives for this SDG.

5.5.3 STL Savannah SDG 22012-1

This SDG (22012-1) is relevant to the analytical findings associated with the 2006 surface and subsurface 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:

VOCs

- Two samples (68TB02 and 68SB10-2) both exceeded their holding time by one day, which resulted in qualifying all of the results in these two samples as values.
- Four samples (68SB08-01, 68SB07-00, 68SB07-01, and 68SB10-02) had percent surrogate recoveries outside acceptable limits, which resulted in qualifying the associated results as estimated values.
- The percent recovery and relative percent difference in the MS/MSD sample resulted in qualifying some of the volatile organic compound results in two samples (68SB10-00 and 68SB10-02) as either estimated or rejected values. The two compounds that had their respective non-detect results rejected include styrene and vinyl acetate in sample 68SB10-02.
- The associated initial and continuing GC/MS calibrations exhibited high relative standard deviations and percent difference for several compounds, which resulted in qualifying some of these compounds as estimated or rejected values. The VOCs that had their results qualified as estimated include: acrolein, iodomethane, chloroethane, 3-chloro-1-propene, 2-chloro-1,3-butadine, pentachloroethane, 4-methyl-2-pentanone, cis & trans-1,3-dichloropropene, and chloromethane. However, all of the non-detect results for isobutanol in this SDG were rejected.
- The internal standard area performance was considered low for one sample (68SB08-1) which resulted in qualifying the results as estimated. The only constituent that had detected concentration qualified as estimated in this sample was acetone.

SVOCs

- The associated initial and continuing calibrations exhibited percent difference and relative response factor values outside of acceptable limits for several compounds, which resulted in qualifying their non-detect results in 20 samples as estimated. The SVOCs effected include: 4-nitroquinoline-1-oxide, 1,4-dioxane, 2,4-dinitrophenol, a,a-dimethylphenethylamine, 0,0,0-triethylphosphorothioate, phorate, dimethoate, 2-picoline, n-nitrosodiethylamine, ethylmethanesulfonate, n-nitrosomorpholine, methapyriline, hexachlorophene, aramite, diallate, 2-picoline, diallate, and hexachloropropene.

PAHs

- Method blank contamination was noted for naphthalene which resulted in each result in the 20 soil samples to be considered non-detect.
- The continuing calibrations exhibited percent difference and relative response factor values outside the acceptable limits for fluoranthene and benzo(a)pyrene in one soil sample, which resulted in qualifying the non-detect results for these compounds in sample 68SB10-02 as estimated.

PCBs

- Only one sample exhibited unacceptable surrogate percent recovery values (68SB04-00), which resulted in qualifying the results in the sample as estimated values.

Metals

- The CRDL standards exhibited low percent recovery values for tin which resulted in qualifying all of the non-detect results for this metal as estimated.
- The method and calibration blanks exhibited contamination of nickel and mercury which resulted in the detected values for mercury in two samples, and nickel in six samples to be qualified as non-detects.
- The percent recovery for the ICP interference check sample resulted in the zinc 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 antimony, barium, cobalt, copper, mercury, chromium, and tin in a number of samples that resulted in the results to be considered estimated values.
- The ICP serial dilution sample exhibited unacceptable percent difference values for barium and vanadium which resulted in qualifying their respective detected values as estimated in samples 69SB06-02, 68SB08-01, and 68SB09-01.
- Contamination in the field blank sample 2006FB02 resulted in the detected concentrations for copper in all 20 samples to be considered estimated values.

Data Validation Summary for SDG 22012-1

The majority of the data validation measures for this SDG involved the qualification of non-detected results as estimated values primarily due to issues identified during initial and continuing GC/MS calibration. The only potentially important data validation issue noted in this SDG is with regards to some of the metals. The method and calibration blanks showed contamination of nickel and mercury. This validation measure resulted in the detected concentrations for mercury

in two samples and nickel in six samples to be considered non-detects. However, the unvalidated detected concentrations for these two metals were orders of magnitude less than their respective U.S. EPA Region III Risk-Based Levels. Based on this analysis, the changes in the results due to the application of the data validation qualifies did not compromise the data quality objectives for this SDG.

5.5.4 STL Savannah SDG 22012-5

This SDG (22012-5) 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

- The MS/MSD samples exhibited percent recovery and relative percent difference values outside acceptable limits for dichlorodifluoromethane, which resulted in the non-detect results in all of the samples to be considered estimated values.
- Some volatile organic compounds had unacceptable relative response factor and percent difference values during initial and continuing GC/MS calibration, which resulted in qualifying some results as either estimated or rejected. The non-detected results for isobutanol and pentachloroethane and in 10 samples were qualified as rejected. The non-detect results for dichlorodifluoromethane were qualified as estimated in six samples. The non-detect results for bromomethane and 4-methyl-2-pentanone were qualified as estimated in seven samples and the trans-1,4-dichloro-2-butene non-detect result in one sample was qualified as estimated.

SVOCs

- The compound diethyl phthalate was detected in the field blank, which resulted in the detected result in sample 68TW09 to be considered a non-detect.
- Some semi-volatile organic compounds had unacceptable relative response factor and percent difference values during initial and continuing GC/MS calibration, which resulted in qualifying their results as either estimated or rejected. The non-detect results for 4-nitroquinoline-1-oxide were rejected in six samples, while the non-detect results for 13 other VOCs were qualified as estimated in various samples.

PAHs

- The MS/MSD samples exhibited percent recovery and relative percent difference values outside acceptable limits for benzo(b)pyrene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene in sample 68TW05, which resulted in the non-detect results for these compounds to be further qualified as estimated.

DROs

- The results of the field blank resulted in the detected values for DRO C10-C28 in eight samples to be qualified as non-detects.

PCBs

- The surrogate recoveries in five samples exceeded acceptable limits which resulted in all of the non-detect results to be further qualified as estimated.

Metals

- The CRDL standards associated with various samples exhibited a percent recovery outside the QC limits for tin, which resulted in the qualification of the detected concentrations in two samples to be qualified as estimated and the non-detect results in the remaining samples to be qualified as estimated.
- The method and continuing calibration blanks exhibited contamination for nickel, selenium, and thallium in various samples which resulted in the detected values to be considered non-detects. This validation measure impacted the results in seven samples for nickel, four samples for selenium, and three samples for thallium.
- The percent recovery in the ICP interference check sample was outside acceptable limits which resulted in the detected zinc concentrations in eight samples to be qualified as estimated.
- The MS/MSD samples exhibited percent recovery and relative percent difference values were outside acceptable limits for barium, vanadium, chromium and cobalt in various samples, which resulted in the results in eight samples to be qualified as estimated.

Data Validation Summary for SDG 22012-5

The majority of the data validation measures for this SDG involved the qualification of non-detected results as estimated or rejected values primarily due to issues identified during initial and continuing GC/MS calibration. The only potentially important data validation issue identified in this SDG was related to the contamination of the field blank with DRO. The field blank sample 2006FB01 had contamination that resulted in the detected concentration of DRO in eight samples to be qualified as non-detects. However, these detected concentrations were all within the same range as the concentration for DRO that was detected in the field blank. Therefore, the potential impact of this measure on the data quality objectives was not significant.

5.5.5 Test America Savannah SDG PRN-30548-3

This SDG (PRN-30548-3) is relevant to the analytical findings associated with the September 2007 soil sampling. Laboratory analyses were performed by Test America (Savannah, Georgia). Validation services were provided by DataQual Environmental Services, Inc. (St. Louis, Missouri). Arsenic was the only analyte required for this SDG. No actions to qualify the data were required based on validation criteria not being met.

5.5.6 Test America Savannah SDG SWMU31377

This SDG (SWMU31377) is relevant to the analytical findings associated with the October 2007 soil sampling. Laboratory analyses were performed by Test America (Savannah, Georgia). Validation services were provided by DataQual Environmental Services, Inc. (St. Louis, Missouri). Copper, lead, and zinc were the only analytes required for this SDG. The MS/MSD samples exhibited recoveries that were slightly outside acceptable limits for lead, but not sufficiently to require qualification of the field results. In addition, the MS/MSD samples exhibited percent recovery values outside acceptable limits for zinc (<75 percent). All sample results for zinc were qualified as estimated by the data validator. No additional qualification actions were taken 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 past operation of the southern fire training area, 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 very little impact due to organic contaminants on the environment due to Navy activities at SWMU 68. Only a few organic compounds were detected in any of the media, and all organic concentrations were well below any screening criteria for human health and ecological receptors.

One surface soil sample, 68SB02-00, exceeded the surface soil ecological screening level and background screening level for cobalt. This one exceedance was not much above the background level, and would likely be eliminated as a COPC during a baseline ecological risk assessment (ERA).

During the ECP investigation (NAVFAC, 2004), lead was found in the surface soil at three locations at concentrations ranging from 17 to 230 mg/kg (see Appendix D). These concentrations were at locations within the areas of distressed vegetation as noted on the historical aerial photographs. The RFI investigation delineated these three areas with the lower lead concentrations seen in the RFI results. The extent of lead contamination around ECP sample locations 14E-01 and 14E-03 was determined using the RFI data. Concentrations of copper and zinc that were detected at elevated concentrations in the ECP samples were further investigated and the extents of their contamination around ECP sample locations 14E-01 and 14E-03 were also determined using the RFI data.

Arsenic concentrations in surface soil samples at several locations and in one subsurface soil sample exceeded the arsenic PRG and background screening levels at locations within a human health risk pathway. Potential human exposure to arsenic concentrations in soil at SWMU 68 was evaluated due to exceedences of both the PRG and background. The preliminary risk calculations showed that there are no unacceptable carcinogenic or noncarcinogenic risks from potential exposure to arsenic in soil at SWMU 68. Furthermore, the low carcinogenic and noncarcinogenic risk levels demonstrate that arsenic in soil would not be a risk driver if a baseline human health risk assessment was conducted.

Based on concentrations found in temporary wells during the investigation, it is concluded that no impact to the groundwater is present due to past Navy operations. The naturally occurring geology, including very tight clay formations, would likely serve to contain any contamination that may have migrated downward to the water table, if it had been present.

6.2 Recommendations

Very little impact on the environment was found during the extensive Phase I RFI investigation at SWMU 68. However, because concentrations of lead, copper and zinc from the ECP

investigation indicated the presence of contamination in the surface soil above their ecological screening values and respective background levels, and nearby surface soil samples from the Phase I RFI had relatively low concentrations with no exceedances for these metals, a very limited remedial action for surface soil (excavation and disposal) is warranted in order to address potential ecological risks at this site. The extent of contamination associated with lead, copper and zinc has been adequately defined to support a removal action for surface soil covering an area of 5,000 square feet (100 feet by 50 feet rectangle) around ECP sample location 14E-01 and an area of 2,500 square feet (50 feet by 50 feet square) around ECP sample location 14E-03. No additional investigations are warranted, because the contaminants found during the ECP investigation were completely delineated during the Phase I RFI investigation.

6.3 Development of Ecological Corrective Action Objectives

This section presents the methodology used to develop surface soil Corrective Action Objectives (CAOs) protective of ecological receptors. The application of the CAOs to corrective actions at the SWMU are also discussed.

6.3.1 Methodology for CAO Development

Copper, lead, and zinc were detected in SWMU 68 surface soil at concentrations greater than terrestrial plant/invertebrate-based surface soil screening values and NAPR background screening values. Lead also was detected in SWMU 68 surface soil at concentrations that result in a modeled dietary intake for the American robin greater than the NOAEL-based screening value. The sections that follow present the methodology used to develop surface soil CAOs for these chemical-receptor combinations, as well as the methodology used to develop CAOs based on background concentrations.

6.3.1.1 Terrestrial Plants and Invertebrates

Copper, lead, and zinc surface soil CAOs protective of terrestrial plants and invertebrates were established by multiplying surface soil screening values by 0.99:

$$CAO_x = SSSV_x(0.99)$$

Where CAO_x is the Corrective Action Objective for chemical x, $SSSV_x$ is the surface soil screening value for chemical x, and 0.99 represents a default HQ for the derivation of CAOs. CAOs calculated using this default value correspond to surface soil concentrations that result in risk estimates equal to 0.99 (HQ values less than 1.0 indicate that risks are unlikely).

6.3.1.2 Terrestrial Avian Receptors

A surface soil CAO for lead protective of terrestrial avian omnivores (i.e., American robin) was established by modifying the dietary intake equation presented in Section 5.2.1.3.2:

$$CAO_x = \frac{(0.99)(SV)(BW)}{[[\sum_i (FIR)(BAF_i \text{ or } BCF_i)(PDF_i)] + [(FIR)(PDS)]] [AUF]}$$

where:

<i>CAO</i>	=	Corrective Action Objective (mg/kg, dry weight)
<i>SV</i>	=	Ingestion-based screening value (mg chemical/kg body weight/day)
<i>BW</i>	=	Body weight (kg, wet weight)
<i>FIR</i>	=	Food ingestion rate (kg/day, dry-weight)
<i>BAF_i</i>	=	Surface soil-to-biota bioaccumulation factor for food item i (dry weight basis)
<i>BCF_i</i>	=	Surface soil-to-biota bioconcentration factor for food item i (dry weight basis)
<i>PDF_i</i>	=	Proportion of diet composed of food item i (dry weight basis)
<i>PDS</i>	=	Proportion of diet composed of surface soil (dry weight basis)
<i>AUF</i>	=	Area Use Factor for receptor j (unitless)
0.99	=	Default HQ

Input parameters applied to the equation are summarized in Table 5-2 (ingestion-based screening values), Table 5-4 (soil-to-plant and soil-to-invertebrate BCFs/BAFs), Table 5-6 (body weights, food ingestion rates, and AUFs), and Table 5-7 (diets).

6.3.1.3 Background

Upper limit of the mean concentrations presented in the document entitled Revised Final Summary Report for Environmental Background Concentrations of Inorganic Compounds (Baker, 2006b) were used as background-based CAOs for copper, lead, and zinc (168 mg/kg, 22 mg/kg, and 115 mg/kg, respectively).

6.3.2 Identification of Corrective Action Objectives

A summary of the copper, lead, and zinc CAOs developed for terrestrial plants and invertebrates, terrestrial avian receptors (i.e., American robin), and background are presented in Table 6-1. As evidenced by Table 6-1, the background-based CAO for copper exceeds the risk-based CAO derived for terrestrial plants and invertebrates. For this metal, the background-based CAO (168 mg/kg) was selected as the final CAO. This approach is consistent with Navy Policy on the Use of Background Chemical Levels (Chief of Naval Operations [CNO], 2004; available at <http://web.ead.anl.gov/ecorisk/policy/>), which states that *“The action level for the remediation of sites should be risk-based, should not be below background levels, and should target the risk associated with the COC or contaminant concentration exceeding background chemical levels.”*

The risk-based CAOs developed for lead and zinc exceed their respective background-based CAOs (see Table 6-1). For these two metals, minimum risk-based CAOs (87 mg/kg for lead [established for the American robin] and 120 mg/kg for zinc [established for terrestrial plants and invertebrates]) were selected as final CAOs.

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APPENDIX C.6
STL SAVANNAH SDG # SWMU31377

APPENDIX E
IDENTIFICATION OF BIOACCUMULATIVE CHEMICALS

APPENDIX F
ProUCL VERSION 4.00.02 CALCULATIONS

APPENDIX G
PRELIMINARY HUMAN HEALTH RISK
CALCULATIONS FOR ARSENIC

FINAL

**PHASE I RCRA FACILITY INVESTIGATION REPORT
SWMU 68 – FORMER SOUTHERN FIRE TRAINING AREA**

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

CONTRACT TASK ORDER 0121

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TABLES

TABLE 4-1

**SUMMARY OF 2006/2007 RFI SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLING AND ANALYSIS
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample Media	Sampling Event	Site ID	Sample ID	Sample Depth (ft bgs)	Field Screening (PID)	Analysis Requested										Comments		
						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			
Surface Soil	2006		68SB01	68SB01-00	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X			
			68SB02	68SB02-00	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X		
			68SB03	68SB03-00	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X		
			68SB04	68SB04-00	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X		
			68SB05	68SB05-00	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X		
			68SB06	68SB06-00	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X		
			68SB07	68SB07-00	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X		
			68SB08	68SB08-00	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X		
			68SB09	68SB09-00	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X		
			68SB10	68SB10-00	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X		
			68SB10-00D	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X	Duplicate		
			68SB10-00MS/MSD	0.0 - 1.0	X	X	X	X	X	X	X	X	X	X	X	Matrix Spike/Matrix Spike Duplicate		
		2007		68SS01	68SS01	0.0 - 1.0					X ⁽¹⁾							
				68SS01-D	68SS01-D	0.0 - 1.0					X ⁽¹⁾							Duplicate
				68SS01-MS/MSD	68SS01-MS/MSD	0.0 - 1.0					X ⁽¹⁾							Matrix Spike/Matrix Spike Duplicate
				68SS02	68SS02	0.0 - 1.0					X ⁽¹⁾							
				68SS03	68SS03	0.0 - 1.0					X ⁽¹⁾							
				68SS04	68SS04	0.0 - 1.0					X ⁽¹⁾							
				68SS05	68SS05	0.0 - 1.0					X ⁽¹⁾							
				68SS06	68SS06	0.0 - 1.0					X ⁽²⁾							
			68SS07	68SS07	0.0 - 1.0					X ⁽²⁾								
			68SS08	68SS08	0.0 - 1.0					X ⁽²⁾								
		68SS09	68SS09	0.0 - 1.0					X ⁽²⁾									
		68SS09-D	68SS09-D	0.0 - 1.0					X ⁽²⁾							Duplicate		
		68SS09-MS/MSD	68SS09-MS/MSD	0.0 - 1.0					X ⁽²⁾							Matrix Spike/Matrix Spike Duplicate		

TABLE 4-1

**SUMMARY OF 2006/2007 RFI SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLING AND ANALYSIS
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample Media	Sampling Event	Site ID	Sample ID	Sample Depth (ft bgs)	Field Screening (PID)	Analysis Requested										Comments				
						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					
Surface Soil (continued)	2007	68SS10	68SS10	0.0 - 1.0						X ⁽²⁾										
		68SS11	68SS11	0.0 - 1.0						X ⁽²⁾										
		68SS12	68SS12	0.0 - 1.0						X ⁽²⁾										
		68SS13	68SS13	0.0 - 1.0						X ⁽²⁾										
		68SS14	68SS14	0.0 - 1.0						X ⁽²⁾									Placed on hold and not analyzed	
		68SS15	68SS15	0.0 - 1.0						X ⁽²⁾										Placed on hold and analyzed
		68SS16	68SS16	0.0-1.0						X ⁽²⁾										Placed on hold and not analyzed
		68SS17	68SS17	0.0 - 1.0						X ⁽²⁾										Placed on hold and analyzed
			68SS17-D	0.0 - 1.0						X ⁽²⁾										Duplicate, placed on hold, not analyzed
		68SS18	68SS18	0.0 - 1.0						X ⁽²⁾										Placed on hold and not analyzed
		68SS19	68SS19	0.0 - 1.0						X ⁽²⁾										Placed on hold and not analyzed
		68SS20	68SS20	0.0 - 1.0						X ⁽²⁾										Placed on hold and not analyzed
68SS21	68SS21	0.0 - 1.0						X ⁽²⁾										Placed on hold and not analyzed		
Subsurface Soil	2006	68SB01	68SB01-01	5.0 - 7.0	X	X	X	X	X	X			X	X	X	X				
			68SB01-02	13.0 - 15.0	X	X	X	X	X	X	X			X	X	X	X			
		68SB02	68SB02-01	2.0 - 4.0	X	X	X	X	X	X	X			X	X	X	X			
			68SB02-02	12.0 - 14.0	X	X	X	X	X	X	X			X	X	X	X			
		68SB03	68SB03-01	5.0 - 7.0	X	X	X	X	X	X	X			X	X	X	X			
			68SB03-02	17.0 - 19.0	X	X	X	X	X	X	X			X	X	X	X			
		68SB04	68SB04-01	5.0 - 7.0	X	X	X	X	X	X	X			X	X	X	X			
			68SB04-02	12.0 - 14.0	X	X	X	X	X	X	X			X	X	X	X			
		68SB05	68SB05-01	5.0 - 7.0	X	X	X	X	X	X	X			X	X	X	X			
			68SB05-01D	5.0 - 7.0		X	X	X	X	X	X			X	X	X	X			Duplicate
		68SB06	68SB06-01	2.0 - 4.0	X	X	X	X	X	X	X			X	X	X	X			
			68SB06-02	6.0 - 8.0	X	X	X	X	X	X	X			X	X	X	X			
		68SB07	68SB07-01	5.0 - 7.0		X	X	X	X	X	X			X	X	X	X			
			68SB07-02	12.0 - 14.0	X	X	X	X	X	X	X			X	X	X	X			

TABLE 4-1
SUMMARY OF 2006/2007 RFI SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLING AND ANALYSIS
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample Media	Sampling Event	Site ID	Sample ID	Sample Depth (ft bgs)	Field Screening (PID)	Analysis Requested										Comments	
						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		
Subsurface Soil (cont'd)	2006	68SB08	68SB08-01	5.0 - 7.0		X	X	X	X	X		X	X	X	X		
			68SB08-02	10.0 - 12.0		X	X	X	X	X		X	X	X	X		
		68SB09	68SB09-01	5.0 - 7.0		X	X	X	X	X		X	X	X	X		
			68SB09-02	7.0 - 9.0		X	X	X	X	X		X	X	X	X		
		68SB10	68SB10-01	5.0 - 7.0		X	X	X	X	X		X	X	X	X		
			68SB10-01D	5.0 - 7.0		X	X	X	X	X		X	X	X	X	Duplicate	
			68SB10-02	12.0 - 14.0		X	X	X	X	X		X	X	X	X		
		68SB10-02MS/MSD	12.0 - 14.0		X	X	X	X	X		X	X	X	X	Matrix Spike/Matrix Spike Duplicate		
Groundwater	2006	68TW01 ⁽³⁾	68TW01	NA	NA	X		X		X	X	X	X	X			
		68TW02 ⁽³⁾	68TW02	NA	NA	X			X	X	X		X	X			
		68TW04	68TW04	NA	NA	X	X	X	X	X	X	X	X	X	X		
		68TW05	68TW05	NA	NA	X	X	X	X	X	X	X	X	X	X	X	
			68TW05D	NA	NA	X	X	X	X	X	X	X	X	X	X	X	Duplicate
			68TW05MS	NA	NA	X	X	X	X	X	X	X	X	X	X	X	Matrix Spike
				68TW05MSD	NA	NA	X	X	X	X	X	X	X	X	X	X	Matrix Spike Duplicate
		68TW06 ⁽³⁾	68TW06	NA	NA	X	X	X	X	X	X	X	X	X	X		
		68TW07	68TW07	NA	NA	X	X	X	X	X	X	X	X	X	X		
		68TW08	68TW08	NA	NA	X	X	X	X	X	X	X	X	X	X		
68TW09 ⁽³⁾	68TW09	NA	NA	X	X	X	X		X			X	X				
68SB10	68TW10	NA	NA	X	X	X	X	X	X	X	X	X	X				

Notes:

(1) Analysis requested for arsenic only

(2) Analysis requested for copper, lead, and zinc only

(3) 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 2006/2007 RFI QUALITY ASSURANCE / QUALITY CONTROL SAMPLING AND ANALYSIS
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	Analysis Requested									Comments
	App. IX VOCs	App. IX SVOCs	App. IX PCBs	Low Level PAHs	App. IX Metals (Total)	Lead	Arsenic	TPH DRO	TPH GRO	
2006 Event QA/QC Samples										
Trip Blank Samples										
68TB01	X								X	
68TB02	X								X	
68TB03	X								X	
27TB01	X								X	
Equipment Rinsate Samples										
2006ER01	X	X	X	X	X	X		X	X	Stainless Steel Spoon
2006ER02	X	X	X	X	X	X		X	X	Geoprobe Acetate Liner
2006ER04	X	X	X	X	X	X		X	X	Silicon/Polyethylene Tubing
Field Blank Samples										
2006FB01	X	X	X	X	X	X		X	X	Lab Grade Deionized Water
2006FB02	X	X	X	X	X			X	X	NAPR Potable Water
2007 Event QA/QC Samples										
Equipment Rinsate Samples										
68ER01							X			Stainless Steel Spoon
68PbER01						X				Stainless Steel Spoon
Field Blank Samples										
68PbFB01						X				Lab Grade Deionized Water

TABLE 4-3

**PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
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)
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)

TABLE 4-3

**PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
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)	
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
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

TABLE 4-3

**PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
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)	
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
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
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

TABLE 4-3

**PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
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)	
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
Saffrole	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
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

TABLE 4-3

**PARAMETER LISTS AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

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
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 68 -FORMER SOUTHERN FIRE TRAINING AREA
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 68								
68-TW01	802690.8734	924315.2933	144.14	144.14	20.0	11/17/06	10.19	133.95
68-TW02	802635.2903	924412.2046	140.93	140.93	20.0	11/17/06	14.65	126.28
68-TW04	802465.3892	924416.0348	137.48	138.34	20.0	11/17/06	5.95	132.39
68-TW05	802443.1651	924160.2211	142.48	143.33	20.0	11/17/06	11.85	131.48
68-TW06	802379.2951	924312.2813	137.74	139.40	19.0	11/17/06	8.35	131.05
68-TW07	802386.1040	923997.9854	143.03	143.03	20.0	11/17/06	13.58	129.45
68-TW08	802355.6355	924197.4298	140.58	140.58	20.0	11/17/06	12.69	127.89
68-TW09	802264.7382	923997.6355	140.23	140.23	20.0	11/17/06	7.42	132.81
68-TW10	802253.4035	924221.6661	137.24	137.24	20.0	11/17/06	7.14	130.10

Notes:

msl - mean see level

ft - feet

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	Selected Ecological Surface Soil Screening Values	<u>NAPR</u>⁽¹⁾ <u>Basewide</u> <u>Background</u>	68SB01-00 (0.0 - 1.0) 11/13/06	68SB02-00 (0.0 - 1.0) 11/14/06	68SB03-00 (0.0 - 1.0) 11/13/06	68SB04-00 (0.0 - 1.0) 11/14/06	68SB05-00 (0.0 - 1.0) 11/13/06	68SB06-00 (0.0 - 1.0) 11/14/06
Sample Depth (ft bgs)	Residential	Industrial								
Sampling Date	Soil PRGs	Soil PRGs								
Volatiles (ug/kg)										
Acetone	1,412,657 ⁽²⁾	5,432,098 ⁽²⁾	NE	NE	44	170	110	93 J	55	71 J
Benzene	643	1,409	105 ⁽⁵⁾	NE	4.3 UJ	4.6 UJ	4.4 U	1.0 J	4.7 UJ	5.0 U
Iodomethane	NE	NE	NE	NE	4.3 U	4.6 U	4.4 UJ	4.3 UJ	4.7 U	5.0 UJ
Methyl Ethyl Ketone	2,231,120 ⁽²⁾	1,1326,440 ⁽²⁾	NE	NE	21 U	12 J	5.2 U	6.2 J	23 U	5.2 J
Styrene	1,700,000	1,700,000	10,030 ⁽⁵⁾	NE	4.3 U	4.6 U	2.8 J	4.3 U	4.7 U	5.0 U
Semivolatiles (ug/kg) (none detected)										
PAHs (ug/kg)										
Benzo[a]anthracene	621	2,110	18,000 ⁽⁶⁾	NE	7.8 U	1.8 J	7.8 U	8.2 U	8.3 U	9.2 U
Chrysenes	62,146	210,962	18,000 ⁽⁶⁾	NE	7.8 U	2.3 J	7.8 U	8.2 U	8.3 U	9.2 U
Fluoranthene	2,293,610	22,000,353	18,000 ⁽⁶⁾	NE	7.8 U	1.9 J	7.8 U	8.2 U	8.3 U	9.2 U
Pyrene	231,595 ⁽²⁾	2,912,620 ⁽²⁾	18,000 ⁽⁶⁾	NE	7.8 U	2.3 J	7.8 U	8.2 U	8.3 U	9.2 U
PCBs (ug/kg) (none detected)										
TPH (mg/kg)										
Gasoline Range Organics	100 ⁽³⁾	NE	NE	NE	0.22 U	0.096 J	0.16 J	0.088 J	0.21 U	0.24 U

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	Selected Ecological Surface Soil Screening Values	<u>NAPR</u>⁽¹⁾ <u>Basewide</u> <u>Background</u>	68SB07-00 (0.0 - 1.0) 11/15/06	68SB08-00 (0.0 - 1.0) 11/14/06	68SB09-00 (0.0 - 1.0) 11/14/06	68SB10-00 (0.0 - 1.0) 11/15/06	68SB10-00D (0.0 - 1.0) 11/15/06	68SS01 (0.0 - 1.0) 09/27/07
Sample Depth (ft bgs)	Residential	Industrial								
Sampling Date	Soil PRGs	Soil PRGs								
Volatiles (ug/kg)										
Acetone	1,412,657 ⁽²⁾	5,432,098 ⁽²⁾	NE	NE	80 J	170	51	150 J	180 J	NA
Benzene	643	1,409	105 ⁽⁵⁾	NE	4.9 U	1.2 J	1.1 J	1.2 J	1.1 J	NA
Iodomethane	NE	NE	NE	NE	1.9 J	5.8 UJ	4.8 UJ	5.3 UJ	5.5 UJ	NA
Methyl Ethyl Ketone	2,231,120 ⁽²⁾	1,1326,440 ⁽²⁾	NE	NE	7.8 J	9.9 J	24 U	7.2 J	10 J	NA
Styrene	1,700,000	1,700,000	10,030 ⁽⁵⁾	NE	4.9 U	5.8 U	4.8 U	5.3 UJ	5.5 U	NA
Semivolatiles (ug/kg) (none detected)										
PAHs (ug/kg)										
Benzo[a]anthracene	621	2,110	18,000 ⁽⁶⁾	NE	8.0 U	9.7 U	8.3 U	9.5 U	11 U	NA
Chrysenes	62,146	210,962	18,000 ⁽⁶⁾	NE	8.0 U	9.7 U	8.3 U	9.5 U	11 U	NA
Fluoranthene	2,293,610	22,000,353	18,000 ⁽⁶⁾	NE	8.0 U	9.7 U	8.3 U	9.5 U	11 U	NA
Pyrene	231,595 ⁽²⁾	2,912,620 ⁽²⁾	18,000 ⁽⁶⁾	NE	8.0 U	9.7 U	8.3 U	9.5 U	11 U	NA
PCBs (ug/kg) (none detected)										
TPH (mg/kg)										
Gasoline Range Organics	100 ⁽³⁾	NE	NE	NE	0.25 U	0.11 J	0.24 U	0.12 J	0.12 J	NA

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	Selected Ecological Surface Soil Screening Values	<u>NAPR</u>⁽¹⁾ Basewide <u>Background</u>	68SS01D (0.0 - 1.0) 09/27/07	68SS02 (0.0 - 1.0) 09/27/07	68SS03 (0.0 - 1.0) 09/27/07	68SS04 (0.0 - 1.0) 09/27/07	68SS05 (0.0 - 1.0) 09/27/07	68SS06 (0.0 - 1.0) 10/24/07
Sample Depth (ft bgs)	Residential	Industrial								
Sampling Date	Soil PRGs	Soil PRGs								
Volatiles (ug/kg)										
Acetone	1,412,657 ⁽²⁾	5,432,098 ⁽²⁾	NE	NE	NA	NA	NA	NA	NA	NA
Benzene	643	1,409	105 ⁽⁵⁾	NE	NA	NA	NA	NA	NA	NA
Iodomethane	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	2,231,120 ⁽²⁾	1,1326,440 ⁽²⁾	NE	NE	NA	NA	NA	NA	NA	NA
Styrene	1,700,000	1,700,000	10,030 ⁽⁵⁾	NE	NA	NA	NA	NA	NA	NA
Semivolatiles (ug/kg) (none detected)										
PAHs (ug/kg)										
Benzo[a]anthracene	621	2,110	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA	NA	NA
Chrysene	62,146	210,962	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA	NA	NA
Fluoranthene	2,293,610	22,000,353	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA	NA	NA
Pyrene	231,595 ⁽²⁾	2,912,620 ⁽²⁾	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA	NA	NA
PCBs (ug/kg) (none detected)										
TPH (mg/kg)										
Gasoline Range Organics	100 ⁽³⁾	NE	NE	NE	NA	NA	NA	NA	NA	NA

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	Selected Ecological Surface Soil Screening Values	<u>NAPR</u>⁽¹⁾ <u>Basewide</u> <u>Background</u>	68SS07 (0.0 - 1.0) 10/24/07	68SS08 (0.0 - 1.0) 10/24/07	68SS09 (0.0 - 1.0) 10/24/07	68SS09D (0.0 - 1.0) 10/24/07	68SS10 (0.0 - 1.0) 10/24/07	68SS11 (0.0 - 1.0) 10/24/07
Sample Depth (ft bgs)	Residential	Industrial								
Sampling Date	Soil PRGs	Soil PRGs								
Volatiles (ug/kg)										
Acetone	1,412,657 ⁽²⁾	5,432,098 ⁽²⁾	NE	NE	NA	NA	NA	NA	NA	NA
Benzene	643	1,409	105 ⁽⁵⁾	NE	NA	NA	NA	NA	NA	NA
Iodomethane	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	2,231,120 ⁽²⁾	1,132,640 ⁽²⁾	NE	NE	NA	NA	NA	NA	NA	NA
Styrene	1,700,000	1,700,000	10,030 ⁽⁵⁾	NE	NA	NA	NA	NA	NA	NA
Semivolatiles (ug/kg) (none detected)										
PAHs (ug/kg)										
Benzo[a]anthracene	621	2,110	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA	NA	NA
Chrysene	62,146	210,962	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA	NA	NA
Fluoranthene	2,293,610	22,000,353	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA	NA	NA
Pyrene	231,595 ⁽²⁾	2,912,620 ⁽²⁾	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA	NA	NA
PCBs (ug/kg) (none detected)										
TPH (mg/kg)										
Gasoline Range Organics	100 ⁽³⁾	NE	NE	NE	NA	NA	NA	NA	NA	NA

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	Selected Ecological Surface Soil Screening Values	<u>NAPR</u>⁽¹⁾ <u>Basewide</u> <u>Background</u>	68SS12 (0.0 - 1.0) 10/24/07	68SS13 (0.0 - 1.0) 10/24/07	68SS15 (0.0 - 1.0) 10/24/07	68SS17 (0.0 - 1.0) 10/24/07
Sample Depth (ft bgs)	Residential	Industrial						
Sampling Date	Soil PRGs	Soil PRGs						
Volatiles (ug/kg)								
Acetone	1,412,657 ⁽²⁾	5,432,098 ⁽²⁾	NE	NE	NA	NA	NA	NA
Benzene	643	1,409	105 ⁽⁵⁾	NE	NA	NA	NA	NA
Iodomethane	NE	NE	NE	NE	NA	NA	NA	NA
Methyl Ethyl Ketone	2,231,120 ⁽²⁾	1,132,644 ⁽²⁾	NE	NE	NA	NA	NA	NA
Styrene	1,700,000	1,700,000	10,030 ⁽⁵⁾	NE	NA	NA	NA	NA
Semivolatiles (ug/kg) (none detected)								
PAHs (ug/kg)								
Benzo[a]anthracene	621	2,110	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA
Chrysene	62,146	210,962	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA
Fluoranthene	2,293,610	22,000,353	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA
Pyrene	231,595 ⁽²⁾	2,912,620 ⁽²⁾	18,000 ⁽⁶⁾	NE	NA	NA	NA	NA
PCBs (ug/kg) (none detected)								
TPH (mg/kg)								
Gasoline Range Organics	100 ⁽³⁾	NE	NE	NE	NA	NA	NA	NA

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	Selected Ecological Surface Soil Screening Values	NAPR ⁽¹⁾ Basewide Background	68SB01-00 (0.0 - 1.0) 11/13/06	68SB02-00 (0.0 - 1.0) 11/14/06	68SB03-00 (0.0 - 1.0) 11/13/06	68SB04-00 (0.0 - 1.0) 11/14/06	68SB05-00 (0.0 - 1.0) 11/13/06	68SB06-00 (0.0 - 1.0) 11/14/06
Inorganics (mg/kg)										
Arsenic	0.39	1.59	18 ⁽⁷⁾	2.65	1.4 J	3.4	1.2 J	1.7 J	1.3 J	0.92 J
Barium	537 ⁽²⁾	6658 ⁽²⁾	330 ⁽⁸⁾	199	76	260	78	100 J	87	72 J
Beryllium	15.44 ⁽²⁾	1,941	40 ⁽⁸⁾	0.590	0.27 J	0.30 J	0.28 J	0.28 J	0.28 J	0.27 J
Cadmium	3.7 ⁽²⁾	45.14 ⁽²⁾	32 ⁽⁷⁾	1.02	1.0 U	0.19 J	0.047 J	0.13 J	1.2 U	0.61 J
Chromium	211	448	0.4 ⁽⁹⁾	49.8	16 J	21 J	15 J	22	40 J	24
Cobalt	903	1,921	13 ⁽⁷⁾	46.2	15	47	11	25 J	15	10 J
Copper	313 ⁽²⁾	4088 ⁽²⁾	70 ⁽⁷⁾	168	28 J	26 J	28 J	35 J	50 J	64 J
Lead	400 ⁽⁴⁾	800 ⁽⁴⁾	120 ⁽⁷⁾	22.0	2.1 J	7.0 J	1.8 J	2.5	1.7 J	4.2
Nickel	156 ⁽²⁾	2,043 ⁽²⁾	38 ⁽⁷⁾	20.7	7.8 J	7.5 J	7.5 J	12	16 J	10
Selenium	39 ⁽²⁾	511 ⁽²⁾	0.52 ⁽⁷⁾	1.48	0.38 J	0.66 J	0.23 J	0.41 J	2.4 U	0.42 J
Thallium	0.52 ⁽²⁾	6.75 ⁽²⁾	1 ⁽¹⁰⁾	NE	2.1 U	0.18 J	2.2 U	2.2 U	2.4 U	2.5 U
Vanadium	7.82 ⁽²⁾	102 ⁽²⁾	2 ⁽¹⁰⁾	259	100	130	91	130	170	94
Zinc	2346 ⁽²⁾	100,000	120 ⁽⁸⁾	115	35 J	34 J	39 J	42 J	61 J	55 J
Mercury -7471A	2.35 ⁽²⁾	30.7 ⁽²⁾	0.1 ⁽⁹⁾	0.109	0.016 J	0.060	0.033	0.034 J	0.020 J	0.031 J
Sulfide - 9034	NE	NE	NE	NE	29 U	29 U	29 U	30 U	36	35 U

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	Selected Ecological Surface Soil Screening Values	NAPR ⁽¹⁾ Basewide Background	68SB07-00 (0.0 - 1.0) 11/15/06	68SB08-00 (0.0 - 1.0) 11/14/06	68SB09-00 (0.0 - 1.0) 11/14/06	68SB10-00 (0.0 - 1.0) 11/15/06	68SB10-00D (0.0 - 1.0) 11/15/06	68SS01 (0.0 - 1.0) 09/27/07
Inorganics (mg/kg)										
Arsenic	0.39	1.59	18 ⁽⁷⁾	2.65	1.4 J	2.3 J	1.3 J	1.9 J	2.4 J	0.87 J
Barium	537 ⁽²⁾	6658 ⁽²⁾	330 ⁽⁸⁾	199	110 J	61 J	69 J	53 J	59 J	NA
Beryllium	15.44 ⁽²⁾	1,941	40 ⁽⁸⁾	0.590	0.33 J	0.14 J	0.35 J	0.21 J	0.26 J	NA
Cadmium	3.7 ⁽²⁾	45.14 ⁽²⁾	32 ⁽⁷⁾	1.02	0.073 J	0.27 J	0.056 J	0.39 J	0.57 J	NA
Chromium	211	448	0.4 ⁽⁹⁾	49.8	37	18	37	20	22	NA
Cobalt	903	1,921	13 ⁽⁷⁾	46.2	31 J	13 J	18 J	12 J	13 J	NA
Copper	313 ⁽²⁾	4088 ⁽²⁾	70 ⁽⁷⁾	168	57 J	29 J	42 J	28 J	30 J	NA
Lead	400 ⁽⁴⁾	800 ⁽⁴⁾	120 ⁽⁷⁾	22.0	2.1	53	2.1	5.1	5.3	NA
Nickel	156 ⁽²⁾	2,043 ⁽²⁾	38 ⁽⁷⁾	20.7	19	11 U	11	10 U	12 U	NA
Selenium	39 ⁽²⁾	511 ⁽²⁾	0.52 ⁽⁷⁾	1.48	0.31 J	0.56 J	0.35 J	0.73 J	0.79 J	NA
Thallium	0.52 ⁽²⁾	6.75 ⁽²⁾	1 ⁽¹⁰⁾	NE	2.2 U	2.7 U	2.2 U	2.6 U	2.9 U	NA
Vanadium	7.82 ⁽²⁾	102 ⁽²⁾	2 ⁽¹⁰⁾	259	160	81	130	85	94	NA
Zinc	2346 ⁽²⁾	100,000	120 ⁽⁸⁾	115	50 J	51 J	45 J	42 J	44 J	NA
Mercury -7471A	2.35 ⁽²⁾	30.7 ⁽²⁾	0.1 ⁽⁹⁾	0.109	0.022 J	0.050 J	0.030 J	0.049 J	0.052 J	NA
Sulfide - 9034	NE	NE	NE	NE	30 U	36 U	31 U	36 U	40 U	NA

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	<i>USEPA Region IX</i>	Selected Ecological Surface Soil Screening Values	<u>NAPR</u> ⁽¹⁾ <u>Basewide</u> <u>Background</u>	68SS01D (0.0 - 1.0) 09/27/07	68SS02 (0.0 - 1.0) 09/27/07	68SS03 (0.0 - 1.0) 09/27/07	68SS04 (0.0 - 1.0) 09/27/07	68SS05 (0.0 - 1.0) 09/27/07	68SS06 (0.0 - 1.0) 10/24/07
Inorganics (mg/kg)										
Arsenic	0.39	1.59	18 ⁽⁷⁾	2.65	1 J	0.86 J	1.2 U	0.82 J	1.9	NA
Barium	537 ⁽²⁾	6658 ⁽²⁾	330 ⁽⁸⁾	199	NA	NA	NA	NA	NA	NA
Beryllium	15.44 ⁽²⁾	1,941	40 ⁽⁸⁾	0.590	NA	NA	NA	NA	NA	NA
Cadmium	3.7 ⁽²⁾	45.14 ⁽²⁾	32 ⁽⁷⁾	1.02	NA	NA	NA	NA	NA	NA
Chromium	211	448	0.4 ⁽⁹⁾	49.8	NA	NA	NA	NA	NA	NA
Cobalt	903	1,921	13 ⁽⁷⁾	46.2	NA	NA	NA	NA	NA	NA
Copper	313 ⁽²⁾	4088 ⁽²⁾	70 ⁽⁷⁾	168	NA	NA	NA	NA	NA	55
Lead	400 ⁽⁴⁾	800 ⁽⁴⁾	120 ⁽⁷⁾	22.0	NA	NA	NA	NA	NA	21
Nickel	156 ⁽²⁾	2,043 ⁽²⁾	38 ⁽⁷⁾	20.7	NA	NA	NA	NA	NA	NA
Selenium	39 ⁽²⁾	511 ⁽²⁾	0.52 ⁽⁷⁾	1.48	NA	NA	NA	NA	NA	NA
Thallium	0.52 ⁽²⁾	6.75 ⁽²⁾	1 ⁽¹⁰⁾	NE	NA	NA	NA	NA	NA	NA
Vanadium	7.82 ⁽²⁾	102 ⁽²⁾	2 ⁽¹⁰⁾	259	NA	NA	NA	NA	NA	NA
Zinc	2346 ⁽²⁾	100,000	120 ⁽⁸⁾	115	NA	NA	NA	NA	NA	47
Mercury -7471A	2.35 ⁽²⁾	30.7 ⁽²⁾	0.1 ⁽⁹⁾	0.109	NA	NA	NA	NA	NA	NA
Sulfide - 9034	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	Selected Ecological Surface Soil Screening Values	NAPR ⁽¹⁾ Basewide Background	68SS07 (0.0 - 1.0) 10/24/07	68SS08 (0.0 - 1.0) 10/24/07	68SS09 (0.0 - 1.0) 10/24/07	68SS09D (0.0 - 1.0) 10/24/07	68SS10 (0.0 - 1.0) 10/24/07	68SS11 (0.0 - 1.0) 10/24/07
Inorganics (mg/kg)										
Arsenic	0.39	1.59	18 ⁽⁷⁾	2.65	NA	NA	NA	NA	NA	NA
Barium	537 ⁽²⁾	6658 ⁽²⁾	330 ⁽⁸⁾	199	NA	NA	NA	NA	NA	NA
Beryllium	15.44 ⁽²⁾	1,941	40 ⁽⁸⁾	0.590	NA	NA	NA	NA	NA	NA
Cadmium	3.7 ⁽²⁾	45.14 ⁽²⁾	32 ⁽⁷⁾	1.02	NA	NA	NA	NA	NA	NA
Chromium	211	448	0.4 ⁽⁹⁾	49.8	NA	NA	NA	NA	NA	NA
Cobalt	903	1,921	13 ⁽⁷⁾	46.2	NA	NA	NA	NA	NA	NA
Copper	313 ⁽²⁾	4088 ⁽²⁾	70 ⁽⁷⁾	168	120	40	40	38	69	20
Lead	400 ⁽⁴⁾	800 ⁽⁴⁾	120 ⁽⁷⁾	22.0	110	18	95	85	66	6.7
Nickel	156 ⁽²⁾	2,043 ⁽²⁾	38 ⁽⁷⁾	20.7	NA	NA	NA	NA	NA	NA
Selenium	39 ⁽²⁾	511 ⁽²⁾	0.52 ⁽⁷⁾	1.48	NA	NA	NA	NA	NA	NA
Thallium	0.52 ⁽²⁾	6.75 ⁽²⁾	1 ⁽¹⁰⁾	NE	NA	NA	NA	NA	NA	NA
Vanadium	7.82 ⁽²⁾	102 ⁽²⁾	2 ⁽¹⁰⁾	259	NA	NA	NA	NA	NA	NA
Zinc	2346 ⁽²⁾	100,000	120 ⁽⁸⁾	115	92 J	47 J	77 J	54 J	79 J	35 J
Mercury -7471A	2.35 ⁽²⁾	30.7 ⁽²⁾	0.1 ⁽⁹⁾	0.109	NA	NA	NA	NA	NA	NA
Sulfide - 9034	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	Selected Ecological Surface Soil Screening Values	<u>NAPR</u>⁽¹⁾ <u>Basewide</u> <u>Background</u>	68SS12 (0.0 - 1.0) 10/24/07	68SS13 (0.0 - 1.0) 10/24/07	68SS15 (0.0 - 1.0) 10/24/07	68SS17 (0.0 - 1.0) 10/24/07
Sample Depth (ft bgs)	Residential	Industrial						
Sampling Date	Soil PRGs	Soil PRGs						
Inorganics (mg/kg)								
Arsenic	0.39	1.59	18 ⁽⁷⁾	2.65	NA	NA	NA	NA
Barium	537 ⁽²⁾	6658 ⁽²⁾	330 ⁽⁸⁾	199	NA	NA	NA	NA
Beryllium	15.44 ⁽²⁾	1,941	40 ⁽⁸⁾	0.590	NA	NA	NA	NA
Cadmium	3.7 ⁽²⁾	45.14 ⁽²⁾	32 ⁽⁷⁾	1.02	NA	NA	NA	NA
Chromium	211	448	0.4 ⁽⁹⁾	49.8	NA	NA	NA	NA
Cobalt	903	1,921	13 ⁽⁷⁾	46.2	NA	NA	NA	NA
Copper	313 ⁽²⁾	4088 ⁽²⁾	70 ⁽⁷⁾	168	29	16	31	28
Lead	400 ⁽⁴⁾	800 ⁽⁴⁾	120 ⁽⁷⁾	22.0	12	8.2	31	7.9
Nickel	156 ⁽²⁾	2,043 ⁽²⁾	38 ⁽⁷⁾	20.7	NA	NA	NA	NA
Selenium	39 ⁽²⁾	511 ⁽²⁾	0.52 ⁽⁷⁾	1.48	NA	NA	NA	NA
Thallium	0.52 ⁽²⁾	6.75 ⁽²⁾	1 ⁽¹⁰⁾	NE	NA	NA	NA	NA
Vanadium	7.82 ⁽²⁾	102 ⁽²⁾	2 ⁽¹⁰⁾	259	NA	NA	NA	NA
Zinc	2346 ⁽²⁾	100,000	120 ⁽⁸⁾	115	48 J	34 J	57 J	52 J
Mercury -7471A	2.35 ⁽²⁾	30.7 ⁽²⁾	0.1 ⁽⁹⁾	0.109	NA	NA	NA	NA
Sulfide - 9034	NE	NE	NE	NE	NA	NA	NA	NA

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

J - Analyte present - Reported value is estimated	ug/kg - microgram per kilogram
U - Not detected	mg/kg - milligram per kilogram
UJ - Reported quantitation limit is qualified as estimated	TPH - Total Petroleum Hydrocarbon
NA - Not Analyzed	PAHs - Polycyclic Aromatic Hydrocarbons
NE - Not Established	PCBs - Polychlorinated biphenyls
PRG - Preliminary Remedial Goal	USEPA - United States Environmental Protection Agency
NAPR - Naval Activity Puerto Rico	MHSPE - Ministry of Housing, Spatial Planning and Environment
ft bgs - feet below ground surface	

- (1) NAPR basewide background surface soil screening value (upper limit of the means concentration [mean plus two standard deviations]) (Baker, 2006)
- (2) Noncarcinogenic PRGs based on a target hazard quotient of 0.1 for conservative screening purposes
- (3) PREQB Screening Criterion
- (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) Invertebrate-based ecological soil screening level for high molecular weight PAHs (USEPA, 2007a). USEPA defines high molecular weight PAHs as those with four or more rings.
- (7) Plant-based ecological soil screening level (USEPA, 2005a [arsenic]; USEPA, 2005b [cadmium]; USEPA, 2005c [cobalt]; USEPA, 2005d [lead]; USEPA, 2007b [copper]; USEPA, 2007c [nickel]; USEPA, 2007d [selenium])
- (8) Invertebrate-based ecological soil screening level (USEPA, 2005e [barium]; USEPA, 2005f [beryllium]; USEPA, 2007e [zinc])
- (9) Toxicological threshold for earthworms (Efroymson et al., 1997a)
- (10) Toxicological threshold for plants (Efroymson et al., 1997b)

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Table References:

Baker Environmental, Inc. (2006). Revised Final Summary Report for Environmental Background Concentrations of Inorganic Compounds, Naval Activity Puerto Rico, Ceiba, Puerto Rico. October 16, 2006.

Efroymson, R.A., M.E. Will, and G.W. Suter II. 1997a. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revisions. Oak Ridge National Laboratory, Oak Ridge, TN. ES/ER/TM-126/R2.

Efroymson, R.A., M.E. Will, G.W. Suter II, and A.C. Wooten. 1997b. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revisions. Oak Ridge National Laboratory, Oak Ridge, TN. ES/ER/TM-85/R3

Ministry of Housing, Spatial Planning and Environment (MHSPE). 2000. Circular on Target Values and Intervention Values for Soil Remediation. Directorate-General for Environmental Protection, Department of Soil Protection, The Hague, Netherlands. February 4, 2000.

United States Environmental Protection Agency (USEPA). 2007a. Ecological Soil Screening Levels for Polycyclic Aromatic Hydrocarbons (PAH): Interim Final. Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-78.

USEPA. 2007b. Ecological Soil Screening Levels for Copper (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-68.

USEPA. 2007c. Ecological Soil Screening Levels for Nickel (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-76.

USEPA. 2007d. Ecological Soil Screening Levels for Selenium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-72.

USEPA. 2007e. Ecological Soil Screening Levels for Zinc (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-72.

TABLE 5-1

**SUMMARY OF DETECTED RESULTS - SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

USEPA. 2005a. Ecological Soil Screening Levels for Arsenic (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C.

USEPA. 2005b. Ecological Soil Screening Levels for Cadmium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C.
OSWER Directive 9285.7-62.

Table References (continued):

USEPA. 2005c. Ecological Soil Screening Levels for Cobalt (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C.
OSWER Directive 9285.7-67

USEPA. 2005d. Ecological Soil Screening Levels for Lead (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C.
OSWER Directive 9285.7-70.

USEPA. 2005e. Ecological Soil Screening Levels for Barium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C.
OSWER Directive 9285.7-63.

USEPA. 2005f. Ecological Soil Screening Levels for Beryllium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C.
OSWER Directive 9285.7-63.

TABLE 5-2
INGESTION-BASED SCREENING VALUES FOR BIRDS
SWMU 68 - FORMER SOUTHERN TRAINING AEA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Chemical	Test Organism	Body Weight (kg)	Duration	Exposure Route	Effect/Endpoint	Test Material	LOAEL (mg/kg/d)	NOAEL (mg/kg/d)	Reference
Volatile Organics:									
Chlorobenzene	---	---	---	---	---	---	NA	NA	---
Styrene	---	---	---	---	---	---	NA	NA	---
PAHs:									
Benzo(a)anthracene	Chicken	1.50	34 days	Oral in diet	Reproduction	Not Applicable	395	39.5	Rigdon and Neal 1963
Chrysene	Chicken	1.50	34 days	Oral in diet	Reproduction	Not Applicable	395	39.5	Rigdon and Neal 1963
Fluoranthene	Chicken	1.50	34 days	Oral in diet	Reproduction	Not Applicable	395	39.5	Rigdon and Neal 1963
Pyrene	Chicken	1.50	34 days	Oral in diet	Reproduction	Not Applicable	395	39.5	Rigdon and Neal 1963
Inorganics:									
Arsenic	Chicken	Unknown	19 days	Oral in diet	Mortality	Unknown	22.4	2.24	USEPA 2005a
Barium	One-day old chicks	0.121	4 weeks	Oral in diet	Mortality	Barium hydroxide	41.7	20.8	Sample et al. 1996
Cobalt	Multiple species	Unknown	Various	Oral in diet	Growth	Unknown	76.1	7.61 ⁽¹⁾	USEPA 2005b
Copper	Chicken	Unknown	84 days	Oral in diet	Reproduction	Unknown	12.1	4.05	USEPA 2006
Lead	Chicken	Unknown	4 weeks	Oral in diet	Reproduction	Unknown	3.26	1.63	USEPA 2005c
Tin	Japanese quail	0.15	6 weeks	Oral in diet	Reproduction	bis(Tributyltin)-oxide	16.9	6.80	Sample et al. 1996
Zinc	White leghorn hen	1.935	44 weeks	Oral in diet	Reproduction	Zinc sulfate	131	14.5	Sample et al. 1996

Notes:

NA = Not Available

NOAEL = No Observed Adverse Effect Level

LOAEL = Lowest Observed Adverse Effect Level

USEPA = United States Environmental Protection Agency

mg/kg/day = milligram per kilogram-body weight per day

PAH = Polynuclear Aromatic Hydrocarbon

kg = kilogram

⁽¹⁾ The NOAEL value represents a geometric mean of NOAEL values for growth and/or reproduction. The NOAEL value was used in the derivation of the avian ecological soil screening level.⁽²⁾ The NOAEL value shown is for trivalent chromium.**Table References:**Rigdon, R.H. and J.Neal. 1963. Fluorescence of Chickens and Eggs Following the Feeding of Benzpyrene Crystals. Texas Reports on Biology and Medicine. 21(4):558-566.Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. Oak Ridge National Laboratory, Health Sciences Research Division, Oak Ridge, TN. ES/ER/TM-86/R3.United States Environmental Protection Agency (USEPA). 2006. Ecological Soil Screening Levels for Copper (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-77.USEPA. 2005a. Ecological Soil Screening Levels for Arsenic (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-62.USEPA. 2005b. Ecological Soil Screening Levels for Cobalt (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-67.USEPA. 2005c. Ecological Soil Screening Levels for Lead (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-70.

TABLE 5-3
LOG K_{ow} VALUES FOR DETECTED ORGANIC CHEMICALS
SWMU 68 - FORMER SOUTHERN TRAINING AEA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

	Log K _{ow} Range	Recommended Log K _{ow}	Reference	Bioaccumulative Chemical ⁽¹⁾
Volatile Organics:				
2-Butanone (Methyl ethyl ketone)	0.28 to 0.69	0.28	USEPA 1995	No
Acetone	-0.21 to -0.24	-0.24	USEPA 1995	No
Benzene	1.83 to 2.50	2.13	USEPA 1995	No
Chlorobenzene	2.56 to 3.79	2.86	USEPA 1995	Yes
Iodomethane (Methyl iodide)	Not Reported	1.51	SRC 1998	No
Styrene	2.76 to 3.16	2.94	USEPA 1995	Yes
PAHs:				
Benzo(a)anthracene	4.00 to 5.79	5.70	USEPA 1995	Yes
Chrysene	5.41 to 5.79	5.70	USEPA 1995	Yes
Fluoranthene	4.31 to 5.39	5.12	USEPA 1995	Yes
Fluorene	4.04 to 4.40	4.21	USEPA 1995	Yes
Pyrene	4.76 to 5.52	5.11	USEPA 1995	Yes

Notes:

K_{ow} = Octanol-Water Partition Coefficient

SRC = Syracuse Research Corporation

USEPA = United States Environmental Protection Agency

⁽¹⁾ An organic chemical is considered a bioaccumulative chemical if its Log K_{ow} value is greater than or equal to 3.0. When a range of Log K_{ow} values is reported, the upper value within the range was conservatively used to identify bioaccumulative chemicals.

Table references:

United States Environmental Protection Agency (USEPA). 1995. Internal Report on Summary of Measured, Calculated and Recommended Log Kow Values. Environmental Research Laboratory, Athens, GA. April 10, 1995.

Syracuse Research Corporation (SRC). 1998. Experimental Octanol/Water Partition Coefficient (Log P) Database.
<http://www.syrres.com/esc/default.htm>

TABLE 5-4
SOIL BIOCONCENTRATION FACTORS FOR TERRESTRIAL PLANTS AND SOIL
BIOACCUMULATION FACTORS FOR TERRESTRIAL INVERTEBRATES
SWMU 68 - FORMER SOUTHERN TRAINING AEA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Chemical	Soil-Plant BCF (dry weight)		Soil-Invertebrate BAF (dry weight)	
	Value	Reference	Value	Reference
Volatile Organics:				
Chlorobenzene	0.8608	Travis and Arms 1988	1.00	Assumed
Styrene	0.7739	Travis and Arms 1988	1.00	Assumed
PAHs:				
Benzo(a)anthracene	0.0197	Travis and Arms 1988	0.27	Beyer and Stafford 1993
Chrysene	0.0197	Travis and Arms 1988	0.44	Beyer and Stafford 1993
Fluoranthene	0.0425	Travis and Arms 1988	0.37	Beyer and Stafford 1993
Pyrene	0.0056	Travis and Arms 1988	0.39	Beyer and Stafford 1993
Inorganics:				
Arsenic	0.371	Bechtel Jacobs 1998	0.258	Sample et al. 1998
Barium	0.15	Baes et al. 1984	0.36	Beyer and Stafford 1993
Cobalt	0.02	Baes et al. 1984	0.38	Helmke et al. 1979
Copper	0.123	Bechtel Jacobs 1998	0.468	Sample et al. 1998
Lead	0.0377	Bechtel Jacobs 1998	0.307	Sample et al. 1998
Tin	0.03	Baes et al. 1984	1.00	Assumed
Zinc	0.358	Bechtel Jacobs 1998	2.482	Sample et al. 1998

Notes:

BCF = Bioconcentration Factor

BAF = Bioaccumulation Factor

Table References:

Baes III, C.F., R.D. Scharp, A.L. Sjoreen, and R.W. Shor. 1984. A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides through Agriculture. Oak Ridge National Laboratory, Oak Ridge, TN. ORNL-5786.

Bechtel Jacobs. 1998. Empirical Models for the Uptake of Inorganic Chemicals from Soil by Plants. Prepared for U.S. Department of Energy. BJC/OR-133. September 1998.

Beyer, W.N. and C. Stafford. 1993. Survey and Evaluation of Contaminants in Earthworms and in Soils Derived from Dredged Material at Confined

Disposal Facilities in the Great Lakes Region. Environ. Monit. Assess. 24:151-165.

Table References (continued):

TABLE 5-4
SOIL BIOCONCENTRATION FACTORS FOR TERRESTRIAL PLANTS AND SOIL
BIOACCUMULATION FACTORS FOR TERRESTRIAL INVERTEBRATES
SWMU 68 - FORMER SOUTHERN TRAINING AEA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Helmke, P.A., W.P. Robarge, R.L. Korotev, and P.J. Schomberg. 1979. Effects of Soil-Applied Sewage Sludge on Concentrations of Elements in Earthworms. J. Environ. Qual. 8:322-327.

Sample, B.E., J.J. Beauchamp, R.A. Efraymson, G.W. Syer II, and T.L. Ashwood. 1998. Development and Validation of Bioaccumulation Models for Earthworms. Oak Ridge National Laboratory, Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-220.

Travis, C.C. and R.K. Arms. 1988. Bioconcentration of Organics in Beef, Milk, and Vegetation. Environ. Sci. Technol. 22:271-274.

TABLE 5-5
SOIL BIOACCUMULATION FACTORS USED FOR SMALL MAMMAL PREY ITEMS
SWMU 68 - FORMER SOUTHERN TRAINING AEA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Chemical	Soil-Omnivore BAF (dry weight)	
	Value	Reference
Volatile Organics:		
Chlorobenzene	---	see text
Styrene	---	see text
PAHs:		
Benzo(a)anthracene	---	see text
Chrysene	---	see text
Fluoranthene	---	see text
Pyrene	---	see text
Inorganics:		
Arsenic	0.0033	Sample et al. 1998
Barium	0.0451	Sample et al. 1998
Cobalt	0.0168	Sample et al. 1998
Copper	0.1107	Sample et al. 1998
Lead	0.0548	Sample et al. 1998
Tin	---	see text
Zinc	0.5092	Sample et al. 1998

Notes:

BAF = Bioaccumulation Factor

Table References:

Sample, B.E., J.J. Beauchamp, R.A. Efroymson, and G.W. Suter III. 1998. Development and Validation of Bioaccumulation Models for Small Mammals. Oak Ridge National Laboratory, Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-219.

TABLE 5-6
EXPOSURE PARAMETERS FOR UPPER TROPHIC LEVEL TERRESTRIAL AVIAN RECEPTORS
SWMU 68 - FORMER SOUTHERN TRAINING AEA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Receptor	Habitat	Body Weight (kg)		Food Ingestion Rate (kg/day - dry)		Area Use Factor
		Value	Reference	Value	Reference	
Birds: American robin	Terrestrial	0.0773	USEPA 1993	0.00426	Levey and Karasov 1989	1.00
Mourning dove	Terrestrial	0.1265	Tomlinson et al. 1994	0.01515	Allometric equation from Nagy 1987 for all birds	1.00
Red-tailed hawk	Terrestrial	1.126	USEPA 1993	0.03603	Sample and Suter II 1994	1.00
Mammals: Small mammal omnivore (prey item)	Terrestrial	0.275	Jackson 1992	0.01477	Allometric equation from Nagy 1987 for rodents	1.00

Notes:

kg = Kilogram

kg/day - dry = Dry weight of food ingested per individual per day.

Table references:

Jackson, W.B. 1992. Norway rat and Allies. Chapter 54 In Chapman, J.A. and GA Feldhamer (eds.), Wild Mammals of North America: Biology, Management, and Economics. The John Hopkins University Press, Baltimore, MD. pp. 1077-1088.

Levey, D.J., and W.H. Karasov. 1989. Digestive Responses of Temperate Birds Switched to Fruit or Insect Diets. AUK. 106:675-686.

Nagy, K.A. 1987. Field metabolic rate and Food Requirement Scaling in Mammals and Birds. Ecol. Monogr. 57:11-128.

Sample, B.E. and G.W. Suter II. 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants. Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-125.

Tomlinson, R.E., D.D. Dolton, R.R. George, and R.R. Mirarchi. 1994. Mourning Dove. In T.C. Tacha and C.E. Braun (eds.), Migratory Shore and Upland Game Bird Management in North America. Int. Assoc. Fish and Wildlife Agencies, Washington, D.C. pp. 1-26.

United States Environmental Protection Agency (USEPA). 1993. Wildlife Exposures Factors Handbook. Office of Research and Development, Washington, D.C. EPA/630/R92/001.

TABLE 5-7
DIETARY COMPOSITION FOR UPPER TROPHIC LEVEL TERRESTRIAL AVIAN RECEPTORS
SWMU 68 - FORMER SOUTHERN TRAINING AEA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Receptor	Dietary Composition (percent)						Soil Ingestion (percent)		
	Terr. Plants	Soil Invert.	Small Mammals	Fish	Aquatic Plants	Aquatic Invert.	Reference	Value	Reference
Birds:									
American robin	12.0	78.9 ⁽¹⁾	0	0	0	0	Martin et al. 1951	9.1	Sample and Suter II 1994
Mourning dove	95.0	0	0	0	0	0	Tomlinson et al. 1994	5.0	Assumed
Red-tailed hawk	0	0	97.5	0	0	0	USEPA 1993; Sample and Suter II 1994	2.5	Assumed
Mammals:									
Small Mammal Omnivore (prey item)	49.0	49.0	0	0	0	0	Assumed	2.0	Assumed

Notes:

USEPA = United States Environmental Protection Agency

⁽¹⁾ Dietary compositions were available for spring, summer, winter, and fall. For conservatism, the percentage of soil invertebrates shown represents the highest percentage of terrestrial insects reported for a given season (spring).

Table references:

Martin, A.C., H.S. Zim, and A.L. Nelson. 1951. American Wildlife and Plants: A Guide to Wildlife Food Habits. Dover Publications, Inc., New York, N.Y. 500 pp.

Sample, B.E. and G.W. Suter II. 1994. Estimating Exposure of Terrestrial Wildlife to Contaminants. Environmental Restoration Division, ORNL Environmental Restoration Program. ES/ER/TM-125.

Tomlinson, R.E., D.D. Dolton, R.R. George, and R.R. Mirarchi. 1994. Mourning Dove. In T.C. Tacha and C.E. Braun (eds.), Migratory Shore and Upland Game Bird Management in North America. Int. Assoc. Fish and Wildlife Agencies, Washington, D.C. pp. 1-26.

United States Environmental Protection Agency (USEPA). 1993. Wildlife Exposures Factors Handbook. Office of Research and Development, Washington, D.C. EPA/630/R92/001.

TABLE 5-8
HAZARD QUOTIENT VALUES FOR UPPER TROPHIC LEVEL TERRESTRIAL AVIAN FOOD WEB EXPOSURES
SWMU 68 - FORMER SOUTHERN TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Chemical	American robin			Mourning dove			Red-tailed hawk		
	NOAEL	LOAEL	MATC	NOAEL	LOAEL	MATC	NOAEL	LOAEL	MATC
Volatile Organics:									
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAHs:									
Benzo(a)anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Inorganics:									
Arsenic	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	0.12	0.06	0.09	0.13	0.07	0.09	0.01	<0.01	<0.01
Cobalt	0.35	0.03	0.11	0.13	0.01	0.04	0.02	<0.01	<0.01
Copper	0.63	0.21	0.37	0.48	0.16	0.28	0.10	0.03	0.06
Lead	1.15	0.58	0.81	0.64	0.32	0.45	0.07	<0.01	0.02
Tin	0.04	0.01	0.02	0.08	0.03	0.05	<0.01	<0.01	<0.01
Zinc	0.53	0.06	0.18	0.22	0.02	0.07	0.08	<0.01	0.03

Notes:

NA = A hazard quotient value could not be derived due to the lack of an ingestion-based screening value

NOAEL = No Observed Adverse Effect Level

LOAEL = Lowest Observed Adverse Effect Level

MATC = Maximum Acceptable Toxicant Concentration

TABLE 5-9

**SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA	USEPA	NAPR ⁽¹⁾ Basewide Background	68SB01-01 (5.0 - 7.0) 11/13/06	68SB01-02 (13.0 - 15.0) 11/13/06	68SB02-01 (2.0 - 4.0) 11/14/06	68SB02-02 (12.0 - 14.0) 11/14/06	68SB03-01 (5.0 - 7.0) 11/13/06	68SB03-02 (17.0 - 19.0) 11/13/06	68SB04-01 (5.0 - 7.0) 11/14/06	68SB04-02 (12.0 - 14.0) 11/14/06
	Region IX Residential Soil PRGs	Region IX Industrial Soil PRGs									
Volatiles (ug/kg)											
Acetone	1,412,657 ⁽²⁾	5,432,098 ⁽²⁾	NE	22 J	46 U	65	45	8.3 J	45 U	51 UJ	5.8 J
Benzene	643	1,409	NE	5.1 UJ	4.6 UJ	4.5 UJ	4.2 UJ	4.4 UJ	4.5 UJ	5.1 U	1.3 J
Iodomethane	NE	NE	NE	5.1 U	4.6 U	6.1	4.2 U	4.4 U	4.5 U	5.1 U	5.8 UJ
Methyl Ethyl Ketone	2231120 ⁽²⁾	11326440 ⁽²⁾	NE	25 U	23 U	8.7 J	21 U	22 U	23 U	26 U	29 U
Styrene	1,700,000	1,700,000	NE	1.2 J	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U	5.1 U	5.8 U
Semivolatiles (ug/kg) (none detected)											
PAHs (ug/kg)											
Anthracene	2,189,612 ⁽²⁾	100,000,000	NE	8.2 U	8.1 U	7.7 U	8.2 U	1.6 J	8.8 U	9.0 U	8.9 U
Benzo[a]anthracene	621	2,110	NE	8.2 U	8.1 U	7.7 U	8.2 U	2.3 J	8.8 U	9.0 U	8.9 U
Chrysene	62,146	210,962	NE	8.2 U	8.1 U	7.7 U	8.2 U	3.0 J	8.8 U	9.0 U	8.9 U
Phenanthrene	NE	NE	NE	8.2 U	8.1 U	7.7 U	8.2 U	4.0 J	8.8 U	9.0 U	8.9 U
Pyrene	231,595 ⁽²⁾	2,912,620 ⁽²⁾	NE	8.2 U	8.1 U	7.7 U	8.2 U	6.8 J	8.8 U	9.0 U	8.9 U
PCBs (ug/kg)	(none detected)										
TPH (mg/kg)	(none detected)										

TABLE 5-9

**SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	NAPR ⁽¹⁾ Basewide	68SB05-01 (5.0 - 7.0)	68SB05-01D (5.0 - 7.0)	68SB05-02 (10.0 - 12.0)	68SB06-01 (2.0 - 4.0)	68SB06-02 (6.0 - 8.0)	68SB07-01 (5.0 - 7.0)	68SB07-02 (12.0 - 14.0)	68SB08-01 (5.0 - 7.0)
Sample Depth (ft bgs)	Residential	Industrial	Background	11/13/06	11/13/06	11/13/06	11/14/06	11/14/06	11/15/06	11/15/06	11/14/06
Sampling Date	Soil PRGs	Soil PRGs									
Volatiles (ug/kg)											
Acetone	1,412,657 ⁽²⁾	5,432,098 ⁽²⁾	NE	15 J	12 J	14 J	13 J	85 J	11 J	4.9 J	14 J
Benzene	643	1,409	NE	4.7 UJ	5.1 UJ	4.0 UJ	0.86 J	1.0 J	1.0 J	0.77 J	5.9 UJ
Iodomethane	NE	NE	NE	4.7 U	5.1 U	4.0 U	4.8 UJ	1.9 J	4.8 UJ	4.2 UJ	5.9 UJ
Methyl Ethyl Ketone	2231120 ⁽²⁾	11326440 ⁽²⁾	NE	24 U	26 U	20 U	24 U	13 J	24 U	21 U	29 UJ
Styrene	1,700,000	1,700,000	NE	4.7 U	5.1 U	4.0 U	4.8 U	5.2 U	4.8 U	4.2 U	5.9 UJ
Semivolatiles (ug/kg) (none detected)											
PAHs (ug/kg)											
Anthracene	2,189,612 ⁽²⁾	100,000,000	NE	8.0 U	8.1 U	7.9 U	8.2 U	8.1 U	8.3 U	8.1 U	7.9 U
Benzo[a]anthracene	621	2,110	NE	8.0 U	8.1 U	7.9 U	8.2 U	8.1 U	8.3 U	8.1 U	7.9 U
Chrysene	62,146	210,962	NE	8.0 U	8.1 U	7.9 U	8.2 U	8.1 U	8.3 U	8.1 U	7.9 U
Phenanthrene	NE	NE	NE	8.0 U	8.1 U	7.9 U	8.2 U	8.1 U	8.3 U	8.1 U	7.9 U
Pyrene	231,595 ⁽²⁾	2,912,620 ⁽²⁾	NE	8.0 U	8.1 U	7.9 U	8.2 U	8.1 U	8.3 U	8.1 U	7.9 U
PCBs (ug/kg)	(none detected)										
TPH (mg/kg)	(none detected)										

TABLE 5-9

**SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	NAPR⁽¹⁾	68SB08-02	68SB09-01	68SB09-02	68SB10-01	68SB10-01D	68SB10-02
Sample Depth (ft bgs)	Residential	Industrial	Basewide	(10.0 - 12.0)	(5.0 - 7.0)	(7.0 - 9.0)	(5.0 - 7.0)	(5.0 - 7.0)	(12.0 - 14.0)
Sampling Date	Soil PRGs	Soil PRGs	Background	11/14/06	11/14/06	11/14/06	11/15/06	11/15/06	11/15/06
Volatiles (ug/kg)									
Acetone	1,412,657 ⁽²⁾	5,432,098 ⁽²⁾	NE	5.8 J	9.3 J	43 UJ	25 J	25 J	7.2 J
Benzene	643	1,409	NE	0.69 J	0.98 J	4.3 U	0.90 J	1.0 J	4.4 U
Iodomethane	NE	NE	NE	3.6 UJ	4.7 UJ	4.3 UJ	2.7 J	2.5 J	0.99 J
Methyl Ethyl Ketone	2231120 ⁽²⁾	11326440 ⁽²⁾	NE	18 U	24 U	22 U	4.9 J	4.8 J	22 U
Styrene	1,700,000	1,700,000	NE	3.6 U	4.7 U	4.3 U	4.8 U	4.5 U	4.4 R
Semivolatiles (ug/kg) (none detected)									
PAHs (ug/kg)									
Anthracene	2,189,612 ⁽²⁾	100,000,000	NE	7.7 U	8.0 U	8.3 U	7.9 U	7.8 U	8.9 U
Benzo[a]anthracene	621	2,110	NE	7.7 U	8.0 U	8.3 U	7.9 U	7.8 U	8.9 U
Chrysene	62,146	210,962	NE	7.7 U	8.0 U	8.3 U	7.9 U	7.8 U	8.9 U
Phenanthrene	NE	NE	NE	7.7 U	8.0 U	8.3 U	7.9 U	7.8 U	8.9 U
Pyrene	231,595 ⁽²⁾	2,912,620 ⁽²⁾	NE	7.7 U	8.0 U	8.3 U	7.9 U	7.8 U	8.9 U
PCBs (ug/kg)	(none detected)								
TPH (mg/kg)	(none detected)								

TABLE 5-9

**SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID Sample Depth (ft bgs) Sampling Date	USEPA	USEPA	NAPR ⁽¹⁾	68SB01-01	68SB01-02	68SB02-01	68SB02-02	68SB03-01	68SB03-02	68SB04-01	68SB04-02
	Region IX Residential Soil PRGs	Region IX Industrial Soil PRGs	Basewide Background	(5.0 - 7.0) 11/13/06	(13.0 - 15.0) 11/13/06	(2.0 - 4.0) 11/14/06	(12.0 - 14.0) 11/14/06	(5.0 - 7.0) 11/13/06	(17.0 - 19.0) 11/13/06	(5.0 - 7.0) 11/14/06	(12.0 - 14.0) 11/14/06
Inorganics (mg/kg)											
Arsenic	0.39	1.59	1.59	<u>2.7</u>	1.1 J	1.2 J	<u>3.2</u>	1.1 J	0.35 J	1.2 J	<u>3.6</u>
Barium	537 ⁽²⁾	6,658 ⁽²⁾	220	13 J	25	34	<u>260</u>	60	18	11 J	11 J
Beryllium	15.4 ⁽²⁾	1,941	0.596	0.27 J	0.51 J	0.21 J	1.2	0.28 J	0.97 U	1.0 U	0.95 U
Cadmium	3.7 ⁽²⁾	45.1 ⁽²⁾	0.66	1.2 U	1.1 U	1.0 U	1.1 U	1.1 U	1.2 U	1.3 U	1.2 U
Chromium	211	448	114	15 J	20 J	15 J	17 J	19 J	15 J	63	<u>190</u>
Cobalt	903	1,921	26.9	8.0	7.6	8.9	20	9.9	0.68 J	1.3 J	0.57 J
Copper	313 ⁽²⁾	4,088 ⁽²⁾	246	19 J	10 R	20 J	62 J	32 J	15 R	29 J	66 J
Lead	400 ⁽³⁾	800 ⁽³⁾	6.29	3.9	1.3 J	2.6 J	2.1 J	1.8 J	0.79 J	2.2	4.9
Nickel	156 ⁽²⁾	2,044 ⁽²⁾	24.7	12	4.7 J	5.0 J	10 J	8.1 J	1.3 J	10 U	9.6 U
Selenium	39 ⁽²⁾	511 ⁽²⁾	4.04	1.1 J	2.3 U	2.1 U	2.3 U	2.3 U	2.4 U	<u>4.1</u>	<u>4.2</u>
Vanadium	7.82 ⁽²⁾	102 ⁽²⁾	434	180 J	48	76	220	95	48	110	440
Zinc	2,346 ⁽²⁾	100,000	88.1	29 J	25 J	26 J	75 J	42 J	3.9 J	7.9	7.9
Mercury -7471A	2.35 ⁽²⁾	30.7 ⁽²⁾	0.171	0.097	0.013 J	0.16	0.022 U	0.083	0.0051 J	0.035	0.026
Sulfide - 9034	NE	NE	NE	31 U	30 U	29 U	30 U	29 U	33 U	42	33 U

TABLE 5-9

**SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	USEPA Region IX	USEPA Region IX	NAPR ⁽¹⁾ Basewide	68SB05-01 (5.0 - 7.0) 11/13/06	68SB05-01D (5.0 - 7.0) 11/13/06	68SB05-02 (10.0 - 12.0) 11/13/06	68SB06-01 (2.0 - 4.0) 11/14/06	68SB06-02 (6.0 - 8.0) 11/14/06	68SB07-01 (5.0 - 7.0) 11/15/06	68SB07-02 (12.0 - 14.0) 11/15/06	68SB08-01 (5.0 - 7.0) 11/14/06
Sample Depth (ft bgs)	Residential	Industrial	Background								
Sampling Date	Soil PRGs	Soil PRGs									
Inorganics (mg/kg)											
Arsenic	0.39	1.59	1.59	0.93 J	1.1 J	1.2 J	1.1 J	1.1 J	0.80 J	1.3 J	1.3 J
Barium	537 ⁽²⁾	6,658 ⁽²⁾	220	59	81	65	72 J	87 J	44 J	72 J	64 J
Beryllium	15.4 ⁽²⁾	1,941	0.596	0.31 J	0.33 J	0.31 J	0.28 J	0.37 J	0.22 J	0.37 J	0.42 J
Cadmium	3.7 ⁽²⁾	45.1 ⁽²⁾	0.66	1.1 U	1.1 U	0.051 J	1.2 U	0.061 J	1.1 U	0.17 J	1.1 U
Chromium	211	448	114	26 J	36 J	32 J	35	34 J	22	28	22 J
Cobalt	903	1,921	26.9	6.9 R	16	15	14 J	14	6.3 J	17 J	15
Copper	313 ⁽²⁾	4,088 ⁽²⁾	246	39 J	52 J	44 J	61 J	51 J	27 J	36 J	39 J
Lead	400 ⁽³⁾	800 ⁽³⁾	6.29	1.6 J	2.0 J	2.0 J	1.8	2.4	1.8	2.3	2.6
Nickel	156 ⁽²⁾	2,044 ⁽²⁾	24.7	11 J	14 J	12 J	16	14	8.8 U	13	10
Selenium	39 ⁽²⁾	511 ⁽²⁾	4.04	2.2 U	2.2 U	2.2 U	2.4 U	2.3 U	2.2 U	2.2 U	2.3 U
Vanadium	7.82 ⁽²⁾	102 ⁽²⁾	434	100 J	150 J	140	170	140 J	90	120	110 J
Zinc	2,346 ⁽²⁾	100,000	88.1	42 J	45 J	44 J	56 J	60 J	39 J	61 J	57 J
Mercury -7471A	2.35 ⁽²⁾	30.7 ⁽²⁾	0.171	0.051	0.044	0.041	0.030 J	0.053 J	0.047 J	0.060 J	0.028 J
Sulfide - 9034	NE	NE	NE	30 U	30 U	30 U	31 U	30 U	44	40	29 U

TABLE 5-9

**SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID Sample Depth (ft bgs) Sampling Date	USEPA	USEPA							
	Region IX Residential Soil PRGs	Region IX Industrial Soil PRGs	NAPR ⁽¹⁾ Basewide Background	68SB08-02 (10.0 - 12.0) 11/14/06	68SB09-01 (5.0 - 7.0) 11/14/06	68SB09-02 (7.0 - 9.0) 11/14/06	68SB10-01 (5.0 - 7.0) 11/15/06	68SB10-01D (5.0 - 7.0) 11/15/06	68SB10-02 (12.0 - 14.0) 11/15/06
Inorganics (mg/kg)									
Arsenic	0.39	1.59	1.59	0.89 J	1.0 J	0.94 J	0.85 J	1.8 J	1.4 J
Barium	537 ⁽²⁾	6,658 ⁽²⁾	220	53 J	60 J	36 J	26 J	52 J	47 J
Beryllium	15.4 ⁽²⁾	1,941	0.596	0.22 J	0.31 J	0.24 J	0.34 J	0.36 J	0.30 J
Cadmium	3.7 ⁽²⁾	45.1 ⁽²⁾	0.66	1.0 U	1.1 U	1.2 U	1.1 U	0.087 J	0.094 J
Chromium	211	448	114	22	41 J	31	23	22	34
Cobalt	903	1,921	26.9	12 J	14	9.8 J	4.7 J	13 J	16 J
Copper	313 ⁽²⁾	4,088 ⁽²⁾	246	34 J	53 J	45 J	32 J	34 J	37 J
Lead	400 ⁽³⁾	800 ⁽³⁾	6.29	1.9	2.0	1.9	1.9	2.9	2.1
Nickel	156 ⁽²⁾	2,044 ⁽²⁾	24.7	9.8	16	12	9.6	11	12
Selenium	39 ⁽²⁾	511 ⁽²⁾	4.04	2.0 U	0.28 J	2.4 U	2.2 U	0.22 J	0.27 J
Vanadium	7.82 ⁽²⁾	102 ⁽²⁾	434	110	160 J	140	98	130	140
Zinc	2,346 ⁽²⁾	100,000	88.1	38 J	64 J	53 J	48 J	43 J	45 J
Mercury -7471A	2.35 ⁽²⁾	30.7 ⁽²⁾	0.171	0.02 U	0.024 U	0.035 J	0.11 J	0.082 J	0.029 J
Sulfide - 9034	NE	NE	NE	29 U	30 U	31 U	29 U	29 U	33 U

TABLE 5-9

**SUMMARY OF DETECTED RESULTS - SUBSURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Notes:

U - Not detected

UJ - Reported quantitation limit is qualified as estimated

J - Analyte present - Reported value is estimated

R - Validator rejected analytical result

PRG - Preliminary Remedial Goal

NAPR - Naval Activity Puerto Rico

NE - Not Established

PAHs - Polycyclic Aromatic Hydrocarbons

PCBs - Polychlorinated Biphenyls

TPH - Total Petroleum Hydrocarbon

USEPA = United States Environmental Protection Agency

ft bgs - feet below ground surface

ug/kg - microgram per kilogram

mg/kg - milligram per kilogram

(1) NAPR basewide background subsurface soil screening value - clay soil type
(upper limit of the means concentration [mean plus two standard deviations]) (Baker, 2006)

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

(3) USEPA Action Level for lead in soils

Table References:

Baker Environmental, Inc, (2006). Revised Final Summary Report for Environmental Background Concentrations of Inorganic Compounds, Naval Activity Puerto Rico, Ceiba, Puerto Rico. October 16, 2006.

TABLE 5-10

**SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID Sampling Date	USEPA Region IX Tap Water PRGs	<i>USEPA MCLs</i>	Selected Ecological Surface Water Screening Values	<u>NAPR</u> ⁽¹⁾ <u>Basewide</u> <u>Background</u>	68TW01 11/16/06	68TW02 11/16/06	68TW04 11/16/06	68TW05 11/14/06	68TW05D 11/14/06
Volatiles (ug/L)									
Acetone	548 ⁽²⁾	NE	1,000 ⁽⁵⁾	NE	25 U				
Methyl Ethyl Ketone	697 ⁽²⁾	NE	40,000 ⁽⁶⁾	NE	10 U				
Semivolatiles (ug/L)									
2-Methylphenol	180 ⁽²⁾	NE	NE	NE	NA	NA	11 U	10 U	10 U
Benzyl alcohol	1,095 ⁽²⁾	NE	150 ⁽⁷⁾	NE	NA	NA	11 U	10 U	10 U
PAHs (ug/L)	(none detected)								
PCBs (ug/L)	(none detected)								
TPH (ug/L)	(none detected)								

TABLE 5-10

**SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID Sampling Date	USEPA Region IX Tap Water PRGs	<i>USEPA MCLs</i>	Selected Ecological Surface Water Screening Values	<u>NAPR</u> ⁽¹⁾ <u>Basewide</u> <u>Background</u>	68TW06 11/15/06	68TW07 11/16/06	68TW08 11/16/06	68TW09 11/16/06	68TW10 11/16/06
Volatiles (ug/L)									
Acetone	548 ⁽²⁾	NE	1,000 ⁽⁵⁾	NE	25 U	25 U	25 U	9.1 J	25 U
Methyl Ethyl Ketone	697 ⁽²⁾	NE	40,000 ⁽⁶⁾	NE	10 U	2.0 J	1.8 J	10 U	10 U
Semivolatiles (ug/L)									
2-Methylphenol	180 ⁽²⁾	NE	NE	NE	10 U	11 U	9.6 U	1.5 J	10 U
Benzyl alcohol	1,095 ⁽²⁾	NE	150 ⁽⁷⁾	NE	10 U	11 U	9.6 U	2.7 J	10 U
PAHs (ug/L)	(none detected)								
PCBs (ug/L)	(none detected)								
TPH (ug/L)	(none detected)								

TABLE 5-10

**SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Inorganics (ug/L)

Arsenic	0.045	10	36 ⁽⁸⁾	18.89	3.0 J	NA	1.6 J	10 U	10 U
Barium	260 ⁽²⁾	2,000	50,000 ⁽⁹⁾	686	150 J	NA	17 J	62 J	84 J
Beryllium	7 ⁽²⁾	4	310 ⁽¹⁰⁾	2.21	0.71 J	NA	4.0 U	4.0 U	4.0 U
Cadmium	1.8 ⁽²⁾	5	8.85 ⁽⁸⁾	55.83	5.0 U	NA	5.0 U	5.0 U	5.0 U
Chromium	5,470 ⁽²⁾⁽³⁾	100	50.4 ⁽⁸⁾	162.41	39 J	NA	92 J	8.2 J	8.1 J
Cobalt	73 ⁽²⁾	NE	45 ⁽¹¹⁾	633.21	19 J	NA	2.0 J	3.9 J	8.5 J
Lead	NE	15 ⁽⁴⁾	8.52 ⁽⁸⁾	26.25	4.8 J	NA	2.1 J	0.66 J	0.96 J
Tin	2,190 ⁽²⁾	NE	NE	20.68	1.7 J	NA	10 UJ	10 UJ	10 UJ
Vanadium	3.6 ⁽²⁾	NE	120 ⁽¹²⁾	484.66	210 J	NA	160 J	34 J	33 J
Zinc	1,090 ⁽²⁾	NE	85.6 ⁽⁸⁾	547.53	80 J	NA	24 J	21 J	22 J
Mercury - 7470A (ug/L)	0.36 ⁽²⁾	2	0.94 ⁽⁸⁾	0.29	0.20 U	NA	0.20 U	0.20 U	0.13 J
Sulfide - 9034 (mg/L)	NE	NE	NE	NE	1.0 U	NA	1.0 U	1.0 U	1.0 U
Arsenic, Dissolved	0.05	10	36 ⁽¹³⁾	20.41	10 U	10 U	10 U	10 U	10 U
Barium, Dissolved	260 ⁽²⁾	2,000	50,000 ⁽⁹⁾	260	48	39	15	39	40
Chromium, Dissolved	5,470 ⁽²⁾	100	50 ⁽¹³⁾	9.0	10 U	10 U	10 U	10 U	10 U
Cobalt, Dissolved	73 ⁽²⁾	NE	45 ⁽¹¹⁾	580.5	11	8.6 J	7.6 J	1.4 J	0.89 J
Lead, Dissolved	NE	15 ⁽⁴⁾	8.1 ⁽¹³⁾	2.2	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Nickel, Dissolved	73 ⁽²⁾	NE	8.2 ⁽¹³⁾	84.1	2.4 J	2.8 J	1.5 J	0.96 J	0.99 J
Selenium, Dissolved	18 ⁽²⁾	50	71 ⁽¹³⁾	33.98	4.0 J	1.6 J	1.7 J	10 U	10 U
Vanadium, Dissolved	3.6 ⁽²⁾	NE	120 ⁽¹²⁾	265.61	6.6 J	10	3.1 J	3.7 J	3.8 J
Zinc, Dissolved	1,090 ⁽²⁾	NE	81 ⁽¹³⁾	360.64	6.4 J	10 J	6.8 J	4.8 J	5.4 J

TABLE 5-10

**SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Inorganics (ug/L)

Arsenic	0.045	10	36 ⁽⁸⁾	18.89	10 U	10 U	1.3 J	NA	10 U
Barium	260 ⁽²⁾	2,000	50,000 ⁽⁹⁾	686	51 J	68 J	150 J	NA	43 J
Beryllium	7 ⁽²⁾	4	310 ⁽¹⁰⁾	2.21	4.0 U	4.0 U	0.20 J	NA	4.0 U
Cadmium	1.8 ⁽²⁾	5	8.85 ⁽⁸⁾	55.83	0.17 J	5.0 U	5.0 U	NA	5.0 U
Chromium	5,470 ⁽²⁾⁽³⁾	100	50.4 ⁽⁸⁾	162.41	4.2 J	5.1 J	28 J	NA	6.8 J
Cobalt	73 ⁽²⁾	NE	45 ⁽¹¹⁾	633.21	1.9 J	8.2 J	24 J	NA	7.4 J
Lead	NE	15 ⁽⁴⁾	8.52 ⁽⁸⁾	26.25	1.1 J	5.0 U	1.7 J	NA	0.77 J
Tin	2,190 ⁽²⁾	NE	NE	20.68	10 UJ	10 UJ	1.3 J	NA	10 UJ
Vanadium	3.6 ⁽²⁾	NE	120 ⁽¹²⁾	484.66	17 J	24 J	100 J	NA	34 J
Zinc	1,090 ⁽²⁾	NE	85.6 ⁽⁸⁾	547.53	18 J	16 J	45 J	NA	15 J
Mercury - 7470A (ug/L)	0.36 ⁽²⁾	2	0.94 ⁽⁸⁾	0.29	0.20 U	0.20 U	0.20 U	NA	0.20 U
Sulfide - 9034 (mg/L)	NE	NE	NE	NE	1.0 U	1.0 U	1.0 U	NA	1.1
Arsenic, Dissolved	0.05	10	36 ⁽¹³⁾	20.41	10 U	10 U	10 U	10 U	0.63 J
Barium, Dissolved	260 ⁽²⁾	2,000	50,000 ⁽⁹⁾	260	39	74	53	25	36
Chromium, Dissolved	5,470 ⁽²⁾	100	50 ⁽¹³⁾	9.0	10 U	10 U	10 U	10 U	5.9 J
Cobalt, Dissolved	73 ⁽²⁾	NE	45 ⁽¹¹⁾	580.5	3.2 J	11	12	9.5 J	14
Lead, Dissolved	NE	15 ⁽⁴⁾	8.1 ⁽¹³⁾	2.2	5.0 U	5.0 U	5.0 U	5.0 U	0.62 J
Nickel, Dissolved	73 ⁽²⁾	NE	8.2 ⁽¹³⁾	84.1	1.2 J	3.2 J	3.3 J	3.5 J	4.3 J
Selenium, Dissolved	18 ⁽²⁾	50	71 ⁽¹³⁾	33.98	10 U	10 U	10 U	10 U	6.7 J
Vanadium, Dissolved	3.6 ⁽²⁾	NE	120 ⁽¹²⁾	265.61	4.0 J	4.5 J	2.6 J	3.8 J	34
Zinc, Dissolved	1,090 ⁽²⁾	NE	81 ⁽¹³⁾	360.64	8.6 J	30 J	8.4 J	11 J	16 J

TABLE 5-10

**SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Notes:

U - Not detected	mg/kg - milligram per kilogram
UJ - Reported quantitation limit is qualified as estimated	TPH - Total Petroleum Hydrocarbon
J - Analyte present - Reported value is estimated	PAHs - Polycyclic Aromatic Hydrocarbons
NA - Not Analyzed	PCBs - Polychlorinated biphenyls
ND - Not Detected	LC50 - Median Lethal Concentration
NE - Not Established	NOEC - No Observed Effect Concentration
PRG - Preliminary Remedial Goal	CCC - Criteria Continuous Concentration
NAPR - Naval Activity Puerto Rico	USEPA - United States Environmental Protection Agency
ug/kg - microgram per kilogram	

- (1) NAPR basewide background groundwater screening value (upper limit of the means concentration [mean plus two standard deviations]) (Baker, 2006)
- (2) Noncarcinogenic PRGs based on a target hazard quotient of 0.1 for conservative screening purposes
- (3) Tap-Water PRG value for hexavalent chromium presented
- (4) USEPA Action Level for lead in drinking water
- (5) Minimum acute value (96-hr LC₅₀ for *Lumbriculus variegatus* [oligochaete]) with a safety factor of 10 (USEPA, 2003)
- (6) Minimum acute value (96-hour NOEC for *Cyprinodon variegatus* [sheepshead minnow]) with a safety factor of 10 (USEPA, 2003)
- (7) Minimum acute value (96-hr LC₅₀ for *Menidia beryllina* [inland silverside]) with a safety factor of 100
- (8) 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)
- (9) Minimum acute value (96-hr NOEC for *Cyprinodon variegatus* [sheepshead minnow]) with a safety factor of 100 (USEPA, 2003)
- (10) Minimum acute value (96-hr LC₅₀ for *Fundulus heteroclitus* [mummichog]) with a safety factor of 100 (USEPA, 2003)
- (11) Minimum acute value (96-hr LC₅₀ for *Nitocra spinipes* [Harpacticoid copepod]) with a safety factor of 100 (USEPA, 2003)
- (12) Minimum chronic value (28-day NOEC for *Pimephales promelas* [fathead minnow]) based on growth (USEPA, 2003)
- (13) USEPA National recommended water quality criterion (dissolved saltwater CCC) (USEPA, 2006)

TABLE 5-10

**SUMMARY OF DETECTED RESULTS - GROUNDWATER
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Table references:

Baker Environmental, Inc. (2006). Revised Final Summary Report for Environmental Background Concentrations of Inorganic Compounds, Naval Activity Puerto Rico, Ceiba, Puerto Rico. October 16, 2006.

United States Environmental Protection Agency (USEPA). 2006. National Recommended Water Quality Criteria. Office of Water and Office of Science and Technology, Washington, D.C.

USEPA. 2003. ECOTOX Database System, Aquatic Toxicity Information Retrieval (AQUIRE) Database. Mid-Continent Ecology Division (MED), Duluth, MN. <http://cfpub.epa.gov/ecotox/>.

TABLE 5-11

**SUMMARY OF DETECTED RESULTS - QUALITY ASSURANCE / QUALITY CONTROL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID Sampling Date	Equipment Rinsates					Field Blanks		
	2006ER01 11/13/2006	2006ER02 11/15/2006	2006ER04 11/16/2006	68ER01 9/27/2007	68PbER01 9/27/2007	2006FB01 11/18/2006	2006FB02 11/18/2006	68PbFB01 10/24/2007
Volatiles (ug/L)								
Bromoform	1.0 U	1.0 U	1.0 U	NA	NA	1.0 U	1.0 U	NA
Chlorodibromomethane	1.0 U	1.0 U	1.0 U	NA	NA	1.0 U	2.8	NA
Chloroform	1.0 U	1.0 U	1.0 U	NA	NA	1.0 U	160	NA
Dichlorobromomethane	1.0 U	1.0 U	1.0 U	NA	NA	1.0 U	18	NA
Toluene	1.0 U	2.3	2.2	NA	NA	1.0 U	1.0 U	NA
Semivolatiles (ug/L)								
14-Dichlorobenzene	9.4 UJ	0.56 J	10 U	NA	NA	0.53 J	10 U	NA
Diethyl phthalate	0.82 J	10 UJ	10 U	NA	NA	0.69 J	10 U	NA
PAHs (ug/L)								
Fluoranthene	0.19 UJ	0.19 UJ	0.20 U	NA	NA	0.20 U	0.080 J	NA
PCBs (ug/L) (none detected)								
TPH (mg/L)								
Diesel Range Organics	0.096 UJ	0.10 UJ	0.10 U	NA	NA	0.052 J	0.10 U	NA
Metals (ug/L)								
Copper	20 U	20 U	20 U	NA	NA	20 U	79	NA
Lead	5.0 U	5.0 U	5.0 U	NA	6.3 U	5.0 U	0.69 J	6.3 U
Nickel	40 U	0.26 J	0.19 J	NA	NA	40 U	40 U	NA
Zinc	3.7 J	20 U	20 U	NA	NA	20 U	20 U	NA

Notes:

U - Not detected

UJ - Reported quantitation limit is qualified as estimated

J - Analyte present - Reported value is estimated

NA - Not Analyzed

TABLE 5-11

SUMMARY OF DETECTED RESULTS - QUALITY ASSURANCE / QUALITY CONTROL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID	Trip Blanks			
	68TB01	68TB02	68TB03	27TB01
Sampling Date	11/14/06	11/15/06	11/15/06	11/16/06
Volatiles (ug/L)				
Bromoform	1.0 U	1.0 J	1.0 UJ	1.0 U
Chlorodibromomethane	1.0 U	0.85 J	1.0 UJ	1.0 U
Chloroform	1.0 U	1.0 UJ	1.0 UJ	1.0 U
Dichlorobromomethane	1.0 U	1.0 UJ	1.0 UJ	1.0 U
Toluene	1.0 U	1.0 UJ	1.0 UJ	1.0 U
Semivolatiles (ug/L)				
14-Dichlorobenzene	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA
PAHs (ug/L)				
Fluoranthene	NA	NA	NA	NA
PCBs (ug/L)				
TPH (mg/L)				
Diesel Range Organics	NA	NA	NA	NA
Metals (ug/L)				
Copper	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Nickel	NA	NA	NA	NA
Zinc	NA	NA	NA	NA

Notes:

U - Not detected

UJ - Reported quantitation limit is qualified as estimated

J - Analyte present - Reported value is estimated

NA - Not Analyzed

TABLE 6-1
CORRECTIVE ACTION OBJECTIVES FOR COPPER, LEAD, AND ZINC IN SURFACE SOIL
SWMU 68 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE I RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Chemical	Corrective Action Objective (mg/kg)			Final Corrective Action Objective (mg/kg)
	Terrestrial Invertebrates and Plants	American Robin (Avian Omnivore)	Background ⁽¹⁾	
Copper	70 ⁽²⁾	NA	168	168
Lead	120 ⁽³⁾	87 ⁽⁵⁾	22	87
Zinc	120 ⁽⁴⁾	NA	115	120

Notes:

NA = Not applicable (chemical does not present an unacceptable risk to terrestrial avian omnivore populations)

⁽¹⁾ NAPR background surface soil screening value (upper limit of the means) present in Baker (2006)

⁽²⁾ The value shown is an Ecological Soil Screening Level for plants (USEPA, 2007a).

⁽³⁾ The value shown is an Ecological Soil Screening Level for terrestrial invertebrates (USEPA, 2005).

⁽⁴⁾ The value shown is an Ecological Soil Screening Level for terrestrial plants. (USEPA, 2007b).

⁽⁵⁾ The value shown is the surface soil concentration that results in a hazard quotient value of 0.99.

Table references:

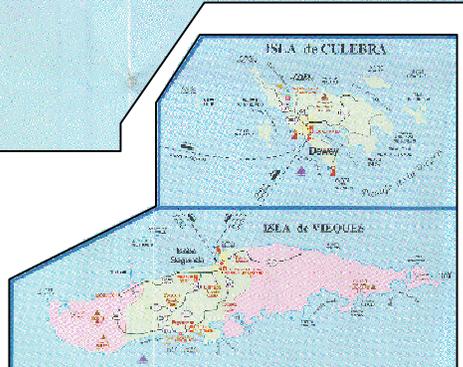
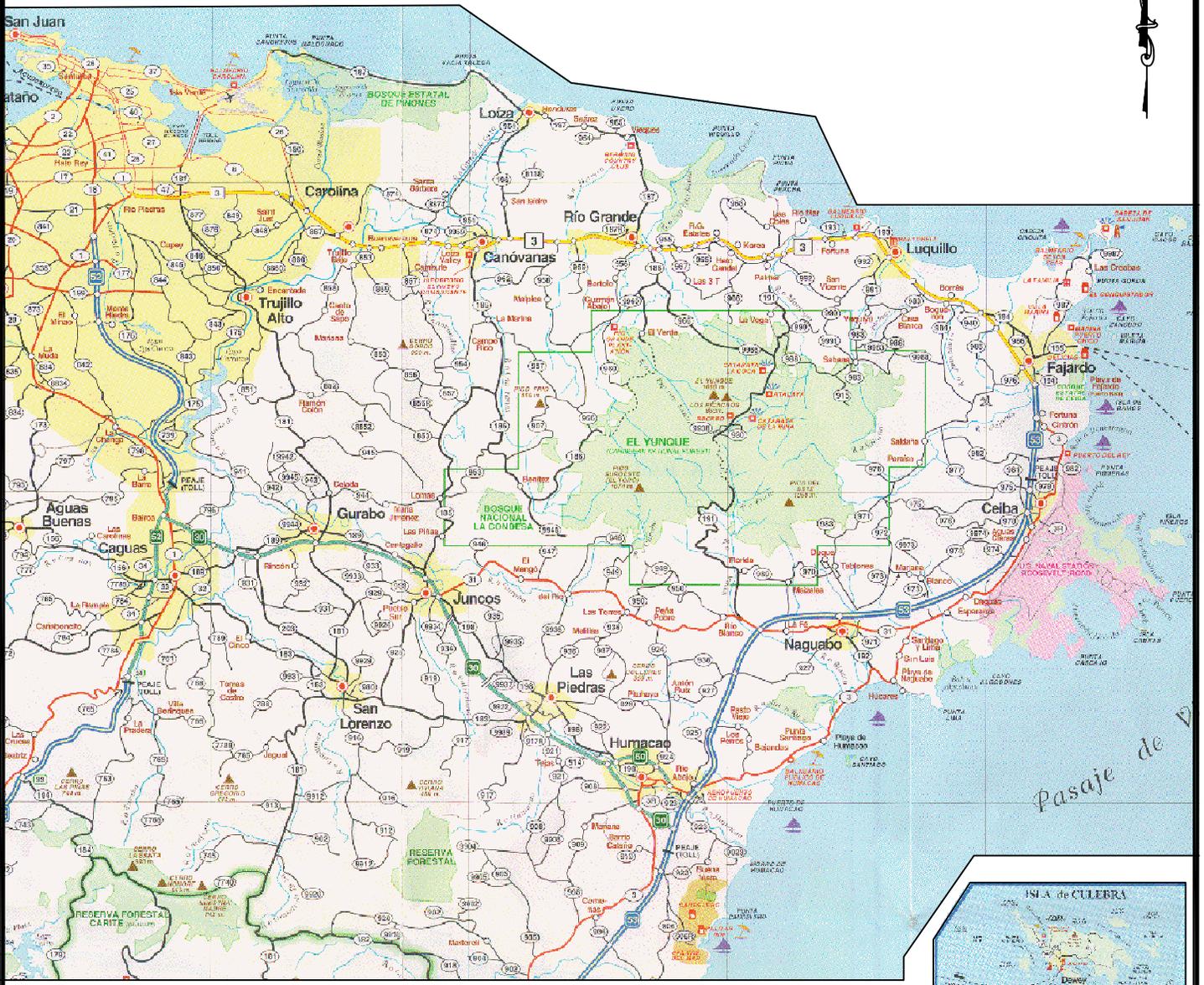
Baker Environmental, Inc. (Baker). 2006. Revised Final Report for Environmental Background Concentrations of Inorganic Compounds, Naval Activity, Puerto Rico, Ceiba, Puerto Rico. October 17, 2006.

United States Environmental Protection Agency. 2007a. Ecological Soil Screening Levels for Copper (Interim Final). Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-68.

USEPA. 2007b. Ecological Soil Screening Levels for Zinc (Interim Final). Office of Solid Waste and Emergency Response. OSWER Directive 9285.7-73.

USEPA. 2005. Ecological Soil Screening Levels for Lead (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-70

FIGURES



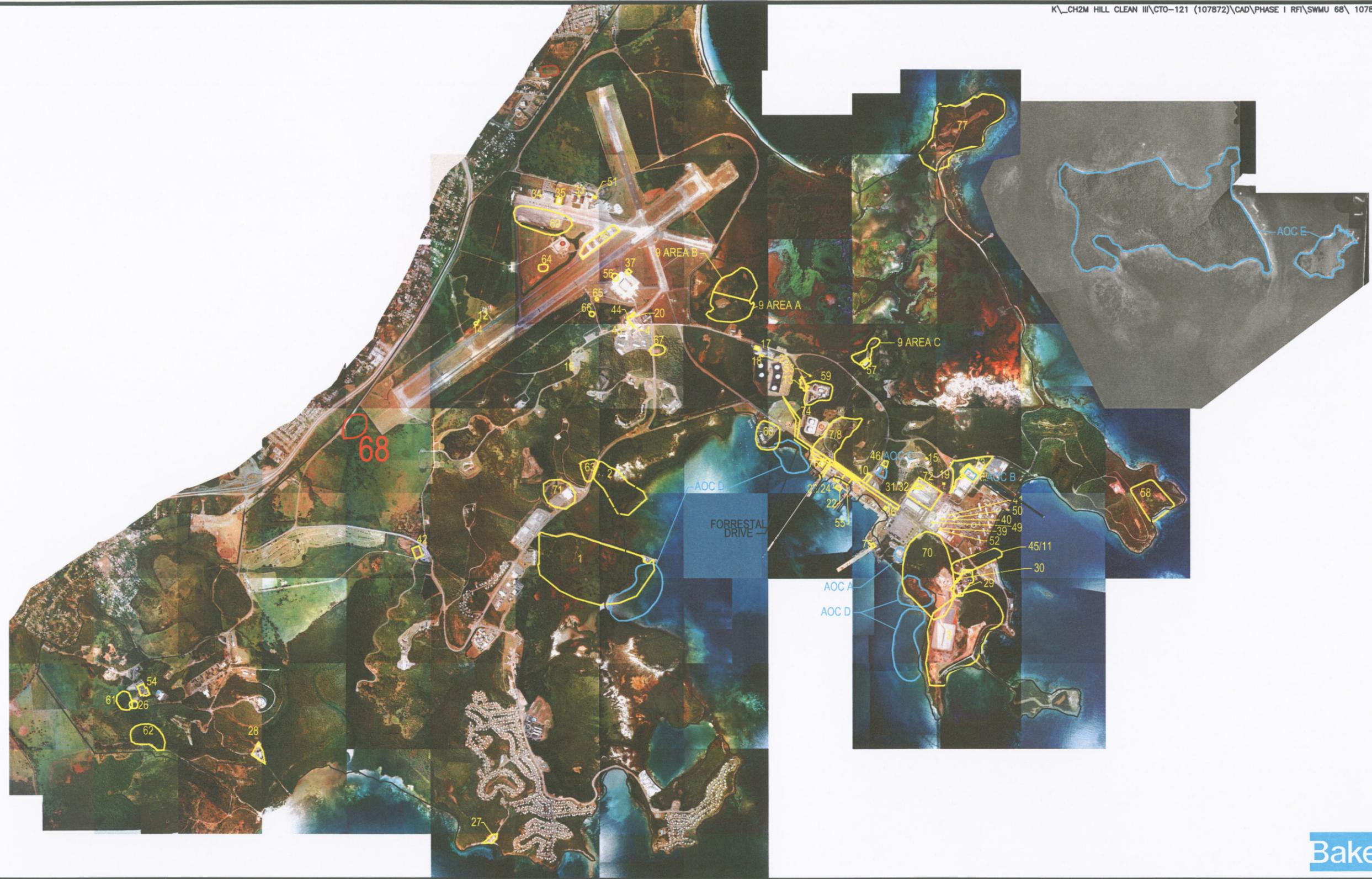
1 inch = 4 miles



FIGURE 2-1
REGIONAL LOCATION MAP
PHASE I RFI
SWMU 68

NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

SOURCE: METRODATA, INC., 1999.



Baker

LEGEND

- SWMUs

68 - AREA OF WHICH THIS INVESTIGATION PERTAINS TO

- AOCs

AOC D - AOCs

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

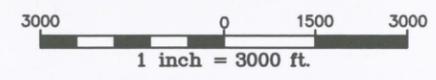


FIGURE 2-2
NAPR LOCATION MAP
PHASE I RFI WORK PLAN FOR
SWMU 68
NAVAL ACTIVITY PUERTO RICO
PUERTO RICO



LEGEND

 - SWMU 68

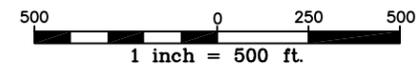
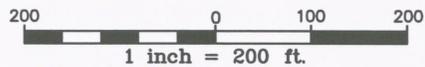


FIGURE 2-3
SWMU 68 LOCATION MAP
NAVAL ACTIVITY PUERTO RICO
PUERTO RICO

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

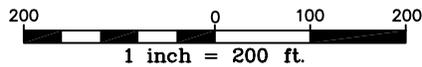


LEGEND

- - 1961 POLYGON FEATURE
- - 1961 DRAINAGE
- - 1964 POLYGON FEATURE
- ⊙ - EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP INVESTIGATION)
- - PROPOSED SAMPLING LOCATIONS
- ◇ - ECP SITE BOUNDARY

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

FIGURE 2-4
 1961 AERIAL PHOTOGRAPH
 WITH SAMPLE LOCATIONS
 FORMER SOUTHERN
 FIRE TRAINING AREA
 PHASE I RFI SWMU 68
 NAVAL ACTIVITY PUERTO RICO



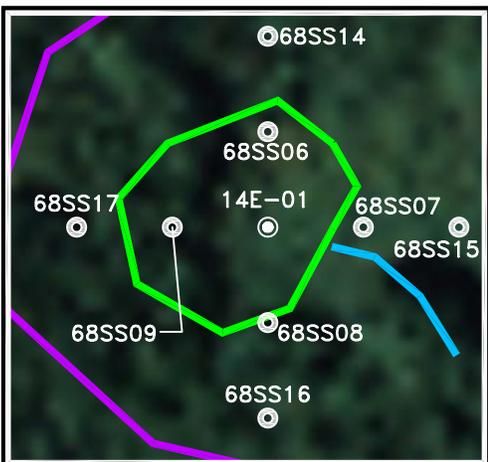
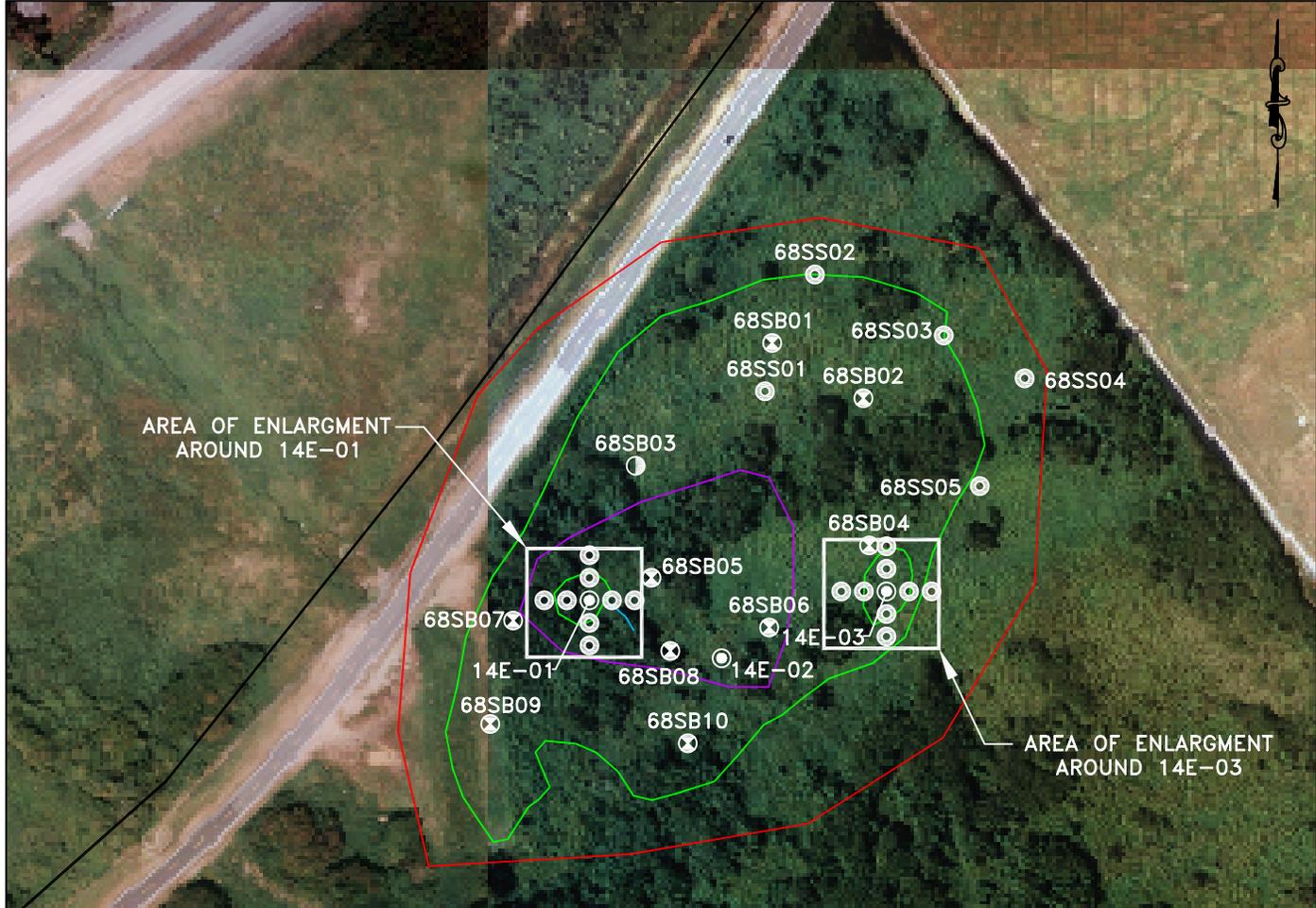
LEGEND

- ▭ - 1961 POLYGON FEATURE
- ▭ - 1961 DRAINAGE
- ▭ - 1964 POLYGON FEATURE
- (130.10) - GROUNDWATER ELEVATION
- ⊕ - TEMPORARY MONITORING WELL LOCATION
- ◇ - ECP SITE BOUNDARY

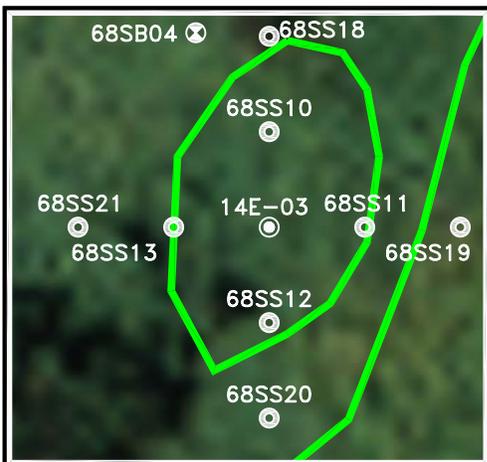
FIGURE 3-1
GROUNDWATER ELEVATIONS (11/17/06)
FORMER SOUTHERN
FIRE TRAINING AREA
PHASE I RFI SWMU 68

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

NAVAL ACTIVITY PUERTO RICO



AREA OF ENLARGMENT AROUND 14E-01



AREA OF ENLARGMENT AROUND 14E-03



SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000. 1 inch = 200 ft.



LEGEND

- - 1961 POLYGON FEATURE
- - 1961 DRAINAGE
- - 1964 POLYGON FEATURE
- SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP INVESTIGATION)
- SURFACE AND SUBSURFACE SOIL AND GROUNDWATER SAMPLE LOCATION (PHASE I RFI NOV. 06)
- SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE I RFI NOV. 06)
- SURFACE SOIL (PHASE I RFI SEPT. AND OCT. 07)
- ECP SITE BOUNDARY

FIGURE 4-1
SAMPLE LOCATION MAP
FORMER SOUTHERN
FIRE TRAINING AREA
PHASE I RFI SWMU 68

NAVAL ACTIVITY PUERTO RICO

APPENDIX A
2006/20007 FIELD ACTIVITIES

APPENDIX A.1
SWMU 68 FIELD LOG BOOK NOTES

11/14/06
SWMU-28

Temp Well 3

SWL @ 0900 = 6.79 ft.

1055 - Begin Sampling.
28TW03

1105 - Ran Dry before last VOA filled.
(Water very carbonated, cannot fill
VOA's without many bubbles)

AA

11/14/06
SWMU-68

Temp Well 5

SWL @ 1626 = 12.19 ft.

1630 - Begin Sampling.
68TW05

" D
" MS
" MSD

Pumped @ Max speed.
No Meter Measurements Taken.

AA

Weather: Mostly Sunny,
~ 80°F

11/15/06

SWMU-42

Temp. Well 1

SLK @ 0715 = 12.17 °F

0730 - Basin Sampling

42TW01

" D

" MS

" MSD

Pumped @ 3/4 speed

Post Sample Readings:

Temp. °C	Cond. mS	pH	ORP	Turb.
29.68	0.356	6.91	-85	14

AAH

11/15/06

SWMU-42

Temp. Well 3

SLK @ 0920 = 5.38 °F

0930 - Basin Sampling

Pumped @ 3/4 speed. Ren Dry after
UBA's & 2 Ambers. Very slow re-charge

42TW03

AAH

11/15/06

SWMU-68

Temp. Well 6

SWL @ 1633 = 8.35 ft

1652 - Basin Sampling.
68TW06

Note: Started w/ Tubing near bottom, but
water was too viscous - clogged tubing.

Had to pull tubing up ~ 7 ft.
Pumping @ ~ 1/2 speed & water cleared
up nicely.

Post Sample Readings:

Temp. °C	Cond. ^{ns}	pH	ORP	Turb.
25.99	0.836	6.55	42	30

MAH

Weather: Mostly cloudy,
breezy, ~ 75°F

11/16/06

SWMU-68

Temp. Well 2

SWL @ 0745 = 13.71

0750 - Basin Sampling.
68TW02

Note: OBU - Well Dry after VOA's & 1 Amber.
Was pumping @ ~ 3/4 speed - not fast.
- Waited 10 min. & got only ~ 50-75 mills
more.
- After 46 min., got only ~ 100 mills.

MAH

11/16/06

SWMU-68

Static Water Levels:

Time	Well	Depth (ft.)
0836	04	5.86
0839	06	8.27
0842	10	7.03
0845	08	11.02
0847	05	11.78
0853	07	11.08
0856	09	7.53

MA

Weather: Hard rain,
~75°F

11/16/06

SWMU-68

Temp. Well 10

SLR @ 0842 = 7.03

0940 - Begin Sampling
6BTW10

Post Sample Readings:

Temp ^{°C}	Cond ^{ms}	pH	ORP	Turb.
26.00	1.641	6.65	-60	Error

MA

11/16/06

Weather:
Steady Rain.
~ 80°F

SLMU-68

[Temp. Well 08]

SL @ 0845 = 11.02

1315 - Begin Sampling.
68TW08

Note: Dry after UDA's

DA

11/16/06

SLMU-68

[Temp. Well 9]

SL @ 0856 = 7.53

1320 - Begin Sampling.
68TW09

Note: 1334 - Well Dry after VDA's +
1 1/2 Amber. 10 min. Wait = 400 mills.

DA

11/16/06

SUMU-29

Temp. Well 5

SLR @ 1701 = 5.77A

1705. Begin Sampling.
29TW05

Note: 1710. Dry after "4" vol's.

DAV

11/17/06

Remains bottles obtained from
SUMU 6A

01 T/F-Metals, CN, sulfide, X-val. PCB

02 PAH, F. Metals

04 CN; sulfide, X-val.

07 Sulfide, CN, F. Metals, X-val. (PCB) (Sulfide)

08 SVOC, CN, Sulfide, T. Metals

09 Pest., PCB, T. Metals

DAV

11/17/06

SWMU-29

Temp. Well 01

SLK @ 1115 = 7.95

29TW01

1225. Basin Samplings.

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

AA

11/18/06

Static Water Levels

Time Well Depth

SWMU-42

0711 01 12.26

0715 03 12.82

0717 02 11.11

SWMU-6A

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

AA

685B03/
TW03
↓

Swml 68

SWL

	Swl	wd	WE
Tw03✓	8.35	17.40	9.05
Tw04	5.95	15.81	9.88.
Tw02	14.65	19.94	4.76
Tw01	10.19	19.41	9.22
Tw08	12.67	19.94	7.25
Tw05✓	11.85	19.85	8.00
B03 - collapsed - BORING DEPTH 4'			
Tw07	13.58	19.79	6.21
Tw09	7.42	19.83	12.41
Tw10	7.14	19.94	12.80

~~SW~~ 68

PRIORITY-

- VOCS
- GRO
- DRO
- LL-PATH.
- PCBS.
- P.B.S METALS
- SVOCs.
- TOTAL METALS



Swml-68 - Do-Another-Round
of water levels.

68 Two 1

SWL 10.63

SAMPLE TIME 0800

well went DRY @ 0814 - 6-40mL
15-amber.

68 Two 4.

SAMPLE TIME 0815

- water levels

Site 68.

	SWL	Time	
TW01	10.86	0708	
TW02	14.15	0712	
TW04	7.13	0717	
TW06	7.95	0719	
TW10	6.68	0722	
TW11	11.44	0725	
TW05	11.45	0728	

Site 28.

28	7.48	0739	2"
28	6.17	0740	By TR-c
28	6.27	0742	Behind sludge bed.

28

TW03	9.07	0752	
------	------	------	--

11/13/06 ①
Roosevelt Roads
Puerto Rico

6:00 On-site
Obtain passes from guards

6:45 Public Works Building
Unload/unpack equipment

8:30 Meet Drillers, GeoEnvironTech, Inc.
Drive to site (SWMU 68)

9:15 Clear path into SWMU 68
Mark boring locations with GPS
Clear paths to locations.

11:00 Set up to Drill @ SB03
Advance to 23' BGS
No significant water found
will leave boring open to see if
water accumulates.

12:30 Break for lunch

1:30 Resume sample collection @ SB03

11/13/06 (2)

1340 Mobilize to SB05

Drill to 20' water @ ~15'
moist @ 12'

Set 10' Screen in open borehole

Grab Samples

Collect Duplicate Sample @ SB05

1510 Mobilize to SB01 Begins to
rain hard and some distant
lightning. Suspend drilling for 0.5 hrs

1540 Drill SB01 to 20'

Moist to wet ~15' in zone 5

Set 10' screen in open borehole

Grab Samples

1630 Return to Public Works Building
Secure bottles and tape.

Prepare Bottle sets and labels
for next day

18:00 off-site

11/13/06

SB03/TW03

0-5' Sandy Clay DARK Brown to 0.6'
Med Brown to 4.4
100% Recast
21ppm
Med grained, damp, mod stiff
Some rounded pebbles,
4.4 Becomes light brown clayey sand

5.0 Med Brown sandy clay, stiff
damp

100%
recast

6.2 heavier clay very stiff damp

21ppm

pebbles @ 2.1' to 2.3

(5-10) Becomes lean clay. little sand
light brown most @ 8.5'

10-15' Becomes white clay @ 10.7'
mod soft, damp to dry mod stiff
21ppm
Some red stain intermixed

15-19' Same white and red clay
lean, damp to dry, very stiff
21ppm

19-23' Moist clay @ 20.7' softer
21ppm
red & white clay

(4)

Samples collected @ SB03

68 SB03 - 00	0-12" - 1045
68 SB03 - 01	5-7' - 1105
68 SB03 - 02	17-19' - 1280

SB05

11/13/86

0-5' 0.3' Topsoil
 Dark Brown, damp
 <1 ppm 0.3 to 4' sand and gravel
 little clay, med. grain
 4' rec. mod hard, (Fill)

4' Mod brown, sandy clay
 mod st. H damp

5-10' Sandy clay continues
 damp to dry, mod hard

<1 ppm
 5' rec. Becomes light brown leaner clay
 at 9.5'

10-15' Sandy clay @ 12', some gravel, moist
 5' rec wet @ 14.5'

<1 ppm white & red clay @ 15.5' to 17'
 stiff, damp to moist
 15'-25' Sandy clay with gravel @ 17' wet
 5' rec
 <1 ppm

(5)

Samples collected @ SB05

68SB05-00	0-12"	1410
68SB05-01	5-7'	1425
68SB05-01D	5-7' Dup	1440
68SB05-02	10-12'	1450

SB01

11/13/06

0-5' Topsoil Dark Brown Soft
to 0.4'
<1 ppm Sandy clay @ 0.4'
5' Rec Med brown, hard, dry
med stained sand, iron stains

5-10' sandy clay to 7.5'
then clay trace of sand
<1 ppm stiff, med brown to light brown
5' Rec iron staining damp to dry

10-15' clay, some sand, iron staining
rounded pebbles throughout
<1 ppm med hard, stiff, damp to dry
5' Rec softer and plastic @ 11.2-11.3
and 14.5-14.8' damp to moist

15-20' clay med brown, red, white
<1 ppm some sand, trace gravel
5' Rec moist in zones

6

Samples collected @ SB01

68 SB01-00	0-12"	1530
68 SB01-01	5-7'	1545
68 SB01-02	13-15'	1610

⑦

11/14/06
Roosevelt Roads
Puerto Rico

600 on site prepare equip
label Bottles.

V	SB03	1.2'	TD 23'
V	SB05	12.25'	TD 20'
V	SB01	6.10'	TD 20'

800 Drillers on site

Begin drilling of SB02 sumu 68

1000 Drill SB-04

Lunch 11-11:30

Drill SB06 @ 1330

Street
545

SB-02

11/14/66

0-5

Topsoil Sandy loam
to 1.1'

< 1 ppm

then sandy clay, med brown
damp, med hard, some gravel

5' Rec

Zone of darker rock frags
to 2-3'

then sandy clay, no rock frags
med brown, med stiff

5-10'

Sandy clay

< 1 ppm

Olive gray and med brown

5' Rec

Very stiff, no gravel
damp to dry

10-15'

Sandy clay

< 1 ppm

Olive gray to med brown

4' Rec

Very stiff, plastic at 13'

golf ball, damp

Colable @ 14.2'

15-20'

Same sandy clay

< 1 ppm

Becomes white and brown

5' Rec

lean clay @ 18', damp
stiff, slightly plastic

11/14/66 (8)

Samples collected @ SB02

68 SB02 - 00

0 - 12" 900

68 SB02 - 01

2 - 4' 928

68 SB02 - 02

12 - 14' 940

Start
10:35

SB-04

0-5' Topsoil Sandy loam
Dark Brown, soft moist
1 ppm to 1.1'
5' Rec then silty clay, trace sand
mod stiff damp. plastic

5-10' Silty clay continuous
plastic. damp
1 ppm
Became light brown red 2.1'
5' Rec then light red gray and red @ 3.3'
Broken rock throughout mod stiff
damp

10-15' Water @ 14'
Red and white clay from 10-14'
mottled, mod stiff, damp to moist
1 ppm
5' Rec. some sand fine grained
14' Mod brown, sandy clay
with gravel, wet

15-20'
1 ppm
5' Rec Red & white clay with some sand
and gravel, damp to moist

9

11/14/06

Samples collected from SB-04

68SB04-00	0-12"	1055
68SB04-01	5-7	1245
68SB04-02	12-14	1300

Street
1335

SB-06

0-5' Topsoil Sandy loam to 1.5'
Dark Brown, damp to moist, soft
1.5 to 3.5 Sandy clay

< 1ppm Grayish Brown, med stiff damp
fine-grained sand. rock frags

5' Rec. 3.5 Silty clay
Med Brown gray, med stiff
damp, No rock frags

5-10' silty clay to 7.5'

< 1ppm then sand and gravel
wet @ 9'

4.5' Rec well rounded gravel med grained
sand, some larger cobbles

10-15' sand & gravel to 12' then

4.0' Rec → silty clay med brown, damp
some sand moist to wet @ 13.5'

< 1ppm Sandier, med brown

Probe to 19' - No Sample

10

Samples collected @ SB06

68SB06-00	0-12"	1340
68SB06-01	2-4	1350
68SB06-02	6-8	1400

Set temp well @ 19'

Sheet
1500

SB-08

11/14/06

0-5' Topsoil Sandy loam
DARK Brown {soft
damp to moist 0-1'
2/1ppm Sandy clay from 1 to 5
2.5' rec med brown, med. stiff, moey rock
frags throughout damp.

5-10' Silty clay, Med Brown
mod stiff. Some sand
<1ppm damp

5' rec

10-15 Silty clay mixed with
rock frags and gravel.
<1ppm moist @ 13.5 iron staining
3.5' rec

15-20' Rock frags and gravel mixed
with silty clay, damp.
<1ppm mod. hard
4.5' rec @ 18' Blue gray clay
damp, stiff, No sand.

11

Samples collected @ SB08

685808 - 00	0-12"	1515
685808 - 01	5-7'	1530
685808 - 02	10-12'	1540

Strat
1600

SB-09

11/14/06

0-5' Top soil Sandy Loam
Dark Brown, soft, damp to moist
1.5' Sandy Clay
Med Brown, mod stiff
some gravel throughout damp
to dry

5-10 Sandy clay continues with
intermixed gravel damp to
dry. Becomes moist @ 9.5'

10-15 Sandy Clay Med Brown, moist
mod soft, fine to med grained
sand.
Cobbles @ 14.5'

15-20' Becomes clay, white and
brown, mod stiff, little
sand, damp @ 17'

(12)

Samples collected @ SB-09

68SB09-00	0-12" 1625
68SB09-01	5-7 1640
68SB09-02	7-9 1650

(13)

11/15/06
Roosevelt Roads
Puerto Rico

600 ON-site
prepare equipment, label Bottles

730 Drills on-site
Begin drilling @ SB07 SWMU 68

1100 Demob from SWMU 68

1130 lunch

1200 Mob to SWMU 28 (Bundy)
Set up to drill with
augers.

Meet with Pedro and Brian
Lee @ SWMU 28. Discuss
progress of investigation.

11/15/06

SB-07

0-5 Topsoil Sandy loam
Dark Brown, soft moist

<1ppm to 1.2'

3' Rec. then silty clay with some sand
med brown, med hard, damp.

5-10' Silty clay Dark Brown
grading to med yellow brown

<1ppm med hard, damp, some sand
throughout in distinct spots

5' Rec. occasional rock frag

10-15' silty clay (same)

<1ppm

5' Rec. sandy clay @ 14' moist
med grained sand, med soft
Brown & Gray

15-20' sandy clay, granular @ 16' to 17'
<1ppm moist to wet, brown, med soft

5' Rec. white and brown clay, stiff
plastic, med hard. damp

14

11/15/06

Samples collected from SB-07

68SB07-00

0-12" 800

68SB07-01

5-7' 815

68SB07-02

12-14' 830

11/15/06

SB-10

0-5' Topsoil Sandy loam to 1.3'
then silty clay med brown
1 ppm mod. hard, plastic, damp
1/2 gravel throughout
1.5 Rec. cobble @ 1.5'

5-10' Silty clay med brown
1 ppm damp plastic, some sand
trace gravel
5' Rec.

10-15' Becomes sandy clay @ 11'
1 ppm Darker brown, damp to moist
5' Rec. med-grained sand, iron staining
mod hard.

15-20' Sandy clay with gravel
1 ppm Med brownish red
5' Rec. damp to moist, med grained sand

15

11/15/06

Samples collected from SB-10

68SB10 - 00	0-12" 940
68SB10 - 00D	0-12" 940
68SB10 - 00MS/MSD	0-12" 940
68SB10 - 01	5-7' 1060
68SB10 - 01D	5-7' 1060
68SB10 - 02	12-14' 1020
68SB10 - 02MS/MSD	12-14' 1020

"Rite in the Rain"
ALL-WEATHER WRITING PAPER



Name Adam Guiley
Baker Environmental, Inc.
Address 100 Arside Drive
Moore Twp, PA. 15108
Phone 412-269-4616 (Office)

Project Additional Sampling
SWMU 68 (Arsenic)
Naval Activity Puerto Rico
September 2007

"Rite in the Rain" - a unique all-weather writing surface created to shed water and to enhance the written image. Makes it possible to write sharp, legible field data in any kind of weather.

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TACOMA, WA 98424-1017 USA
www.RiteintheRain.com

CONTENTS

PAGE	REFERENCE	DATE
1	Summit 68 - Arsenic Sampling	9/27/06

- Summary -

- Field Team consisted of Mark Kimes (MEK) and Adam Griley (ADG).

- Arrived at Summit 68 at 0800 hours and departed approximately 0915

- Sample locations 685501 - 685505 included mostly open canopies - little to no tree/shrub cover. However, thick, persistent herbaceous vegetation (mainly grasses) were evident at each sample location.

- All sample locations included a light - medium brown, clay loam.

ADG.

Thursday 27 September 2007⁽¹⁾

0800 Arrive at Summit 68 - Pack necessary equipment and hike to sample point 685501

0822 Collect 685501, 685501D and 685501 Ms/MsD. Soil texture was primarily a clay loam

0831 Collected 685502. Brown, clay loam.

0837 Collected 685503. Brown, clay loam

0843 Collected 685504. Brown, clay loam

0849 Collected 685505. Brown, clay loam.

0915 Depart Summit 68.

1000 Collected Equip inside Sumite 68ER01 with S.S. spoon with D.I. water.

ADG.

"Rite in the Rain"

24 OCT. 2007

①

- 0900 ARRIVED ON-BASE AND PROCEEDED TO PWD TO PREPARE FOR SURFACE SOIL SAMPLING @ SWMU 68 TO DELINEATE LEAD CONTAMINATION FROM TWO PREVIOUS SAMPLE LOCATIONS.
- 0930 COLLECTED 68P6ERO1 EQUIPMENT RINSEATE FROM STAINLESS STEEL SPOON UTILIZING LAB GRADE DI WATER. COLLECTING THE RINSEATE IN A 250 ml POLY BOTTLE PRESERVED w/ HNO_3 .
- 0935 COLLECTED 68P6FBO1 FIELD BLANK OF LAB GRADE DI H_2O . COLLECTED THE SAMPLE IN A 500 ml poly BOTTLE PRESERVED w/ HNO_3 .
- 0940 DEPARTED TO SWMU 68 TO LOCATE SAMPLE LOCATIONS w/ GPS UNIT LOADED w/ SAMPLE LOCATION MAP.
- 1000 COLLECTED 68SS09, IT'S DUPLICATE 68SS09D, AND THE MS/MSD 68SS09 MS/MSD. THE SAMPLE WAS OBTAINED FOR 0-12" BLS w/ A STAINLESS STEEL SPOON. THE SAMPLE WAS COMPOSITED IN THE WHOLE IN THE GROUND AND

CMK

②

24 OCT. 2007

PLACED IN A 8 OZ. WIDE MOUTH
POLY CONTAINER. THIS SAMPLING
METHOD IS BEING USED FOR ALL
SURFACE SOIL SAMPLES BEING

COLLECTED FROM SWMU 68 TODAY.

1008 COLLECTED 685517 AND IT'S DUPLICATE
685517 D. THIS SAMPLE IS LOCATED
50' AWAY FROM THE SOURCE SAMPLE
14E

1013 COLLECTED 685508 25' FROM SOURCE

1020 COLLECTED 685516 50' FROM SOURCE

1025 COLLECTED 685515 50' FROM SOURCE

1029 COLLECTED 685507 25' FROM SOURCE

1033 COLLECTED 685506 25' FROM SOURCE

1036 COLLECTED 685514 50' FROM SOURCE

RETURNED BACK TO VEHICLE TO PLACE

SAMPLES IN COOLER ON ICE. RETURNING

BACK TO SITE TO COLLECT SAMPLES

AROUND 14E

1100 COLLECTED 685521 50' FROM SOURCE

1105 COLLECTED 685510 25' FROM SOURCE

1107 COLLECTED 685518 50' FROM SOURCE

1113 COLLECTED 685513 25' FROM SOURCE

1115 COLLECTED 685512 25' FROM SOURCE

1117 COLLECTED 685511 25' FROM SOURCE

MEK

24 OCT. 2007

③

1120 COLLECTED 685519 50' FROM SOURCE

1127 COLLECTED 685520 50' FROM SOURCE

1145 DEPARTED SWMU 68 FOR THE
MARINA TO OBTAIN ADD'L ICE
FOR SAMPLES AND DRINKS.
PROCESSED ALL THE SAMPLES,
PREPARED COC AND PACKAGED
SAMPLES FOR SHIPMENT TO
TEST AMERICA SAVANNAH FOR ANALYSIS
OF LEAD.

1700 DROPPED ONE COOLER WEIGHING
51 LBS CONTAINING ALL SOIL
AND WATER SAMPLES AND 3
BAGS OF ICE ALONG W/ A
TEMP BLANK. FEDEX INT'L
AIR BILL 8480 2694 7499 FOR
PRIORITY OVERNIGHT DELIVERY.

MEK

APPENDIX A.2
CHAIN-OF-CUSTODY FORMS

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD



STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

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

68-001

Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE <i>Swmw 68 RFI</i>	PROJECT NO. <i>CTO -121</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS								PAGE <i>1</i>	OF <i>2</i>										
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	<i>8260 B VOCs</i>	<i>App IX LST</i>	<i>8270 C SVOCs</i>	<i>App IX LST</i>	<i>8270 C LAPAKs</i>	<i>8082 PCBs</i>	<i>8015 B DEO</i>	<i>5030 B</i>	<i>8415 B GRO</i>	<i>3530 B</i>	<i>6010 B Metals</i>	<i>App IX LST</i>	<i>9471 A Hg</i>	<i>5050 B</i>	<i>9030 B</i>	<i>Cyanide</i>	<i>9012 B</i>	STANDARD REPORT DELIVERY <input checked="" type="radio"/>	DATE DUE <i>28 days TAT</i>	
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412 337 7465</i>	CLIENT FAX		EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="radio"/>																			DATE DUE
CLIENT NAME <i>Baker</i>	CLIENT E-MAIL <i>mkimes@mbakercorp.com</i>			NUMBER OF COOLERS SUBMITTED PER SHIPMENT: <i>2</i>																			
CLIENT ADDRESS <i>100 Airside Dr, Moon Twp, PA 15108</i>	COMPANY CONTRACTING THIS WORK (if applicable) <i>CH2M Hill</i>			REMARKS																			

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	NUMBER OF CONTAINERS SUBMITTED								REMARKS						
DATE	TIME							1	2	3	4	5	6	7	8							
<i>11/13/06</i>	<i>1530</i>	<i>68SB01-00</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
<i>11/13/06</i>	<i>1545</i>	<i>68SB01-01</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
<i>11/13/06</i>	<i>1610</i>	<i>68SB01-02</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
<i>11/14/06</i>	<i>0900</i>	<i>68SB02-00</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
	<i>0920</i>	<i>68SB02-01</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
	<i>0940</i>	<i>68SB02-02</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
<i>11/13/06</i>	<i>1045</i>	<i>68SB03-00</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
	<i>1105</i>	<i>68SB03-01</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
	<i>1230</i>	<i>68SB03-02</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
	<i>1410</i>	<i>68SB05-00</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
	<i>1425</i>	<i>68SB05-01</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							
	<i>1450</i>	<i>68SB05-02</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>							

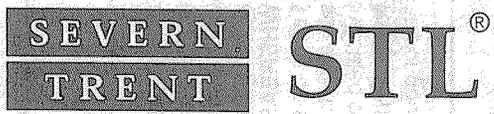
TEMP. *0.0*
1.0
0.0
0.0
0.0

RELINQUISHED BY: (SIGNATURE) <i>[Signature]</i>	DATE	TIME	RELINQUISHED BY: (SIGNATURE) <i>[Signature]</i>	DATE <i>11/14/06</i>	TIME <i>0500</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>[Signature]</i>	DATE <i>11/13/06</i>	TIME <i>0630</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

RECEIVED FOR LABORATORY BY: (SIGNATURE) <i>KL</i>	DATE <i>11/16/06</i>	TIME <i>0921</i>	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>680-22001</i>	LABORATORY REMARKS
--	-------------------------	---------------------	---	------------------	--	--------------------

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

STL Savannah
 5102 LaRoche Avenue
 Savannah, GA 31404
 Website: www.stl-inc.com
 Phone: (912) 354-7858
 Fax: (912) 352-0165 **68-001**



Alternate Laboratory Name/Location
 Phone:
 Fax:

PROJECT REFERENCE <i>Swm 68 RFT</i>	PROJECT NO. <i>OTO-121</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>2</i>	OF <i>2</i>																							
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	<i>B260 G VOCs</i>	<i>App IX List</i>	<i>B270 C SVOCs</i>	<i>App IX List</i>	<i>B270 C LLDHAs</i>	<i>8082 PCBs</i>	<i>2015 B DRG</i>	<i>5030 B</i>	<i>2015 B GRD</i>	<i>3350 B</i>	<i>6010 B Metals</i>	<i>App IX List</i>	<i>7471 A Hg</i>	<i>Sulfide</i>	<i>9030 B</i>	<i>Cyanide</i>	<i>9017 B</i>	STANDARD REPORT DELIVERY <input checked="" type="radio"/>	DATE DUE <i>28 Dec 1997</i>																
CLIENT (SITE) PM <i>Mark Kilnes</i>	CLIENT PHONE	CLIENT FAX																			EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="radio"/>	DATE DUE _____																
CLIENT NAME <i>Baker</i>	CLIENT E-MAIL																				PRESERVATIVE																	NUMBER OF COOLERS SUBMITTED PER SHIPMENT: <i>2</i>
CLIENT ADDRESS <i>100 Airside</i>		COMPANY CONTRACTING THIS WORK (if applicable)																			NUMBER OF CONTAINERS SUBMITTED																	REMARKS

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G)	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS					
DATE	TIME							1	2	3	4	5	6	7	8	9	10		11	12			
<i>11/13/06</i>	<i>1440</i>	<i>68SB 05-01 D</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>	<i>1</i>											
<i>11/14/06</i>	<i>1500</i>	<i>68 TB 01</i>	<i>G</i>	<i>X</i>			<i>3</i>			<i>3</i>													

RELINQUISHED BY: (SIGNATURE) <i>Mark Kilnes</i>	DATE <i>11/13/06</i>	TIME <i>0630</i>	RELINQUISHED BY: (SIGNATURE) <i>Mark Kilnes</i>	DATE <i>11/13/06</i>	TIME <i>1500</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>Mark Kilnes</i>	DATE <i>11/13/06</i>	TIME <i>0630</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY						
RECEIVED FOR LABORATORY BY: (SIGNATURE) <i>KL</i>	DATE <i>11/16/06</i>	TIME <i>0921</i>	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>680-22001</i>	LABORATORY REMARKS

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

**SEVERN
TRENT**

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FEDEX AIRBILL No.
8462 4272 0290

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5102 LaRoche Avenue
Savannah, GA 31404

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Phone: (912) 354-7858
Fax: (912) 352-0165

68-002

Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE <i>SUMU 68 RFI</i>	PROJECT NO. <i>CTO-121</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>1</i>	OF <i>3</i>										
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	<i>8260 B VOCs</i>	<i>App IX List</i>	<i>8270 C SVOCs</i>	<i>App IX List</i>	<i>8270 C LLPs</i>	<i>8082 PCBs</i>	<i>8015 B DRO</i>	<i>8030 B</i>	<i>8015 B GRO</i>	<i>3550 B</i>	<i>6010 B Metals</i>	<i>App IX List</i>	<i>7474 A Hg</i>	<i>Subide</i>	<i>9030 B</i>	<i>Cyanide</i>	<i>9012 B</i>	STANDARD REPORT DELIVERY <input checked="" type="radio"/>	DATE DUE <i>28 day TAT</i>	EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="radio"/>	DATE DUE	NUMBER OF COOLERS SUBMITTED PER SHIPMENT:
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412-337-7465</i>	CLIENT FAX		<i>8260 B VOCs</i>	<i>App IX List</i>	<i>8270 C SVOCs</i>	<i>App IX List</i>	<i>8270 C LLPs</i>	<i>8082 PCBs</i>	<i>8015 B DRO</i>	<i>8030 B</i>	<i>8015 B GRO</i>	<i>3550 B</i>	<i>6010 B Metals</i>	<i>App IX List</i>	<i>7474 A Hg</i>	<i>Subide</i>	<i>9030 B</i>	<i>Cyanide</i>	<i>9012 B</i>	REMARKS				
CLIENT NAME <i>Baker</i>	CLIENT E-MAIL <i>m.kimes@mbakercorp.com</i>			<i>8260 B VOCs</i>	<i>App IX List</i>	<i>8270 C SVOCs</i>	<i>App IX List</i>	<i>8270 C LLPs</i>	<i>8082 PCBs</i>	<i>8015 B DRO</i>	<i>8030 B</i>	<i>8015 B GRO</i>	<i>3550 B</i>	<i>6010 B Metals</i>	<i>App IX List</i>	<i>7474 A Hg</i>	<i>Subide</i>	<i>9030 B</i>	<i>Cyanide</i>	<i>9012 B</i>	REMARKS				
CLIENT ADDRESS <i>100 Airside Dr. Moon Twp., PA 15108</i>	COMPANY CONTRACTING THIS WORK (if applicable) <i>Ch2M Hill</i>			<i>8260 B VOCs</i>	<i>App IX List</i>	<i>8270 C SVOCs</i>	<i>App IX List</i>	<i>8270 C LLPs</i>	<i>8082 PCBs</i>	<i>8015 B DRO</i>	<i>8030 B</i>	<i>8015 B GRO</i>	<i>3550 B</i>	<i>6010 B Metals</i>	<i>App IX List</i>	<i>7474 A Hg</i>	<i>Subide</i>	<i>9030 B</i>	<i>Cyanide</i>	<i>9012 B</i>	REMARKS				

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS						
DATE	TIME							1	2	3	4	5	6	7	8	9	10		11	12				
<i>11/14/06</i>	<i>1055</i>	<i>68SB04-00</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1245</i>	<i>68SB04-01</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1300</i>	<i>68SB04-02</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1340</i>	<i>68SB06-00</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1350</i>	<i>68SB06-01</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1400</i>	<i>68SB06-02</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1515</i>	<i>68SB08-00</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1530</i>	<i>68SB08-01</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1540</i>	<i>68SB08-02</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1625</i>	<i>68SB09-00</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1640</i>	<i>68SB09-01</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											
	<i>1650</i>	<i>68SB09-02</i>	<i>G</i>	<i>X</i>			<i>3</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>3</i>	<i>1</i>											

TEMP: 0.0/0.0/0.0
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0.0/1.0
1.0/1.0/0.0
0.0/1.0
1.0/1.0

RELINQUISHED BY: (SIGNATURE) <i>Mark E. Kimes</i>	DATE <i>11/15/06</i>	TIME <i>1500</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>Mark E. Kimes</i>	DATE <i>11/13/06</i>	TIME <i>0630</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

RECEIVED FOR LABORATORY BY: (SIGNATURE) <i>KL</i>	DATE <i>11/16/06</i>	TIME <i>0921</i>	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>680-22012</i>	LABORATORY REMARKS
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ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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68-002

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PROJECT REFERENCE <i>Swmu/68 RFI</i>	PROJECT NO.	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>3</i>	OF <i>3</i>							
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	8260 B VOCs	App IX LIST	8270 C SVOCs	App IX LIST	8270 C L-PATHs	8002 PCBs	8015 B DRO	9030 B	8015 B GRG	3530 B	6010 B Metals	App IX LIST	7471AA9	SULFIDE	9030 B	CYANIDE	9012 B	STANDARD REPORT DELIVERY <input checked="" type="checkbox"/>	DATE DUE <i>20 Day TAT</i>
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412-337-7465</i>	CLIENT FAX																			EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="checkbox"/>	DATE DUE
CLIENT NAME <i>Baker</i>	CLIENT E-MAIL <i>mkimes@mbakercorp.com</i>																				NUMBER OF COOLERS SUBMITTED PER SHIPMENT:	DATE DUE
CLIENT ADDRESS <i>600 Airside Dr., Moon Twp, PA 15108</i>	COMPANY CONTRACTING THIS WORK (if applicable)																					

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS						
DATE	TIME							1	2	3	4	5	6	7	8	9	10		11	12				
<i>11/15/06</i>	<i>1500</i>	<i>68 TB-02</i>	<i>G</i>	<i>X</i>			<input checked="" type="checkbox"/>																	
<i>11/15/06</i>	<i>1020</i>	<i>68 SB10-02</i>	<i>G</i>	<i>X</i>			<i>3</i>																	
<i>11/15/06</i>	<i>1020</i>	<i>68 SB10-02 MS/MSD</i>	<i>G</i>	<i>X</i>			<i>3</i>																	
<i>11/15/06</i>	<i>1500</i>	<i>68 TB-03</i>	<i>G</i>	<i>X</i>			<input checked="" type="checkbox"/>																	

RELINQUISHED BY: (SIGNATURE) <i>Mark E. Kimes</i>	DATE <i>11/15/06</i>	TIME <i>1500</i>	RELINQUISHED BY: (SIGNATURE)	DATE <i>11/15/06</i>	TIME <i>1500</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>Mark E. Kimes</i>	DATE <i>11/15/06</i>	TIME <i>0630</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

RECEIVED FOR LABORATORY BY: (SIGNATURE) <i>KL</i>	DATE <i>11/15/06</i>	TIME <i>0921</i>	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>680-22012</i>	LABORATORY REMARKS
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ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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68-003

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Fed Ex A/c No.:
8462 4272 0316

PROJECT REFERENCE <i>Swmu 68</i>	PROJECT NO. <i>CTO-121</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE	OF
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT,...)	<p><i>8260 B VOCs</i> <i>App IX List</i> <i>8270 C SVOC</i> <i>App IX List</i> <i>8270 C LLPATS</i> <i>8082 ALB</i> <i>8015 B DEO</i> <i>5030 B</i> <i>8015 B GRO</i> <i>3550 B</i> <i>6010 B Metals Total</i> <i>App IX List/PAHs</i> <i>6010 B Metals DBP</i> <i>App IX List/PAHs</i> <i>Sulfide</i> <i>9030 B</i> <i>Cyanide</i> <i>9020 B</i></p> <p>PRESERVATIVE</p>										STANDARD REPORT DELIVERY	
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412 337 7465</i>	CLIENT FAX												DATE DUE <i>29 Day TAT</i>	
CLIENT NAME <i>Baker</i>	CLIENT E-MAIL <i>mkimes@mbakercorp.com</i>													EXPEDITED REPORT DELIVERY (SURCHARGE)	
CLIENT ADDRESS <i>100 Airside Dr., Moon Twp., PA 15108</i>														DATE DUE	
COMPANY CONTRACTING THIS WORK (if applicable) <i>Chm Hill</i>														NUMBER OF COOLERS SUBMITTED PER SHIPMENT:	

SAMPLE		SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS SUBMITTED										REMARKS		
DATE	TIME														
11/16/06	0800	68TW01							1	1		1	1	2	1
11/16/06	0750	02							1		1				
		03 MEK													
11/16/06	0915	04						R	1	1	R	1	1	1	1
11/16/06	1630	05 MEK													
11/15/06	1652	06												1	
11/16/06	1315	07							1	1	1	1	1	2	1
11/16/06	1045	08							1	1	1	1	1	1	1
11/16/06	1320	09							1	1	1	1	1		
11/16/06	0940	10							2	2	2	2	1	1	2

RELINQUISHED BY: (SIGNATURE) <i>Empty Containers</i>	DATE	TIME	RELINQUISHED BY: (SIGNATURE) <i>Mad E. Fri</i>	DATE <i>11/17/06</i>	TIME <i>1500</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>Mad E. Fri</i>	DATE <i>11/13/06</i>	TIME <i>8630</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

RECEIVED FOR LABORATORY BY: (SIGNATURE) <i>John Harvey</i>	DATE <i>11/15/06</i>	TIME <i>0902</i>	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>22098</i>	LABORATORY REMARKS <i>TEMP 03/03/04/14</i> <i>03/05/02/03/04/16</i>
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ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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27-001
~~68-003~~

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STL® *FEDEx ARBILL No:*
8462 4272 0305

PROJECT REFERENCE <i>Swm 68 RET</i>	PROJECT NO. <i>CTO-121</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>2</i>	OF <i>2</i>		
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	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 Pnts	6082 PCBs	8015B DRO	9015B GRO	3550B	2010B Metals Total App IX List/Traceable	2000 Metals Base App IX List/Traceable	3010B Substrate	9030B	9012B	STANDARD REPORT DELIVERY <input checked="" type="radio"/>	DATE DUE <i>28 D, TAT</i>
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412-337-7465</i>	CLIENT FAX														EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="radio"/>	DATE DUE _____
CLIENT NAME <i>Baker</i>	CLIENT E-MAIL <i>mkimes@mbakercorp.com</i>																
CLIENT ADDRESS <i>100 Airside Dr, Moon Twp, PA 15108</i>																	
COMPANY CONTRACTING THIS WORK (if applicable) <i>Chem Hill</i>				PRESERVATIVE										NUMBER OF COOLERS SUBMITTED PER SHIPMENT:			

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS								
DATE	TIME							1	2	3	4	5	6	7	8	9	10		11	12						
<i>11/16/06</i>	<i>0800</i>	<i>68TW01</i>	<i>GX</i>																							
<i>↓</i>	<i>0750</i>	<i>68TW02</i>	<i>GX</i>																							
<i>↓</i>	<i>1045</i>	<i>68TW08</i>	<i>GX</i>																							
<i>↓</i>	<i>0940</i>	<i>68TW10</i>	<i>GX</i>																							
<i>11/15/06</i>	<i>1652</i>	<i>68TW06</i>	<i>GX</i>					<i>✓</i>	<i>✓</i>	<i>✓</i>				<i>✓</i>	<i>added 11/17/06</i>											

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

LABORATORY USE ONLY								
RECEIVED FOR LABORATORY BY: (SIGNATURE) <i>KL</i>	DATE <i>11/17/06</i>	TIME <i>0916</i>	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>680-22060</i>	LABORATORY REMARKS		

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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2006-002

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FedEx AIRBILL No:
8462 4272 0327

PROJECT REFERENCE <i>QA/QC</i>	PROJECT NO. <i>CTO-121</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>1</i>	OF <i>1</i>				
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	<i>B240B VOL5</i>	<i>App IX List</i>	<i>B270C SV06</i>	<i>App IX List</i>	<i>B270C LL04th</i>	<i>B092 PCBs</i>	<i>6010B Metals Total</i>	<i>App IX List / 7420th</i>	<i>6015B DED</i>	<i>6015B DED</i>	<i>6015B GPO</i>	<i>3550B</i>	<i>EXPLOSIVES</i>	<i>8330</i>	STANDARD REPORT DELIVERY <input checked="" type="radio"/>	DATE DUE <i>28 day 79T</i>
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412 337 7465</i>	CLIENT FAX		EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="radio"/>															DATE DUE _____
CLIENT NAME <i>Baker</i>	CLIENT E-MAIL <i>mkimes@mbakercorp.com</i>																		
CLIENT ADDRESS <i>100 Airside Dr., Moon Twp, PA 15108</i>																			
COMPANY CONTRACTING THIS WORK (if applicable) <i>CHM Hill</i>																			

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS	
DATE	TIME							1	2	3	4	5	6	7	8	9	10		11
<i>11/14/06</i>	<i>1700</i>	<i>2006 ER02</i>	<i>G</i>	<i>X</i>				<i>3</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>2</i>				
<i>11/15/06</i>	<i>1700</i>	<i>2006 ER03</i>	<i>G</i>	<i>X</i>				<i>3</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>2</i>				
<i>11/17/06</i>	<i>1700</i>	<i>2006 ER05</i>	<i>G</i>	<i>X</i>				<i>3</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>2</i>				
<i>11/18/06</i>	<i>1700</i>	<i>2006 FB01</i>	<i>G</i>	<i>X</i>				<i>3</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>2</i>				
<i>11/19/06</i>	<i>1700</i>	<i>2006 FB02</i>	<i>G</i>	<i>X</i>				<i>3</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>2</i>				
<i>11/16/06</i>		<i>2006 ER04</i>	<i>G</i>	<i>X</i>				<i>3</i>	<i>2</i>	<i>2</i>	<i>2</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>2</i>				

11/24/06
OKC
TEMP: *5.0*
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0.0/0.0/0.0/0.0/4.0/6.0/1.0
0.0/0.0/1.0

RELINQUISHED BY: (SIGNATURE) <i>Ma E. K...</i>	DATE <i>11/20/06</i>	TIME <i>1200</i>	RELINQUISHED BY: (SIGNATURE)	DATE <i>11/20/06</i>	TIME <i>1200</i>	RELINQUISHED BY: (SIGNATURE)	DATE <i>0.0/0.0/1.0</i>	TIME
RECEIVED BY: (SIGNATURE) <i>Ma E. K...</i>	DATE <i>11/13/06</i>	TIME <i>0630</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

RECEIVED FOR LABORATORY BY: (SIGNATURE) <i>KL</i>	DATE <i>11/21/06</i>	TIME <i>0919</i>	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>680-22139</i>	LABORATORY REMARKS
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ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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8480 2694 7477

PROJECT REFERENCE <i>Swmu 68</i>	PROJECT NO. <i>11626 3-1</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS								PAGE <i>1</i>	OF <i>1</i>
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (G) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT,...)	<i>Arsenic</i>	<i>Arsenic</i>	<i>Hg₃</i>	<i>RESERVATIVE</i>						STANDARD REPORT DELIVERY <input checked="" type="radio"/>
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>A12 337 7465</i>	CLIENT FAX											DATE DUE <i>29 Day TAT</i>
CLIENT NAME <i>Baker Environmental, Inc.</i>	CLIENT E-MAIL <i>MKimes@mbakercorp.com</i>												EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="radio"/>
CLIENT ADDRESS <i>100 Airside Drive, Moon Twp., PA 15108</i>													DATE DUE _____
COMPANY CONTRACTING THIS WORK (if applicable) <i>Michael Baker Jr., Inc.</i>			NUMBER OF CONTAINERS SUBMITTED								NUMBER OF COOLERS SUBMITTED PER SHIPMENT:		

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (G) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	NUMBER OF CONTAINERS SUBMITTED								REMARKS
DATE	TIME															
<i>9/27/07</i>	<i>0822</i>	<i>685501</i>	<i>G</i>	<i>X</i>				<i>1</i>								
<i>1</i>	<i>0822</i>	<i>685501D</i>	<i>G</i>	<i>X</i>				<i>1</i>								
	<i>0822</i>	<i>685501MS/MSD</i>	<i>G</i>	<i>X</i>				<i>1</i>								
	<i>0831</i>	<i>685502</i>	<i>G</i>	<i>X</i>				<i>1</i>								
	<i>0837</i>	<i>685503</i>	<i>G</i>	<i>X</i>				<i>1</i>								
	<i>0843</i>	<i>685504</i>	<i>G</i>	<i>X</i>				<i>1</i>								
	<i>0849</i>	<i>685505</i>	<i>G</i>	<i>X</i>				<i>1</i>								
<i>↓</i>	<i>1000</i>	<i>68ER01</i>	<i>G</i>	<i>X</i>				<i>1</i>								

RELINQUISHED BY: (SIGNATURE) <i>Mal E. K</i>	DATE <i>9/27/07</i>	TIME <i>1200</i>	RELINQUISHED BY: (SIGNATURE) <i>Mal E. K</i>	DATE <i>9/27/07</i>	TIME <i>1200</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>Mal E. K</i>	DATE <i>9/26/07</i>	TIME <i>0715</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY						
RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

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

68 Pb 01

Alternate Laboratory Name/Location

Phone:
Fax:

**SEVERN
TRENT**

STL FEDEx INTL AIRBILL NO.:
8480-2694 7499

PROJECT REFERENCE <i>Swim 108 Pb</i>	PROJECT NO. <i>111626</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>1</i>	OF <i>2</i>				
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT,...)	TAL LEAD	TAL LEAD	PRESERVATIVE	H ₂ O ₂											STANDARD REPORT DELIVERY <input checked="" type="radio"/>	DATE DUE <i>28 July 2007</i>
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412 269 2009</i>	CLIENT FAX																EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="radio"/>	DATE DUE _____
CLIENT NAME <i>Michael Baker Jr, Inc.</i>	CLIENT E-MAIL <i>MKimes@mbakercorp.com</i>																	NUMBER OF COOLERS SUBMITTED PER SHIPMENT:	
CLIENT ADDRESS <i>100 Airside Drive, Moon Twp., PA 15108</i>																			
COMPANY CONTRACTING THIS WORK (if applicable) <i>Baker</i>																			

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS						
DATE	TIME																							
<i>10/24/07</i>	<i>1029</i>	<i>685507</i>	<i>G</i>	<i>X</i>																				
	<i>1013</i>	<i>685508</i>	<i>G</i>	<i>X</i>																				
	<i>1000</i>	<i>685509</i>	<i>G</i>	<i>X</i>																				
	<i>1000</i>	<i>685509 D</i>	<i>G</i>	<i>X</i>																				
	<i>1000</i>	<i>685509 MS/MSD</i>	<i>G</i>	<i>X</i>																				
	<i>1105</i>	<i>685510</i>	<i>G</i>	<i>X</i>																				
	<i>1117</i>	<i>685511</i>	<i>G</i>	<i>X</i>																				
	<i>1115</i>	<i>685512</i>	<i>G</i>	<i>X</i>																				
	<i>1113</i>	<i>685513</i>	<i>G</i>	<i>X</i>																				
	<i>1036</i>	<i>685514</i>	<i>G</i>	<i>X</i>																				<i>Hold for Analysis</i>
	<i>1025</i>	<i>685515</i>	<i>G</i>	<i>X</i>																				<i>Hold for Analysis</i>
	<i>1020</i>	<i>685516</i>	<i>G</i>	<i>X</i>																				<i>Hold for Analysis</i>

RELINQUISHED BY: (SIGNATURE) <i>[Signature]</i>	DATE	TIME	RELINQUISHED BY: (SIGNATURE) <i>[Signature]</i>	DATE <i>10/24/07</i>	TIME <i>1700</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>[Signature]</i>	DATE <i>10/24/07</i>	TIME <i>0900</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY							
RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS	

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

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

68P607

Alternate Laboratory Name/Location

Phone:
Fax:

**SEVERN
TRENT** **STL**

PROJECT REFERENCE <i>Sum 108 Pb</i>	PROJECT NO. <i>111626</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>2</i>	OF <i>2</i>															
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT,...)	TAIL LEAD TAL LEAD	- HAD 3 PRESERVATIVE												STANDARD REPORT DELIVERY <input checked="" type="radio"/>	DATE DUE <i>28 DAY TAT</i>												
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412 269-2009</i>	CLIENT FAX															EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="radio"/>	DATE DUE _____												
CLIENT NAME <i>Michael Baker Jr., Inc.</i>	CLIENT E-MAIL <i>m.kimes@mbakercorp.com</i>																NUMBER OF COOLERS SUBMITTED PER SHIPMENT:													
CLIENT ADDRESS <i>100 Airside Dr. Moon Twp. PA 15108</i>		COMPANY CONTRACTING THIS WORK (if applicable) <i>Baker</i>																												

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT,...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS
DATE	TIME																	
<i>10/24/07</i>	<i>1008</i>	<i>685517</i>	<i>G</i>	<i>X</i>				<i>1</i>										<i>HOLD FOR ANALYSIS</i>
	<i>1008</i>	<i>685517D</i>	<i>G</i>	<i>X</i>				<i>1</i>										<i>HOLD FOR ANALYSIS</i>
	<i>1107</i>	<i>685518</i>	<i>G</i>	<i>X</i>				<i>1</i>										<i>HOLD FOR ANALYSIS</i>
	<i>1120</i>	<i>685519</i>	<i>G</i>	<i>X</i>				<i>1</i>										<i>HOLD FOR ANALYSIS</i>
	<i>1127</i>	<i>685520</i>	<i>G</i>	<i>X</i>				<i>4</i>										<i>HOLD FOR ANALYSIS</i>
	<i>1100</i>	<i>685521</i>	<i>G</i>	<i>X</i>				<i>1</i>										<i>HOLD FOR ANALYSIS</i>
	<i>1033</i>	<i>685506</i>	<i>G</i>	<i>X</i>				<i>1</i>										
	<i>0930</i>	<i>68 PB EROL</i>	<i>G</i>	<i>X</i>				<i>1</i>										
	<i>0935</i>	<i>68 PBFBO1</i>	<i>G</i>	<i>X</i>				<i>1</i>										

RELINQUISHED BY: (SIGNATURE) <i>Mad E. K.</i>	DATE <i>10/24/07</i>	TIME <i>0900</i>	RELINQUISHED BY: (SIGNATURE) <i>Mad E. K.</i>	DATE <i>10/24/07</i>	TIME <i>1700</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>Mad E. K.</i>	DATE <i>10/24/07</i>	TIME <i>0900</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY							
RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO.	LABORATORY REMARKS	

APPENDIX A.3
SOIL BORING LOGS AND WELL CONSTRUCTION RECORDS

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68
 PROJ. NO.: 107872 BORING NO.: 68SB01/TW01
 COORDINATES: EAST: 924315.2933 NORTH: 802690.8734
 ELEVATION: SURFACE: 144.14 TOP OF PVC CASING: 144.14

Rig: Geoprobe Track Rig 6620 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1-5/8" I.D.	--	--	--	11/13/2006	0.0 - 20.0	Pt. Cloudy, Rain, 80s	
Length	5'	--	--	--	11/14/2006			6.1
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE						WELL INFORMATION			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push P = Piston N = No Sample						Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
						Schedule 40 PVC Riser	1"	0	10.0
						Schedule 40 PVC Screen	1"	10.0	20.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail	Elevation (Ft. MSL)	
1	C-1	5.0		68SB01-00 (0-12")	<1	TOPSOIL: soft; dark brown 0.4'	1" PVC Riser	143.74	
2						SANDY CLAY(medium grained); hard; medium brown, iron stains; dry			
3						*Collect soil sample from 0 to 12"			
4									
5						5.0			
6	C-2	5.0		68SB01-01 (5-7')	<1	*Collect soil sample from 5 to 7'	Open Borehole		
7									
8									
9									
10						10.0			
	C-3					CLAY, trace sand; stiff; medium to light brown, iron staining; damp to dry	Top of 1" PVC Screen at 10'	136.64	
						some sand, rounded pebbles throughout		134.14	

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB01/TW01 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68

SO NO.: 107872

BORING NO.:

68SB01/TW01

SAMPLE TYPE						DEFINITIONS			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample						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)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
11	C-3	5.0		68SB01-02 (13-15')	<1	Continued from Sheet 1			
12						CLAY, some sand, rounded pebbles			
13						throughout; moderately hard to stiff; softer and plastic at 11.2' to 11.3'; iron staining; damp to dry, damp to moist from 14.5' to 14.8'			
14						*Collect soil sample from 13' to 15'			
15						15.0			
16	C-4	5.0			<1	some sand, trace gravel; medium brown, red and white; moist in zones			
17									
18									
19									
20						20.0			
21						End of Boring at 20.0'			
22									
23									
24									
25									
26									
27									
28									
29									
30									

DRILLING CO.: GeoEnviroTech, Inc.
DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
BORING NO.: 68SB01/TW01 SHEET 2 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68
 PROJ. NO.: 107872 BORING NO.: 68SB02/TW02
 COORDINATES: EAST: 924412.2046 NORTH: 802635.2903
 ELEVATION: SURFACE: 140.93 TOP OF PVC CASING: 140.93

Rig: Geoprobe Track Rig 6620 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1-5/8" I.D.	--	--	--	11/14/2006	0.0 - 20.0	Pt. Sunny, 80s	
Length	5'	--	--	--				
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE						WELL INFORMATION			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push P = Piston N = No Sample						Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
						Schedule 40 PVC Riser	1"	0	10.0
						Schedule 40 PVC Screen	1"	10.0	20.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
1				68SB02-00 (0-12")		TOPSOIL (Sandy Loam) *Collect soil sample from 0 to 12" 1.1'			139.83
2				68SB02-01 (2-4)	<1	SANDY CLAY, some gravel, zone of darker rock fragments from 2' to 3'; moderately hard; medium brown; damp *Collect soil sample from 2' to 4'	1" PVC Riser		
3	C-1	5.0				becomes medium stiff; medium brown			
4									
5	5.0								
6						becomes very stiff; olive gray and medium brown; damp to dry	Open Borehole		
7									
8	C-2	4.0			<1				
9									
10	10.0						Top of 1" PVC Screen at 10'		130.93
	C-3								

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB02/TW02 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68

SO NO.: 107872

BORING NO.: 68SB02/TW02

SAMPLE TYPE						DEFINITIONS			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample						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)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
11	C-3	4.0		68SB02-02 (12-14')	<1	Continued from Sheet 1 (SANDY CLAY)		120.93	
12						*Collect soil sample from 12' to 14'			
13						becomes plastic at 13'; softer; damp			
14						cobble at 14.2'			
15						15.0			
16	C-4	5.0			<1	becomes lean clay; stiff; slightly plastic; white and brown		20.0	
17						17.0			
18						18.0			
19						19.0			
20						20.0			
21						End of Boring at 20.0'			
22									
23									
24									
25									
26									
27									
28									
29									
30									

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB02/TW02 SHEET 2 OF 2

TEST BORING RECORD

Michael Baker Jr., Inc.

PROJECT: Roosevelt Roads Puerto Rico, SWMU 68

PROJ. NO.: 107872

BORING NO.: 68SB03

COORDINATES: EAST: 924178.5985

NORTH: 802577.6573

ELEVATION: SURFACE: 144.85

Rig: Geoprobe Track Rig 6620 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Macro Sampler	Casing	Augers	Core Barrel					
Size (ID)	1-5/8" I.D.				11/13/2006	0.0 - 20.0'	Pt. Sunny, 80s	
Length	5'				11/14/2006			1.2
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)	Visual Description		Elevation (Ft. MSL)
1	C-1	5.0		68SB03 -00 (0-12")	<1	SANDY CLAY (medium grained), some rounded pebbles; moderately stiff; dark brown to 0.6', medium brown to 4.4'		140.45
2						*Collect soil sample from 0 to 12"		
3								
4								
5								
5	C-2	5.0		68SB03 -01 (5-7)	<1	CLAYEY SAND; light brown		139.85
6						SANDY CLAY; stiff; medium brown; damp		138.65
7						CLAY; lean; very stiff; damp		
8						*Collect soil sample from 5' to 7'		
9						cobbles from 7.1' to 7.3'		
10	C-3					little sand; light brown; moist		
10								

DRILLING COMPANY: GeoEnviroTech, Inc.

BAKER REP.: Joe Burawa

DRILLER: Jessie, Abraham

BORING NO.: 68SB03

SHEET 1 OF 2

TEST BORING RECORD

PROJECT: Roosevelt Roads Puerto Rico, SWMU 68

SO NO.: 107872

BORING NO.: 68SB03

<u>SAMPLE TYPE</u>						<u>DEFINITIONS</u>	
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample						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)	Visual Description	Elevation (Ft. MSL)
11	C-3	5.0			<1	Continued from Sheet 1 (CLAY) some red stone intermixed; moderately soft to stiff; white and red; damp to dry	
12							
13							
14							
15							
15.0							
16	C-4	4.0		68SB03 -02 (17-19')	<1	becomes lean; very stiff *Collect soil sample from 17' to 19'	
17							
18							
19							
19.0							
20	C-5	4.0			<1	becomes softer; red and white; moist	
21							
22							
23							
23.0							23.0 121.85
24						End of Boring at 23.0'	
25							
26							
27							
28							
29							
30							

DRILLING COMPANY: GeoEnviroTech, Inc.

DRILLER: Jessie, Abraham

BAKER REP.: Joe Burawa

BORING NO.: 68SB03

SHEET 2 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68
 PROJ. NO.: 107872 BORING NO.: 68SB04/TW04
 COORDINATES: EAST: 924416.0348 NORTH: 802465.3892
 ELEVATION: SURFACE: 137.48 TOP OF PVC CASING: 138.34

Rig: Geoprobe Track Rig 6620 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1-5/8" I.D.	--	--	--	11/14/2006	0.0 - 20.0	Pt. Sunny, 80s	
Length	5'	--	--	--				
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE						WELL INFORMATION			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push P = Piston N = No Sample						Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
						Schedule 40 PVC Riser	1"	0	10.0
						Schedule 40 PVC Screen	1"	10.0	20.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
1	C-1	5.0		68SB04-00 (0-12")	<1	TOPSOIL (Sandy Loam); soft; dark brown; moist	1" PVC Riser		136.38
2						*Collect soil sample from 0 to 12" 1.1'			
3						SILTY CLAY, trace sand; moderately stiff; plastic; damp			
4									
5						5.0			
6	C-2	5.0		68SB04-01 (5-7")	<1	*Collect soil sample from 5' to 7'	Open Borehole		127.48
7						becomes light brown and red after 7.1'			
8									
9									
10						10.0			
	C-3					CLAY, some fine grained sand; moderately stiff	Top of 1" PVC Screen at 10'		

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB04/TW04 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68

SO NO.: 107872

BORING NO.: 68SB04/TW04

SAMPLE TYPE						DEFINITIONS			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample						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)	Visual Description	Well Installation Detail	Elevation (Ft. MSL)	
11	C-3	4.0		68SB04 -02 (12-14')	<1	Continued from Sheet 1		123.48	
12						CLAY, some fine grained sand; moderately stiff; red and white mottled			
13						*Collect soil sample from 12' to 14'			
14						Water at 14' 14.0'			
15	15.0					SANDY CLAY with GRAVEL; medium brown; wet			
16	C-4	5.0			<1	red and white after 15'; damp to moist		117.48	
17									
18									
19									
20						20.0			
21						End of Boring at 20.0'			
22									
23									
24									
25									
26									
27									
28									
29									
30									

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB04/TW04 SHEET 2 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68
 PROJ. NO.: 107872 BORING NO.: 68SB05/TW05
 COORDINATES: EAST: 924160.2211 NORTH: 802443.1651
 ELEVATION: SURFACE: 142.48 TOP OF PVC CASING: 143.33

Rig: Geoprobe Track Rig 6620 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1-5/8" I.D.	--	--	--	11/13/2006	0.0 - 20.0	Pt. Cloudy, Rain, 80s	
Length	5'	--	--	--	11/14/2006			12.25
Type	--	--	--	--				
Hammer Wt. Fall	--	--	--	--				

Remarks:

SAMPLE TYPE						WELL INFORMATION			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push P = Piston N = No Sample						Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
						Schedule 40 PVC Riser	1"	0	10.0
						Schedule 40 PVC Screen	1"	10.0	20.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
1	C-1	4.0		68SB05-00 (0-12")	<1	TOPSOIL; dark brown; damp	1" PVC Riser		142.28
2						SAND and GRAVEL (medium grained), little clay; moderately hard; (FILL) *Collect soil sample from 0 to 12"			
3									
4						4.0'			
5	5.0					SANDY CLAY; moderately stiff; medium brown; damp			
6	C-2	5.0		68SB05-01 (5-7") and Dup. -01D	<1	*Collect soil sample from 5' to 7' with Duplicate	Open Borehole		
7						moderately hard; damp to dry			
8									
9									
10	C-3					becomes leaner clay; lighter brown at 9.5'	Top of 1" PVC Screen at 10'	132.48	

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB05/TW05 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68

SO NO.: 107872

BORING NO.: 68SB05/TW05

SAMPLE TYPE						DEFINITIONS		
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample						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)	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11	C-3	5.0		68SB05 -02 (10-12)	<1	Continued from Sheet 1 (SANDY CLAY)		126.98
12						*Collect soil sample from 10' to 12'		
13						some gravel; moist		
14						wet at 14.5'		
15						15.0'		
16	C-4	5.0			<1	CLAY; stiff; white and red; damp to moist		125.48
17						17.0'		
18						SANDY CLAY with GRAVEL; wet		
19								
20						20.0'		
21						End of Boring at 20.0'		122.48
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB05/TW05 SHEET 2 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68
 PROJ. NO.: 107872 BORING NO.: 68SB06/TW06
 COORDINATES: EAST: 924312.2813 NORTH: 802379.2951
 ELEVATION: SURFACE: 137.74 TOP OF PVC CASING: 139.40

Rig: Geoprobe Track Rig 6620 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1-5/8" I.D.	--	--	--	11/14/2006	0.0 - 19.0	Pt. Sunny, 80s	
Length	5'	--	--	--				
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE						WELL INFORMATION			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push P = Piston N = No Sample						Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
						Schedule 40 PVC Riser	1"	0	9.0
						Schedule 40 PVC Screen	1"	9.0	19.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
1				68SB06-00 (0-12")		TOP SOIL (Sandy Loam); soft; dark brown; damp to moist *Collect soil sample from 0 to 12" 1.5'			136.24
2				68SB06-01 (2-4)	<1	SANDY CLAY (fine grained) with rock fragments; moderately stiff; grayish-brown; damp *Collect soil sample from 2' to 4' 3.5'	1" PVC Riser		134.24
3									
4									
5	5.0								
6				68SB06-02 (6-8")	<1	*Collect soil sample from 6' to 8' 7.5'	Open Borehole		130.24
7									
8						SAND (medium grained) and GRAVEL (well rounded), some large cobbles			
9							Top of 1" PVC Screen at 9'		128.74
10	10.0								
		C-3							

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB06/TW06 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68

SO NO.: 107872

BORING NO.:

68SB06/TW06

SAMPLE TYPE						DEFINITIONS			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample						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)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
11						Continued from Sheet 1 (SAND and GRAVEL)	1" PVC Screen		125.74
12	C-3	4.0			<1	SILTY CLAY, some sand; medium brown; damp			
13						moist to wet and sandier after 13.5'	Open Borehole		
14									
15	15.0								
16							19'		118.74
17	C-4	0.0			---	No Sample Recovery from 15' to 19'			
18									
19	19.0								
20						End of Boring at 19.0'			
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

DRILLING CO.: GeoEnviroTech, Inc.
DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
BORING NO.: 68SB06/TW06 SHEET 2 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68
 PROJ. NO.: 107872 BORING NO.: 68SB07/TW07
 COORDINATES: EAST: 923997.9854 NORTH: 802386.1040
 ELEVATION: SURFACE: 143.03 TOP OF PVC CASING: 143.03

Rig: Geoprobe Track Rig 6620 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1-5/8" I.D.	--	--	--	11/15/2006	0.0 - 20.0	Pt. Sunny, 80s	
Length	5'	--	--	--				
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE						WELL INFORMATION			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push P = Piston N = No Sample						Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
						Schedule 40 PVC Riser	1"	0	10.0
						Schedule 40 PVC Screen	1"	10.0	20.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
1	C-1	3.0		68SB07-00 (0-12')	<1	TOPSOIL (Sandy Loam); soft; dark brown; moist	1" PVC Riser		141.83
2						*Collect soil sample from 0 to 12"			
3						SILTY CLAY, some sand; moderately hard; medium brown; damp			
4									
5									
6	C-2	5.0		68SB07-01 (5-7')	<1	some sand throughout in distinct spots, occasional rock fragments; moderately hard; dark brown grading to medium yellow-brown; damp from 5' to 14'	Open Borehole		133.03
7						*Collect soil sample from 5' to 7'			
8									
9									
10									
	C-3						Top of 1" PVC Screen at 10'		

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB07/TW07 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68

SO NO.: 107872

BORING NO.: 68SB07/TW07

SAMPLE TYPE						DEFINITIONS			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample						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)	Visual Description	Well Installation Detail	Elevation (Ft. MSL)	
11	C-3	5.0		68SB07 -02 (12-14')	<1	Continued from Sheet 1 (SILTY CLAY)		129.03	
12						*Collect soil sample from 12' to 14'			
13									
14									
15	15.0					SANDY CLAY (medium grained sand); moderately soft; brown and gray; moist			
16	C-4	5.0			<1	gravelly from 16' to 17'; moderately soft; brown; moist to wet		126.03	
17									
18						CLAY; plastic; moderately hard; stiff; white and brown; damp			
19									
20	20.0					End of Boring at 20.0'		123.03	
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

DRILLING CO.: GeoEnviroTech, Inc.
DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
BORING NO.: 68SB07/TW07 SHEET 2 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68
 PROJ. NO.: 107872 BORING NO.: 68SB08/TW08
 COORDINATES: EAST: 924197.4298 NORTH: 802355.6355
 ELEVATION: SURFACE: 140.58 TOP OF PVC CASING: 140.58

Rig: Geoprobe Track Rig 6620 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1-5/8" I.D.	--	--	--	11/14/2006	0.0 - 20.0	Pt. Sunny, 80s	
Length	5'	--	--	--				
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE						WELL INFORMATION			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push P = Piston N = No Sample						Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
						Schedule 40 PVC Riser	1"	0	10.0
						Schedule 40 PVC Screen	1"	10.0	20.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
1	C-1	2.5		68SB08-00 (0-12')	<1	TOPSOIL (Sandy Loam); soft; dark brown; damp to moist; *Collect soil sample from 0 to 12"	1" PVC Riser		139.58
2						SANDY CLAY, rock fragments throughout; medium stiff; medium brown; damp			135.58
3									
4									
5						5.0			
6	C-2	5.0		68SB08-01 (5-7')	<1	SILTY CLAY, some sand; moderately stiff; medium brown; damp	Open Borehole		130.58
7						*Collect soil sample from 5' to 7'			
8									
9									
10						10.0			
	C-3					mixed with rock frags. and gravel	Top of 1" PVC Screen at 10'		

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB08/TW08 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68

SO NO.: 107872

BORING NO.:

68SB08/TW08

SAMPLE TYPE					DEFINITIONS			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample					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)	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11	C-3	3.5		68SB08 -02 (10-12)	<1	Continued from Sheet 1		125.58
12						(SILTY CLAY) mixed with rock fragments and gravel; iron staining; damp from 11' to 15'		
13						*Collect soil sample from 10' to 12'		
14						moist at 13.5'		
15						15.0'		
16	C-4	4.5			<1	ROCK FRAGMENTS and GRAVEL mixed with silty clay; moderately hard; damp		122.58
17								
18						18.0'		
19						CLAY; stiff; blue-gray; damp		
20						20.0'		
21						End of Boring at 20.0'		120.58
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB08/TW08 SHEET 2 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68
 PROJ. NO.: 107872 BORING NO.: 68SB09/TW09
 COORDINATES: EAST: 923997.6355 NORTH: 802264.7382
 ELEVATION: SURFACE: 140.23 TOP OF PVC CASING: 140.23

Rig: Geoprobe Track Rig 6620 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1-5/8" I.D.	--	--	--	11/14/2006	0.0 - 20.0	Pt. Sunny, 80s	
Length	5'	--	--	--				
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE						WELL INFORMATION			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push P = Piston N = No Sample						Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
						Schedule 40 PVC Riser	1"	0	10.0
						Schedule 40 PVC Screen	1"	10.0	20.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
1	C-1			68SB09-00 (0-12")	<1	TOPSOIL (Sandy Loam); soft; dark brown; damp to moist; *Collect soil sample from 0 to 12"	1" PVC Riser		138.73
2						SANDY CLAY, some gravel throughout; moderately stiff; medium brown; damp to dry			
3									
4									
5						5.0			
6	C-2			68SB09-01 (5-7")	<1	*Collect soil sample from 5' to 7'	Open Borehole		
7						*Collect soil sample from 7' to 9'			
8									
9									
10						10.0			
	C-3					becoming moist at 9.5'	Top of 1" PVC Screen at 10'		

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

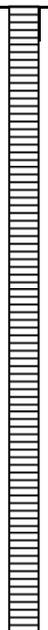
BAKER REP.: Joe Burawa
 BORING NO.: 68SB09/TW09 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68

SO NO.: 107872

BORING NO.: 68SB09/TW09

SAMPLE TYPE						DEFINITIONS		
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample						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)	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11	C-3				<1	Continued from Sheet 1		125.23
12						SANDY CLAY (fine to medium grained sand); moderately soft; medium brown;		
13						moist from 10' to 15'		
14								
15						cobble at 14.5'		
16	C-4				<1	CLAY, little sand; moderately stiff; white and brown; moist	1" PVC Screen	120.23
17						damp at 17'		
18								
19								
20								
21						End of Boring at 20.0'		
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB09/TW09 SHEET 2 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68
 PROJ. NO.: 107872 BORING NO.: 68SB10/TW10
 COORDINATES: EAST: 924221.6661 NORTH: 802253.4035
 ELEVATION: SURFACE: 137.24 TOP OF PVC CASING: 137.24

Rig: Geoprobe Track Rig 6620 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1-5/8" I.D.	--	--	--	11/15/2006	0.0 - 20.0	Pt. Sunny, 80s	
Length	5'	--	--	--				
Type	--	--	--	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks:

SAMPLE TYPE						WELL INFORMATION			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push P = Piston N = No Sample						Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
						Schedule 40 PVC Riser	1"	0	10.0
						Schedule 40 PVC Screen	1"	10.0	20.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
1	C-1	1.5		68SB10-00	<1	TOPSOIL (Sandy Loam) *Collect soil sample from 0 to 12" with duplicate and MS/MSD 1.3'	1" PVC Riser	Open Borehole	135.94
2				and Dup.		SILTY CLAY, gravel throughout; plastic; moderately hard; medium brown; damp			
3				-00D		cobble at 1.5'			
4				and					
5				MS/MSD					
6	C-2	5.0		68SB10-01	<1	some sand, trace gravel from 5' to 10' *Collect soil sample from 5' to 7' with duplicate	Top of 1" PVC Screen at 10'	127.24	
7				and Dup.					
8				-01D					
9									
10	C-3								

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB10/TW10 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Roosevelt Roads Puerto Rico SWMU 68

SO NO.: 107872

BORING NO.: 68SB10/TW10

SAMPLE TYPE						DEFINITIONS		
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample						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)	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
11	C-3	5.0		68SB10-02 (12-14') and MS/MSD	<1	Continued from Sheet 1 (SILTY CLAY) 11.0'		126.24
12						SANDY CLAY (medium grained sand); moderately hard; darker brown, iron staining; damp to moist		
13						*Collect soil sample from 12' to 14' with MS/MSD		
14								
15						15.0		
16	C-4	5.0			<1	(medium grained sand) with gravel; medium brownish-red; damp to moist from 15' to 20'		117.24
17								
18								
19								
20						20.0		
21						End of Boring at 20.0'		
22								
23								
24								
25								
26								
27								
28								
29								
30								

DRILLING CO.: GeoEnviroTech, Inc.
 DRILLER: Jessie/Abraham

BAKER REP.: Joe Burawa
 BORING NO.: 68SB10/TW10 SHEET 2 OF 2

APPENDIX B
SUMMARY OF ANALYTICAL RESULTS

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB01-00	68SB02-00	68SB03-00	68SB04-00	68SB05-00	68SB06-00
Lab Sample Number	680-22001-1	680-22001-4	680-22001-7	680-22012-1	680-22001-10	680-22012-4
Sampling Date	11/13/06	11/14/06	11/13/06	11/14/06	11/13/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8260B (ug/kg)						
1112-Tetrachloroethane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
111-Trichloroethane	4.3 UJ	4.6 UJ	4.4 U	4.3 U	4.7 UJ	5.0 U
1122-Tetrachloroethane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
112-Trichloroethane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
11-Dichloroethane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
11-Dichloroethene	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
123-Trichloropropane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
12-Dibromo-3-Chloropropane	8.5 U	9.2 U	8.7 U	8.7 U	9.3 U	10 U
12-Dichloroethane	4.3 UJ	4.6 UJ	4.4 U	4.3 U	4.7 UJ	5.0 U
12-Dichloropropane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
2-Chloro-1,3-butadiene	4.3 U	4.6 U	4.4 UJ	4.3 UJ	4.7 U	5.0 UJ
2-Hexanone	21 U	23 U	22 U	22 UJ	23 U	25 UJ
3-Chloro-1-propene	4.3 U	4.6 U	4.4 UJ	4.3 UJ	4.7 U	5.0 UJ
Acetone	44	170	110	93 J	55	71 J
Acetonitrile	170 U	180 U	170 U	170 U	190 U	200 U
Acrolein	85 UJ	92 UJ	87 UJ	87 UJ	93 UJ	100 UJ
Acrylonitrile	85 U	92 U	87 U	87 U	93 U	100 U
Benzene	4.3 UJ	4.6 UJ	4.4 U	1.0 J	4.7 UJ	5.0 U
Bromoform	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Bromomethane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Carbon disulfide	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Carbon tetrachloride	4.3 UJ	4.6 UJ	4.4 U	4.3 U	4.7 UJ	5.0 U
Chlorobenzene	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Chlorodibromomethane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Chloroethane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Chloroform	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Chloromethane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
cis-1,3-Dichloropropene	4.3 UJ	4.6 UJ	4.4 U	4.3 U	4.7 UJ	5.0 U
Dibromomethane	4.3 UJ	4.6 UJ	4.4 U	4.3 U	4.7 UJ	5.0 U
Dichlorobromomethane	4.3 UJ	4.6 UJ	4.4 U	4.3 UJ	4.7 UJ	5.0 U
Dichlorodifluoromethane	4.3 R	4.6 R	4.4 U	4.3 U	4.7 R	5.0 UJ
Ethyl methacrylate	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Ethylbenzene	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Ethylene Dibromide	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Iodomethane	4.3 U	4.6 U	4.4 UJ	4.3 UJ	4.7 U	5.0 UJ
Isobutanol	170 UJ	180 UJ	170 U	170 R	190 UJ	200 R
Methacrylonitrile	85 U	92 U	87 U	87 U	93 U	100 U
Methyl Ethyl Ketone	21 U	12 J	5.2 U	6.2 J	23 U	5.2 J
methyl isobutyl ketone	21 U	23 U	22 UJ	22 U	23 U	25 U
Methyl methacrylate	4.3 U	4.6 U	4.4 U	4.3 UJ	4.7 U	5.0 UJ
Methylene Chloride	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Pentachloroethane	21 UJ	23 UJ	22 UJ	22 UJ	23 UJ	25 UJ
Propionitrile	85 U	92 U	87 U	87 U	93 U	100 U
Styrene	4.3 U	4.6 U	2.8 J	4.3 U	4.7 U	5.0 U
Tetrachloroethene	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Toluene	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
trans-1,2-Dichloroethene	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
trans-1,3-Dichloropropene	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
trans-1,4-Dichloro-2-butene	8.5 U	9.2 U	8.7 U	8.7 U	9.3 U	10 U
Trichloroethene	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Trichlorofluoromethane	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Vinyl acetate	8.5 UJ	9.2 UJ	8.7 U	8.7 U	9.3 UJ	10 U
Vinyl chloride	4.3 U	4.6 U	4.4 U	4.3 U	4.7 U	5.0 U
Xylenes Total	8.5 U	9.2 U	8.7 U	8.7 U	9.3 U	10 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB01-00	68SB02-00	68SB03-00	68SB04-00	68SB05-00	68SB06-00
Lab Sample Number	680-22001-1	680-22001-4	680-22001-7	680-22012-1	680-22001-10	680-22012-4
Sampling Date	11/13/06	11/14/06	11/13/06	11/14/06	11/13/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)						
11'-Biphenyl	390 U	380 U	380 U	400 U	410 U	460 U
1245-Tetrachlorobenzene	390 U	380 U	380 U	400 U	410 U	460 U
124-Trichlorobenzene	390 U	380 U	380 U	400 U	410 U	460 U
12-Dichlorobenzene	390 U	380 U	380 U	400 U	410 U	460 U
135-Trinitrobenzene	390 UJ	380 UJ	380 UJ	400 U	410 UJ	460 U
13-Dichlorobenzene	390 U	380 U	380 U	400 U	410 U	460 U
13-Dinitrobenzene	390 U	380 U	380 U	400 U	410 U	460 U
14-Dichlorobenzene	390 U	380 U	380 U	400 U	410 U	460 U
14-Dioxane	390 U	380 U	380 U	400 U	410 U	460 UJ
14-Naphthoquinone	390 U	380 U	380 U	400 U	410 U	460 U
1-Naphthylamine	390 U	380 U	380 U	400 U	410 U	460 U
2346-Tetrachlorophenol	390 U	380 U	380 U	400 U	410 U	460 U
245-Trichlorophenol	390 U	380 U	380 U	400 U	410 U	460 U
246-Trichlorophenol	390 U	380 U	380 U	400 U	410 U	460 U
24-Dichlorophenol	390 U	380 U	380 U	400 U	410 U	460 U
24-Dimethylphenol	390 U	380 U	380 U	400 U	410 U	460 U
24-Dinitrophenol	2000 U	2000 U	2000 U	2100 UJ	2100 U	2300 UJ
24-Dinitrotoluene	390 U	380 U	380 U	400 U	410 U	460 U
26-Dichlorophenol	390 U	380 U	380 U	400 U	410 U	460 U
26-Dinitrotoluene	390 U	380 U	380 U	400 U	410 U	460 U
2-Acetylaminofluorene	390 U	380 U	380 U	400 U	410 U	460 U
2-Chloronaphthalene	390 U	380 U	380 U	400 U	410 U	460 U
2-Chlorophenol	390 U	380 U	380 U	400 U	410 U	460 U
2-Methylphenol	390 U	380 U	380 U	400 U	410 U	460 U
2-Naphthylamine	390 U	380 U	380 U	400 U	410 U	460 U
2-Nitroaniline	2000 U	2000 U	2000 U	2100 U	2100 U	2300 U
2-Nitrophenol	390 U	380 U	380 U	400 UJ	410 U	460 U
2-Picoline	390 U	380 U	380 U	400 U	410 U	460 UJ
2-Toluidine	390 U	380 U	380 U	400 U	410 U	460 U
3 & 4 Methylphenol	390 U	380 U	380 U	400 U	410 U	460 U
33'-Dichlorobenzidine	770 U	760 U	770 U	810 U	820 U	910 U
33'-Dimethylbenzidine	2000 U	2000 U	2000 U	2100 U	2100 U	2300 U
3-Methylcholanthrene	390 U	380 U	380 U	400 U	410 U	460 U
3-Nitroaniline	2000 U	2000 U	2000 U	2100 U	2100 U	2300 U
46-Dinitro-2-methylphenol	2000 U	2000 U	2000 U	2100 U	2100 U	2300 U
4-Aminobiphenyl	390 U	380 U	380 U	400 U	410 U	460 U
4-Bromophenyl phenyl ether	390 U	380 U	380 U	400 U	410 U	460 U
4-Chloro-3-methylphenol	390 U	380 U	380 U	400 U	410 U	460 U
4-Chloroaniline	770 U	760 U	770 U	810 U	820 U	910 U
4-Chlorophenyl phenyl ether	390 U	380 U	380 U	400 U	410 U	460 U
4-Nitroaniline	2000 U	2000 U	2000 U	2100 U	2100 U	2300 U
4-Nitrophenol	2000 U	2000 U	2000 U	2100 U	2100 U	2300 U
4-Nitroquinoline-1-oxide	3900 R	3800 R	3800 R	4000 UJ	4100 R	4600 R
712-Dimethylbenz(a)anthracene	390 U	380 U	380 U	400 U	410 U	460 U
Acetophenone	390 U	380 U	380 U	400 U	410 U	460 U
alphaalpha-Dimethyl phenethylamine	78000 UJ	77000 UJ	78000 UJ	82000 UJ	84000 UJ	92000 UJ
Aniline	770 U	760 U	770 U	810 U	820 U	910 U
Aramite Total	390 U	380 U	380 U	400 UJ	410 U	460 U
Benzyl alcohol	390 U	380 U	380 U	400 U	410 U	460 U
Bis(2-chloroethoxy)methane	390 U	380 U	380 U	400 U	410 U	460 U
Bis(2-chloroethyl)ether	390 U	380 U	380 U	400 U	410 U	460 U
Bis(2-ethylhexyl) phthalate	390 U	380 U	380 U	400 U	410 U	460 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB01-00	68SB02-00	68SB03-00	68SB04-00	68SB05-00	68SB06-00
Lab Sample Number	680-22001-1	680-22001-4	680-22001-7	680-22012-1	680-22001-10	680-22012-4
Sampling Date	11/13/06	11/14/06	11/13/06	11/14/06	11/13/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)						
bis(chloroisopropyl) ether	390 U	380 U	380 U	400 U	410 U	460 U
Butyl benzyl phthalate	390 U	380 U	380 U	400 U	410 U	460 U
Diallate	390 U	380 U	380 U	400 UJ	410 U	460 U
Dibenzofuran	390 U	380 U	380 U	400 U	410 U	460 U
Diethyl phthalate	390 U	380 U	380 U	400 U	410 U	460 U
Dimethoate	390 U	380 U	380 U	400 U	410 U	460 U
Dimethyl phthalate	390 U	380 U	380 U	400 U	410 U	460 U
Di-n-butyl phthalate	390 U	380 U	380 U	400 U	410 U	460 U
Di-n-octyl phthalate	390 U	380 U	380 U	400 U	410 U	460 U
Dinoseb	390 U	380 U	380 U	400 U	410 U	460 U
Disulfoton	390 U	380 U	380 U	400 U	410 U	460 U
Ethyl methanesulfonate	390 U	380 U	380 U	400 UJ	410 U	460 U
Famphur	390 U	380 U	380 U	400 U	410 U	460 U
Hexachlorobenzene	390 U	380 U	380 U	400 U	410 U	460 U
Hexachlorobutadiene	390 U	380 U	380 U	400 U	410 U	460 U
Hexachlorocyclopentadiene	390 U	380 U	380 U	400 U	410 U	460 U
Hexachloroethane	390 U	380 U	380 U	400 U	410 U	460 U
Hexachlorophene	200000 UJ	200000 UJ	200000 UJ	210000 UJ	210000 UJ	230000 UJ
Hexachloropropene	390 U	380 U	380 U	400 U	410 U	460 UJ
Isophorone	390 U	380 U	380 U	400 U	410 U	460 U
Isosafrole	390 U	380 U	380 U	400 U	410 U	460 U
Methapyrilene	78000 UJ	77000 UJ	78000 UJ	82000 UJ	84000 UJ	92000 U
Methyl methanesulfonate	390 U	380 U	380 U	400 U	410 U	460 U
Methyl parathion	390 U	380 U	380 U	400 U	410 U	460 U
Nitrobenzene	390 U	380 U	380 U	400 U	410 U	460 U
N-Nitro-o-toluidine	390 U	380 U	380 U	400 U	410 U	460 U
N-Nitrosodiethylamine	390 U	380 U	380 U	400 UJ	410 U	460 UJ
N-Nitrosodimethylamine	390 U	380 U	380 U	400 U	410 U	460 U
N-Nitrosodi-n-butylamine	390 U	380 U	380 U	400 U	410 U	460 U
N-Nitrosodi-n-propylamine	390 U	380 U	380 U	400 U	410 U	460 U
N-Nitrosodiphenylamine	390 U	380 U	380 U	400 U	410 U	460 U
N-Nitrosomethylethylamine	390 U	380 U	380 U	400 U	410 U	460 U
N-Nitrosomorpholine	390 U	380 U	380 U	400 UJ	410 U	460 U
N-Nitrosopiperidine	390 U	380 U	380 U	400 U	410 U	460 U
N-Nitrosopyrrolidine	390 U	380 U	380 U	400 U	410 U	460 U
oo'o"-Triethylphosphorothioate	390 U	380 U	380 U	400 U	410 U	460 U
Parathion	390 U	380 U	380 U	400 U	410 U	460 U
p-Dimethylamino azobenzene	390 U	380 U	380 U	400 U	410 U	460 U
Pentachlorobenzene	390 U	380 U	380 U	400 U	410 U	460 U
Pentachloronitrobenzene	390 U	380 U	380 U	400 U	410 U	460 U
Pentachlorophenol	2000 U	2000 U	2000 U	2100 U	2100 U	2300 U
Phenacetin	390 U	380 U	380 U	400 U	410 U	460 U
Phenol	390 U	380 U	380 U	400 U	410 U	460 U
Phorate	390 UJ	380 UJ	380 UJ	400 U	410 UJ	460 U
p-Phenylene diamine	2000 U	2000 U	2000 U	2100 U	2100 U	2300 U
Pronamide	390 U	380 U	380 U	400 U	410 U	460 U
Pyridine	390 U	380 U	380 U	400 U	410 U	460 U
Safrole Total	390 U	380 U	380 U	400 U	410 U	460 U
Sulfotepp	390 U	380 U	380 U	400 U	410 U	460 U
Thionazin	390 U	380 U	380 U	400 U	410 U	460 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB01-00	68SB02-00	68SB03-00	68SB04-00	68SB05-00	68SB06-00
Lab Sample Number	680-22001-1	680-22001-4	680-22001-7	680-22012-1	680-22001-10	680-22012-4
Sampling Date	11/13/06	11/14/06	11/13/06	11/14/06	11/13/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270_LL (ug/kg)						
1-Methylnaphthalene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
2-Methylnaphthalene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Acenaphthene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Acenaphthylene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Anthracene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Benzo[a]anthracene	7.8 U	1.8 J	7.8 U	8.2 U	8.3 U	9.2 U
Benzo[a]pyrene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Benzo[b]fluoranthene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Benzo[ghi]perylene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Benzo[k]fluoranthene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Chrysene	7.8 U	2.3 J	7.8 U	8.2 U	8.3 U	9.2 U
Dibenz(ah)anthracene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Fluoranthene	7.8 U	1.9 J	7.8 U	8.2 U	8.3 U	9.2 U
Fluorene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Indeno[123-cd]pyrene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Naphthalene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Phenanthrene	7.8 U	7.7 U	7.8 U	8.2 U	8.3 U	9.2 U
Pyrene	7.8 U	2.3 J	7.8 U	8.2 U	8.3 U	9.2 U
Method - 8081A_8082 (ug/kg)						
Aroclor 1016	39 U	38 U	39 U	40 U	41 U	46 U
Aroclor 1221	79 U	77 U	78 U	81 U	84 U	92 U
Aroclor 1232	39 U	38 U	39 U	40 U	41 U	46 U
Aroclor 1242	39 U	38 U	39 U	40 U	41 U	46 U
Aroclor 1248	39 U	38 U	39 U	40 U	41 U	46 U
Aroclor 1254	39 U	38 U	39 U	40 U	41 U	46 U
Aroclor 1260	39 U	38 U	39 U	40 U	41 U	46 U
Method - 8015B (mg/kg)						
Diesel Range Organics	3.9 U	3.8 U	3.9 U	4.0 U	4.1 U	4.6 U
Gasoline Range Organics	0.22 U	0.096 J	0.16 J	0.088 J	0.21 U	0.24 U
Method - 6020 (mg/kg)						
Antimony	4.2 UJ	4.1 UJ	4.5 UJ	4.5 UJ	4.7 UJ	0.90 J
Arsenic	1.4 J	3.4	1.2 J	1.7 J	1.3 J	0.92 J
Barium	76	260	78	100 J	87	72 J
Beryllium	0.27 J	0.30 J	0.28 J	0.28 J	0.28 J	0.27 J
Cadmium	1.0 U	0.19 J	0.047 J	0.13 J	1.2 U	0.61 J
Chromium	16 J	21 J	15 J	22	40 J	24
Cobalt	15	47	11	25 J	15	10 J
Copper	28 J	26 J	28 J	35 J	50 J	64 J
Lead	2.1 J	7.0 J	1.8 J	2.5	1.7 J	4.2
Nickel	7.8 J	7.5 J	7.5 J	12	16 J	10
Selenium	0.38 J	0.66 J	0.23 J	0.41 J	2.4 U	0.42 J
Silver	2.1 U	2.0 U	2.2 U	2.2 U	2.4 U	2.5 U
Thallium	2.1 U	0.18 J	2.2 U	2.2 U	2.4 U	2.5 U
Tin	10 UJ	10 UJ	11 UJ	11 UJ	12 UJ	12 UJ
Vanadium	100	130	91	130	170	94
Zinc	35 J	34 J	39 J	42 J	61 J	55 J
Mercury -7471A	0.016 J	0.060	0.033	0.034 J	0.020 J	0.031 J
Cyanide Total - 9012A	0.58 U	0.56 U	0.57 U	0.60 U	0.60 U	0.68 U
Sulfide - 9034	29 U	29 U	29 U	30 U	36	35 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB07-00	68SB08-00	68SB09-00	68SB10-00	68SB10-00D
Lab Sample Number	680-22012-15	680-22012-7	680-22012-10	680-22012-18	680-22012-19
Sampling Date	11/15/06	11/14/06	11/14/06	11/15/06	11/15/06
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8260B (ug/kg)					
1112-Tetrachloroethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
111-Trichloroethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
1122-Tetrachloroethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
112-Trichloroethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
11-Dichloroethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
11-Dichloroethene	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
123-Trichloropropane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
12-Dibromo-3-Chloropropane	9.7 U	12 UJ	9.6 UJ	11 U	11 U
12-Dichloroethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
12-Dichloropropane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
2-Chloro-1,3-butadiene	4.9 UJ	5.8 U	4.8 U	5.3 UJ	5.5 UJ
2-Hexanone	24 UJ	29 UJ	24 UJ	27 UJ	28 UJ
3-Chloro-1-propene	4.9 UJ	5.8 UJ	4.8 UJ	5.3 UJ	5.5 UJ
Acetone	80 J	170	51	150 J	180 J
Acetonitrile	190 U	230 U	190 U	210 U	220 U
Acrolein	97 UJ	120 UJ	96 UJ	110 UJ	110 UJ
Acrylonitrile	97 U	120 U	96 U	110 U	110 U
Benzene	4.9 U	1.2 J	1.1 J	1.2 J	1.1 J
Bromoform	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Bromomethane	4.9 U	5.8 UJ	4.8 UJ	5.3 U	5.5 U
Carbon disulfide	4.9 U	5.8 UJ	4.8 UJ	5.3 U	5.5 U
Carbon tetrachloride	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Chlorobenzene	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Chlorodibromomethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Chloroethane	4.9 U	5.8 UJ	4.8 UJ	5.3 U	5.5 U
Chloroform	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Chloromethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
cis-1,3-Dichloropropene	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Dibromomethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Dichlorobromomethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Dichlorodifluoromethane	4.9 UJ	5.8 U	4.8 U	5.3 UJ	5.5 UJ
Ethyl methacrylate	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Ethylbenzene	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Ethylene Dibromide	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Iodomethane	1.9 J	5.8 UJ	4.8 UJ	5.3 UJ	5.5 UJ
Isobutanol	190 R	230 R	190 R	210 R	220 R
Methacrylonitrile	97 U	120 U	96 U	110 U	110 U
Methyl Ethyl Ketone	7.8 J	9.9 J	24 U	7.2 J	10 J
methyl isobutyl ketone	24 U	29 UJ	24 UJ	27 U	28 U
Methyl methacrylate	4.9 UJ	5.8 U	4.8 U	5.3 UJ	5.5 UJ
Methylene Chloride	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Pentachloroethane	24 UJ	29 UJ	24 UJ	27 UJ	28 UJ
Propionitrile	97 U	120 U	96 U	110 U	110 U
Styrene	4.9 U	5.8 U	4.8 U	5.3 UJ	5.5 U
Tetrachloroethene	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Toluene	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
trans-1,2-Dichloroethene	4.9 U	5.8 UJ	4.8 UJ	5.3 U	5.5 U
trans-1,3-Dichloropropene	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
trans-1,4-Dichloro-2-butene	9.7 U	12 U	9.6 U	11 U	11 U
Trichloroethene	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Trichlorofluoromethane	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Vinyl acetate	9.7 U	12 U	9.6 U	11 U	11 U
Vinyl chloride	4.9 U	5.8 U	4.8 U	5.3 U	5.5 U
Xylenes Total	9.7 U	12 U	9.6 U	11 U	11 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB07-00	68SB08-00	68SB09-00	68SB10-00	68SB10-00D
Lab Sample Number	680-22012-15	680-22012-7	680-22012-10	680-22012-18	680-22012-19
Sampling Date	11/15/06	11/14/06	11/14/06	11/15/06	11/15/06
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)					
11'-Biphenyl	390 U	480 U	410 U	470 U	530 U
1245-Tetrachlorobenzene	390 U	480 U	410 U	470 U	530 U
124-Trichlorobenzene	390 U	480 U	410 U	470 U	530 U
12-Dichlorobenzene	390 U	480 U	410 U	470 U	530 U
135-Trinitrobenzene	390 U	480 U	410 U	470 U	530 U
13-Dichlorobenzene	390 U	480 U	410 U	470 U	530 U
13-Dinitrobenzene	390 U	480 U	410 U	470 U	530 U
14-Dichlorobenzene	390 U	480 U	410 U	470 U	530 U
14-Dioxane	390 U	480 U	410 U	470 U	530 U
14-Naphthoquinone	390 U	480 U	410 U	470 U	530 U
1-Naphthylamine	390 U	480 U	410 U	470 U	530 U
2346-Tetrachlorophenol	390 U	480 U	410 U	470 U	530 U
245-Trichlorophenol	390 U	480 U	410 U	470 U	530 U
246-Trichlorophenol	390 U	480 U	410 U	470 U	530 U
24-Dichlorophenol	390 U	480 U	410 U	470 U	530 U
24-Dimethylphenol	390 U	480 U	410 U	470 U	530 U
24-Dinitrophenol	2000 U	2500 UJ	2100 UJ	2400 U	2700 U
24-Dinitrotoluene	390 U	480 U	410 U	470 U	530 U
26-Dichlorophenol	390 U	480 U	410 U	470 U	530 U
26-Dinitrotoluene	390 U	480 U	410 U	470 U	530 U
2-Acetylaminofluorene	390 U	480 U	410 U	470 U	530 U
2-Chloronaphthalene	390 U	480 U	410 U	470 U	530 U
2-Chlorophenol	390 U	480 U	410 U	470 U	530 U
2-Methylphenol	390 U	480 U	410 U	470 U	530 U
2-Naphthylamine	390 U	480 U	410 U	470 U	530 U
2-Nitroaniline	2000 U	2500 U	2100 U	2400 U	2700 U
2-Nitrophenol	390 U	480 U	410 U	470 U	530 U
2-Picoline	390 UJ	480 UJ	410 UJ	470 UJ	530 UJ
2-Toluidine	390 U	480 U	410 U	470 U	530 U
3 & 4 Methylphenol	390 U	480 U	410 U	470 U	530 U
33'-Dichlorobenzidine	790 U	950 U	810 U	930 U	1100 U
33'-Dimethylbenzidine	2000 U	2500 U	2100 U	2400 U	2700 U
3-Methylcholanthrene	390 U	480 U	410 U	470 U	530 U
3-Nitroaniline	2000 U	2500 U	2100 U	2400 U	2700 U
46-Dinitro-2-methylphenol	2000 U	2500 U	2100 U	2400 U	2700 U
4-Aminobiphenyl	390 U	480 U	410 U	470 U	530 U
4-Bromophenyl phenyl ether	390 U	480 U	410 U	470 U	530 U
4-Chloro-3-methylphenol	390 U	480 U	410 U	470 U	530 U
4-Chloroaniline	790 U	950 U	810 U	930 U	1100 U
4-Chlorophenyl phenyl ether	390 U	480 U	410 U	470 U	530 U
4-Nitroaniline	2000 U	2500 U	2100 U	2400 U	2700 U
4-Nitrophenol	2000 U	2500 U	2100 U	2400 U	2700 U
4-Nitroquinoline-1-oxide	3900 U	4800 UJ	4100 UJ	4700 U	5300 U
712-Dimethylbenz(a)anthracene	390 U	480 U	410 U	470 U	530 U
Acetophenone	390 U	480 U	410 U	470 U	530 U
alphaalpha-Dimethyl phenethylamine	80000 U	97000 UJ	83000 UJ	95000 U	110000 U
Aniline	790 U	950 U	810 U	930 U	1100 U
Aramite Total	390 U	480 UJ	410 UJ	470 U	530 U
Benzyl alcohol	390 U	480 U	410 U	470 U	530 U
Bis(2-chloroethoxy)methane	390 U	480 U	410 U	470 U	530 U
Bis(2-chloroethyl)ether	390 U	480 U	410 U	470 U	530 U
Bis(2-ethylhexyl) phthalate	390 U	480 U	410 U	470 U	530 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB07-00	68SB08-00	68SB09-00	68SB10-00	68SB10-00D
Lab Sample Number	680-22012-15	680-22012-7	680-22012-10	680-22012-18	680-22012-19
Sampling Date	11/15/06	11/14/06	11/14/06	11/15/06	11/15/06
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)					
bis(chloroisopropyl) ether	390 U	480 U	410 U	470 U	530 U
Butyl benzyl phthalate	390 U	480 U	410 U	470 U	530 U
Diallate	390 UJ	480 UJ	410 UJ	470 UJ	530 UJ
Dibenzofuran	390 U	480 U	410 U	470 U	530 U
Diethyl phthalate	390 U	480 U	410 U	470 U	530 U
Dimethoate	390 U	480 U	410 U	470 U	530 U
Dimethyl phthalate	390 U	480 U	410 U	470 U	530 U
Di-n-butyl phthalate	390 U	480 U	410 U	470 U	530 U
Di-n-octyl phthalate	390 U	480 U	410 U	470 U	530 U
Dinoseb	390 U	480 U	410 U	470 U	530 U
Disulfoton	390 U	480 U	410 U	470 U	530 U
Ethyl methanesulfonate	390 U	480 UJ	410 UJ	470 U	530 U
Famphur	390 U	480 U	410 U	470 U	530 U
Hexachlorobenzene	390 U	480 U	410 U	470 U	530 U
Hexachlorobutadiene	390 U	480 U	410 U	470 U	530 U
Hexachlorocyclopentadiene	390 U	480 U	410 U	470 U	530 U
Hexachloroethane	390 U	480 U	410 U	470 U	530 U
Hexachlorophene	200000 U	250000 UJ	210000 UJ	240000 U	270000 U
Hexachloropropene	390 U	480 U	410 U	470 U	530 U
Isophorone	390 U	480 U	410 U	470 U	530 U
Isosafrole	390 U	480 U	410 U	470 U	530 U
Methapyrilene	80000 U	97000 UJ	83000 UJ	95000 U	110000 U
Methyl methanesulfonate	390 U	480 U	410 U	470 U	530 U
Methyl parathion	390 U	480 U	410 U	470 U	530 U
Nitrobenzene	390 U	480 U	410 U	470 U	530 U
N-Nitro-o-toluidine	390 U	480 U	410 U	470 U	530 U
N-Nitrosodiethylamine	390 U	480 UJ	410 UJ	470 U	530 U
N-Nitrosodimethylamine	390 U	480 U	410 U	470 U	530 U
N-Nitrosodi-n-butylamine	390 U	480 U	410 U	470 U	530 U
N-Nitrosodi-n-propylamine	390 U	480 U	410 U	470 U	530 U
N-Nitrosodiphenylamine	390 U	480 U	410 U	470 U	530 U
N-Nitrosomethylethylamine	390 U	480 U	410 U	470 U	530 U
N-Nitrosomorpholine	390 U	480 UJ	410 UJ	470 U	530 U
N-Nitrosopiperidine	390 U	480 U	410 U	470 U	530 U
N-Nitrosopyrrolidine	390 U	480 U	410 U	470 U	530 U
oo'o"-Triethylphosphorothioate	390 U	480 U	410 U	470 U	530 U
Parathion	390 U	480 U	410 U	470 U	530 U
p-Dimethylamino azobenzene	390 U	480 U	410 U	470 U	530 U
Pentachlorobenzene	390 U	480 U	410 U	470 U	530 U
Pentachloronitrobenzene	390 U	480 U	410 U	470 U	530 U
Pentachlorophenol	2000 U	2500 U	2100 U	2400 U	2700 U
Phenacetin	390 U	480 U	410 U	470 U	530 U
Phenol	390 U	480 U	410 U	470 U	530 U
Phorate	390 U	480 U	410 U	470 U	530 U
p-Phenylene diamine	2000 U	2500 U	2100 U	2400 U	2700 U
Pronamide	390 U	480 U	410 U	470 U	530 U
Pyridine	390 U	480 U	410 U	470 U	530 U
Safrole Total	390 U	480 U	410 U	470 U	530 U
Sulfotepp	390 U	480 U	410 U	470 U	530 U
Thionazin	390 U	480 U	410 U	470 U	530 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB07-00	68SB08-00	68SB09-00	68SB10-00	68SB10-00D
Lab Sample Number	680-22012-15	680-22012-7	680-22012-10	680-22012-18	680-22012-19
Sampling Date	11/15/06	11/14/06	11/14/06	11/15/06	11/15/06
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8270_LL (ug/kg)					
1-Methylnaphthalene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
2-Methylnaphthalene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Acenaphthene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Acenaphthylene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Anthracene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Benzo[a]anthracene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Benzo[a]pyrene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Benzo[b]fluoranthene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Benzo[ghi]perylene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Benzo[k]fluoranthene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Chrysene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Dibenz(ah)anthracene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Fluoranthene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Fluorene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Indeno[123-cd]pyrene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Naphthalene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Phenanthrene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Pyrene	8.0 U	9.7 U	8.3 U	9.5 U	11 U
Method - 8081A_8082 (ug/kg)					
Aroclor 1016	40 U	48 U	40 U	46 U	53 U
Aroclor 1221	80 U	97 U	82 U	94 U	110 U
Aroclor 1232	40 U	48 U	40 U	46 U	53 U
Aroclor 1242	40 U	48 U	40 U	46 U	53 U
Aroclor 1248	40 U	48 U	40 U	46 U	53 U
Aroclor 1254	40 U	48 U	40 U	46 U	53 U
Aroclor 1260	40 U	48 U	40 U	46 U	53 U
Method - 8015B (mg/kg)					
Diesel Range Organics	4.0 U	4.8 U	4.1 U	4.6 U	5.3 U
Gasoline Range Organics	0.25 U	0.11 J	0.24 U	0.12 J	0.12 J
Method - 6020 (mg/kg)					
Antimony	4.5 UJ	5.3 UJ	4.4 UJ	5.2 UJ	5.9 UJ
Arsenic	1.4 J	2.3 J	1.3 J	1.9 J	2.4 J
Barium	110 J	61 J	69 J	53 J	59 J
Beryllium	0.33 J	0.14 J	0.35 J	0.21 J	0.26 J
Cadmium	0.073 J	0.27 J	0.056 J	0.39 J	0.57 J
Chromium	37	18	37	20	22
Cobalt	31 J	13 J	18 J	12 J	13 J
Copper	57 J	29 J	42 J	28 J	30 J
Lead	2.1	53	2.1	5.1	5.3
Nickel	19	11 U	11	10 U	12 U
Selenium	0.31 J	0.56 J	0.35 J	0.73 J	0.79 J
Silver	2.2 U	2.7 U	2.2 U	2.6 U	2.9 U
Thallium	2.2 U	2.7 U	2.2 U	2.6 U	2.9 U
Tin	11 UJ	13 UJ	11 UJ	13 UJ	15 UJ
Vanadium	160	81	130	85	94
Zinc	50 J	51 J	45 J	42 J	44 J
Mercury -7471A	0.022 J	0.050 J	0.030 J	0.049 J	0.052 J
Cyanide Total - 9012A	0.58 U	0.71 U	0.59 U	0.71 U	0.78 U
Sulfide - 9034	30 U	36 U	31 U	36 U	40 U

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SS01	68SS01D	68SS02	68SS03	68SS04	68SS05	68SS06
Lab Sample Number	680-30548-14	680-30548-15	680-30548-16	680-30548-17	680-30548-18	680-30548-19	680-31377-18
Sampling Date	09/27/07	09/27/07	09/27/07	09/27/07	09/27/07	09/27/07	10/24/07
Matrix	Solid	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8260B (ug/kg)							
1112-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA
111-Trichloroethane	NA	NA	NA	NA	NA	NA	NA
1122-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA
112-Trichloroethane	NA	NA	NA	NA	NA	NA	NA
11-Dichloroethane	NA	NA	NA	NA	NA	NA	NA
11-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
123-Trichloropropane	NA	NA	NA	NA	NA	NA	NA
12-Dibromo-3-Chloropropane	NA	NA	NA	NA	NA	NA	NA
12-Dichloroethane	NA	NA	NA	NA	NA	NA	NA
12-Dichloropropane	NA	NA	NA	NA	NA	NA	NA
2-Chloro-1,3-butadiene	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA	NA	NA
3-Chloro-1-propene	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA
Acetonitrile	NA	NA	NA	NA	NA	NA	NA
Acrolein	NA	NA	NA	NA	NA	NA	NA
Acrylonitrile	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA
Chlorodibromomethane	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NA	NA	NA	NA	NA	NA	NA
Dichlorobromomethane	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA	NA
Ethyl methacrylate	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA
Ethylene Dibromide	NA	NA	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA	NA	NA
Isobutanol	NA	NA	NA	NA	NA	NA	NA
Methacrylonitrile	NA	NA	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	NA	NA	NA	NA	NA	NA	NA
methyl isobutyl ketone	NA	NA	NA	NA	NA	NA	NA
Methyl methacrylate	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA	NA	NA
Pentachloroethane	NA	NA	NA	NA	NA	NA	NA
Propionitrile	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NA	NA	NA	NA	NA	NA	NA
Vinyl acetate	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA
Xylenes Total	NA	NA	NA	NA	NA	NA	NA

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SS01	68SS01D	68SS02	68SS03	68SS04	68SS05	68SS06
Lab Sample Number	680-30548-14	680-30548-15	680-30548-16	680-30548-17	680-30548-18	680-30548-19	680-31377-18
Sampling Date	09/27/07	09/27/07	09/27/07	09/27/07	09/27/07	09/27/07	10/24/07
Matrix	Solid						
Method - 8270C (ug/kg)							
11'-Biphenyl	NA						
1245-Tetrachlorobenzene	NA						
124-Trichlorobenzene	NA						
12-Dichlorobenzene	NA						
135-Trinitrobenzene	NA						
13-Dichlorobenzene	NA						
13-Dinitrobenzene	NA						
14-Dichlorobenzene	NA						
14-Dioxane	NA						
14-Naphthoquinone	NA						
1-Naphthylamine	NA						
2346-Tetrachlorophenol	NA						
245-Trichlorophenol	NA						
246-Trichlorophenol	NA						
24-Dichlorophenol	NA						
24-Dimethylphenol	NA						
24-Dinitrophenol	NA						
24-Dinitrotoluene	NA						
26-Dichlorophenol	NA						
26-Dinitrotoluene	NA						
2-Acetylaminofluorene	NA						
2-Chloronaphthalene	NA						
2-Chlorophenol	NA						
2-Methylphenol	NA						
2-Naphthylamine	NA						
2-Nitroaniline	NA						
2-Nitrophenol	NA						
2-Picoline	NA						
2-Toluidine	NA						
3 & 4 Methylphenol	NA						
33'-Dichlorobenzidine	NA						
33'-Dimethylbenzidine	NA						
3-Methylcholanthrene	NA						
3-Nitroaniline	NA						
46-Dinitro-2-methylphenol	NA						
4-Aminobiphenyl	NA						
4-Bromophenyl phenyl ether	NA						
4-Chloro-3-methylphenol	NA						
4-Chloroaniline	NA						
4-Chlorophenyl phenyl ether	NA						
4-Nitroaniline	NA						
4-Nitrophenol	NA						
4-Nitroquinoline-1-oxide	NA						
712-Dimethylbenz(a)anthracene	NA						
Acetophenone	NA						
alphaalpha-Dimethyl phenethylamine	NA						
Aniline	NA						
Aramite Total	NA						
Benzyl alcohol	NA						
Bis(2-chloroethoxy)methane	NA						
Bis(2-chloroethyl)ether	NA						
Bis(2-ethylhexyl) phthalate	NA						

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SS01	68SS01D	68SS02	68SS03	68SS04	68SS05	68SS06
Lab Sample Number	680-30548-14	680-30548-15	680-30548-16	680-30548-17	680-30548-18	680-30548-19	680-31377-18
Sampling Date	09/27/07	09/27/07	09/27/07	09/27/07	09/27/07	09/27/07	10/24/07
Matrix	Solid						
Method - 8270C (ug/kg)							
bis(chloroisopropyl) ether	NA						
Butyl benzyl phthalate	NA						
Diallate	NA						
Dibenzofuran	NA						
Diethyl phthalate	NA						
Dimethoate	NA						
Dimethyl phthalate	NA						
Di-n-butyl phthalate	NA						
Di-n-octyl phthalate	NA						
Dinoseb	NA						
Disulfoton	NA						
Ethyl methanesulfonate	NA						
Famphur	NA						
Hexachlorobenzene	NA						
Hexachlorobutadiene	NA						
Hexachlorocyclopentadiene	NA						
Hexachloroethane	NA						
Hexachlorophene	NA						
Hexachloropropene	NA						
Isophorone	NA						
Isosafrole	NA						
Methapyrilene	NA						
Methyl methanesulfonate	NA						
Methyl parathion	NA						
Nitrobenzene	NA						
N-Nitro-o-toluidine	NA						
N-Nitrosodiethylamine	NA						
N-Nitrosodimethylamine	NA						
N-Nitrosodi-n-butylamine	NA						
N-Nitrosodi-n-propylamine	NA						
N-Nitrosodiphenylamine	NA						
N-Nitrosomethylethylamine	NA						
N-Nitrosomorpholine	NA						
N-Nitrosopiperidine	NA						
N-Nitrosopyrrolidine	NA						
oo'o"-Triethylphosphorothioate	NA						
Parathion	NA						
p-Dimethylamino azobenzene	NA						
Pentachlorobenzene	NA						
Pentachloronitrobenzene	NA						
Pentachlorophenol	NA						
Phenacetin	NA						
Phenol	NA						
Phorate	NA						
p-Phenylene diamine	NA						
Pronamide	NA						
Pyridine	NA						
Safrole Total	NA						
Sulfotepp	NA						
Thionazin	NA						

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SS01	68SS01D	68SS02	68SS03	68SS04	68SS05	68SS06
Lab Sample Number	680-30548-14	680-30548-15	680-30548-16	680-30548-17	680-30548-18	680-30548-19	680-31377-18
Sampling Date	09/27/07	09/27/07	09/27/07	09/27/07	09/27/07	09/27/07	10/24/07
Matrix	Solid						
Method - 8270_LL (ug/kg)							
1-Methylnaphthalene	NA						
2-Methylnaphthalene	NA						
Acenaphthene	NA						
Acenaphthylene	NA						
Anthracene	NA						
Benzo[a]anthracene	NA						
Benzo[a]pyrene	NA						
Benzo[b]fluoranthene	NA						
Benzo[ghi]perylene	NA						
Benzo[k]fluoranthene	NA						
Chrysene	NA						
Dibenz(ah)anthracene	NA						
Fluoranthene	NA						
Fluorene	NA						
Indeno[123-cd]pyrene	NA						
Naphthalene	NA						
Phenanthrene	NA						
Pyrene	NA						
Method - 8081A_8082 (ug/kg)							
Aroclor 1016	NA						
Aroclor 1221	NA						
Aroclor 1232	NA						
Aroclor 1242	NA						
Aroclor 1248	NA						
Aroclor 1254	NA						
Aroclor 1260	NA						
Method - 8015B (mg/kg)							
Diesel Range Organics	NA						
Gasoline Range Organics	NA						
Method - 6020 (mg/kg)							
Antimony	NA						
Arsenic	0.87 J	1 J	0.86 J	1.2 U	0.82 J	1.9	NA
Barium	NA						
Beryllium	NA						
Cadmium	NA						
Chromium	NA						
Cobalt	NA						
Copper	NA	NA	NA	NA	NA	NA	55
Lead	NA	NA	NA	NA	NA	NA	21
Nickel	NA						
Selenium	NA						
Silver	NA						
Thallium	NA						
Tin	NA						
Vanadium	NA						
Zinc	NA	NA	NA	NA	NA	NA	47J
Mercury -7471A	NA						
Cyanide Total - 9012A	NA						
Sulfide - 9034	NA						

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
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Sample ID	68SS07	68SS08	68SS09	68SS09D	68SS10
Lab Sample Number	680-31377-1	680-31377-2	680-31377-3	680-31377-4	680-31377-5
Sampling Date	10/24/07	10/24/07	10/24/07	10/24/07	10/24/07
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8260B (ug/kg)					
1112-Tetrachloroethane	NA	NA	NA	NA	NA
111-Trichloroethane	NA	NA	NA	NA	NA
1122-Tetrachloroethane	NA	NA	NA	NA	NA
112-Trichloroethane	NA	NA	NA	NA	NA
11-Dichloroethane	NA	NA	NA	NA	NA
11-Dichloroethene	NA	NA	NA	NA	NA
123-Trichloropropane	NA	NA	NA	NA	NA
12-Dibromo-3-Chloropropane	NA	NA	NA	NA	NA
12-Dichloroethane	NA	NA	NA	NA	NA
12-Dichloropropane	NA	NA	NA	NA	NA
2-Chloro-1,3-butadiene	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA
3-Chloro-1-propene	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA
Acetonitrile	NA	NA	NA	NA	NA
Acrolein	NA	NA	NA	NA	NA
Acrylonitrile	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA
Chlorodibromomethane	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	NA	NA	NA	NA	NA
Dibromomethane	NA	NA	NA	NA	NA
Dichlorobromomethane	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NA	NA	NA	NA	NA
Ethyl methacrylate	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA
Ethylene Dibromide	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA
Isobutanol	NA	NA	NA	NA	NA
Methacrylonitrile	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	NA	NA	NA	NA	NA
methyl isobutyl ketone	NA	NA	NA	NA	NA
Methyl methacrylate	NA	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA
Pentachloroethane	NA	NA	NA	NA	NA
Propionitrile	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA
Trichlorofluoromethane	NA	NA	NA	NA	NA
Vinyl acetate	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA
Xylenes Total	NA	NA	NA	NA	NA

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
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Sample ID	68SS07	68SS08	68SS09	68SS09D	68SS10
Lab Sample Number	680-31377-1	680-31377-2	680-31377-3	680-31377-4	680-31377-5
Sampling Date	10/24/07	10/24/07	10/24/07	10/24/07	10/24/07
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)					
11'-Biphenyl	NA	NA	NA	NA	NA
1245-Tetrachlorobenzene	NA	NA	NA	NA	NA
124-Trichlorobenzene	NA	NA	NA	NA	NA
12-Dichlorobenzene	NA	NA	NA	NA	NA
135-Trinitrobenzene	NA	NA	NA	NA	NA
13-Dichlorobenzene	NA	NA	NA	NA	NA
13-Dinitrobenzene	NA	NA	NA	NA	NA
14-Dichlorobenzene	NA	NA	NA	NA	NA
14-Dioxane	NA	NA	NA	NA	NA
14-Naphthoquinone	NA	NA	NA	NA	NA
1-Naphthylamine	NA	NA	NA	NA	NA
2346-Tetrachlorophenol	NA	NA	NA	NA	NA
245-Trichlorophenol	NA	NA	NA	NA	NA
246-Trichlorophenol	NA	NA	NA	NA	NA
24-Dichlorophenol	NA	NA	NA	NA	NA
24-Dimethylphenol	NA	NA	NA	NA	NA
24-Dinitrophenol	NA	NA	NA	NA	NA
24-Dinitrotoluene	NA	NA	NA	NA	NA
26-Dichlorophenol	NA	NA	NA	NA	NA
26-Dinitrotoluene	NA	NA	NA	NA	NA
2-Acetylaminofluorene	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA
2-Naphthylamine	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA
2-Picoline	NA	NA	NA	NA	NA
2-Toluidine	NA	NA	NA	NA	NA
3 & 4 Methylphenol	NA	NA	NA	NA	NA
33'-Dichlorobenzidine	NA	NA	NA	NA	NA
33'-Dimethylbenzidine	NA	NA	NA	NA	NA
3-Methylcholanthrene	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA
46-Dinitro-2-methylphenol	NA	NA	NA	NA	NA
4-Aminobiphenyl	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA
712-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA	NA
alphaalpha-Dimethyl phenethylamine	NA	NA	NA	NA	NA
Aniline	NA	NA	NA	NA	NA
Aramite Total	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	NA	NA	NA	NA	NA
Bis(2-ethylhexyl) phthalate	NA	NA	NA	NA	NA

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
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Sample ID	68SS07	68SS08	68SS09	68SS09D	68SS10
Lab Sample Number	680-31377-1	680-31377-2	680-31377-3	680-31377-4	680-31377-5
Sampling Date	10/24/07	10/24/07	10/24/07	10/24/07	10/24/07
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)					
bis(chloroisopropyl) ether	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA
Diallate	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA
Dimethoate	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA
Disulfoton	NA	NA	NA	NA	NA
Ethyl methanesulfonate	NA	NA	NA	NA	NA
Famphur	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA
Hexachlorophene	NA	NA	NA	NA	NA
Hexachloropropene	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA
Isosafrole	NA	NA	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA
Methyl methanesulfonate	NA	NA	NA	NA	NA
Methyl parathion	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA
N-Nitro-o-toluidine	NA	NA	NA	NA	NA
N-Nitrosodiethylamine	NA	NA	NA	NA	NA
N-Nitrosodimethylamine	NA	NA	NA	NA	NA
N-Nitrosodi-n-butylamine	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA
N-Nitrosomethylethylamine	NA	NA	NA	NA	NA
N-Nitrosomorpholine	NA	NA	NA	NA	NA
N-Nitrosopiperidine	NA	NA	NA	NA	NA
N-Nitrosopyrrolidine	NA	NA	NA	NA	NA
oo'o"-Triethylphosphorothioate	NA	NA	NA	NA	NA
Parathion	NA	NA	NA	NA	NA
p-Dimethylamino azobenzene	NA	NA	NA	NA	NA
Pentachlorobenzene	NA	NA	NA	NA	NA
Pentachloronitrobenzene	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA
Phenacetin	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA
Phorate	NA	NA	NA	NA	NA
p-Phenylene diamine	NA	NA	NA	NA	NA
Pronamide	NA	NA	NA	NA	NA
Pyridine	NA	NA	NA	NA	NA
Safrole Total	NA	NA	NA	NA	NA
Sulfotepp	NA	NA	NA	NA	NA
Thionazin	NA	NA	NA	NA	NA

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
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Sample ID	68SS07	68SS08	68SS09	68SS09D	68SS10
Lab Sample Number	680-31377-1	680-31377-2	680-31377-3	680-31377-4	680-31377-5
Sampling Date	10/24/07	10/24/07	10/24/07	10/24/07	10/24/07
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8270_LL (ug/kg)					
1-Methylnaphthalene	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA
Benzo[a]anthracene	NA	NA	NA	NA	NA
Benzo[a]pyrene	NA	NA	NA	NA	NA
Benzo[b]fluoranthene	NA	NA	NA	NA	NA
Benzo[ghi]perylene	NA	NA	NA	NA	NA
Benzo[k]fluoranthene	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA
Dibenz(ah)anthracene	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA
Indeno[123-cd]pyrene	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Method - 8081A_8082 (ug/kg)					
Aroclor 1016	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA
Method - 8015B (mg/kg)					
Diesel Range Organics	NA	NA	NA	NA	NA
Gasoline Range Organics	NA	NA	NA	NA	NA
Method - 6020 (mg/kg)					
Antimony	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA
Copper	120	40	40	38	69
Lead	110	18	95	85	66
Nickel	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA
Tin	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA
Zinc	92J	47J	77J	54J	79J
Mercury -7471A	NA	NA	NA	NA	NA
Cyanide Total - 9012A	NA	NA	NA	NA	NA
Sulfide - 9034	NA	NA	NA	NA	NA

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SS11	68SS12	68SS13	68SS15	68SS17
Lab Sample Number	680-31377-6	680-31377-7	680-31377-8	680-31377-10	680-31377-12
Sampling Date	10/24/07	10/24/07	10/24/07	10/24/07	10/24/07
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8260B (ug/kg)					
1112-Tetrachloroethane	NA	NA	NA	NA	NA
111-Trichloroethane	NA	NA	NA	NA	NA
1122-Tetrachloroethane	NA	NA	NA	NA	NA
112-Trichloroethane	NA	NA	NA	NA	NA
11-Dichloroethane	NA	NA	NA	NA	NA
11-Dichloroethene	NA	NA	NA	NA	NA
123-Trichloropropane	NA	NA	NA	NA	NA
12-Dibromo-3-Chloropropane	NA	NA	NA	NA	NA
12-Dichloroethane	NA	NA	NA	NA	NA
12-Dichloropropane	NA	NA	NA	NA	NA
2-Chloro-1,3-butadiene	NA	NA	NA	NA	NA
2-Hexanone	NA	NA	NA	NA	NA
3-Chloro-1-propene	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA
Acetonitrile	NA	NA	NA	NA	NA
Acrolein	NA	NA	NA	NA	NA
Acrylonitrile	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA
Bromoform	NA	NA	NA	NA	NA
Bromomethane	NA	NA	NA	NA	NA
Carbon disulfide	NA	NA	NA	NA	NA
Carbon tetrachloride	NA	NA	NA	NA	NA
Chlorobenzene	NA	NA	NA	NA	NA
Chlorodibromomethane	NA	NA	NA	NA	NA
Chloroethane	NA	NA	NA	NA	NA
Chloroform	NA	NA	NA	NA	NA
Chloromethane	NA	NA	NA	NA	NA
cis-1,2-Dichloropropene	NA	NA	NA	NA	NA
Dibromomethane	NA	NA	NA	NA	NA
Dichlorobromomethane	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NA	NA	NA	NA	NA
Ethyl methacrylate	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA
Ethylene Dibromide	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA
Isobutanol	NA	NA	NA	NA	NA
Methacrylonitrile	NA	NA	NA	NA	NA
Methyl Ethyl Ketone	NA	NA	NA	NA	NA
methyl isobutyl ketone	NA	NA	NA	NA	NA
Methyl methacrylate	NA	NA	NA	NA	NA
Methylene Chloride	NA	NA	NA	NA	NA
Pentachloroethane	NA	NA	NA	NA	NA
Propionitrile	NA	NA	NA	NA	NA
Styrene	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	NA	NA	NA	NA	NA
trans-1,4-Dichloro-2-butene	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA
Trichlorofluoromethane	NA	NA	NA	NA	NA
Vinyl acetate	NA	NA	NA	NA	NA
Vinyl chloride	NA	NA	NA	NA	NA
Xylenes Total	NA	NA	NA	NA	NA

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
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Sample ID	68SS11	68SS12	68SS13	68SS15	68SS17
Lab Sample Number	680-31377-6	680-31377-7	680-31377-8	680-31377-10	680-31377-12
Sampling Date	10/24/07	10/24/07	10/24/07	10/24/07	10/24/07
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)					
11'-Biphenyl	NA	NA	NA	NA	NA
1245-Tetrachlorobenzene	NA	NA	NA	NA	NA
124-Trichlorobenzene	NA	NA	NA	NA	NA
12-Dichlorobenzene	NA	NA	NA	NA	NA
135-Trinitrobenzene	NA	NA	NA	NA	NA
13-Dichlorobenzene	NA	NA	NA	NA	NA
13-Dinitrobenzene	NA	NA	NA	NA	NA
14-Dichlorobenzene	NA	NA	NA	NA	NA
14-Dioxane	NA	NA	NA	NA	NA
14-Naphthoquinone	NA	NA	NA	NA	NA
1-Naphthylamine	NA	NA	NA	NA	NA
2346-Tetrachlorophenol	NA	NA	NA	NA	NA
245-Trichlorophenol	NA	NA	NA	NA	NA
246-Trichlorophenol	NA	NA	NA	NA	NA
24-Dichlorophenol	NA	NA	NA	NA	NA
24-Dimethylphenol	NA	NA	NA	NA	NA
24-Dinitrophenol	NA	NA	NA	NA	NA
24-Dinitrotoluene	NA	NA	NA	NA	NA
26-Dichlorophenol	NA	NA	NA	NA	NA
26-Dinitrotoluene	NA	NA	NA	NA	NA
2-Acetylaminofluorene	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA
2-Methylphenol	NA	NA	NA	NA	NA
2-Naphthylamine	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA
2-Picoline	NA	NA	NA	NA	NA
2-Toluidine	NA	NA	NA	NA	NA
3 & 4 Methylphenol	NA	NA	NA	NA	NA
33'-Dichlorobenzidine	NA	NA	NA	NA	NA
33'-Dimethylbenzidine	NA	NA	NA	NA	NA
3-Methylcholanthrene	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA
46-Dinitro-2-methylphenol	NA	NA	NA	NA	NA
4-Aminobiphenyl	NA	NA	NA	NA	NA
4-Bromophenyl phenyl ether	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA
712-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA	NA
alphaalpha-Dimethyl phenethylamine	NA	NA	NA	NA	NA
Aniline	NA	NA	NA	NA	NA
Aramite Total	NA	NA	NA	NA	NA
Benzyl alcohol	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	NA	NA	NA	NA	NA
Bis(2-ethylhexyl) phthalate	NA	NA	NA	NA	NA

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
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Sample ID	68SS11	68SS12	68SS13	68SS15	68SS17
Lab Sample Number	680-31377-6	680-31377-7	680-31377-8	680-31377-10	680-31377-12
Sampling Date	10/24/07	10/24/07	10/24/07	10/24/07	10/24/07
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)					
bis(chloroisopropyl) ether	NA	NA	NA	NA	NA
Butyl benzyl phthalate	NA	NA	NA	NA	NA
Diallate	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA
Diethyl phthalate	NA	NA	NA	NA	NA
Dimethoate	NA	NA	NA	NA	NA
Dimethyl phthalate	NA	NA	NA	NA	NA
Di-n-butyl phthalate	NA	NA	NA	NA	NA
Di-n-octyl phthalate	NA	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA	NA
Disulfoton	NA	NA	NA	NA	NA
Ethyl methanesulfonate	NA	NA	NA	NA	NA
Famphur	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA
Hexachlorophene	NA	NA	NA	NA	NA
Hexachloropropene	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA
Isosafrole	NA	NA	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA
Methyl methanesulfonate	NA	NA	NA	NA	NA
Methyl parathion	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA
N-Nitro-o-toluidine	NA	NA	NA	NA	NA
N-Nitrosodiethylamine	NA	NA	NA	NA	NA
N-Nitrosodimethylamine	NA	NA	NA	NA	NA
N-Nitrosodi-n-butylamine	NA	NA	NA	NA	NA
N-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	NA	NA	NA	NA	NA
N-Nitrosomethylethylamine	NA	NA	NA	NA	NA
N-Nitrosomorpholine	NA	NA	NA	NA	NA
N-Nitrosopiperidine	NA	NA	NA	NA	NA
N-Nitrosopyrrolidine	NA	NA	NA	NA	NA
oo'o"-Triethylphosphorothioate	NA	NA	NA	NA	NA
Parathion	NA	NA	NA	NA	NA
p-Dimethylamino azobenzene	NA	NA	NA	NA	NA
Pentachlorobenzene	NA	NA	NA	NA	NA
Pentachloronitrobenzene	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA
Phenacetin	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA
Phorate	NA	NA	NA	NA	NA
p-Phenylene diamine	NA	NA	NA	NA	NA
Pronamide	NA	NA	NA	NA	NA
Pyridine	NA	NA	NA	NA	NA
Safrole Total	NA	NA	NA	NA	NA
Sulfotepp	NA	NA	NA	NA	NA
Thionazin	NA	NA	NA	NA	NA

SURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SS11	68SS12	68SS13	68SS15	68SS17
Lab Sample Number	680-31377-6	680-31377-7	680-31377-8	680-31377-10	680-31377-12
Sampling Date	10/24/07	10/24/07	10/24/07	10/24/07	10/24/07
Matrix	Solid	Solid	Solid	Solid	Solid
Method - 8270_LL (ug/kg)					
1-Methylnaphthalene	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA
Benzo[a]anthracene	NA	NA	NA	NA	NA
Benzo[a]pyrene	NA	NA	NA	NA	NA
Benzo[b]fluoranthene	NA	NA	NA	NA	NA
Benzo[ghi]perylene	NA	NA	NA	NA	NA
Benzo[k]fluoranthene	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA
Dibenz(ah)anthracene	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA
Indeno[123-cd]pyrene	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Method - 8081A_8082 (ug/kg)					
Aroclor 1016	NA	NA	NA	NA	NA
Aroclor 1221	NA	NA	NA	NA	NA
Aroclor 1232	NA	NA	NA	NA	NA
Aroclor 1242	NA	NA	NA	NA	NA
Aroclor 1248	NA	NA	NA	NA	NA
Aroclor 1254	NA	NA	NA	NA	NA
Aroclor 1260	NA	NA	NA	NA	NA
Method - 8015B (mg/kg)					
Diesel Range Organics	NA	NA	NA	NA	NA
Gasoline Range Organics	NA	NA	NA	NA	NA
Method - 6020 (mg/kg)					
Antimony	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA
Copper	20	29	16	31	28
Lead	6.7	12	8.2	31	7.9
Nickel	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA
Tin	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA
Zinc	35J	48J	34J	57J	52J
Mercury -7471A	NA	NA	NA	NA	NA
Cyanide Total - 9012A	NA	NA	NA	NA	NA
Sulfide - 9034	NA	NA	NA	NA	NA

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB01-01	68SB01-02	68SB02-01	68SB02-02	68SB03-01	68SB03-02
Lab Sample Number	680-22001-2	680-22001-3	680-22001-5	680-22001-6	680-22001-8	680-22001-9
Sampling Date	11/13/06	11/13/06	11/14/06	11/14/06	11/13/06	11/13/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8260B (ug/kg)						
1112-Tetrachloroethane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
111-Trichloroethane	5.1 UJ	4.6 UJ	4.5 UJ	4.2 UJ	4.4 UJ	4.5 UJ
1122-Tetrachloroethane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
112-Trichloroethane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
11-Dichloroethane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
11-Dichloroethene	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
123-Trichloropropane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
12-Dibromo-3-Chloropropane	10 U	9.2 U	9.0 U	8.5 U	8.8 U	9.0 U
12-Dichloroethane	5.1 UJ	4.6 UJ	4.5 UJ	4.2 UJ	4.4 UJ	4.5 UJ
12-Dichloropropane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
2-Chloro-1,3-butadiene	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
2-Hexanone	25 U	23 U	22 U	21 U	22 U	23 U
3-Chloro-1-propene	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Acetone	22 J	46 U	65	45	8.3 J	45 U
Acetonitrile	200 U	180 U	180 U	170 U	180 U	180 U
Acrolein	100 UJ	92 UJ	90 UJ	85 UJ	88 UJ	90 UJ
Acrylonitrile	100 U	92 U	90 U	85 U	88 U	90 U
Benzene	5.1 UJ	4.6 UJ	4.5 UJ	4.2 UJ	4.4 UJ	4.5 UJ
Bromoform	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Bromomethane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Carbon disulfide	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Carbon tetrachloride	5.1 UJ	4.6 UJ	4.5 UJ	4.2 UJ	4.4 UJ	4.5 UJ
Chlorobenzene	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Chlorodibromomethane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Chloroethane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Chloroform	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Chloromethane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
cis-1,3-Dichloropropene	5.1 UJ	4.6 UJ	4.5 UJ	4.2 UJ	4.4 UJ	4.5 UJ
Dibromomethane	5.1 UJ	4.6 UJ	4.5 UJ	4.2 UJ	4.4 UJ	4.5 UJ
Dichlorobromomethane	5.1 UJ	4.6 UJ	4.5 UJ	4.2 UJ	4.4 UJ	4.5 UJ
Dichlorodifluoromethane	5.1 R	4.6 R	4.5 R	4.2 R	4.4 R	4.5 R
Ethyl methacrylate	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Ethylbenzene	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Ethylene Dibromide	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Iodomethane	5.1 U	4.6 U	6.1	4.2 U	4.4 U	4.5 U
Isobutanol	200 UJ	180 UJ	180 UJ	170 UJ	180 UJ	180 UJ
Methacrylonitrile	100 U	92 U	90 U	85 U	88 U	90 U
Methyl Ethyl Ketone	25 U	23 U	8.7 J	21 U	22 U	23 U
methyl isobutyl ketone	25 U	23 U	22 U	21 U	22 U	23 U
Methyl methacrylate	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Methylene Chloride	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Pentachloroethane	25 UJ	23 UJ	22 UJ	21 UJ	22 UJ	23 UJ
Propionitrile	100 U	92 U	90 U	85 U	88 U	90 U
Styrene	1.2 J	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Tetrachloroethene	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Toluene	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
trans-1,2-Dichloroethene	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
trans-1,3-Dichloropropene	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
trans-1,4-Dichloro-2-butene	10 U	9.2 U	9.0 U	8.5 U	8.8 U	9.0 U
Trichloroethene	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Trichlorofluoromethane	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Vinyl acetate	10 UJ	9.2 UJ	9.0 UJ	8.5 UJ	8.8 UJ	9.0 UJ
Vinyl chloride	5.1 U	4.6 U	4.5 U	4.2 U	4.4 U	4.5 U
Xylenes Total	10 U	9.2 U	9.0 U	8.5 U	8.8 U	9.0 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB01-01	68SB01-02	68SB02-01	68SB02-02	68SB03-01	68SB03-02
Lab Sample Number	680-22001-2	680-22001-3	680-22001-5	680-22001-6	680-22001-8	680-22001-9
Sampling Date	11/13/06	11/13/06	11/14/06	11/14/06	11/13/06	11/13/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)						
11'-Biphenyl	400 U	400 U	380 U	400 U	390 U	430 U
1245-Tetrachlorobenzene	400 U	400 U	380 U	400 U	390 U	430 U
124-Trichlorobenzene	400 U	400 U	380 U	400 U	390 U	430 U
12-Dichlorobenzene	400 U	400 U	380 U	400 U	390 U	430 U
135-Trinitrobenzene	400 UJ	400 UJ	380 UJ	400 UJ	390 UJ	430 UJ
13-Dichlorobenzene	400 U	400 U	380 U	400 U	390 U	430 U
13-Dinitrobenzene	400 U	400 U	380 U	400 U	390 U	430 U
14-Dichlorobenzene	400 U	400 U	380 U	400 U	390 U	430 U
14-Dioxane	400 U	400 U	380 U	400 U	390 U	430 U
14-Naphthoquinone	400 U	400 U	380 U	400 U	390 U	430 U
1-Naphthylamine	400 U	400 U	380 U	400 U	390 U	430 U
2346-Tetrachlorophenol	400 U	400 U	380 U	400 U	390 U	430 U
245-Trichlorophenol	400 U	400 U	380 U	400 U	390 U	430 U
246-Trichlorophenol	400 U	400 U	380 U	400 U	390 U	430 U
24-Dichlorophenol	400 U	400 U	380 U	400 U	390 U	430 U
24-Dimethylphenol	400 U	400 U	380 U	400 U	390 U	430 U
24-Dinitrophenol	2100 U	2100 U	2000 U	2100 U	2000 U	2200 U
24-Dinitrotoluene	400 U	400 U	380 U	400 U	390 U	430 U
26-Dichlorophenol	400 U	400 U	380 U	400 U	390 U	430 U
26-Dinitrotoluene	400 U	400 U	380 U	400 U	390 U	430 U
2-Acetylaminofluorene	400 U	400 U	380 U	400 U	390 U	430 U
2-Chloronaphthalene	400 U	400 U	380 U	400 U	390 U	430 U
2-Chlorophenol	400 U	400 U	380 U	400 U	390 U	430 U
2-Methylphenol	400 U	400 U	380 U	400 U	390 U	430 U
2-Naphthylamine	400 U	400 U	380 U	400 U	390 U	430 U
2-Nitroaniline	2100 U	2100 U	2000 U	2100 U	2000 U	2200 U
2-Nitrophenol	400 U	400 U	380 U	400 U	390 U	430 U
2-Picoline	400 U	400 U	380 U	400 U	390 U	430 U
2-Toluidine	400 U	400 U	380 U	400 U	390 U	430 U
3 & 4 Methylphenol	400 U	400 U	380 U	400 U	390 U	430 U
33'-Dichlorobenzidine	800 U	800 U	760 U	800 U	770 U	870 U
33'-Dimethylbenzidine	2100 U	2100 U	2000 U	2100 U	2000 U	2200 U
3-Methylcholanthrene	400 U	400 U	380 U	400 U	390 U	430 U
3-Nitroaniline	2100 U	2100 U	2000 U	2100 U	2000 U	2200 U
46-Dinitro-2-methylphenol	2100 U	2100 U	2000 U	2100 U	2000 U	2200 U
4-Aminobiphenyl	400 U	400 U	380 U	400 U	390 U	430 U
4-Bromophenyl phenyl ether	400 U	400 U	380 U	400 U	390 U	430 U
4-Chloro-3-methylphenol	400 U	400 U	380 U	400 U	390 U	430 U
4-Chloroaniline	800 U	800 U	760 U	800 U	770 U	870 U
4-Chlorophenyl phenyl ether	400 U	400 U	380 U	400 U	390 U	430 U
4-Nitroaniline	2100 U	2100 U	2000 U	2100 U	2000 U	2200 U
4-Nitrophenol	2100 U	2100 U	2000 U	2100 U	2000 U	2200 U
4-Nitroquinoline-1-oxide	4000 R	4000 R	3800 R	4000 R	3900 R	4300 R
712-Dimethylbenz(a)anthracene	400 U	400 U	380 U	400 U	390 U	430 U
Acetophenone	400 U	400 U	380 U	400 U	390 U	430 U
alphaalpha-Dimethyl phenethylamine	82000 UJ	81000 UJ	77000 UJ	82000 UJ	78000 UJ	88000 UJ
Aniline	800 U	800 U	760 U	800 U	770 U	870 U
Aramite Total	400 U	400 U	380 U	400 U	390 U	430 U
Benzyl alcohol	400 U	400 U	380 U	400 U	390 U	430 U
Bis(2-chloroethoxy)methane	400 U	400 U	380 U	400 U	390 U	430 U
Bis(2-chloroethyl)ether	400 U	400 U	380 U	400 U	390 U	430 U
Bis(2-ethylhexyl) phthalate	400 U	400 U	380 U	400 U	390 U	430 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB01-01	68SB01-02	68SB02-01	68SB02-02	68SB03-01	68SB03-02
Lab Sample Number	680-22001-2	680-22001-3	680-22001-5	680-22001-6	680-22001-8	680-22001-9
Sampling Date	11/13/06	11/13/06	11/14/06	11/14/06	11/13/06	11/13/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)						
bis(chloroisopropyl) ether	400 U	400 U	380 U	400 U	390 U	430 U
Butyl benzyl phthalate	400 U	400 U	380 U	400 U	390 U	430 U
Diallate	400 U	400 U	380 U	400 U	390 U	430 U
Dibenzofuran	400 U	400 U	380 U	400 U	390 U	430 U
Diethyl phthalate	400 U	400 U	380 U	400 U	390 U	430 U
Dimethoate	400 U	400 U	380 U	400 U	390 U	430 U
Dimethyl phthalate	400 U	400 U	380 U	400 U	390 U	430 U
Di-n-butyl phthalate	400 U	400 U	380 U	400 U	390 U	430 U
Di-n-octyl phthalate	400 U	400 U	380 U	400 U	390 U	430 U
Dinoseb	400 U	400 U	380 U	400 U	390 U	430 U
Disulfoton	400 U	400 U	380 U	400 U	390 U	430 U
Ethyl methanesulfonate	400 U	400 U	380 U	400 U	390 U	430 U
Famphur	400 U	400 U	380 U	400 U	390 U	430 U
Hexachlorobenzene	400 U	400 U	380 U	400 U	390 U	430 U
Hexachlorobutadiene	400 U	400 U	380 U	400 U	390 U	430 U
Hexachlorocyclopentadiene	400 U	400 U	380 U	400 U	390 U	430 U
Hexachloroethane	400 U	400 U	380 U	400 U	390 U	430 U
Hexachlorophene	210000 UJ	210000 UJ	200000 UJ	210000 UJ	200000 UJ	220000 UJ
Hexachloropropene	400 U	400 U	380 U	400 U	390 U	430 U
Isophorone	400 U	400 U	380 U	400 U	390 U	430 U
Isosafrole	400 U	400 U	380 U	400 U	390 U	430 U
Methapyrilene	82000 UJ	81000 UJ	77000 UJ	82000 UJ	78000 UJ	88000 UJ
Methyl methanesulfonate	400 U	400 U	380 U	400 U	390 U	430 U
Methyl parathion	400 U	400 U	380 U	400 U	390 U	430 U
Nitrobenzene	400 U	400 U	380 U	400 U	390 U	430 U
N-Nitro-o-toluidine	400 U	400 U	380 U	400 U	390 U	430 U
N-Nitrosodiethylamine	400 U	400 U	380 U	400 U	390 U	430 U
N-Nitrosodimethylamine	400 U	400 U	380 U	400 U	390 U	430 U
N-Nitrosodi-n-butylamine	400 U	400 U	380 U	400 U	390 U	430 U
N-Nitrosodi-n-propylamine	400 U	400 U	380 U	400 U	390 U	430 U
N-Nitrosodiphenylamine	400 U	400 U	380 U	400 U	390 U	430 U
N-Nitrosomethylethylamine	400 U	400 U	380 U	400 U	390 U	430 U
N-Nitrosomorpholine	400 U	400 U	380 U	400 U	390 U	430 U
N-Nitrosopiperidine	400 U	400 U	380 U	400 U	390 U	430 U
N-Nitrosopyrrolidine	400 U	400 U	380 U	400 U	390 U	430 U
oo'o"-Triethylphosphorothioate	400 U	400 U	380 U	400 U	390 U	430 U
Parathion	400 U	400 U	380 U	400 U	390 U	430 U
p-Dimethylamino azobenzene	400 U	400 U	380 U	400 U	390 U	430 U
Pentachlorobenzene	400 U	400 U	380 U	400 U	390 U	430 U
Pentachloronitrobenzene	400 U	400 U	380 U	400 U	390 U	430 U
Pentachlorophenol	2100 U	2100 U	2000 U	2100 U	2000 U	2200 U
Phenacetin	400 U	400 U	380 U	400 U	390 U	430 U
Phenol	400 U	400 U	380 U	400 U	390 U	430 U
Phorate	400 UJ	400 UJ	380 UJ	400 UJ	390 UJ	430 UJ
p-Phenylene diamine	2100 U	2100 U	2000 U	2100 U	2000 U	2200 U
Pronamide	400 U	400 U	380 U	400 U	390 U	430 U
Pyridine	400 U	400 U	380 U	400 U	390 U	430 U
Safrole Total	400 U	400 U	380 U	400 U	390 U	430 U
Sulfotepp	400 U	400 U	380 U	400 U	390 U	430 U
Thionazin	400 U	400 U	380 U	400 U	390 U	430 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB01-01	68SB01-02	68SB02-01	68SB02-02	68SB03-01	68SB03-02
Lab Sample Number	680-22001-2	680-22001-3	680-22001-5	680-22001-6	680-22001-8	680-22001-9
Sampling Date	11/13/06	11/13/06	11/14/06	11/14/06	11/13/06	11/13/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270_LL (ug/kg)						
1-Methylnaphthalene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
2-Methylnaphthalene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Acenaphthene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Acenaphthylene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Anthracene	8.2 U	8.1 U	7.7 U	8.2 U	1.6 J	8.8 U
Benzo[a]anthracene	8.2 U	8.1 U	7.7 U	8.2 U	2.3 J	8.8 U
Benzo[a]pyrene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Benzo[b]fluoranthene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Benzo[ghi]perylene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Benzo[k]fluoranthene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Chrysene	8.2 U	8.1 U	7.7 U	8.2 U	3.0 J	8.8 U
Dibenz(ah)anthracene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Fluoranthene	8.2 U	8.1 U	7.7 U	8.2 U	8.5 U	8.8 U
Fluorene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Indeno[123-cd]pyrene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Naphthalene	8.2 U	8.1 U	7.7 U	8.2 U	7.9 U	8.8 U
Phenanthrene	8.2 U	8.1 U	7.7 U	8.2 U	4.0 J	8.8 U
Pyrene	8.2 U	8.1 U	7.7 U	8.2 U	6.8 J	8.8 U
Method - 8081A_8082 (ug/kg)						
Aroclor 1016	40 U	40 U	38 U	40 U	39 U	44 U
Aroclor 1221	82 U	82 U	77 U	81 U	79 U	88 U
Aroclor 1232	40 U	40 U	38 U	40 U	39 U	44 U
Aroclor 1242	40 U	40 U	38 U	40 U	39 U	44 U
Aroclor 1248	40 U	40 U	38 U	40 U	39 U	44 U
Aroclor 1254	40 U	40 U	38 U	40 U	39 U	44 U
Aroclor 1260	40 U	40 U	38 U	40 U	39 U	44 U
Method - 8015B (mg/kg)						
Diesel Range Organics [C10-C28]	4.0 U	4.0 U	3.8 U	4.0 U	3.9 U	4.4 U
Gasoline Range Organics (GRO)-C6-C10	0.21 U	0.23 U	0.22 U	0.25 U	0.23 U	0.25 U
Method - 6020 (mg/kg)						
Antimony	4.7 U	4.6 UJ	4.2 UJ	4.5 UJ	4.5 UJ	4.8 UJ
Arsenic	2.7	1.1 J	1.2 J	3.2	1.1 J	0.35 J
Barium	13 J	25	34	260	60	18
Beryllium	0.27 J	0.51 J	0.21 J	1.2	0.28 J	0.97 U
Cadmium	1.2 U	1.1 U	1.0 U	1.1 U	1.1 U	1.2 U
Chromium	15 J	20 J	15 J	17 J	19 J	15 J
Cobalt	8.0	7.6	8.9	20	9.9	0.68 J
Copper	19 J	10 R	20 J	62 J	32 J	15 R
Lead	3.9	1.3 J	2.6 J	2.1 J	1.8 J	0.79 J
Nickel	12	4.7 J	5.0 J	10 J	8.1 J	1.3 J
Selenium	1.1 J	2.3 U	2.1 U	2.3 U	2.3 U	2.4 U
Silver	2.3 U	2.3 U	2.1 U	2.3 U	2.3 U	2.4 U
Thallium	2.3 U	2.3 U	2.1 U	2.3 U	2.3 U	2.4 U
Tin	12 UJ	11 UJ	10 UJ	11 UJ	11 UJ	12 UJ
Vanadium	180 J	48	76	220	95	48
Zinc	29 J	25 J	26 J	75 J	42 J	3.9 J
Mercury -7471A	0.097	0.013 J	0.16	0.022 U	0.083	0.0051 J
Cyanide Total - 9012A	0.59 U	0.60 U	0.55 U	0.60 U	0.59 U	0.65 U
Sulfide - 9034	31 U	30 U	29 U	30 U	29 U	33 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB04-01	68SB04-02	68SB05-01	68SB05-01D	68SB05-02	68SB06-01
Lab Sample Number	680-22012-2	680-22012-3	680-22001-11	680-22001-13	680-22001-12	680-22012-5
Sampling Date	11/14/06	11/14/06	11/13/06	11/13/06	11/13/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8260B (ug/kg)						
1112-Tetrachloroethane	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
111-Trichloroethane	5.1 UJ	5.8 U	4.7 UJ	5.1 UJ	4.0 UJ	4.8 U
1122-Tetrachloroethane	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
112-Trichloroethane	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
11-Dichloroethane	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
11-Dichloroethene	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
123-Trichloropropane	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
12-Dibromo-3-Chloropropane	10 U	12 U	9.5 U	10 U	8.0 U	9.7 U
12-Dichloroethane	5.1 U	5.8 U	4.7 UJ	5.1 UJ	4.0 UJ	4.8 U
12-Dichloropropane	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
2-Chloro-1,3-butadiene	5.1 UJ	5.8 UJ	4.7 U	5.1 U	4.0 U	4.8 UJ
2-Hexanone	26 UJ	29 UJ	24 U	26 U	20 U	24 UJ
3-Chloro-1-propene	5.1 UJ	5.8 UJ	4.7 U	5.1 U	4.0 U	4.8 UJ
Acetone	51 UJ	5.8 J	15 J	12 J	14 J	13 J
Acetonitrile	200 U	230 U	190 U	200 U	160 U	190 U
Acrolein	100 UJ	120 UJ	95 UJ	100 UJ	80 UJ	97 UJ
Acrylonitrile	100 U	120 U	95 U	100 U	80 U	97 U
Benzene	5.1 U	1.3 J	4.7 UJ	5.1 UJ	4.0 UJ	0.86 J
Bromoform	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Bromomethane	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Carbon disulfide	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Carbon tetrachloride	5.1 U	5.8 U	4.7 UJ	5.1 UJ	4.0 UJ	4.8 U
Chlorobenzene	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Chlorodibromomethane	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Chloroethane	5.1 UJ	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Chloroform	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Chloromethane	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
cis-1,3-Dichloropropene	5.1 U	5.8 U	4.7 UJ	5.1 UJ	4.0 UJ	4.8 U
Dibromomethane	5.1 U	5.8 U	4.7 UJ	5.1 UJ	4.0 UJ	4.8 U
Dichlorobromomethane	5.1 U	5.8 U	4.7 UJ	5.1 UJ	4.0 UJ	4.8 U
Dichlorodifluoromethane	5.1 U	5.8 UJ	4.7 R	5.1 R	4.0 R	4.8 UJ
Ethyl methacrylate	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Ethylbenzene	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Ethylene Dibromide	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Iodomethane	5.1 U	5.8 UJ	4.7 U	5.1 U	4.0 U	4.8 UJ
Isobutanol	200 R	230 R	190 UJ	200 UJ	160 UJ	190 R
Methacrylonitrile	100 U	120 U	95 U	100 U	80 U	97 U
Methyl Ethyl Ketone	26 U	29 U	24 U	26 U	20 U	24 U
methyl isobutyl ketone	26 UJ	29 U	24 U	26 U	20 U	24 U
Methyl methacrylate	5.1 U	5.8 UJ	4.7 U	5.1 U	4.0 U	4.8 UJ
Methylene Chloride	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Pentachloroethane	26 UJ	29 UJ	24 UJ	26 UJ	20 UJ	24 UJ
Propionitrile	100 U	120 U	95 U	100 U	80 U	97 U
Styrene	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Tetrachloroethene	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Toluene	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
trans-1,2-Dichloroethene	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
trans-1,3-Dichloropropene	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
trans-1,4-Dichloro-2-butene	10 U	12 U	9.5 U	10 U	8.0 U	9.7 U
Trichloroethene	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Trichlorofluoromethane	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Vinyl acetate	10 U	12 U	9.5 UJ	10 UJ	8.0 UJ	9.7 U
Vinyl chloride	5.1 U	5.8 U	4.7 U	5.1 U	4.0 U	4.8 U
Xylenes Total	10 U	12 U	9.5 U	10 U	8.0 U	9.7 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB04-01	68SB04-02	68SB05-01	68SB05-01D	68SB05-02	68SB06-01
Lab Sample Number	680-22012-2	680-22012-3	680-22001-11	680-22001-13	680-22001-12	680-22012-5
Sampling Date	11/14/06	11/14/06	11/13/06	11/13/06	11/13/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)						
11'-Biphenyl	440 U	440 U	390 U	400 U	390 U	400 U
1245-Tetrachlorobenzene	440 U	440 U	390 U	400 U	390 U	400 U
124-Trichlorobenzene	440 U	440 U	390 U	400 U	390 U	400 U
12-Dichlorobenzene	440 U	440 U	390 U	400 U	390 U	400 U
135-Trinitrobenzene	440 U	440 U	390 UJ	400 UJ	390 UJ	400 U
13-Dichlorobenzene	440 U	440 U	390 U	400 U	390 U	400 U
13-Dinitrobenzene	440 U	440 U	390 U	400 U	390 U	400 U
14-Dichlorobenzene	440 U	440 U	390 U	400 U	390 U	400 U
14-Dioxane	440 U	440 U	390 U	400 U	390 U	400 U
14-Naphthoquinone	440 U	440 U	390 U	400 U	390 U	400 U
1-Naphthylamine	440 U	440 U	390 U	400 U	390 U	400 U
2346-Tetrachlorophenol	440 U	440 U	390 U	400 U	390 U	400 U
245-Trichlorophenol	440 U	440 U	390 U	400 U	390 U	400 U
246-Trichlorophenol	440 U	440 U	390 U	400 U	390 U	400 U
24-Dichlorophenol	440 U	440 U	390 U	400 U	390 U	400 U
24-Dimethylphenol	440 U	440 U	390 U	400 U	390 U	400 U
24-Dinitrophenol	2300 UJ	2300 UJ	2000 U	2000 U	2000 U	2100 UJ
24-Dinitrotoluene	440 U	440 U	390 U	400 U	390 U	400 U
26-Dichlorophenol	440 U	440 U	390 U	400 U	390 U	400 U
26-Dinitrotoluene	440 U	440 U	390 U	400 U	390 U	400 U
2-Acetylaminofluorene	440 U	440 U	390 U	400 U	390 U	400 U
2-Chloronaphthalene	440 U	440 U	390 U	400 U	390 U	400 U
2-Chlorophenol	440 U	440 U	390 U	400 U	390 U	400 U
2-Methylphenol	440 U	440 U	390 U	400 U	390 U	400 U
2-Naphthylamine	440 U	440 U	390 U	400 U	390 U	400 U
2-Nitroaniline	2300 U	2300 U	2000 U	2000 U	2000 U	2100 U
2-Nitrophenol	440 U	440 U	390 U	400 U	390 U	400 U
2-Picoline	440 UJ	440 UJ	390 U	400 U	390 U	400 UJ
2-Toluidine	440 U	440 U	390 U	400 U	390 U	400 U
3 & 4 Methylphenol	440 U	440 U	390 U	400 U	390 U	400 U
33'-Dichlorobenzidine	890 U	880 U	790 U	800 U	780 U	800 U
33'-Dimethylbenzidine	2300 U	2300 U	2000 U	2000 U	2000 U	2100 U
3-Methylcholanthrene	440 U	440 U	390 U	400 U	390 U	400 U
3-Nitroaniline	2300 U	2300 U	2000 U	2000 U	2000 U	2100 U
46-Dinitro-2-methylphenol	2300 U	2300 U	2000 U	2000 U	2000 U	2100 U
4-Aminobiphenyl	440 U	440 U	390 U	400 U	390 U	400 U
4-Bromophenyl phenyl ether	440 U	440 U	390 U	400 U	390 U	400 U
4-Chloro-3-methylphenol	440 U	440 U	390 U	400 U	390 U	400 U
4-Chloroaniline	890 U	880 U	790 U	800 U	780 U	800 U
4-Chlorophenyl phenyl ether	440 U	440 UJ	390 U	400 U	390 U	400 U
4-Nitroaniline	2300 U	2300 U	2000 U	2000 U	2000 U	2100 U
4-Nitrophenol	2300 U	2300 U	2000 U	2000 U	2000 U	2100 U
4-Nitroquinoline-1-oxide	4400 UJ	4400 UJ	3900 R	4000 R	3900 R	4000 UJ
712-Dimethylbenz(a)anthracene	440 U	440 U	390 U	400 U	390 U	400 U
Acetophenone	440 U	440 U	390 U	400 U	390 U	400 U
alphaalpha-Dimethyl phenethylamine	90000 UJ	89000 UJ	80000 UJ	81000 UJ	79000 UJ	81000 UJ
Aniline	890 U	880 U	790 U	800 U	780 U	800 U
Aramite Total	440 UJ	440 UJ	390 U	400 U	390 U	400 UJ
Benzyl alcohol	440 U	440 U	390 U	400 U	390 U	400 U
Bis(2-chloroethoxy)methane	440 U	440 U	390 U	400 U	390 U	400 U
Bis(2-chloroethyl)ether	440 U	440 U	390 U	400 U	390 U	400 U
Bis(2-ethylhexyl) phthalate	440 U	440 U	390 U	400 U	390 U	400 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB04-01	68SB04-02	68SB05-01	68SB05-01D	68SB05-02	68SB06-01
Lab Sample Number	680-22012-2	680-22012-3	680-22001-11	680-22001-13	680-22001-12	680-22012-5
Sampling Date	11/14/06	11/14/06	11/13/06	11/13/06	11/13/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)						
bis(chloroisopropyl) ether	440 U	440 U	390 U	400 U	390 U	400 U
Butyl benzyl phthalate	440 U	440 U	390 U	400 U	390 U	400 U
Diallate	440 UJ	440 UJ	390 U	400 U	390 U	400 UJ
Dibenzofuran	440 U	440 U	390 U	400 U	390 U	400 U
Diethyl phthalate	440 U	440 U	390 U	400 U	390 U	400 U
Dimethoate	440 U	440 U	390 U	400 U	390 U	400 U
Dimethyl phthalate	440 U	440 U	390 U	400 U	390 U	400 U
Di-n-butyl phthalate	440 U	440 U	390 U	400 U	390 U	400 U
Di-n-octyl phthalate	440 U	440 U	390 U	400 U	390 U	400 U
Dinoseb	440 U	440 U	390 U	400 U	390 U	400 U
Disulfoton	440 U	440 U	390 U	400 U	390 U	400 U
Ethyl methanesulfonate	440 UJ	440 UJ	390 U	400 U	390 U	400 UJ
Famphur	440 U	440 U	390 U	400 U	390 U	400 U
Hexachlorobenzene	440 U	440 U	390 U	400 U	390 U	400 U
Hexachlorobutadiene	440 U	440 U	390 U	400 U	390 U	400 U
Hexachlorocyclopentadiene	440 U	440 U	390 U	400 U	390 U	400 U
Hexachloroethane	440 U	440 U	390 U	400 U	390 U	400 U
Hexachlorophene	230000 UJ	230000 UJ	200000 UJ	200000 UJ	200000 UJ	210000 UJ
Hexachloropropene	440 U	440 U	390 U	400 U	390 U	400 U
Isophorone	440 U	440 U	390 U	400 U	390 U	400 U
Isosafrole	440 U	440 U	390 U	400 U	390 U	400 U
Methapyrilene	90000 UJ	89000 UJ	80000 UJ	81000 UJ	79000 UJ	81000 UJ
Methyl methanesulfonate	440 U	440 U	390 U	400 U	390 U	400 U
Methyl parathion	440 U	440 U	390 U	400 U	390 U	400 U
Nitrobenzene	440 U	440 U	390 U	400 U	390 U	400 U
N-Nitro-o-toluidine	440 U	440 U	390 U	400 U	390 U	400 U
N-Nitrosodiethylamine	440 U	440 UJ	390 U	400 U	390 U	400 UJ
N-Nitrosodimethylamine	440 U	440 U	390 U	400 U	390 U	400 U
N-Nitrosodi-n-butylamine	440 U	440 U	390 U	400 U	390 U	400 U
N-Nitrosodi-n-propylamine	440 U	440 U	390 U	400 U	390 U	400 U
N-Nitrosodiphenylamine	440 U	440 U	390 U	400 U	390 U	400 U
N-Nitrosomethylethylamine	440 U	440 U	390 U	400 U	390 U	400 U
N-Nitrosomorpholine	440 UJ	440 UJ	390 U	400 U	390 U	400 UJ
N-Nitrosopiperidine	440 U	440 U	390 U	400 U	390 U	400 U
N-Nitrosopyrrolidine	440 U	440 U	390 U	400 U	390 U	400 U
oo'o"-Triethylphosphorothioate	440 U	440 U	390 U	400 U	390 U	400 U
Parathion	440 U	440 U	390 U	400 U	390 U	400 U
p-Dimethylamino azobenzene	440 U	440 U	390 U	400 U	390 U	400 U
Pentachlorobenzene	440 U	440 U	390 U	400 U	390 U	400 U
Pentachloronitrobenzene	440 U	440 U	390 U	400 U	390 U	400 U
Pentachlorophenol	2300 U	2300 U	2000 U	2000 U	2000 U	2100 U
Phenacetin	440 U	440 U	390 U	400 U	390 U	400 U
Phenol	440 U	440 U	390 U	400 U	390 U	400 U
Phorate	440 U	440 U	390 UJ	400 UJ	390 UJ	400 U
p-Phenylene diamine	2300 U	2300 U	2000 U	2000 U	2000 U	2100 U
Pronamide	440 U	440 U	390 U	400 U	390 U	400 U
Pyridine	440 U	440 U	390 U	400 U	390 U	400 U
Safrole Total	440 U	440 U	390 U	400 U	390 U	400 U
Sulfotepp	440 U	440 U	390 U	400 U	390 U	400 U
Thionazin	440 U	440 U	390 U	400 U	390 U	400 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB04-01	68SB04-02	68SB05-01	68SB05-01D	68SB05-02	68SB06-01
Lab Sample Number	680-22012-2	680-22012-3	680-22001-11	680-22001-13	680-22001-12	680-22012-5
Sampling Date	11/14/06	11/14/06	11/13/06	11/13/06	11/13/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270_LL (ug/kg)						
1-Methylnaphthalene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
2-Methylnaphthalene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Acenaphthene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Acenaphthylene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Anthracene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Benzo[a]anthracene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Benzo[a]pyrene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Benzo[b]fluoranthene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Benzo[ghi]perylene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Benzo[k]fluoranthene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Chrysene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Dibenz(ah)anthracene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Fluoranthene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Fluorene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Indeno[123-cd]pyrene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Naphthalene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Phenanthrene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Pyrene	9.0 U	8.9 U	8.0 U	8.1 U	7.9 U	8.2 U
Method - 8081A_8082 (ug/kg)						
Aroclor 1016	44 UJ	44 U	39 U	40 U	39 U	40 U
Aroclor 1221	90 UJ	88 U	80 U	81 U	79 U	81 U
Aroclor 1232	44 UJ	44 U	39 U	40 U	39 U	40 U
Aroclor 1242	44 UJ	44 U	39 U	40 U	39 U	40 U
Aroclor 1248	44 UJ	44 U	39 U	40 U	39 U	40 U
Aroclor 1254	44 UJ	44 U	39 U	40 U	39 U	40 U
Aroclor 1260	44 UJ	44 U	39 U	40 U	39 U	40 U
Method - 8015B (mg/kg)						
Diesel Range Organics [C10-C28]	4.4 U	4.4 U	3.9 U	4.0 U	3.9 U	4.0 U
Gasoline Range Organics (GRO)-C6-C10	0.30 U	0.25 U	0.24 U	0.21 U	0.18 U	0.24 U
Method - 6020 (mg/kg)						
Antimony	5.2 UJ	4.8 UJ	4.4 UJ	4.4 UJ	4.3 UJ	4.7 UJ
Arsenic	1.2 J	3.6	0.93 J	1.1 J	1.2 J	1.1 J
Barium	11 J	11 J	59	81	65	72 J
Beryllium	1.0 U	0.95 U	0.31 J	0.33 J	0.31 J	0.28 J
Cadmium	1.3 U	1.2 U	1.1 U	1.1 U	0.051 J	1.2 U
Chromium	63	190	26 J	36 J	32 J	35
Cobalt	1.3 J	0.57 J	6.9 R	16	15	14 J
Copper	29 J	66 J	39 J	52 J	44 J	61 J
Lead	2.2	4.9	1.6 J	2.0 J	2.0 J	1.8
Nickel	10 U	9.6 U	11 J	14 J	12 J	16
Selenium	4.1	4.2	2.2 U	2.2 U	2.2 U	2.4 U
Silver	2.6 U	2.4 U	2.2 U	2.2 U	2.2 U	2.4 U
Thallium	2.6 U	2.4 U	2.2 U	2.2 U	2.2 U	2.4 U
Tin	13 UJ	12 UJ	11 UJ	11 UJ	11 UJ	12 UJ
Vanadium	110	440	100 J	150 J	140	170
Zinc	7.9	7.9	42 J	45 J	44 J	56 J
Mercury -7471A	0.035	0.026	0.051	0.044	0.041	0.030 J
Cyanide Total - 9012A	0.65 U	0.66 U	0.60 U	0.59 U	0.57 U	0.60 U
Sulfide - 9034	42	33 U	30 U	30 U	30 U	31 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB06-02	68SB07-01	68SB07-02	68SB08-01	68SB08-02	68SB09-01
Lab Sample Number	680-22012-6	680-22012-16	680-22012-17	680-22012-8	680-22012-9	680-22012-11
Sampling Date	11/14/06	11/15/06	11/15/06	11/14/06	11/14/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8260B (ug/kg)						
1112-Tetrachloroethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
111-Trichloroethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
1122-Tetrachloroethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
112-Trichloroethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
11-Dichloroethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
11-Dichloroethene	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
123-Trichloropropane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
12-Dibromo-3-Chloropropane	10 U	9.6 UJ	8.4 UJ	12 UJ	7.2 UJ	9.4 U
12-Dichloroethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
12-Dichloropropane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
2-Chloro-1,3-butadiene	5.2 UJ	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 UJ
2-Hexanone	26 UJ	24 UJ	21 UJ	29 UJ	18 UJ	24 UJ
3-Chloro-1-propene	5.2 UJ	4.8 UJ	4.2 UJ	5.9 UJ	3.6 UJ	4.7 UJ
Acetone	85 J	11 J	4.9 J	14 J	5.8 J	9.3 J
Acetonitrile	210 U	190 U	170 U	230 UJ	140 U	190 U
Acrolein	100 UJ	96 UJ	84 UJ	120 UJ	72 U	94 UJ
Acrylonitrile	100 U	96 U	84 U	120 UJ	72 UJ	94 U
Benzene	1.0 J	1.0 J	0.77 J	5.9 UJ	0.69 J	0.98 J
Bromoform	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Bromomethane	5.2 U	4.8 UJ	4.2 UJ	5.9 UJ	3.6 UJ	4.7 U
Carbon disulfide	5.2 U	4.8 U	4.2 UJ	5.9 UJ	3.6 UJ	4.7 U
Carbon tetrachloride	5.2 U	4.8 UJ	4.2 U	5.9 UJ	3.6 U	4.7 U
Chlorobenzene	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Chlorodibromomethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Chloroethane	5.2 U	4.8 UJ	4.2 UJ	5.9 UJ	3.6 UJ	4.7 U
Chloroform	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Chloromethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
cis-1,3-Dichloropropene	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Dibromomethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Dichlorobromomethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Dichlorodifluoromethane	5.2 UJ	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 UJ
Ethyl methacrylate	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Ethylbenzene	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Ethylene Dibromide	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Iodomethane	1.9 J	4.8 UJ	4.2 UJ	5.9 UJ	3.6 UJ	4.7 UJ
Isobutanol	210 R	190 R	170 R	230 R	140 R	190 R
Methacrylonitrile	100 U	96 U	84 U	120 UJ	72 U	94 U
Methyl Ethyl Ketone	13 J	24 U	21 U	29 UJ	18 U	24 U
methyl isobutyl ketone	26 U	24 UJ	21 UJ	29 UJ	18 UJ	24 U
Methyl methacrylate	5.2 UJ	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 UJ
Methylene Chloride	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Pentachloroethane	26 UJ	24 UJ	21 UJ	29 UJ	18 UJ	24 UJ
Propionitrile	100 U	96 U	84 U	120 UJ	72 U	94 U
Styrene	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Tetrachloroethene	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Toluene	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
trans-1,2-Dichloroethene	5.2 U	4.8 UJ	4.2 UJ	5.9 UJ	3.6 UJ	4.7 U
trans-1,3-Dichloropropene	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
trans-1,4-Dichloro-2-butene	10 U	9.6 U	8.4 U	12 UJ	7.2 U	9.4 U
Trichloroethene	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Trichlorofluoromethane	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Vinyl acetate	10 U	9.6 U	8.4 U	12 UJ	7.2 U	9.4 U
Vinyl chloride	5.2 U	4.8 U	4.2 U	5.9 UJ	3.6 U	4.7 U
Xylenes Total	10 U	9.6 U	8.4 U	12 UJ	7.2 U	9.4 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB06-02	68SB07-01	68SB07-02	68SB08-01	68SB08-02	68SB09-01
Lab Sample Number	680-22012-6	680-22012-16	680-22012-17	680-22012-8	680-22012-9	680-22012-11
Sampling Date	11/14/06	11/15/06	11/15/06	11/14/06	11/14/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)						
11'-Biphenyl	400 U	410 U	400 U	380 U	370 U	400 U
1245-Tetrachlorobenzene	400 U	410 U	400 U	380 U	370 U	400 U
124-Trichlorobenzene	400 U	410 U	400 U	380 U	370 U	400 U
12-Dichlorobenzene	400 U	410 U	400 U	380 U	370 U	400 U
135-Trinitrobenzene	400 U	410 U	400 U	380 U	370 U	400 U
13-Dichlorobenzene	400 U	410 U	400 U	380 U	370 U	400 U
13-Dinitrobenzene	400 U	410 U	400 U	380 U	370 U	400 U
14-Dichlorobenzene	400 U	410 U	400 U	380 U	370 U	400 U
14-Dioxane	400 U	410 U	400 U	380 U	370 U	400 UJ
14-Naphthoquinone	400 U	410 U	400 U	380 U	370 U	400 U
1-Naphthylamine	400 U	410 U	400 U	380 U	370 U	400 U
2346-Tetrachlorophenol	400 U	410 U	400 U	380 U	370 U	400 U
245-Trichlorophenol	400 U	410 U	400 U	380 U	370 U	400 U
246-Trichlorophenol	400 U	410 U	400 U	380 U	370 U	400 U
24-Dichlorophenol	400 U	410 U	400 U	380 U	370 U	400 U
24-Dimethylphenol	400 U	410 U	400 U	380 U	370 U	400 U
24-Dinitrophenol	2100 UJ	2100 U	2000 U	2000 UJ	1900 UJ	2000 UJ
24-Dinitrotoluene	400 U	410 U	400 U	380 U	370 U	400 U
26-Dichlorophenol	400 U	410 U	400 U	380 U	370 U	400 U
26-Dinitrotoluene	400 U	410 U	400 U	380 U	370 U	400 U
2-Acetylaminofluorene	400 U	410 U	400 U	380 U	370 U	400 U
2-Chloronaphthalene	400 U	410 U	400 U	380 U	370 U	400 U
2-Chlorophenol	400 U	410 U	400 U	380 U	370 U	400 U
2-Methylphenol	400 U	410 U	400 U	380 U	370 U	400 U
2-Naphthylamine	400 U	410 U	400 U	380 U	370 U	400 U
2-Nitroaniline	2100 U	2100 U	2000 U	2000 U	1900 U	2000 U
2-Nitrophenol	400 U	410 U	400 U	380 U	370 U	400 U
2-Picoline	400 UJ	410 UJ	400 UJ	380 UJ	370 UJ	400 UJ
2-Toluidine	400 U	410 U	400 U	380 U	370 U	400 U
3 & 4 Methylphenol	400 U	410 U	400 U	380 U	370 U	400 U
33'-Dichlorobenzidine	800 U	810 U	790 U	770 U	750 U	790 U
33'-Dimethylbenzidine	2100 U	2100 U	2000 U	2000 U	1900 U	2000 U
3-Methylcholanthrene	400 U	410 U	400 U	380 U	370 U	400 U
3-Nitroaniline	2100 U	2100 U	2000 U	2000 U	1900 U	2000 U
46-Dinitro-2-methylphenol	2100 U	2100 U	2000 U	2000 U	1900 U	2000 U
4-Aminobiphenyl	400 U	410 U	400 U	380 U	370 U	400 U
4-Bromophenyl phenyl ether	400 U	410 U	400 U	380 U	370 U	400 U
4-Chloro-3-methylphenol	400 U	410 U	400 U	380 U	370 U	400 U
4-Chloroaniline	800 U	810 U	790 U	770 U	750 U	790 U
4-Chlorophenyl phenyl ether	400 U	410 U	400 U	380 U	370 U	400 U
4-Nitroaniline	2100 U	2100 U	2000 U	2000 U	1900 U	2000 U
4-Nitrophenol	2100 U	2100 U	2000 U	2000 U	1900 U	2000 U
4-Nitroquinoline-1-oxide	4000 UJ	4100 U	4000 U	3800 UJ	3700 UJ	4000 R
712-Dimethylbenz(a)anthracene	400 U	410 U	400 U	380 U	370 U	400 U
Acetophenone	400 U	410 U	400 U	380 U	370 U	400 U
alphaalpha-Dimethyl phenethylamine	81000 UJ	83000 U	80000 U	78000 UJ	76000 UJ	80000 UJ
Aniline	800 U	810 U	790 U	770 U	750 U	790 U
Aramite Total	400 UJ	410 U	400 U	380 UJ	370 UJ	400 U
Benzyl alcohol	400 U	410 U	400 U	380 U	370 U	400 U
Bis(2-chloroethoxy)methane	400 U	410 U	400 U	380 U	370 U	400 U
Bis(2-chloroethyl)ether	400 U	410 U	400 U	380 U	370 U	400 U
Bis(2-ethylhexyl) phthalate	400 U	410 U	400 U	380 U	370 U	400 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB06-02	68SB07-01	68SB07-02	68SB08-01	68SB08-02	68SB09-01
Lab Sample Number	680-22012-6	680-22012-16	680-22012-17	680-22012-8	680-22012-9	680-22012-11
Sampling Date	11/14/06	11/15/06	11/15/06	11/14/06	11/14/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)						
bis(chloroisopropyl) ether	400 U	410 U	400 U	380 U	370 U	400 U
Butyl benzyl phthalate	400 U	410 U	400 U	380 U	370 U	400 U
Diallate	400 UJ	410 UJ	400 UJ	380 UJ	370 UJ	400 U
Dibenzofuran	400 U	410 U	400 U	380 U	370 U	400 U
Diethyl phthalate	400 U	410 U	400 U	380 U	370 U	400 U
Dimethoate	400 U	410 U	400 U	380 U	370 U	400 U
Dimethyl phthalate	400 U	410 U	400 U	380 U	370 U	400 U
Di-n-butyl phthalate	400 U	410 U	400 U	380 U	370 U	400 U
Di-n-octyl phthalate	400 U	410 U	400 U	380 U	370 U	400 U
Dinoseb	400 U	410 U	400 U	380 U	370 U	400 U
Disulfoton	400 U	410 U	400 U	380 U	370 U	400 U
Ethyl methanesulfonate	400 UJ	410 U	400 U	380 UJ	370 UJ	400 U
Famphur	400 U	410 U	400 U	380 U	370 U	400 U
Hexachlorobenzene	400 U	410 U	400 U	380 U	370 U	400 U
Hexachlorobutadiene	400 U	410 U	400 U	380 U	370 U	400 U
Hexachlorocyclopentadiene	400 U	410 U	400 U	380 U	370 U	400 U
Hexachloroethane	400 U	410 U	400 U	380 U	370 U	400 U
Hexachlorophene	210000 UJ	210000 U	200000 U	200000 UJ	190000 UJ	200000 UJ
Hexachloropropene	400 U	410 U	400 U	380 U	370 U	400 UJ
Isophorone	400 U	410 U	400 U	380 U	370 U	400 U
Isosafrole	400 U	410 U	400 U	380 U	370 U	400 U
Methapyrilene	81000 UJ	83000 U	80000 U	78000 UJ	76000 UJ	80000 U
Methyl methanesulfonate	400 U	410 U	400 U	380 U	370 U	400 U
Methyl parathion	400 U	410 U	400 U	380 U	370 U	400 U
Nitrobenzene	400 U	410 U	400 U	380 U	370 U	400 U
N-Nitro-o-toluidine	400 U	410 U	400 U	380 U	370 U	400 U
N-Nitrosodiethylamine	400 UJ	410 U	400 U	380 UJ	370 UJ	400 UJ
N-Nitrosodimethylamine	400 U	410 U	400 U	380 U	370 U	400 U
N-Nitrosodi-n-butylamine	400 U	410 U	400 U	380 U	370 U	400 U
N-Nitrosodi-n-propylamine	400 U	410 U	400 U	380 U	370 U	400 U
N-Nitrosodiphenylamine	400 U	410 U	400 U	380 U	370 U	400 U
N-Nitrosomethylethylamine	400 U	410 U	400 U	380 U	370 U	400 U
N-Nitrosomorpholine	400 UJ	410 U	400 U	380 UJ	370 UJ	400 U
N-Nitrosopiperidine	400 U	410 U	400 U	380 U	370 U	400 U
N-Nitrosopyrrolidine	400 U	410 U	400 U	380 U	370 U	400 U
oo'o"-Triethylphosphorothioate	400 U	410 U	400 U	380 U	370 U	400 U
Parathion	400 U	410 U	400 U	380 U	370 U	400 U
p-Dimethylamino azobenzene	400 U	410 U	400 U	380 U	370 U	400 U
Pentachlorobenzene	400 U	410 U	400 U	380 U	370 U	400 U
Pentachloronitrobenzene	400 U	410 U	400 U	380 U	370 U	400 U
Pentachlorophenol	2100 U	2100 U	2000 U	2000 U	1900 U	2000 U
Phenacetin	400 U	410 U	400 U	380 U	370 U	400 U
Phenol	400 U	410 U	400 U	380 U	370 U	400 U
Phorate	400 U	410 U	400 U	380 U	370 U	400 U
p-Phenylene diamine	2100 U	2100 U	2000 U	2000 U	1900 U	2000 U
Pronamide	400 U	410 U	400 U	380 U	370 U	400 U
Pyridine	400 U	410 U	400 U	380 U	370 U	400 U
Safrole Total	400 U	410 U	400 U	380 U	370 U	400 U
Sulfotepp	400 U	410 U	400 U	380 U	370 U	400 U
Thionazin	400 U	410 U	400 U	380 U	370 U	400 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB06-02	68SB07-01	68SB07-02	68SB08-01	68SB08-02	68SB09-01
Lab Sample Number	680-22012-6	680-22012-16	680-22012-17	680-22012-8	680-22012-9	680-22012-11
Sampling Date	11/14/06	11/15/06	11/15/06	11/14/06	11/14/06	11/14/06
Matrix	Solid	Solid	Solid	Solid	Solid	Solid
Method - 8270_LL (ug/kg)						
1-Methylnaphthalene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
2-Methylnaphthalene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Acenaphthene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Acenaphthylene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Anthracene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Benzo[a]anthracene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Benzo[a]pyrene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Benzo[b]fluoranthene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Benzo[ghi]perylene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Benzo[k]fluoranthene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Chrysene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Dibenz(ah)anthracene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Fluoranthene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Fluorene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Indeno[123-cd]pyrene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Naphthalene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Phenanthrene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Pyrene	8.1 U	8.3 U	8.1 U	7.9 U	7.7 U	8.0 U
Method - 8081A_8082 (ug/kg)						
Aroclor 1016	40 U	41 U	40 U	38 U	37 U	40 U
Aroclor 1221	81 U	83 U	81 U	78 U	76 U	81 U
Aroclor 1232	40 U	41 U	40 U	38 U	37 U	40 U
Aroclor 1242	40 U	41 U	40 U	38 U	37 U	40 U
Aroclor 1248	40 U	41 U	40 U	38 U	37 U	40 U
Aroclor 1254	40 U	41 U	40 U	38 U	37 U	40 U
Aroclor 1260	40 U	41 U	40 U	38 U	37 U	40 U
Method - 8015B (mg/kg)						
Diesel Range Organics [C10-C28]	4.0 U	4.1 U	3.9 U	3.9 U	3.8 U	4.0 U
Gasoline Range Organics (GRO)-C6-C10	0.25 U	0.23 U	0.21 U	0.23 U	0.27 U	0.22 U
Method - 6020 (mg/kg)						
Antimony	4.6 U	4.4 UJ	4.5 UJ	4.5 U	4.1 UJ	4.5 U
Arsenic	1.1 J	0.80 J	1.3 J	1.3 J	0.89 J	1.0 J
Barium	87 J	44 J	72 J	64 J	53 J	60 J
Beryllium	0.37 J	0.22 J	0.37 J	0.42 J	0.22 J	0.31 J
Cadmium	0.061 J	1.1 U	0.17 J	1.1 U	1.0 U	1.1 U
Chromium	34 J	22	28	22 J	22	41 J
Cobalt	14	6.3 J	17 J	15	12 J	14
Copper	51 J	27 J	36 J	39 J	34 J	53 J
Lead	2.4	1.8	2.3	2.6	1.9	2.0
Nickel	14	8.8 U	13	10	9.8	16
Selenium	2.3 U	2.2 U	2.2 U	2.3 U	2.0 U	0.28 J
Silver	2.3 U	2.2 U	2.2 U	2.3 U	2.0 U	2.3 U
Thallium	2.3 U	2.2 U	2.2 U	2.3 U	2.0 U	2.3 U
Tin	11 UJ	11 UJ	11 UJ	11 UJ	10 UJ	11 UJ
Vanadium	140 J	90	120	110 J	110	160 J
Zinc	60 J	39 J	61 J	57 J	38 J	64 J
Mercury -7471A	0.053 J	0.047 J	0.060 J	0.028 J	0.02 U	0.024 U
Cyanide Total - 9012A	0.59 U	0.63 U	0.59 U	0.58 U	0.57 U	0.59 U
Sulfide - 9034	30 U	44	40	29 U	29 U	30 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB09-02	68SB10-01	68SB10-01D	68SB10-02
Lab Sample Number	680-22012-12	680-22012-20	680-22012-21	680-22012-23
Sampling Date	11/14/06	11/15/06	11/15/06	11/15/06
Matrix	Solid	Solid	Solid	Solid
Method - 8260B (ug/kg)				
1112-Tetrachloroethane	4.3 U	4.8 U	4.5 U	4.4 U
111-Trichloroethane	4.3 U	4.8 U	4.5 U	4.4 U
1122-Tetrachloroethane	4.3 U	4.8 U	4.5 U	4.4 U
112-Trichloroethane	4.3 U	4.8 U	4.5 U	4.4 U
11-Dichloroethane	4.3 U	4.8 U	4.5 U	4.4 U
11-Dichloroethene	4.3 U	4.8 U	4.5 U	4.4 U
123-Trichloropropane	4.3 U	4.8 U	4.5 U	4.4 U
12-Dibromo-3-Chloropropane	8.7 U	9.5 UJ	8.9 UJ	8.7 UJ
12-Dichloroethane	4.3 U	4.8 U	4.5 U	4.4 U
12-Dichloropropane	4.3 U	4.8 U	4.5 U	4.4 U
2-Chloro-1,3-butadiene	4.3 UJ	4.8 U	4.5 U	4.4 U
2-Hexanone	22 UJ	24 UJ	22 UJ	22 UJ
3-Chloro-1-propene	4.3 UJ	4.8 UJ	4.5 UJ	4.4 UJ
Acetone	43 UJ	25 J	25 J	7.2 J
Acetonitrile	170 U	190 U	180 U	170 U
Acrolein	87 UJ	95 UJ	89 UJ	87 UJ
Acrylonitrile	87 U	95 U	89 U	87 U
Benzene	4.3 U	0.90 J	1.0 J	4.4 U
Bromoform	4.3 U	4.8 U	4.5 U	4.4 U
Bromomethane	4.3 U	4.8 UJ	4.5 UJ	4.4 UJ
Carbon disulfide	4.3 U	4.8 UJ	4.5 UJ	4.4 UJ
Carbon tetrachloride	4.3 U	4.8 U	4.5 U	4.4 U
Chlorobenzene	4.3 U	4.8 U	4.5 U	4.4 U
Chlorodibromomethane	4.3 U	4.8 U	4.5 U	4.4 U
Chloroethane	4.3 U	4.8 UJ	4.5 UJ	4.4 UJ
Chloroform	4.3 U	4.8 U	4.5 U	4.4 U
Chloromethane	4.3 U	4.8 U	4.5 U	4.4 U
cis-1,3-Dichloropropene	4.3 U	4.8 U	4.5 U	4.4 U
Dibromomethane	4.3 U	4.8 U	4.5 U	4.4 U
Dichlorobromomethane	4.3 U	4.8 U	4.5 U	4.4 U
Dichlorodifluoromethane	4.3 UJ	4.8 U	4.5 U	4.4 U
Ethyl methacrylate	4.3 U	4.8 U	4.5 U	4.4 U
Ethylbenzene	4.3 U	4.8 U	4.5 U	4.4 U
Ethylene Dibromide	4.3 U	4.8 U	4.5 U	4.4 U
Iodomethane	4.3 UJ	2.7 J	2.5 J	0.99 J
Isobutanol	170 R	190 R	180 R	170 R
Methacrylonitrile	87 U	95 U	89 U	87 U
Methyl Ethyl Ketone	22 U	4.9 J	4.8 J	22 U
methyl isobutyl ketone	22 U	24 UJ	22 UJ	22 UJ
Methyl methacrylate	4.3 UJ	4.8 U	4.5 U	4.4 U
Methylene Chloride	4.3 U	4.8 U	4.5 U	4.4 U
Pentachloroethane	22 UJ	24 UJ	22 UJ	22 UJ
Propionitrile	87 U	95 U	89 U	87 U
Styrene	4.3 U	4.8 U	4.5 U	4.4 R
Tetrachloroethene	4.3 U	4.8 U	4.5 U	4.4 U
Toluene	4.3 U	4.8 U	4.5 U	4.4 U
trans-1,2-Dichloroethene	4.3 U	4.8 UJ	4.5 UJ	4.4 UJ
trans-1,3-Dichloropropene	4.3 U	4.8 U	4.5 U	4.4 U
trans-1,4-Dichloro-2-butene	8.7 U	9.5 U	8.9 U	8.7 U
Trichloroethene	4.3 U	4.8 U	4.5 U	4.4 UJ
Trichlorofluoromethane	4.3 U	4.8 U	4.5 U	4.4 U
Vinyl acetate	8.7 U	9.5 U	8.9 U	8.7 R
Vinyl chloride	4.3 U	4.8 U	4.5 U	4.4 U
Xylenes Total	8.7 U	9.5 U	8.9 U	8.7 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB09-02	68SB10-01	68SB10-01D	68SB10-02
Lab Sample Number	680-22012-12	680-22012-20	680-22012-21	680-22012-23
Sampling Date	11/14/06	11/15/06	11/15/06	11/15/06
Matrix	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)				
11'-Biphenyl	410 U	390 U	380 U	440 U
1245-Tetrachlorobenzene	410 U	390 U	380 U	440 U
124-Trichlorobenzene	410 U	390 U	380 U	440 U
12-Dichlorobenzene	410 U	390 U	380 U	440 U
135-Trinitrobenzene	410 U	390 U	380 U	440 U
13-Dichlorobenzene	410 U	390 U	380 U	440 U
13-Dinitrobenzene	410 U	390 U	380 U	440 U
14-Dichlorobenzene	410 U	390 U	380 U	440 U
14-Dioxane	410 U	390 UJ	380 UJ	440 UJ
14-Naphthoquinone	410 U	390 U	380 U	440 U
1-Naphthylamine	410 U	390 U	380 U	440 U
2346-Tetrachlorophenol	410 U	390 U	380 U	440 U
245-Trichlorophenol	410 U	390 U	380 U	440 U
246-Trichlorophenol	410 U	390 U	380 U	440 U
24-Dichlorophenol	410 U	390 U	380 U	440 U
24-Dimethylphenol	410 U	390 U	380 U	440 U
24-Dinitrophenol	2100 U	2000 UJ	2000 UJ	2300 UJ
24-Dinitrotoluene	410 U	390 U	380 U	440 U
26-Dichlorophenol	410 U	390 U	380 U	440 U
26-Dinitrotoluene	410 U	390 U	380 U	440 U
2-Acetylaminofluorene	410 U	390 U	380 U	440 U
2-Chloronaphthalene	410 U	390 U	380 U	440 U
2-Chlorophenol	410 U	390 U	380 U	440 U
2-Methylphenol	410 U	390 U	380 U	440 U
2-Naphthylamine	410 U	390 U	380 U	440 U
2-Nitroaniline	2100 U	2000 U	2000 U	2300 U
2-Nitrophenol	410 U	390 U	380 U	440 U
2-Picoline	410 UJ	390 UJ	380 UJ	440 U
2-Toluidine	410 U	390 U	380 U	440 U
3 & 4 Methylphenol	410 U	390 U	380 U	440 U
33'-Dichlorobenzidine	820 U	780 U	760 U	880 U
33'-Dimethylbenzidine	2100 U	2000 U	2000 U	2300 U
3-Methylcholanthrene	410 U	390 U	380 U	440 U
3-Nitroaniline	2100 U	2000 U	2000 U	2300 U
46-Dinitro-2-methylphenol	2100 U	2000 U	2000 U	2300 U
4-Aminobiphenyl	410 U	390 U	380 U	440 U
4-Bromophenyl phenyl ether	410 U	390 U	380 U	440 U
4-Chloro-3-methylphenol	410 U	390 U	380 U	440 U
4-Chloroaniline	820 U	780 U	760 U	880 U
4-Chlorophenyl phenyl ether	410 U	390 U	380 U	440 U
4-Nitroaniline	2100 U	2000 U	2000 U	2300 U
4-Nitrophenol	2100 U	2000 U	2000 U	2300 U
4-Nitroquinoline-1-oxide	4100 U	3900 R	3800 R	4400 R
712-Dimethylbenz(a)anthracene	410 U	390 U	380 U	440 U
Acetophenone	410 U	390 U	380 U	440 U
alphaalpha-Dimethyl phenethylamine	83000 U	79000 UJ	77000 UJ	89000 UJ
Aniline	820 U	780 U	760 U	880 U
Aramite Total	410 U	390 U	380 U	440 U
Benzyl alcohol	410 U	390 U	380 U	440 U
Bis(2-chloroethoxy)methane	410 U	390 U	380 U	440 U
Bis(2-chloroethyl)ether	410 U	390 U	380 U	440 U
Bis(2-ethylhexyl) phthalate	410 U	390 U	380 U	440 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB09-02	68SB10-01	68SB10-01D	68SB10-02
Lab Sample Number	680-22012-12	680-22012-20	680-22012-21	680-22012-23
Sampling Date	11/14/06	11/15/06	11/15/06	11/15/06
Matrix	Solid	Solid	Solid	Solid
Method - 8270C (ug/kg)				
bis(chloroisopropyl) ether	410 U	390 U	380 U	440 U
Butyl benzyl phthalate	410 U	390 U	380 U	440 U
Diallate	410 UJ	390 U	380 U	440 U
Dibenzofuran	410 U	390 U	380 U	440 U
Diethyl phthalate	410 U	390 U	380 U	440 U
Dimethoate	410 U	390 U	380 U	440 UJ
Dimethyl phthalate	410 U	390 U	380 U	440 U
Di-n-butyl phthalate	410 U	390 U	380 U	440 U
Di-n-octyl phthalate	410 U	390 U	380 U	440 U
Dinoseb	410 U	390 U	380 U	440 U
Disulfoton	410 U	390 U	380 U	440 U
Ethyl methanesulfonate	410 U	390 U	380 U	440 U
Famphur	410 U	390 U	380 U	440 U
Hexachlorobenzene	410 U	390 U	380 U	440 U
Hexachlorobutadiene	410 U	390 U	380 U	440 U
Hexachlorocyclopentadiene	410 U	390 U	380 U	440 U
Hexachloroethane	410 U	390 U	380 U	440 U
Hexachlorophene	210000 U	200000 UJ	200000 UJ	230000 U
Hexachloropropene	410 U	390 UJ	380 UJ	440 U
Isophorone	410 U	390 U	380 U	440 U
Isosafrole	410 U	390 U	380 U	440 U
Methapyrilene	83000 U	79000 U	77000 U	89000 U
Methyl methanesulfonate	410 U	390 U	380 U	440 U
Methyl parathion	410 U	390 U	380 U	440 U
Nitrobenzene	410 U	390 U	380 U	440 U
N-Nitro-o-toluidine	410 U	390 U	380 U	440 U
N-Nitrosodiethylamine	410 U	390 UJ	380 UJ	440 U
N-Nitrosodimethylamine	410 U	390 U	380 U	440 U
N-Nitrosodi-n-butylamine	410 U	390 U	380 U	440 U
N-Nitrosodi-n-propylamine	410 U	390 U	380 U	440 U
N-Nitrosodiphenylamine	410 U	390 U	380 U	440 U
N-Nitrosomethylethylamine	410 U	390 U	380 U	440 U
N-Nitrosomorpholine	410 U	390 U	380 U	440 U
N-Nitrosopiperidine	410 U	390 U	380 U	440 U
N-Nitrosopyrrolidine	410 U	390 U	380 U	440 U
oo'o"-Triethylphosphorothioate	410 U	390 U	380 U	440 UJ
Parathion	410 U	390 U	380 U	440 U
p-Dimethylamino azobenzene	410 U	390 U	380 U	440 U
Pentachlorobenzene	410 U	390 U	380 U	440 U
Pentachloronitrobenzene	410 U	390 U	380 U	440 U
Pentachlorophenol	2100 U	2000 U	2000 U	2300 U
Phenacetin	410 U	390 U	380 U	440 U
Phenol	410 U	390 U	380 U	440 U
Phorate	410 U	390 U	380 U	440 UJ
p-Phenylene diamine	2100 U	2000 U	2000 U	2300 U
Pronamide	410 U	390 U	380 U	440 U
Pyridine	410 U	390 U	380 U	440 U
Safrole Total	410 U	390 U	380 U	440 U
Sulfotepp	410 U	390 U	380 U	440 U
Thionazin	410 U	390 U	380 U	440 U

SUBSURFACE SOIL ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68SB09-02	68SB10-01	68SB10-01D	68SB10-02
Lab Sample Number	680-22012-12	680-22012-20	680-22012-21	680-22012-23
Sampling Date	11/14/06	11/15/06	11/15/06	11/15/06
Matrix	Solid	Solid	Solid	Solid
Method - 8270_LL (ug/kg)				
1-Methylnaphthalene	8.3 U	7.9 U	7.8 U	8.9 U
2-Methylnaphthalene	8.3 U	7.9 U	7.8 U	8.9 U
Acenaphthene	8.3 U	7.9 U	7.8 U	8.9 U
Acenaphthylene	8.3 U	7.9 U	7.8 U	8.9 U
Anthracene	8.3 U	7.9 U	7.8 U	8.9 U
Benzo[a]anthracene	8.3 U	7.9 U	7.8 U	8.9 U
Benzo[a]pyrene	8.3 U	7.9 U	7.8 U	8.9 UJ
Benzo[b]fluoranthene	8.3 U	7.9 U	7.8 U	8.9 U
Benzo[ghi]perylene	8.3 U	7.9 U	7.8 U	8.9 U
Benzo[k]fluoranthene	8.3 U	7.9 U	7.8 U	8.9 U
Chrysene	8.3 U	7.9 U	7.8 U	8.9 U
Dibenz(ah)anthracene	8.3 U	7.9 U	7.8 U	8.9 U
Fluoranthene	8.3 U	7.9 U	7.8 U	8.9 UJ
Fluorene	8.3 U	7.9 U	7.8 U	8.9 U
Indeno[123-cd]pyrene	8.3 U	7.9 U	7.8 U	8.9 U
Naphthalene	8.3 U	7.9 U	7.8 U	8.9 U
Phenanthrene	8.3 U	7.9 U	7.8 U	8.9 U
Pyrene	8.3 U	7.9 U	7.8 U	8.9 U
Method - 8081A_8082 (ug/kg)				
Aroclor 1016	41 U	39 U	38 U	44 U
Aroclor 1221	84 U	78 U	77 U	89 U
Aroclor 1232	41 U	39 U	38 U	44 U
Aroclor 1242	41 U	39 U	38 U	44 U
Aroclor 1248	41 U	39 U	38 U	44 U
Aroclor 1254	41 U	39 U	38 U	44 U
Aroclor 1260	41 U	39 U	38 U	44 U
Method - 8015B (mg/kg)				
Diesel Range Organics [C10-C28]	4.1 U	3.9 U	3.8 U	4.4 U
Gasoline Range Organics (GRO)-C6-C10	0.20 U	0.22 U	0.21 U	0.19 U
Method - 6020 (mg/kg)				
Antimony	4.8 UJ	4.3 UJ	4.4 UJ	4.9 UJ
Arsenic	0.94 J	0.85 J	1.8 J	1.4 J
Barium	36 J	26 J	52 J	47 J
Beryllium	0.24 J	0.34 J	0.36 J	0.30 J
Cadmium	1.2 U	1.1 U	0.087 J	0.094 J
Chromium	31	23	22	34
Cobalt	9.8 J	4.7 J	13 J	16 J
Copper	45 J	32 J	34 J	37 J
Lead	1.9	1.9	2.9	2.1
Nickel	12	9.6	11	12
Selenium	2.4 U	2.2 U	0.22 J	0.27 J
Silver	2.4 U	2.2 U	2.2 U	2.5 U
Thallium	2.4 U	2.2 U	2.2 U	2.5 U
Tin	12 UJ	11 UJ	11 UJ	12 UJ
Vanadium	140	98	130	140
Zinc	53 J	48 J	43 J	45 J
Mercury -7471A	0.035 J	0.11 J	0.082 J	0.029 J
Cyanide Total - 9012A	0.61 U	0.57 U	0.57 U	0.66 U
Sulfide - 9034	31 U	29 U	29 U	33 U

APPENDIX B

GROUNDWATER ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TW01	68TW02	68TW04	68TW05	68TW05D
Lab Sample Number	680-22098-1	680-22098-2	680-22098-3	680-22012-13	680-22012-14
Sampling Date	11/16/06	11/16/06	11/16/06	11/14/06	11/14/06
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-1,3-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 U	20 U	20 U	20 U	20 U
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	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	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-1,3-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 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
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 U	5.0 U	5.0 U	5.0 U	5.0 U
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 UJ	10 UJ	10 UJ	10 UJ	10 UJ
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 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
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-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,4-Dichloro-2-butene	2.0 U	2.0 UJ	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 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TW01	68TW02	68TW04	68TW05	68TW05D
Lab Sample Number	680-22098-1	680-22098-2	680-22098-3	680-22012-13	680-22012-14
Sampling Date	11/16/06	11/16/06	11/16/06	11/14/06	11/14/06
Matrix	Water	Water	Water	Water	Water
Method - 8270C (ug/L)					
11'-Biphenyl	NA	NA	11 U	10 U	10 U
1245-Tetrachlorobenzene	NA	NA	11 U	10 U	10 U
124-Trichlorobenzene	NA	NA	11 U	10 U	10 U
12-Dichlorobenzene	NA	NA	11 U	10 U	10 U
135-Trinitrobenzene	NA	NA	11 UJ	10 U	10 UJ
13-Dichlorobenzene	NA	NA	11 U	10 U	10 U
13-Dinitrobenzene	NA	NA	11 U	10 U	10 U
14-Dichlorobenzene	NA	NA	11 U	10 U	10 U
14-Dioxane	NA	NA	11 U	10 U	10 U
14-Naphthoquinone	NA	NA	11 U	10 U	10 U
1-Naphthylamine	NA	NA	11 U	10 U	10 U
2346-Tetrachlorophenol	NA	NA	11 U	10 U	10 U
245-Trichlorophenol	NA	NA	11 U	10 U	10 U
246-Trichlorophenol	NA	NA	11 U	10 U	10 U
24-Dichlorophenol	NA	NA	11 U	10 U	10 U
24-Dimethylphenol	NA	NA	11 U	10 U	10 U
24-Dinitrophenol	NA	NA	57 U	50 U	50 U
24-Dinitrotoluene	NA	NA	11 U	10 U	10 U
26-Dichlorophenol	NA	NA	11 U	10 U	10 U
26-Dinitrotoluene	NA	NA	11 U	10 U	10 U
2-Acetylaminofluorene	NA	NA	11 U	10 U	10 U
2-Chloronaphthalene	NA	NA	11 U	10 U	10 U
2-Chlorophenol	NA	NA	11 U	10 U	10 U
2-Methylphenol	NA	NA	11 U	10 U	10 U
2-Naphthylamine	NA	NA	11 U	10 U	10 U
2-Nitroaniline	NA	NA	57 U	50 U	50 U
2-Nitrophenol	NA	NA	11 U	10 U	10 U
2-Picoline	NA	NA	11 U	10 UJ	10 UJ
2-Toluidine	NA	NA	11 U	10 U	10 U
3 & 4 Methylphenol	NA	NA	11 U	10 U	10 U
33'-Dichlorobenzidine	NA	NA	23 U	20 U	20 U
33'-Dimethylbenzidine	NA	NA	23 U	20 U	20 U
3-Methylcholanthrene	NA	NA	11 U	10 U	10 U
3-Nitroaniline	NA	NA	57 U	50 U	50 U
46-Dinitro-2-methylphenol	NA	NA	57 U	50 U	50 U
4-Aminobiphenyl	NA	NA	11 U	10 U	10 U
4-Bromophenyl phenyl ether	NA	NA	11 U	10 U	10 U
4-Chloro-3-methylphenol	NA	NA	11 U	10 U	10 U
4-Chloroaniline	NA	NA	23 U	20 U	20 U
4-Chlorophenyl phenyl ether	NA	NA	11 U	10 U	10 U
4-Nitroaniline	NA	NA	57 U	50 U	50 U
4-Nitrophenol	NA	NA	57 U	50 U	50 U
4-Nitroquinoline-1-oxide	NA	NA	23 R	20 U	20 U
712-Dimethylbenz(a)anthracene	NA	NA	11 U	10 U	10 U
Acetophenone	NA	NA	11 U	10 U	10 U
alphaalpha-Dimethyl phenethylamine	NA	NA	2300 U	2000 U	2000 UJ
Aniline	NA	NA	23 U	20 U	20 U
Aramite Total	NA	NA	11 U	10 UJ	10 U
Benzyl alcohol	NA	NA	11 U	10 U	10 U
Bis(2-chloroethoxy)methane	NA	NA	11 U	10 U	10 U
Bis(2-chloroethyl)ether	NA	NA	11 U	10 U	10 U
Bis(2-ethylhexyl) phthalate	NA	NA	11 U	10 U	10 U

GROUNDWATER ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TW01	68TW02	68TW04	68TW05	68TW05D
Lab Sample Number	680-22098-1	680-22098-2	680-22098-3	680-22012-13	680-22012-14
Sampling Date	11/16/06	11/16/06	11/16/06	11/14/06	11/14/06
Matrix	Water	Water	Water	Water	Water
Method - 8270C (ug/L)					
bis(chloroisopropyl) ether	NA	NA	11 U	10 U	10 U
Butyl benzyl phthalate	NA	NA	11 U	10 U	10 U
Diallate	NA	NA	11 U	10 U	10 U
Dibenzofuran	NA	NA	11 U	10 U	10 U
Diethyl phthalate	NA	NA	11 U	10 U	10 U
Dimethoate	NA	NA	11 UJ	10 U	10 U
Dimethyl phthalate	NA	NA	11 U	10 U	10 U
Di-n-butyl phthalate	NA	NA	11 U	10 U	10 U
Di-n-octyl phthalate	NA	NA	11 U	10 U	10 U
Dinoseb	NA	NA	11 U	10 U	10 U
Disulfoton	NA	NA	11 U	10 U	10 U
Ethyl methanesulfonate	NA	NA	11 U	10 U	10 U
Famphur	NA	NA	11 U	10 U	10 U
Hexachlorobenzene	NA	NA	11 U	10 U	10 U
Hexachlorobutadiene	NA	NA	11 U	10 U	10 U
Hexachlorocyclopentadiene	NA	NA	11 U	10 U	10 U
Hexachloroethane	NA	NA	11 U	10 U	10 U
Hexachlorophene	NA	NA	5700 UJ	5000 U	5000 U
Hexachloropropene	NA	NA	11 U	10 U	10 U
Isophorone	NA	NA	11 U	10 U	10 U
Isosafrole	NA	NA	11 U	10 U	10 U
Methapyrilene	NA	NA	2300 U	2000 UJ	2000 U
Methyl methanesulfonate	NA	NA	11 U	10 U	10 U
Methyl parathion	NA	NA	11 U	10 UJ	10 U
Nitrobenzene	NA	NA	11 U	10 U	10 U
N-Nitro-o-toluidine	NA	NA	11 U	10 U	10 U
N-Nitrosodiethylamine	NA	NA	11 U	10 U	10 U
N-Nitrosodimethylamine	NA	NA	11 U	10 U	10 U
N-Nitrosodi-n-butylamine	NA	NA	11 U	10 U	10 U
N-Nitrosodi-n-propylamine	NA	NA	11 U	10 U	10 U
N-Nitrosodiphenylamine	NA	NA	11 U	10 U	10 U
N-Nitrosomethylethylamine	NA	NA	11 U	10 U	10 U
N-Nitrosomorpholine	NA	NA	11 U	10 U	10 U
N-Nitrosopiperidine	NA	NA	11 U	10 U	10 U
N-Nitrosopyrrolidine	NA	NA	11 U	10 U	10 U
oo'o"-Triethylphosphorothioate	NA	NA	11 U	10 U	10 U
Parathion	NA	NA	11 U	10 U	10 U
p-Dimethylamino azobenzene	NA	NA	11 U	10 U	10 U
Pentachlorobenzene	NA	NA	11 U	10 U	10 U
Pentachloronitrobenzene	NA	NA	11 U	10 U	10 U
Pentachlorophenol	NA	NA	57 U	50 U	50 U
Phenacetin	NA	NA	11 U	10 U	10 U
Phenol	NA	NA	11 U	10 U	10 U
Phorate	NA	NA	11 UJ	10 U	10 U
p-Phenylene diamine	NA	NA	2300 U	2000 U	2000 U
Pronamide	NA	NA	11 U	10 U	10 U
Pyridine	NA	NA	57 U	50 U	50 U
Safrole Total	NA	NA	11 U	10 U	10 U
Sulfotepp	NA	NA	11 U	10 U	10 U
Thionazin	NA	NA	11 U	10 U	10 U

GROUNDWATER ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TW01	68TW02	68TW04	68TW05	68TW05D
Lab Sample Number	680-22098-1	680-22098-2	680-22098-3	680-22012-13	680-22012-14
Sampling Date	11/16/06	11/16/06	11/16/06	11/14/06	11/14/06
Matrix	Water	Water	Water	Water	Water
Method - 8270_LL (ug/L)					
1-Methylnaphthalene	NA	0.19 U	0.20 U	0.20 U	0.20 U
2-Methylnaphthalene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Acenaphthene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Anthracene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Benzo[a]anthracene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Benzo[a]pyrene	NA	0.19 U	0.20 U	0.20 UJ	0.20 U
Benzo[b]fluoranthene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Benzo[ghi]perylene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Benzo[k]fluoranthene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Chrysene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Dibenz(ah)anthracene	NA	0.19 U	0.20 U	0.20 UJ	0.20 U
Fluoranthene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Fluorene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Indeno[123-cd]pyrene	NA	0.19 U	0.20 U	0.20 UJ	0.20 U
Naphthalene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Phenanthrene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Pyrene	NA	0.19 U	0.20 U	0.20 U	0.20 U
Method - 8081A_8082 (ug/L)					
Aroclor 1016	1.7 UJ	NA	0.98 UJ	0.98 U	0.98 UJ
Aroclor 1221	3.3 UJ	NA	2.0 UJ	2.0 U	2.0 UJ
Aroclor 1232	1.7 UJ	NA	0.98 UJ	0.98 U	0.98 UJ
Aroclor 1242	1.7 UJ	NA	0.98 UJ	0.98 U	0.98 UJ
Aroclor 1248	1.7 UJ	NA	0.98 UJ	0.98 U	0.98 UJ
Aroclor 1254	1.7 UJ	NA	0.98 UJ	0.98 U	0.98 UJ
Aroclor 1260	1.7 UJ	NA	0.98 UJ	0.98 U	0.98 UJ
Method - 8015B (mg/L)					
Diesel Range Organics [C10-C28]	0.18 U	0.10 U	0.17 U	0.10 U	0.096 U
Gasoline Range Organics (GRO)-C6-C10	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Method - 6020 (ug/L)					
Antimony	20 U	NA	20 U	20 U	20 U
Arsenic	3.0 J	NA	1.6 J	10 U	10 U
Barium	150 J	NA	17 J	62 J	84 J
Beryllium	0.71 J	NA	4.0 U	4.0 U	4.0 U
Cadmium	5.0 U	NA	5.0 U	5.0 U	5.0 U
Chromium	39 J	NA	92 J	8.2 J	8.1 J
Cobalt	19 J	NA	2.0 J	3.9 J	8.5 J
Copper	50 R	NA	65 R	20 U	20 U
Lead	4.8 J	NA	2.1 J	0.66 J	0.96 J
Nickel	40 U	NA	40 U	40 U	40 U
Selenium	10 U	NA	10 U	10 U	10 U
Silver	10 U	NA	10 U	10 U	10 U
Thallium	10 UJ	NA	10 U	10 U	10 U
Tin	1.7 J	NA	10 UJ	10 UJ	10 UJ
Vanadium	210 J	NA	160 J	34 J	33 J
Zinc	80 J	NA	24 J	21 J	22 J
Mercury - 7470A (ug/L)	0.20 U	NA	0.20 U	0.20 U	0.13 J
Cyanide Total - 9012A (mg/L)	0.010 U	NA	0.010 U	0.010 U	0.010 U
Sulfide - 9034 (mg/L)	1.0 U	NA	1.0 U	1.0 U	1.0 U

APPENDIX B

GROUNDWATER ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TW01	68TW02	68TW04	68TW05	68TW05D
Lab Sample Number	680-22098-1	680-22098-2	680-22098-3	680-22012-13	680-22012-14
Sampling Date	11/16/06	11/16/06	11/16/06	11/14/06	11/14/06
Matrix	Water	Water	Water	Water	Water
Method - 6020 Dissolved (ug/L)					
Antimony Dissolved	20 U				
Arsenic Dissolved	10 U				
Barium Dissolved	48	39	15	39	40
Beryllium Dissolved	4.0 U				
Cadmium Dissolved	5.0 U				
Chromium Dissolved	10 U				
Cobalt Dissolved	11	8.6 J	7.6 J	1.4 J	0.89 J
Copper Dissolved	20 U				
Lead Dissolved	5.0 U				
Nickel Dissolved	2.4 J	2.8 J	1.5 J	0.96 J	0.99 J
Selenium Dissolved	4.0 J	1.6 J	1.7 J	10 U	10 U
Silver Dissolved	10 U				
Thallium Dissolved	10 U				
Tin Dissolved	10 UJ				
Vanadium Dissolved	6.6 J	10	3.1 J	3.7 J	3.8 J
Zinc Dissolved	6.4 J	10 J	6.8 J	4.8 J	5.4 J
Mercury Dissolved - 7470A (ug/L)	0.20 U				

GROUNDWATER ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TW06	68TW07	68TW08	68TW09	68TW10
Lab Sample Number	680-22060-40	680-22098-5	680-22098-6	680-22098-7	680-22098-8
Sampling Date	11/15/06	11/16/06	11/16/06	11/16/06	11/16/06
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-1,3-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	9.1 J	25 U
Acetonitrile	40 U	40 U	40 U	40 U	40 U
Acrolein	20 U	20 U	20 U	20 U	20 U
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	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	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-1,2-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 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
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 U	5.0 U	5.0 U	5.0 U	5.0 U
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	2.0 J	1.8 J	10 U	10 U
methyl isobutyl ketone	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
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 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
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-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,4-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 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TW06	68TW07	68TW08	68TW09	68TW10
Lab Sample Number	680-22060-40	680-22098-5	680-22098-6	680-22098-7	680-22098-8
Sampling Date	11/15/06	11/16/06	11/16/06	11/16/06	11/16/06
Matrix	Water	Water	Water	Water	Water
Method - 8270C (ug/L)					
11'-Biphenyl	10 U	11 U	9.6 U	10 U	10 U
1245-Tetrachlorobenzene	10 U	11 U	9.6 U	10 U	10 U
124-Trichlorobenzene	10 U	11 U	9.6 U	10 U	10 U
12-Dichlorobenzene	10 U	11 U	9.6 U	10 U	10 U
135-Trinitrobenzene	10 U	11 UJ	9.6 U	10 UJ	10 UJ
13-Dichlorobenzene	10 U	11 U	9.6 U	10 U	10 U
13-Dinitrobenzene	10 U	11 U	9.6 U	10 U	10 U
14-Dichlorobenzene	10 U	11 U	9.6 U	10 U	10 U
14-Dioxane	10 UJ	11 U	9.6 UJ	10 U	10 U
14-Naphthoquinone	10 U	11 U	9.6 U	10 U	10 U
1-Naphthylamine	10 U	11 U	9.6 U	10 U	10 U
2346-Tetrachlorophenol	10 U	11 U	9.6 U	10 U	10 U
245-Trichlorophenol	10 U	11 U	9.6 U	10 U	10 U
246-Trichlorophenol	10 U	11 U	9.6 U	10 U	10 U
24-Dichlorophenol	10 U	11 U	9.6 U	10 U	10 U
24-Dimethylphenol	10 U	11 U	9.6 U	10 U	10 U
24-Dinitrophenol	50 UJ	57 U	48 UJ	50 U	50 U
24-Dinitrotoluene	10 U	11 U	9.6 U	10 U	10 U
26-Dichlorophenol	10 U	11 U	9.6 U	10 U	10 U
26-Dinitrotoluene	10 U	11 U	9.6 U	10 U	10 U
2-Acetylaminofluorene	10 U	11 U	9.6 U	10 U	10 U
2-Chloronaphthalene	10 U	11 U	9.6 U	10 U	10 U
2-Chlorophenol	10 U	11 U	9.6 U	10 U	10 U
2-Methylphenol	10 U	11 U	9.6 U	1.5 J	10 U
2-Naphthylamine	10 U	11 U	9.6 U	10 U	10 U
2-Nitroaniline	50 U	57 U	48 U	50 U	50 U
2-Nitrophenol	10 U	11 U	9.6 U	10 U	10 U
2-Picoline	10 U	11 U	9.6 U	10 U	10 U
2-Toluidine	10 U	11 U	9.6 U	10 U	10 U
3 & 4 Methylphenol	10 U	11 U	9.6 U	10 U	10 U
33'-Dichlorobenzidine	20 U	23 U	19 U	20 U	20 U
33'-Dimethylbenzidine	20 U	23 U	19 U	20 U	20 U
3-Methylcholanthrene	10 U	11 U	9.6 U	10 U	10 U
3-Nitroaniline	50 U	57 U	48 U	50 U	50 U
46-Dinitro-2-methylphenol	50 U	57 U	48 U	50 U	50 U
4-Aminobiphenyl	10 U	11 U	9.6 U	10 U	10 U
4-Bromophenyl phenyl ether	10 U	11 U	9.6 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	11 U	9.6 U	10 U	10 U
4-Chloroaniline	20 U	23 U	19 U	20 U	20 U
4-Chlorophenyl phenyl ether	10 U	11 U	9.6 U	10 U	10 U
4-Nitroaniline	50 U	57 U	48 U	50 U	50 U
4-Nitrophenol	50 U	57 U	48 U	50 U	50 U
4-Nitroquinoline-1-oxide	20 R	23 R	19 R	20 R	20 R
712-Dimethylbenz(a)anthracene	10 U	11 U	9.6 U	10 U	10 U
Acetophenone	10 U	11 U	9.6 U	10 U	10 U
alphaalpha-Dimethyl phenethylamine	2000 UJ	2300 U	1900 UJ	2000 U	2000 U
Aniline	20 U	23 U	19 U	20 U	20 U
Aramite Total	10 U	11 U	9.6 U	10 U	10 U
Benzyl alcohol	10 U	11 U	9.6 U	2.7 J	10 U
Bis(2-chloroethoxy)methane	10 U	11 U	9.6 U	10 U	10 U
Bis(2-chloroethyl)ether	10 U	11 U	9.6 U	10 U	10 U
Bis(2-ethylhexyl) phthalate	10 U	11 U	9.6 U	10 U	10 U

GROUNDWATER ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TW06	68TW07	68TW08	68TW09	68TW10
Lab Sample Number	680-22060-40	680-22098-5	680-22098-6	680-22098-7	680-22098-8
Sampling Date	11/15/06	11/16/06	11/16/06	11/16/06	11/16/06
Matrix	Water	Water	Water	Water	Water
Method - 8270C (ug/L)					
bis(chloroisopropyl) ether	10 U	11 U	9.6 U	10 U	10 U
Butyl benzyl phthalate	10 U	11 U	9.6 U	10 U	10 U
Diallate	10 U	11 U	9.6 U	10 U	10 U
Dibenzofuran	10 U	11 U	9.6 U	10 U	10 U
Diethyl phthalate	10 U	11 U	9.6 U	10 U	10 U
Dimethoate	10 UJ	11 UJ	9.6 UJ	10 UJ	10 UJ
Dimethyl phthalate	10 U	11 U	9.6 U	10 U	10 U
Di-n-butyl phthalate	10 U	11 U	9.6 U	10 U	10 U
Di-n-octyl phthalate	10 U	11 U	9.6 U	10 U	10 U
Dinoseb	10 U	11 U	9.6 U	10 U	10 U
Disulfoton	10 U	11 U	9.6 U	10 U	10 U
Ethyl methanesulfonate	10 U	11 U	9.6 U	10 U	10 U
Famphur	10 U	11 U	9.6 U	10 U	10 U
Hexachlorobenzene	10 U	11 U	9.6 U	10 U	10 U
Hexachlorobutadiene	10 U	11 U	9.6 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	11 U	9.6 U	10 U	10 U
Hexachloroethane	10 U	11 U	9.6 U	10 U	10 U
Hexachlorophene	5000 U	5700 UJ	4800 U	5000 UJ	5000 UJ
Hexachloropropene	10 U	11 U	9.6 U	10 U	10 U
Isophorone	10 U	11 U	9.6 U	10 U	10 U
Isosafrole	10 U	11 U	9.6 U	10 U	10 U
Methapyrilene	2000 U	2300 U	1900 U	2000 U	2000 U
Methyl methanesulfonate	10 U	11 U	9.6 U	10 U	10 U
Methyl parathion	10 U	11 U	9.6 U	10 U	10 U
Nitrobenzene	10 U	11 U	9.6 U	10 U	10 U
N-Nitro-o-toluidine	10 U	11 U	9.6 U	10 U	10 U
N-Nitrosodiethylamine	10 U	11 U	9.6 U	10 U	10 U
N-Nitrosodimethylamine	10 U	11 U	9.6 U	10 U	10 U
N-Nitrosodi-n-butylamine	10 U	11 U	9.6 U	10 U	10 U
N-Nitrosodi-n-propylamine	10 U	11 U	9.6 U	10 U	10 U
N-Nitrosodiphenylamine	10 U	11 U	9.6 U	10 U	10 U
N-Nitrosomethylethylamine	10 U	11 U	9.6 U	10 U	10 U
N-Nitrosomorpholine	10 U	11 U	9.6 U	10 U	10 U
N-Nitrosopiperidine	10 U	11 U	9.6 U	10 U	10 U
N-Nitrosopyrrolidine	10 U	11 U	9.6 U	10 U	10 U
oo'o"-Triethylphosphorothioate	10 UJ	11 U	9.6 UJ	10 U	10 U
Parathion	10 U	11 U	9.6 U	10 U	10 U
p-Dimethylamino azobenzene	10 U	11 U	9.6 U	10 U	10 U
Pentachlorobenzene	10 U	11 U	9.6 U	10 U	10 U
Pentachloronitrobenzene	10 U	11 U	9.6 U	10 U	10 U
Pentachlorophenol	50 U	57 U	48 U	50 U	50 U
Phenacetin	10 U	11 U	9.6 U	10 U	10 U
Phenol	10 U	11 U	9.6 U	10 U	10 U
Phorate	10 UJ	11 UJ	9.6 UJ	10 UJ	10 UJ
p-Phenylene diamine	2000 U	2300 U	1900 U	2000 U	2000 U
Pronamide	10 U	11 U	9.6 U	10 U	10 U
Pyridine	50 U	57 U	48 U	50 U	50 U
Safrole Total	10 U	11 U	9.6 U	10 U	10 U
Sulfotepp	10 U	11 U	9.6 U	10 U	10 U
Thionazin	10 U	11 U	9.6 U	10 U	10 U

GROUNDWATER ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TW06	68TW07	68TW08	68TW09	68TW10
Lab Sample Number	680-22060-40	680-22098-5	680-22098-6	680-22098-7	680-22098-8
Sampling Date	11/15/06	11/16/06	11/16/06	11/16/06	11/16/06
Matrix	Water	Water	Water	Water	Water
Method - 8270_LL (ug/L)					
1-Methylnaphthalene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylnaphthalene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Anthracene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo[a]anthracene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo[a]pyrene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo[b]fluoranthene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo[ghi]perylene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Benzo[k]fluoranthene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Chrysene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Dibenz(ah)anthracene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Fluoranthene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Fluorene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Indeno[123-cd]pyrene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Naphthalene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Phenanthrene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Pyrene	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Method - 8081A_8082 (ug/L)					
Aroclor 1016	1.0 U	1.7 UJ	1.0 U	1.0 UJ	0.97 U
Aroclor 1221	2.0 U	3.3 UJ	2.0 U	2.0 UJ	1.9 U
Aroclor 1232	1.0 U	1.7 UJ	1.0 U	1.0 UJ	0.97 U
Aroclor 1242	1.0 U	1.7 UJ	1.0 U	1.0 UJ	0.97 U
Aroclor 1248	1.0 U	1.7 UJ	1.0 U	1.0 UJ	0.97 U
Aroclor 1254	1.0 U	1.7 UJ	1.0 U	1.0 UJ	0.97 U
Aroclor 1260	1.0 U	1.7 UJ	1.0 U	1.0 UJ	0.97 U
Method - 8015B (mg/L)					
Diesel Range Organics [C10-C28]	0.10 U	0.10 U	0.13 U	0.21 U	0.75 U
Gasoline Range Organics (GRO)-C6-C10	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
Method - 6020 (ug/L)					
Antimony	20 U	20 U	20 U	NA	20 U
Arsenic	10 U	10 U	1.3 J	NA	10 U
Barium	51 J	68 J	150 J	NA	43 J
Beryllium	4.0 U	4.0 U	0.20 J	NA	4.0 U
Cadmium	0.17 J	5.0 U	5.0 U	NA	5.0 U
Chromium	4.2 J	5.1 J	28 J	NA	6.8 J
Cobalt	1.9 J	8.2 J	24 J	NA	7.4 J
Copper	20 U	20 U	36 R	NA	20 U
Lead	1.1 J	5.0 U	1.7 J	NA	0.77 J
Nickel	40 U	40 U	40 U	NA	40 U
Selenium	10 U	10 U	10 U	NA	10 U
Silver	10 U	10 U	10 U	NA	10 U
Thallium	10 U	10 U	10 U	NA	10 U
Tin	10 UJ	10 UJ	1.3 J	NA	10 UJ
Vanadium	17 J	24 J	100 J	NA	34 J
Zinc	18 J	16 J	45 J	NA	15 J
Mercury - 7470A (ug/L)	0.20 U	0.20 U	0.20 U	NA	0.20 U
Cyanide Total - 9012A (mg/L)	0.010 U	0.010 U	0.010 U	NA	0.010 U
Sulfide - 9034 (mg/L)	1.0 U	1.0 U	1.0 U	NA	1.1

APPENDIX B

GROUNDWATER ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TW06	68TW07	68TW08	68TW09	68TW10
Lab Sample Number	680-22060-40	680-22098-5	680-22098-6	680-22098-7	680-22098-8
Sampling Date	11/15/06	11/16/06	11/16/06	11/16/06	11/16/06
Matrix	Water	Water	Water	Water	Water
Method - 6020 Dissolved (ug/L)					
Antimony Dissolved	20 U	20 U	20 U	20 U	20 U
Arsenic Dissolved	10 U	10 U	10 U	10 U	0.63 J
Barium Dissolved	39	74	53	25	36
Beryllium Dissolved	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
Cadmium Dissolved	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chromium Dissolved	10 U	10 U	10 U	10 U	5.9 J
Cobalt Dissolved	3.2 J	11	12	9.5 J	14
Copper Dissolved	20 U	20 U	20 U	20 U	20 U
Lead Dissolved	5.0 U	5.0 U	5.0 U	5.0 U	0.62 J
Nickel Dissolved	1.2 J	3.2 J	3.3 J	3.5 J	4.3 J
Selenium Dissolved	10 U	10 U	10 U	10 U	6.7 J
Silver Dissolved	10 U	10 U	10 U	10 U	10 U
Thallium Dissolved	10 U	10 U	10 U	10 U	10 U
Tin Dissolved	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Vanadium Dissolved	4.0 J	4.5 J	2.6 J	3.8 J	34
Zinc Dissolved	8.6 J	30 J	8.4 J	11 J	16 J
Mercury Dissolved - 7470A (ug/L)	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

TRIP BLANKS ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL AVTIVITY PUERTO RICO, CEIBA, PR

Sample ID	68TB01	68TB02	68TB03
Lab Sample Number	680-22001-14	680-22012-22	680-22012-24
Sampling Date	11/14/06	11/15/06	11/15/06
Matrix	Water	Water	Water
Method - 8260B (ug/kg)			
1112-Tetrachloroethane	1.0 U	1.0 UJ	1.0 UH
111-Trichloroethane	1.0 U	1.0 UJ	1.0 UH
1122-Tetrachloroethane	1.0 U	1.0 UJ	1.0 UH
112-Trichloroethane	1.0 U	1.0 UJ	1.0 UH
11-Dichloroethane	1.0 U	1.0 UJ	1.0 UH
11-Dichloroethene	1.0 U	1.0 UJ	1.0 UH
123-Trichloropropane	1.0 U	1.0 UJ	1.0 UH
12-Dibromo-3-Chloropropane	1.0 U	1.0 UJ	1.0 UJ
12-Dichloroethane	1.0 U	1.0 UJ	1.0 UJ
12-Dichloropropane	1.0 U	1.0 UJ	1.0 UJ
2-Chloro-1,3-butadiene	1.0 U	1.0 UJ	1.0 UJ
2-Hexanone	10 U	10 UJ	10 UJ
3-Chloro-1-propene	1.0 U	1.0 UJ	1.0 UJ
Acetone	25 U	25 UJ	25 UJ
Acetonitrile	40 U	40 UJ	40 UJ
Acrolein	20 R	20 UJ	20 UJ
Acrylonitrile	20 U	20 UJ	20 UJ
Benzene	1.0 U	1.0 UJ	1.0 UJ
Bromoform	1.0 U	1.0 J	1.0 UJ
Bromomethane	1.0 U	1.0 UJ	1.0 UJ
Carbon disulfide	2.0 U	2.0 UJ	2.0 UJ
Carbon tetrachloride	1.0 U	1.0 UJ	1.0 UJ
Chlorobenzene	1.0 U	1.0 UJ	1.0 UJ
Chlorodibromomethane	1.0 U	0.85 J	1.0 UJ
Chloroethane	1.0 UJ	1.0 UJ	1.0 UJ
Chloroform	1.0 U	1.0 UJ	1.0 UJ
Chloromethane	1.0 UJ	1.0 UJ	1.0 UJ
cis-1,3-Dichloropropene	1.0 U	1.0 UJ	1.0 UJ
Dibromomethane	1.0 U	1.0 UJ	1.0 UJ
Dichlorobromomethane	1.0 U	1.0 UJ	1.0 UJ
Dichlorodifluoromethane	1.0 U	1.0 UJ	1.0 UJ
Ethyl methacrylate	1.0 U	1.0 UJ	1.0 UJ
Ethylbenzene	1.0 U	1.0 UJ	1.0 UJ
Ethylene Dibromide	1.0 U	1.0 UJ	1.0 UJ
Iodomethane	5.0 UJ	5.0 UJ	5.0 JH
Isobutanol	40 R	40 R	40 R
Methacrylonitrile	20 U	20 UJ	20 UJ
Methyl Ethyl Ketone	10 U	10 UJ	10 UJ
methyl isobutyl ketone	10 U	10 UJ	10 UJ
Methyl methacrylate	1.0 U	1.0 UJ	1.0 UJ
Methylene Chloride	5.0 U	5.0 UJ	5.0 UJ
Pentachloroethane	5.0 U	5.0 UJ	5.0 UJ
Propionitrile	20 U	20 UJ	20 UJ
Styrene	1.0 U	1.0 UJ	1.0 UJ
Tetrachloroethene	1.0 U	1.0 UJ	1.0 UJ
Toluene	1.0 U	1.0 UJ	1.0 UJ
trans-1,2-Dichloroethene	1.0 U	1.0 UJ	1.0 UJ
trans-1,3-Dichloropropene	1.0 U	1.0 UJ	1.0 UJ
trans-1,4-Dichloro-2-butene	2.0 U	2.0 UJ	2.0 UJ
Trichloroethene	1.0 U	1.0 UJ	1.0 UJ
Trichlorofluoromethane	1.0 U	1.0 UJ	1.0 UJ
Vinyl acetate	2.0 U	2.0 UJ	2.0 UJ
Vinyl chloride	1.0 U	1.0 UJ	1.0 UJ
Xylenes Total	2.0 U	2.0 UJ	2.0 UJ
Method - 8015B (mg/kg)			
Gasoline Range Organics (GRO)-C6-C10	0.050 U	0.050 U	0.050 U

QA/QC ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER01	2006ER02	2006ER03	2006ER04
Lab Sample Number	680-22060-38	680-22139-1	680-22139-2	680-22139-6
Sampling Date	11/13/2006	11/15/2006	11/15/2006	11/16/2006
Matrix	Water	Water	Water	Water
Method - 8260B (ug/L)				
1112-Tetrachloroethane	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
1122-Tetrachloroethane	1.0 U	1.0 U	1.0 U	1.0 U
112-Trichloroethane	1.0 U	1.0 U	1.0 U	1.0 U
11-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U
11-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U
123-Trichloropropane	1.0 U	1.0 UJ	1.0 U	1.0 U
12-Dibromo-3-Chloropropane	1.0 U	1.0 U	1.0 U	1.0 U
12-Dichloroethane	1.0 U	1.0 U	1.0 U	1.0 U
12-Dichloropropane	1.0 U	1.0 U	1.0 U	1.0 U
2-Chloro-1,3-butadiene	1.0 U	1.0 U	1.0 U	1.0 U
2-Hexanone	10 U	10 U	10 U	10 U
3-Chloro-1-propene	1.0 U	1.0 U	1.0 U	1.0 U
Acetone	25 U	25 U	25 U	25 U
Acetonitrile	40 U	40 U	40 U	40 U
Acrolein	20 R	20 R	20 R	20 R
Acrylonitrile	20 U	20 U	20 U	20 U
Benzene	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	2.0 U	2.0 U	2.0 U	2.0 U
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	1.0 U	1.0 U	1.0 U	1.0 U
Chlorodibromomethane	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Chloroform	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U
Dibromomethane	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorobromomethane	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	1.0 U	1.0 U	1.0 U	1.0 U
Ethyl methacrylate	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	1.0 U	1.0 U	1.0 U	1.0 U
Ethylene Dibromide	1.0 U	1.0 U	1.0 U	1.0 U
Iodomethane	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ
Isobutanol	40 R	40 R	40 R	40 R
Methacrylonitrile	20 U	20 U	20 U	20 U
Methyl Ethyl Ketone	10 U	10 U	10 U	10 U
methyl isobutyl ketone	10 U	10 U	10 U	10 U
Methyl methacrylate	1.0 U	1.0 U	1.0 U	1.0 U
Methylene Chloride	5.0 U	5.0 U	5.0 U	5.0 U
Pentachloroethane	5.0 U	5.0 U	5.0 U	5.0 U
Propionitrile	20 U	20 U	20 U	20 U
Styrene	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1.0 U	2.3	6.9	2.2
trans-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,4-Dichloro-2-butene	2.0 U	2.0 U	2.0 U	2.0 U
Trichloroethene	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl acetate	2.0 UJ	2.0 U	2.0 UJ	2.0 UJ
Vinyl chloride	1.0 U	1.0 U	1.0 U	1.0 U
Xylenes Total	2.0 U	2.0 U	2.0 U	2.0 U

QA/QC ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER01	2006ER02	2006ER03	2006ER04
Lab Sample Number	680-22060-38	680-22139-1	680-22139-2	680-22139-6
Sampling Date	11/13/2006	11/15/2006	11/15/2006	11/16/2006
Matrix	Water	Water	Water	Water
Method - 8270C (ug/L)				
11'-Biphenyl	9.4 UJ	10 UJ	10 U	10 U
1245-Tetrachlorobenzene	9.4 UJ	10 UJ	10 U	10 U
124-Trichlorobenzene	9.4 UJ	10 UJ	10 U	10 UJ
12-Dichlorobenzene	9.4 UJ	10 UJ	10 U	10 U
135-Trinitrobenzene	9.4 UJ	10 UJ	10 UJ	10 U
13-Dichlorobenzene	9.4 UJ	10 UJ	10 U	10 U
13-Dinitrobenzene	9.4 UJ	10 UJ	10 U	10 U
14-Dichlorobenzene	9.4 UJ	0.56 J	10 U	10 U
14-Dioxane	9.4 UJ	10 UJ	10 U	10 U
14-Naphthoquinone	9.4 UJ	10 UJ	10 U	10 U
1-Naphthylamine	9.4 UJ	10 UJ	10 U	10 U
2346-Tetrachlorophenol	9.4 UJ	10 UJ	10 U	10 U
245-Trichlorophenol	9.4 UJ	10 UJ	10 U	10 U
246-Trichlorophenol	9.4 UJ	10 UJ	10 U	10 U
24-Dichlorophenol	9.4 UJ	10 UJ	10 U	10 U
24-Dimethylphenol	9.4 UJ	10 UJ	10 U	10 U
24-Dinitrophenol	47 UJ	50 UJ	50 U	50 U
24-Dinitrotoluene	9.4 UJ	10 UJ	10 U	10 U
26-Dichlorophenol	9.4 UJ	10 UJ	10 U	10 U
26-Dinitrotoluene	9.4 UJ	10 UJ	10 U	10 U
2-Acetylaminofluorene	9.4 UJ	10 UJ	10 U	10 U
2-Chloronaphthalene	9.4 UJ	10 UJ	10 U	10 U
2-Chlorophenol	9.4 UJ	10 UJ	10 U	10 U
2-Methylphenol	9.4 UJ	10 UJ	10 U	10 U
2-Naphthylamine	9.4 UJ	10 UJ	10 U	10 U
2-Nitroaniline	47 UJ	50 UJ	50 U	50 U
2-Nitrophenol	9.4 UJ	10 UJ	10 U	10 U
2-Picoline	9.4 UJ	10 UJ	10 U	10 U
2-Toluidine	9.4 UJ	10 UJ	10 U	10 U
3 & 4 Methylphenol	9.4 UJ	10 UJ	10 U	10 U
33'-Dichlorobenzidine	19 UJ	20 UJ	20 U	20 U
33'-Dimethylbenzidine	19 UJ	20 UJ	20 U	20 U
3-Methylcholanthrene	9.4 UJ	10 UJ	10 U	10 U
3-Nitroaniline	47 UJ	50 UJ	50 U	50 U
46-Dinitro-2-methylphenol	47 UJ	50 UJ	50 U	50 U
4-Aminobiphenyl	9.4 UJ	10 UJ	10 U	10 U
4-Bromophenyl phenyl ether	9.4 UJ	10 UJ	10 U	10 U
4-Chloro-3-methylphenol	9.4 UJ	10 UJ	10 U	10 U
4-Chloroaniline	19 UJ	20 UJ	20 U	20 U
4-Chlorophenyl phenyl ether	9.4 UJ	10 UJ	10 U	10 U
4-Nitroaniline	47 UJ	50 UJ	50 U	50 U
4-Nitrophenol	47 UJ	50 UJ	50 U	50 U
4-Nitroquinoline-1-oxide	19 R	20 R	20 R	20 R
712-Dimethylbenz(a)anthracene	9.4 UJ	10 UJ	10 U	10 U
Acetophenone	9.4 UJ	10 UJ	10 U	10 U
alphaalpha-Dimethyl phenethylamine	1900 UJ	2000 UJ	2000 U	2000 U
Aniline	19 UJ	20 UJ	20 U	20 U
Aramite Total	9.4 UJ	10 UJ	10 U	10 U
Benzyl alcohol	9.4 UJ	10 UJ	10 U	10 U
Bis(2-chloroethoxy)methane	9.4 UJ	10 UJ	10 U	10 U
Bis(2-chloroethyl)ether	9.4 UJ	10 UJ	10 U	10 U
Bis(2-ethylhexyl) phthalate	9.4 UJ	10 UJ	10 U	10 U
bis(chloroisopropyl) ether	9.4 UJ	10 UJ	10 U	10 U

QA/QC ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER01	2006ER02	2006ER03	2006ER04
Lab Sample Number	680-22060-38	680-22139-1	680-22139-2	680-22139-6
Sampling Date	11/13/2006	11/15/2006	11/15/2006	11/16/2006
Matrix	Water	Water	Water	Water
Method - 8270C (ug/L)				
Butyl benzyl phthalate	9.4 UJ	10 UJ	10 U	10 U
Diallate	9.4 UJ	10 UJ	10 U	10 U
Dibenzofuran	9.4 UJ	10 UJ	10 U	10 U
Diethyl phthalate	0.82 J	10 UJ	10 U	10 U
Dimethoate	9.4 UJ	10 UJ	10 UJ	10 UJ
Dimethyl phthalate	9.4 UJ	10 UJ	10 U	10 U
Di-n-butyl phthalate	9.4 UJ	10 UJ	10 U	10 U
Di-n-octyl phthalate	9.4 UJ	10 UJ	10 U	10 U
Dinoseb	9.4 UJ	10 UJ	10 U	10 U
Disulfoton	9.4 UJ	10 UJ	10 U	10 U
Ethyl methanesulfonate	9.4 UJ	10 UJ	10 U	10 U
Famphur	9.4 UJ	10 UJ	10 U	10 U
Hexachlorobenzene	9.4 UJ	10 UJ	10 U	10 U
Hexachlorobutadiene	9.4 UJ	10 UJ	10 U	10 U
Hexachlorocyclopentadiene	9.4 UJ	10 UJ	10 U	10 U
Hexachloroethane	9.4 UJ	10 UJ	10 U	10 U
Hexachlorophene	4700 UJ	5000 UJ	5000 UJ	5000 UJ
Hexachloropropene	9.4 UJ	10 UJ	10 U	10 U
Isophorone	9.4 UJ	10 UJ	10 U	10 U
Isosafrole	9.4 UJ	10 UJ	10 U	10 U
Methapyrilene	1900 UJ	2000 UJ	2000 U	2000 U
Methyl methanesulfonate	9.4 UJ	10 UJ	10 U	10 U
Methyl parathion	9.4 UJ	10 UJ	10 U	10 U
Nitrobenzene	9.4 UJ	10 UJ	10 U	10 U
N-Nitro-o-toluidine	9.4 UJ	10 UJ	10 U	10 U
N-Nitrosodiethylamine	9.4 UJ	10 UJ	10 U	10 U
N-Nitrosodimethylamine	9.4 UJ	10 UJ	10 U	10 U
N-Nitrosodi-n-butylamine	9.4 UJ	10 UJ	10 U	10 U
N-Nitrosodi-n-propylamine	9.4 UJ	10 UJ	10 U	10 U
N-Nitrosodiphenylamine	9.4 UJ	10 UJ	10 U	10 U
N-Nitrosomethylethylamine	9.4 UJ	10 UJ	10 U	10 U
N-Nitrosomorpholine	9.4 UJ	10 UJ	10 U	10 U
N-Nitrosopiperidine	9.4 UJ	10 UJ	10 U	10 U
N-Nitrosopyrrolidine	9.4 UJ	10 UJ	10 U	10 U
oo'o"-Triethylphosphorothioate	9.4 UJ	10 UJ	10 U	10 U
Parathion	9.4 UJ	10 UJ	10 U	10 U
p-Dimethylamino azobenzene	9.4 UJ	10 UJ	10 U	10 U
Pentachlorobenzene	9.4 UJ	10 UJ	10 U	10 U
Pentachloronitrobenzene	9.4 UJ	10 UJ	10 U	10 U
Pentachlorophenol	47 UJ	50 UJ	50 U	50 U
Phenacetin	9.4 UJ	10 UJ	10 U	10 U
Phenol	9.4 UJ	10 UJ	10 U	10 U
Phorate	9.4 UJ	10 UJ	10 UJ	10 UJ
p-Phenylene diamine	1900 UJ	2000 UJ	2000 U	2000 U
Pronamide	9.4 UJ	10 UJ	10 U	10 U
Pyridine	47 UJ	50 UJ	50 U	50 U
Safrole Total	9.4 UJ	10 UJ	10 U	10 U
Sulfotepp	9.4 UJ	10 UJ	10 U	10 U
Thionazin	9.4 UJ	10 UJ	10 U	10 U

QA/QC ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER01	2006ER02	2006ER03	2006ER04
Lab Sample Number	680-22060-38	680-22139-1	680-22139-2	680-22139-6
Sampling Date	11/13/2006	11/15/2006	11/15/2006	11/16/2006
Matrix	Water	Water	Water	Water
Method - 8270_LL (ug/L)				
1-Methylnaphthalene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
2-Methylnaphthalene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Acenaphthene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Acenaphthylene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Anthracene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Benzo[a]anthracene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Benzo[a]pyrene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Benzo[b]fluoranthene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Benzo[ghi]perylene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Benzo[k]fluoranthene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Chrysene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Dibenz(ah)anthracene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Fluoranthene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Fluorene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Indeno[123-cd]pyrene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Naphthalene	0.19 UJ	0.19 UJ	0.025 J	0.20 U
Phenanthrene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Pyrene	0.19 UJ	0.19 UJ	0.20 U	0.20 U
Method - 8081A_8082 (ug/L)				
Aroclor 1016	0.96 UJ	1.0 UJ	1.0 U	1.1 U
Aroclor 1221	1.9 UJ	2.0 UJ	2.0 U	2.2 U
Aroclor 1232	0.96 UJ	1.0 UJ	1.0 U	1.1 U
Aroclor 1242	0.96 UJ	1.0 UJ	1.0 U	1.1 U
Aroclor 1248	0.96 UJ	1.0 UJ	1.0 U	1.1 U
Aroclor 1254	0.96 UJ	1.0 UJ	1.0 U	1.1 U
Aroclor 1260	0.96 UJ	1.0 UJ	1.0 UJ	1.1 UJ
Method - 8015B (mg/L)				
Diesel Range Organics [C10-C28]	0.096 UJ	0.10 UJ	0.10 U	0.10 U
Gasoline Range Organics (GRO)-C6-C10	0.050 U	0.050 U	0.015 J	0.050 U
Method - 8330 (ug/L)				
4-Amino-26-dinitrotoluene	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
13-Dinitrobenzene	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
26-Dinitrotoluene	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
Nitrobenzene	0.1 U	0.097 J	0.1 U	0.1 U
2-Nitrotoluene	0.5 U	0.5 U	0.5 U	0.5 U
3-Nitrotoluene	0.5 U	0.22 J	0.14 J	0.31 J
4-Nitrotoluene	0.5 U	0.5 U	0.5 U	0.5 U
RDX	0.1 U	0.1 U	0.1 U	0.1 U
Tetryl	0.1 U	0.1 U	0.1 U	0.1 U
135-Trinitrobenzene	0.1 U	0.13 J	0.13 J	0.13 J
Picric Acid	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

QA/QC ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER01	2006ER02	2006ER03	2006ER04
Lab Sample Number	680-22060-38	680-22139-1	680-22139-2	680-22139-6
Sampling Date	11/13/2006	11/15/2006	11/15/2006	11/16/2006
Matrix	Water	Water	Water	Water
Method - 6020 (ug/L)				
Antimony	20 U	20 U	20 U	20 U
Arsenic	10 U	10 U	10 U	10 U
Barium	10 U	10 U	10 U	10 U
Beryllium	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
Chromium	10 U	10 U	10 U	10 U
Cobalt	10 U	10 U	10 U	10 U
Copper	20 U	20 U	20 U	20 U
Lead	5.0 U	5.0 U	5.0 U	5.0 U
Nickel	40 U	0.26 J	0.16 J	0.19 J
Selenium	10 U	10 U	10 U	10 U
Silver	10 U	10 U	10 U	10 U
Thallium	10 U	10 U	10 U	10 U
Tin	10 UJ	10 UJ	10 UJ	10 UJ
Vanadium	10 U	10 U	10 U	10 U
Zinc	3.7 J	20 U	20 U	20 U
Mercury - 7470A	0.20 U	0.20 UJ	0.20 UJ	0.20 UJ
Cyanide Total - 9012A	0.010 U	NA	NA	NA
Sulfide - 9034	1.0 U	NA	NA	NA

QA/QC ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER05	2006FB01	2006FB02	68ER01	68PbER01	68PbFB01
Lab Sample Number	680-22139-3	680-22139-4	680-22139-5	680-30548-20	680-31377-19	680-31377-20
Sampling Date	11/17/2006	11/18/2006	11/18/2006	9/27/07	10/24/07	10/24/07
Matrix	Water	Water	Water	Water	Water	Water
Method - 8260B (ug/L)						
1112-Tetrachloroethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
111-Trichloroethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
1122-Tetrachloroethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
112-Trichloroethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
11-Dichloroethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
11-Dichloroethene	1.0 U	1.0 U	1.0 U	NA	NA	NA
123-Trichloropropane	1.0 U	1.0 U	1.0 U	NA	NA	NA
12-Dibromo-3-Chloropropane	1.0 U	1.0 U	1.0 U	NA	NA	NA
12-Dichloroethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
12-Dichloropropane	1.0 U	1.0 U	1.0 U	NA	NA	NA
2-Chloro-1,3-butadiene	1.0 U	1.0 U	1.0 U	NA	NA	NA
2-Hexanone	10 U	10 U	10 U	NA	NA	NA
3-Chloro-1-propene	1.0 U	1.0 U	1.0 U	NA	NA	NA
Acetone	25 U	25 U	25 U	NA	NA	NA
Acetonitrile	40 U	40 U	40 U	NA	NA	NA
Acrolein	20 R	20 R	20 R	NA	NA	NA
Acrylonitrile	20 U	20 U	20 U	NA	NA	NA
Benzene	1.0 U	1.0 U	1.0 U	NA	NA	NA
Bromoform	1.0 U	1.0 U	1.0 U	NA	NA	NA
Bromomethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
Carbon disulfide	2.0 U	2.0 U	2.0 U	NA	NA	NA
Carbon tetrachloride	1.0 U	1.0 U	1.0 U	NA	NA	NA
Chlorobenzene	1.0 U	1.0 U	1.0 U	NA	NA	NA
Chlorodibromomethane	1.0 U	1.0 U	2.8	NA	NA	NA
Chloroethane	1.0 UJ	1.0 UJ	1.0 UJ	NA	NA	NA
Chloroform	1.0 U	1.0 U	160	NA	NA	NA
Chloromethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
cis-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	NA	NA	NA
Dibromomethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
Dichlorobromomethane	1.0 U	1.0 U	18	NA	NA	NA
Dichlorodifluoromethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
Ethyl methacrylate	1.0 U	1.0 U	1.0 U	NA	NA	NA
Ethylbenzene	1.0 U	1.0 U	1.0 U	NA	NA	NA
Ethylene Dibromide	1.0 U	1.0 U	1.0 U	NA	NA	NA
Iodomethane	5.0 UJ	5.0 UJ	5.0 UJ	NA	NA	NA
Isobutanol	40 R	40 R	40 R	NA	NA	NA
Methacrylonitrile	20 U	20 U	20 U	NA	NA	NA
Methyl Ethyl Ketone	10 U	10 U	10 U	NA	NA	NA
methyl isobutyl ketone	10 U	10 U	10 U	NA	NA	NA
Methyl methacrylate	1.0 U	1.0 U	1.0 U	NA	NA	NA
Methylene Chloride	5.0 U	5.0 U	5.0 U	NA	NA	NA
Pentachloroethane	5.0 U	5.0 U	5.0 U	NA	NA	NA
Propionitrile	20 U	20 U	20 U	NA	NA	NA
Styrene	1.0 U	1.0 U	1.0 U	NA	NA	NA
Tetrachloroethene	1.0 U	1.0 U	1.0 U	NA	NA	NA
Toluene	3.0	1.0 U	1.0 U	NA	NA	NA
trans-1,2-Dichloroethene	1.0 U	1.0 U	1.0 U	NA	NA	NA
trans-1,3-Dichloropropene	1.0 U	1.0 U	1.0 U	NA	NA	NA
trans-1,4-Dichloro-2-butene	2.0 U	2.0 U	2.0 U	NA	NA	NA
Trichloroethene	1.0 U	1.0 U	1.0 U	NA	NA	NA
Trichlorofluoromethane	1.0 U	1.0 U	1.0 U	NA	NA	NA
Vinyl acetate	2.0 UJ	2.0 UJ	2.0 UJ	NA	NA	NA
Vinyl chloride	1.0 U	1.0 U	1.0 U	NA	NA	NA
Xylenes Total	2.0 U	2.0 U	2.0 U	NA	NA	NA

QA/QC ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER05	2006FB01	2006FB02	68ER01	68PbER01	68PbFB01
Lab Sample Number	680-22139-3	680-22139-4	680-22139-5	680-30548-20	680-31377-19	680-31377-20
Sampling Date	11/17/2006	11/18/2006	11/18/2006	9/27/07	10/24/07	10/24/07
Matrix	Water	Water	Water	Water	Water	Water
Method - 8270C (ug/L)						
11'-Biphenyl	10 U	10 U	10 U	NA	NA	NA
1245-Tetrachlorobenzene	10 U	10 U	10 U	NA	NA	NA
124-Trichlorobenzene	10 U	10 U	10 U	NA	NA	NA
12-Dichlorobenzene	10 U	10 U	10 U	NA	NA	NA
135-Trinitrobenzene	10 UJ	10 UJ	10 U	NA	NA	NA
13-Dichlorobenzene	10 U	10 U	10 U	NA	NA	NA
13-Dinitrobenzene	10 U	10 U	10 U	NA	NA	NA
14-Dichlorobenzene	0.52 J	0.53 J	10 U	NA	NA	NA
14-Dioxane	10 U	10 U	10 U	NA	NA	NA
14-Naphthoquinone	10 UJ	10 UJ	10 U	NA	NA	NA
1-Naphthylamine	10 U	10 U	10 U	NA	NA	NA
2346-Tetrachlorophenol	10 U	10 U	10 U	NA	NA	NA
245-Trichlorophenol	10 U	10 U	10 U	NA	NA	NA
246-Trichlorophenol	10 U	10 U	10 U	NA	NA	NA
24-Dichlorophenol	10 U	10 U	10 U	NA	NA	NA
24-Dimethylphenol	10 U	10 U	10 U	NA	NA	NA
24-Dinitrophenol	50 U	50 U	50 U	NA	NA	NA
24-Dinitrotoluene	10 U	10 U	10 U	NA	NA	NA
26-Dichlorophenol	10 U	10 U	10 U	NA	NA	NA
26-Dinitrotoluene	10 U	10 U	10 U	NA	NA	NA
2-Acetylaminofluorene	10 U	10 U	10 U	NA	NA	NA
2-Chloronaphthalene	10 U	10 U	10 U	NA	NA	NA
2-Chlorophenol	10 U	10 U	10 U	NA	NA	NA
2-Methylphenol	10 U	10 U	10 U	NA	NA	NA
2-Naphthylamine	10 U	10 U	10 U	NA	NA	NA
2-Nitroaniline	50 U	50 U	50 U	NA	NA	NA
2-Nitrophenol	10 U	10 U	10 U	NA	NA	NA
2-Picoline	10 U	10 U	10 UJ	NA	NA	NA
2-Toluidine	10 U	10 U	10 U	NA	NA	NA
3 & 4 Methylphenol	10 U	10 U	10 U	NA	NA	NA
33'-Dichlorobenzidine	20 U	20 U	20 U	NA	NA	NA
33'-Dimethylbenzidine	20 U	20 U	20 U	NA	NA	NA
3-Methylcholanthrene	10 U	10 U	10 U	NA	NA	NA
3-Nitroaniline	50 U	50 U	50 U	NA	NA	NA
46-Dinitro-2-methylphenol	50 U	50 U	50 U	NA	NA	NA
4-Aminobiphenyl	10 U	10 U	10 U	NA	NA	NA
4-Bromophenyl phenyl ether	10 U	10 U	10 U	NA	NA	NA
4-Chloro-3-methylphenol	10 U	10 U	10 U	NA	NA	NA
4-Chloroaniline	20 U	20 U	20 U	NA	NA	NA
4-Chlorophenyl phenyl ether	10 U	10 U	10 U	NA	NA	NA
4-Nitroaniline	50 U	50 U	50 U	NA	NA	NA
4-Nitrophenol	50 U	50 U	50 U	NA	NA	NA
4-Nitroquinoline-1-oxide	20 R	20 R	20 U	NA	NA	NA
712-Dimethylbenz(a)anthracene	10 U	10 U	10 U	NA	NA	NA
Acetophenone	10 U	10 U	10 U	NA	NA	NA
alphaalpha-Dimethyl phenethylamine	2000 U	2000 U	2000 U	NA	NA	NA
Aniline	20 U	20 U	20 U	NA	NA	NA
Aramite Total	10 UJ	10 UJ	10 UJ	NA	NA	NA
Benzyl alcohol	10 U	10 U	10 U	NA	NA	NA
Bis(2-chloroethoxy)methane	10 U	10 U	10 U	NA	NA	NA
Bis(2-chloroethyl)ether	10 U	10 U	10 U	NA	NA	NA
Bis(2-ethylhexyl) phthalate	10 U	10 U	10 U	NA	NA	NA
bis(chloroisopropyl) ether	10 U	10 U	10 U	NA	NA	NA

QA/QC ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER05	2006FB01	2006FB02	68ER01	68PbER01	68PbFB01
Lab Sample Number	680-22139-3	680-22139-4	680-22139-5	680-30548-20	680-31377-19	680-31377-20
Sampling Date	11/17/2006	11/18/2006	11/18/2006	9/27/07	10/24/07	10/24/07
Matrix	Water	Water	Water	Water	Water	Water
Method - 8270C (ug/L)						
Butyl benzyl phthalate	10 U	10 U	10 U	NA	NA	NA
Diallate	10 UJ	10 UJ	10 U	NA	NA	NA
Dibenzofuran	10 U	10 U	10 U	NA	NA	NA
Diethyl phthalate	10 U	0.69 J	10 U	NA	NA	NA
Dimethoate	10 U	10 U	10 U	NA	NA	NA
Dimethyl phthalate	10 U	10 U	10 U	NA	NA	NA
Di-n-butyl phthalate	10 U	10 U	10 U	NA	NA	NA
Di-n-octyl phthalate	10 U	10 U	10 U	NA	NA	NA
Dinoseb	10 U	10 U	10 U	NA	NA	NA
Disulfoton	10 U	10 U	10 U	NA	NA	NA
Ethyl methanesulfonate	10 U	10 U	10 U	NA	NA	NA
Famphur	10 U	10 U	10 U	NA	NA	NA
Hexachlorobenzene	10 U	10 U	10 U	NA	NA	NA
Hexachlorobutadiene	10 U	10 U	10 U	NA	NA	NA
Hexachlorocyclopentadiene	10 U	10 U	10 U	NA	NA	NA
Hexachloroethane	10 U	10 U	10 U	NA	NA	NA
Hexachlorophene	5000 U	5000 U	5000 U	NA	NA	NA
Hexachloropropene	10 U	10 U	10 U	NA	NA	NA
Isophorone	10 U	10 U	10 U	NA	NA	NA
Isosafrole	10 U	10 U	10 U	NA	NA	NA
Methapyrilene	2000 UJ	2000 UJ	2000 U	NA	NA	NA
Methyl methanesulfonate	10 U	10 U	10 U	NA	NA	NA
Methyl parathion	10 U	10 U	10 U	NA	NA	NA
Nitrobenzene	10 U	10 U	10 U	NA	NA	NA
N-Nitro-o-toluidine	10 U	10 U	10 U	NA	NA	NA
N-Nitrosodiethylamine	10 U	10 U	10 U	NA	NA	NA
N-Nitrosodimethylamine	10 U	10 U	10 U	NA	NA	NA
N-Nitrosodi-n-butylamine	10 U	10 U	10 U	NA	NA	NA
N-Nitrosodi-n-propylamine	10 U	10 U	10 U	NA	NA	NA
N-Nitrosodiphenylamine	10 U	10 U	10 U	NA	NA	NA
N-Nitrosomethylethylamine	10 U	10 U	10 U	NA	NA	NA
N-Nitrosomorpholine	10 U	10 U	10 U	NA	NA	NA
N-Nitrosopiperidine	10 U	10 U	10 U	NA	NA	NA
N-Nitrosopyrrolidine	10 U	10 U	10 U	NA	NA	NA
oo'o"-Triethylphosphorothioate	10 U	10 U	10 U	NA	NA	NA
Parathion	10 U	10 U	10 U	NA	NA	NA
p-Dimethylamino azobenzene	10 U	10 U	10 U	NA	NA	NA
Pentachlorobenzene	10 U	10 U	10 U	NA	NA	NA
Pentachloronitrobenzene	10 U	10 U	10 U	NA	NA	NA
Pentachlorophenol	50 U	50 U	50 U	NA	NA	NA
Phenacetin	10 U	10 U	10 U	NA	NA	NA
Phenol	10 U	10 U	10 U	NA	NA	NA
Phorate	10 U	10 U	10 U	NA	NA	NA
p-Phenylene diamine	2000 U	2000 U	2000 U	NA	NA	NA
Pronamide	10 U	10 U	10 U	NA	NA	NA
Pyridine	50 U	50 U	50 U	NA	NA	NA
Safrole Total	10 U	10 U	10 U	NA	NA	NA
Sulfotepp	10 U	10 U	10 U	NA	NA	NA
Thionazin	10 U	10 U	10 U	NA	NA	NA

QA/QC ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER05	2006FB01	2006FB02	68ER01	68PbER01	68PbFB01
Lab Sample Number	680-22139-3	680-22139-4	680-22139-5	680-30548-20	680-31377-19	680-31377-20
Sampling Date	11/17/2006	11/18/2006	11/18/2006	9/27/07	10/24/07	10/24/07
Matrix	Water	Water	Water	Water	Water	Water
Method - 8270_LL (ug/L)						
1-Methylnaphthalene	0.20 U	0.20 U	0.19 U	NA	NA	NA
2-Methylnaphthalene	0.20 UJ	0.20 UJ	0.19 U	NA	NA	NA
Acenaphthene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Acenaphthylene	0.20 UJ	0.20 UJ	0.19 U	NA	NA	NA
Anthracene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Benzo[a]anthracene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Benzo[a]pyrene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Benzo[b]fluoranthene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Benzo[ghi]perylene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Benzo[k]fluoranthene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Chrysene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Dibenz(ah)anthracene	0.20 UJ	0.20 UJ	0.19 U	NA	NA	NA
Fluoranthene	0.20 U	0.20 U	0.080 J	NA	NA	NA
Fluorene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Indeno[123-cd]pyrene	0.20 UJ	0.20 UJ	0.19 U	NA	NA	NA
Naphthalene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Phenanthrene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Pyrene	0.20 U	0.20 U	0.19 U	NA	NA	NA
Method - 8081A_8082 (ug/L)						
Aroclor 1016	0.99 U	1.0 U	0.98 U	NA	NA	NA
Aroclor 1221	2.0 U	2.0 U	2.0 U	NA	NA	NA
Aroclor 1232	0.99 U	1.0 U	0.98 U	NA	NA	NA
Aroclor 1242	0.99 U	1.0 U	0.98 U	NA	NA	NA
Aroclor 1248	0.99 U	1.0 U	0.98 U	NA	NA	NA
Aroclor 1254	0.99 U	1.0 U	0.98 U	NA	NA	NA
Aroclor 1260	0.99 UJ	1.0 UJ	0.98 UJ	NA	NA	NA
Method - 8015B (mg/L)						
Diesel Range Organics [C10-C28]	0.099 U	0.052 J	0.10 U	NA	NA	NA
Gasoline Range Organics (GRO)-C6-C10	0.050 U	0.050 U	0.050 U	NA	NA	NA
Method - 8330 (ug/L)						
4-Amino-26-dinitrotoluene	0.1 U	0.1 U	0.1 U	NA	NA	NA
2-Amino-46-dinitrotoluene	0.2 U	0.2 U	0.2 U	NA	NA	NA
13-Dinitrobenzene	0.1 U	0.1 U	0.1 U	NA	NA	NA
24-Dinitrotoluene	0.1 U	0.1 U	0.1 U	NA	NA	NA
26-Dinitrotoluene	0.1 U	0.1 U	0.1 U	NA	NA	NA
HMX	0.1 U	0.1 U	0.1 U	NA	NA	NA
Nitrobenzene	0.1 U	0.1 U	0.1 U	NA	NA	NA
2-Nitrotoluene	0.5 U	0.5 U	0.5 U	NA	NA	NA
3-Nitrotoluene	0.26 J	0.5 U	0.5 U	NA	NA	NA
4-Nitrotoluene	0.5 U	0.5 U	0.5 U	NA	NA	NA
RDX	0.1 U	0.14	0.1 U	NA	NA	NA
Tetryl	0.1 U	0.077 J	0.1 U	NA	NA	NA
135-Trinitrobenzene	0.15 J	0.1 U	0.1 U	NA	NA	NA
Picric Acid	1.0 U	1.0 U	1.0 U	NA	NA	NA
246-Trinitrotoluene	0.1 U	0.1 U	0.1 U	NA	NA	NA

QA/QC ANALYTICAL RESULTS
SWMU 68 - SOUTHERN FIRE TRAINING PIT AREA
PHASE I RFI
NAVAL ACTIVITY PUERTO RICO, CEIBA, PR

Sample ID	2006ER05	2006FB01	2006FB02	68ER01	68PbER01	68PbFB01
Lab Sample Number	680-22139-3	680-22139-4	680-22139-5	680-30548-20	680-31377-19	680-31377-20
Sampling Date	11/17/2006	11/18/2006	11/18/2006	9/27/07	10/24/07	10/24/07
Matrix	Water	Water	Water	Water	Water	Water
Method - 6020 (ug/L)						
Antimony	20 U	20 U	20 U	NA	NA	NA
Arsenic	10 U	10 U	10 U	10 U	NA	NA
Barium	10 U	10 U	10 U	NA	NA	NA
Beryllium	4.0 U	4.0 U	4.0 U	NA	NA	NA
Cadmium	5.0 U	5.0 U	5.0 U	NA	NA	NA
Chromium	10 U	10 U	10 U	NA	NA	NA
Cobalt	10 U	10 U	10 U	NA	NA	NA
Copper	20 U	20 U	79	NA	NA	NA
Lead	5.0 U	5.0 U	0.69 J	NA	6.3 U	6.3 U
Nickel	40 U	40 U	40 U	NA	NA	NA
Selenium	10 U	10 U	10 U	NA	NA	NA
Silver	10 U	10 U	10 U	NA	NA	NA
Thallium	10 U	10 U	10 U	NA	NA	NA
Tin	10 UJ	10 UJ	10 UJ	NA	NA	NA
Vanadium	10 U	10 U	10 U	NA	NA	NA
Zinc	20 U	20 U	20 U	NA	NA	NA
Mercury - 7470A	0.20 UJ	0.20 UJ	0.20 UJ	NA	NA	NA
Cyanide Total - 9012A	NA	NA	NA	NA	NA	NA
Sulfide - 9034	NA	NA	NA	NA	NA	NA

APPENDIX C
PHASE I RFI DATA VALIDATION SUMMARIES

APPENDIX C.1
STL SAVANNAH SDG 22001-1

VOLATILE ORGANIC COMPOUNDS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22001-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: December 27-28, 2006

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB01-00	680-22001-1	Soil
2	68SB01-01	680-22001-2	Soil
3	68SB01-02	680-22001-3	Soil
4	68SB02-00	680-22001-4	Soil
5	68SB02-01	680-22001-5	Soil
6	68SB02-02	680-22001-6	Soil
7	68SB03-00	680-22001-7	Soil
8	68SB03-01	680-22001-8	Soil
9	68SB03-02	680-22001-9	Soil
10	68SB05-00	680-22001-10	Soil
11	68SB05-01	680-22001-11	Soil
12	68SB05-02	680-22001-12	Soil
13	68SB05-01D	680-22001-13	Soil
14	68TB01	680-22001-14	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 - A MS/MSD sample was not analyzed.

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

LCS ID	Compound	%R	Qualifier	Affected Samples
LCS 680-60268/3	Dichlorodifluoromethane	48%	J/R	1-6, 8-13
LCS 680-60901/3	1,1,1,2-Tetrachloroethane	113%	None	Samples ND

Method Blank - The method blanks were free of contamination.

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

Blank ID	Compound	Conc. ug/L	Action Level ug/kg	Qualifier	Affected Samples
68TB01	None	ND	-	-	-
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	Dichlorobromomethane	18	90	None	Samples ND
	Chloroform	160	800	None	
	Chlorodibromomethane	2.8	14	None	
2006ER02 (SDG 22060-3)	Toluene	2.3	23	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 with the exception of the following:

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/19/06	Acrolein	RRF 0.0222	J/R	14

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/19/06	Isobutanol	RRF 0.0305	J/R	14

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

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples	
11/17/06 0856	Acrolein	28% D	J/UJ	1-6, 8-13	
	Isobutanol	22% D	J/UJ		
	Pentachloroethane	48% D	J/UJ		
11/17/06 0916	Vinyl acetate	20% D	J/UJ		
	1,1,1-Trichloroethane	27% D	J/UJ		
	Carbon tetrachloride	29% D	J/UJ		
	Benzene	21% D	J/UJ		
	1,2-Dichloroethane	25% D	J/UJ		
	Dibromomethane	29% D	J/UJ		
	Dibromodichloromethane	22% D	J/UJ		
	cis-1,3-Dichloropropene	20% D	J/UJ		
	11/17/06 2041	Acrolein	28% D		J/UJ
Iodomethane		25% D	J/UJ		
3-Chloro-1-propene		47% D	J/UJ		
2-Chloro-1,3-butadiene		47% D	J/UJ		
Pentachloroethane		45% D	J/UJ		
11/17/06 2122	4-Methyl-2-pentanone	24% D	J/UJ	14	
11/27/07 1013	Chloromethane	23% D	J/UJ		
	Chloroethane	41% D	J/UJ		
11/27/06 1041	Acrolein	RRF 0.045/101% D	None	Qualified due to ICAL	
	Iodomethane	29% D	J/UJ	14	
	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	68SB05-01 ug/kg	68SB05-01D ug/kg	RPD	Qualifier
Acetone	15	12	22%	None

SEMIVOLATILE ORGANIC COMPOUNDS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22001-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: December 28, 2006

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB01-00	680-22001-1	Soil
2	68SB01-01	680-22001-2	Soil
3	68SB01-02	680-22001-3	Soil
4	68SB02-00	680-22001-4	Soil
5	68SB02-01	680-22001-5	Soil
6	68SB02-02	680-22001-6	Soil
7	68SB03-00	680-22001-7	Soil
8	68SB03-01	680-22001-8	Soil
9	68SB03-02	680-22001-9	Soil
10	68SB05-00	680-22001-10	Soil
11	68SB05-01	680-22001-11	Soil
12	68SB05-02	680-22001-12	Soil
13	68SB05-01D	680-22001-13	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 - A MS/MSD sample was not analyzed.

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

Method Blank - The method blanks exhibited the following contamination.

Blank ID	Compound	Conc. ug/kg	Action Level ug/kg	Qualifier	Affected Samples
680-604071/21-AA	p-Dimethylamino azobenzene	46	230	None	All ND

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-Dichlorobenzene	0.56	93	None	
2006FB01 (SDG 22060-3)	1,4-Dichlorobenzene	0.52	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 with the exception of the following.

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/24/06	a,a-Dimethylphenethylamine	30%	None	Samples ND
	1,3,5-Trinitrobenzene	23%	None	Samples ND

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/24/06	4-Nitroquinoline-1-oxide	RRF 0.0316	J/R	1-13
	Methapyrilene	35%	None	Samples ND

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

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/27/06	a,a-Dimethylphenethylamine	22%	J/UJ	1-13
	1,3,5-Trinitrobenzene	29%	J/UJ	
	4-Nitroquinoline-1-oxide	RRF 0.0313	None	Qualified due to ICAL
	Methapyrilene	39%	J/UJ	1-13
	Hexachlorophene	21%	J/UJ	
	Phorate	28%	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	68SB05-01 ug/kg	68SB05-01D ug/kg	RPD	Qualifier
None	ND	ND	-	-

POLYNUCLEAR AROMATIC HYDROCARBONS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR22001-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: December 28, 2006

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB01-00	680-22001-1	Soil
2	68SB01-01	680-22001-2	Soil
3	68SB01-02	680-22001-3	Soil
4	68SB02-00	680-22001-4	Soil
5	68SB02-01	680-22001-5	Soil
6	68SB02-02	680-22001-6	Soil
7	68SB03-00	680-22001-7	Soil
8	68SB03-01	680-22001-8	Soil
9	68SB03-02	680-22001-9	Soil
10	68SB05-00	680-22001-10	Soil
11	68SB05-01	680-22001-11	Soil
12	68SB05-02	680-22001-12	Soil
13	68SB05-01D	680-22001-13	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 sample was not included in this data package.

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 (NAPR22060-3)	None	ND	-	-	-
2006ER02 (NAPR22060-3)	None	ND	-	-	-
2006FB01 (NAPR22060-3)	None	ND	-	-	-
2006FB02 (NAPR22060-3)	Fluoranthene	0.08	14	U	8

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	68SB05-01 ug/kg	68SB05-01D ug/kg	RPD	Qualifier
None	ND	ND	-	-

PCBs
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR22001-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: December 29, 2006

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB01-00	680-22001-1	Soil
2	68SB01-01	680-22001-2	Soil
3	68SB01-02	680-22001-3	Soil
4	68SB02-00	680-22001-4	Soil
5	68SB02-01	680-22001-5	Soil
6	68SB02-02	680-22001-6	Soil
7	68SB03-00	680-22001-7	Soil
8	68SB03-01	680-22001-8	Soil
9	68SB03-02	680-22001-9	Soil
10	68SB05-00	680-22001-10	Soil
11	68SB05-01	680-22001-11	Soil
12	68SB05-02	680-22001-12	Soil
13	68SB05-01D	680-22001-13	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.

Surrogates - All samples exhibited acceptable surrogate %R values.

MS/MSD - A MS/MSD sample was not analyzed.

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

Method Blank - The method blanks were free of contamination.

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

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

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

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

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 PCB chromatographic data were included and no discrepancies were identified.

Compound Quantitation - No discrepancies were identified.

Field Duplicates - Field duplicate results are summarized below.

Compound	68SB05-01 ug/kg	68SB05-01D ug/kg	RPD	Qualifier
None	ND	ND	-	-

GASOLINE RANGE ORGANICS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22001-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: December 29, 2006

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB01-00	680-22001-1	Soil
2	68SB01-01	680-22001-2	Soil
3	68SB01-02	680-22001-3	Soil
4	68SB02-00	680-22001-4	Soil
5	68SB02-01	680-22001-5	Soil
6	68SB02-02	680-22001-6	Soil
7	68SB03-00	680-22001-7	Soil
8	68SB03-01	680-22001-8	Soil
9	68SB03-02	680-22001-9	Soil
10	68SB05-00	680-22001-10	Soil
11	68SB05-01	680-22001-11	Soil
12	68SB05-02	680-22001-12	Soil
13	68SB05-01D	680-22001-13	Soil
14	68TB01	680-22001-14	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 and soil samples.

Surrogates - All samples exhibited acceptable surrogate recoveries.

MS/MSD - A MS/MSD sample was not analyzed.

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
68TB01	None	ND	-	-	-
2006ER01 (SDG NAPR 22060-3)	None	ND	-	-	-
2006ER02 (SDG NAPR 22060-3)	None	ND	-	-	-
2006FB01 (SDG NAPR 22060-3)	None	ND	-	-	-
2006FB02 (SDG NAPR 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	68SB05-01 mg/kg	68SB05-01D mg/kg	RPD	Qualifier
None	ND	ND	-	-

DIESEL RANGE ORGANICS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22001-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: December 29, 2006

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB01-00	680-22001-1	Soil
2	68SB01-01	680-22001-2	Soil
3	68SB01-02	680-22001-3	Soil
4	68SB02-00	680-22001-4	Soil
5	68SB02-01	680-22001-5	Soil
6	68SB02-02	680-22001-6	Soil
7	68SB03-00	680-22001-7	Soil
8	68SB03-01	680-22001-8	Soil
9	68SB03-02	680-22001-9	Soil
10	68SB05-00	680-22001-10	Soil
11	68SB05-01	680-22001-11	Soil
12	68SB05-02	680-22001-12	Soil
13	68SB05-01D	680-22001-13	Soil

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

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

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

Surrogates - All samples exhibited acceptable surrogate recoveries.

MS/MSD - A MS/MSD sample was not analyzed.

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
2006ER01 (SDG NAPR 22060-3)	None	ND	-	-	-
2006ER02 (SDG NAPR 22060-3)	None	ND	-	-	-
2006FB01 (SDG NAPR 22060-3)	DRO C10-C28	0.052	8.75	U	10, 12, 13
2006FB02 (SDG NAPR 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	68SB05-01 mg/kg	68SB05-01D mg/kg	RPD	Qualifier
DRO C10-C28	ND	ND	-	-

TOTAL METALS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22001-1

Client: CH2M Hill, Inc./Baker Environmental, Inc. Date: January 5, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB01-00	680-22001-1	Soil
2	68SB01-01	680-22001-2	Soil
3	68SB01-02	680-22001-3	Soil
4	68SB02-00	680-22001-4	Soil
5	68SB02-01	680-22001-5	Soil
6	68SB02-02	680-22001-6	Soil
7	68SB03-00	680-22001-7	Soil
8	68SB03-01	680-22001-8	Soil
9	68SB03-02	680-22001-9	Soil
10	68SB05-00	680-22001-10	Soil
11	68SB05-01	680-22001-11	Soil
12	68SB05-02	680-22001-12	Soil
13	68SB05-01D	680-22001-13	Soil

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

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

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

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

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

Compound	%R - High/Low	Qualifier	Affected Samples
Copper 11/22/06	148% High	None	Positive result > 2X CRDL
Tin 11/22/06	69% Low	J/UJ	2
Zinc 11/22/06	55% Low	None	Positive result >2X CRDL
Tin 12/04/06	59% Low	J/UJ	1, 3-13

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

Compound	Conc.	Action Level mg/kg	Qualifier	Affected Samples
Barium PBS-2	0.1111 mg/kg	1.111	None	All >5X blank
CCB Copper 11/22	0.412 ug/L	0.412	None	
Copper PBS-2	0.121 mg/kg	1.21	None	
Nickel PBS-2	0.0499 mg/kg	0.499	None	

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

Compound	%R	Qualifier	Affected Samples
Zinc 11/22	128%	J	2
Cadmium 12/04	71%	J	4, 7, 12
Silver 12/04	76%	None	All ND
Zinc 12/04	129%	J	1, 3-13

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

MS Sample ID	Compound	%R/RPD	Qualifier	Affected Samples
Reference 1	Chromium	69%/OK/OK	J	2
	Tin	184%/185%/OK	J/None	None - Sample ND
Reference 2	Antimony	17%/20%/OK	UJ	1, 3-13
	Chromium	130%/144%/OK	J	
	Lead	156%/26%/OK	J	
	Nickel	OK/136%/OK	J	
	Tin	OK/126%/OK	None	None - All ND

Field Duplicates - Field duplicate results are summarized below.

Compound	68SB05-01 mg/kg	68SB05-01D mg/kg	RPD or difference	Qualifier
Arsenic	0.93 J	1.1 J	0.17	None
Barium	59	81	31%	
Beryllium	0.31 J	0.33 J	0.02	

Compound	68SB05-01 mg/kg	68SB05-01D mg/kg	RPD or difference	Qualifier
Chromium	26	36	32%	None
Cobalt	69	16	9.1	R - 68SB05-01 (<5X CRDL)
Copper	39	52	29%	None
Lead	1.6	2.0	0.4	
Nickel	11	14	3	
Vanadium	100	150	40%	J
Zinc	42	45	7%	None

LCS - The LCS samples exhibited acceptable %R values.

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

ICP Sample ID	Compound	%D	Qualifier	Affected Samples
Reference 1	Barium	11.4% D	J	2
	Chromium	12.8% D	None	Qualified due to ICS AB
	Vanadium	17.0% D	J	2
	Copper	10.4% D	J	

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

Blank ID	Compound	Conc. ug/L	Action Level mg/kg	Qualifier	Affected Samples
2006ER01	None	ND	-	-	-
2006ER02	Nickel	0.26 J	None	None	< CRDL
2006FB01	None	ND	-	-	-
2006FB02	Copper	79	158	J/R	1,3-13
	Lead	0.69J	None	None	< CRDL

Compound Quantitation - All soil samples were analyzed at a 2X dilution for ICPMS compounds.

APPENDIX C.2
STL SAVANNAH SDG 22012-1

VOLATILE ORGANIC COMPOUNDS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO 121, Ceiba, PR SDG #: NAPR 22012-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 9, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB04-00	680-22012-1	Soil
2	68SB04-01	680-22012-2	Soil
3	68SB04-02	680-22012-3	Soil
4	68SB06-00	680-22012-4	Soil
5	68SB06-01	680-22012-5	Soil
6	68SB06-02	680-22012-6	Soil
7	68SB08-00	680-22012-7	Soil
8	68SB08-01	680-22012-8	Soil
9	68SB08-02	680-22012-9	Soil
10	68SB09-00	680-22012-10	Soil
11	68SB09-01	680-22012-11	Soil
12	68SB09-02	680-22012-12	Soil
13	68SB07-00	680-22012-15	Soil
14	68SB07-01	680-22012-16	Soil
15	68SB07-02	680-22012-17	Soil
16	68SB10-00	680-22012-18	Soil
16 MS	68SB10-00 MS	680-22012-18 MS	Soil
16 MSD	68SB10-00 MSD	680-22012-18 MSD	Soil
17	68SB10-00D	680-22012-19	Soil
18	68SB10-01	680-22012-20	Soil
19	68SB10-01D	680-22012-21	Soil
20	68TB02	680-22012-20	Water
21	68SB10-02	680-22012-23	Soil
21 MS	68SB10-02 MS	680-22012-23 MS	Soil
21 MSD	68SB10-02 MSD	680-22012-23 MSD	Soil
22	68SB10-03	680-22012-24	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 except the following.

Sample	Date Sampled	Date Extracted	# of Days	Qualifier
20	11/15/06	11/30/06	15	J/UJ
22	11/15/06	11/30/06	15	

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

Sample ID	Surrogate	%R	Qualifier
8	Dibromofluoromethane	129%	J
	Toluene-d8	215%	
13	Toluene-d8	154%	
14	Dibromofluoromethane	136%	
21	Toluene-d8	170%	

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
16	Acetone	146/475/328%	J
	2-Hexanone	0%/164%/163%	Sample ND
	Methyl isobutyl ketone	0%/180%/179%	
	1,1,2,2-Tetrachloroethane	0%/70%/140%	
	1,1,2-Trichloroethane	0%/61%/121%	J
	Acetone	883%/776%/60	
	Benzene	73%/150%/36	Sample ND
	Dichlorobromomethane	88%/185%/45	
	Bromoform	109%/230%/51	ND- No action for RPD alone
	Carbon tetrachloride	80%/169%/42	Sample ND
	Chlorobenzene	72%/151%/44	
	Chlorodibromomethane	91%/193%/46	
	1,2-Dibromo-3-Chloropropane	126%/265%/53	ND - No action for RPD alone
	Ethylene dibromide	108%/228%/53	Sample ND
	1,2-Dichloroethane	96%/202%/50%	
	1,2-Dichloropropane	88%/185%/48	
	cis-1,3-Dichloropropene	88%/185%/49	
	trans-1,3-Dichloropropene	94%/199%/55	ND- No action for RPD alone
	Ethylbenzene	74%/155%/41	Sample ND
	2-Hexanone	303%/319%/60	ND- No action for RPD alone
Methyl isobutyl ketone	378%/398%/71		
Styrene	71%/148%/47	Sample ND	
1,1,1,2-Tetrachloroethane	75%/157%/41		

MS/MSD Sample ID	Compound	MS/MSD %R/RPD	Qualifier	
16	1,1,2,2-Tetrachloroethane	116%/244%/49	Sample ND	
	Tetrachloroethene	65%/138%/39		
	Toluene	67%/141%/42		
	1,1,1-Trichloroethane	83%/175%/44		
	1,1,2-Trichloroethane	102%/215%/51	ND- No action for RPD alone	
	Trichloroethene	36%/75%/33	Sample ND	
	1,2,3-Trichloropropane	116%/244%/40		
21	Acetone	7.2%/155%/165%	Qualified due to surrogates	
	Benzene	2.51%/59.4%/133%	Sample ND	
	Dichlorobromomethane	0%/59%/131		
	Bromoform	0%/72%/161		
	Ethylene dibromide	0%/64.5/144		
	Dibromomethane	0%/61.4%/137		
	1,2-Dichloropropane	0%/56%/124		
	2-Hexanone	0%/143%/160		
	Methyl isobutyl ketone	0%/154%/172		
	Styrene	0%/4.75%/11%		J/R
	1,1,2,2-Tetrachloroethane	0%/69.9%/156		Sample ND
	1,1,2-Trichloroethane	0%/58.5%/130		Sample ND
	Trichloroethane	0%/52.3%/117	J/UJ	
	Vinyl acetate	0%/0%/0	R	
	Acetone	161/149%/15%	Qualified due to surrogate	
	Benzene	44.2/126%/7%	Sample ND	
	Dichlorobromomethane	62.9%/144%/7%		
	Bromoform	72.6%/166%.0		
	Chlorodibromomethane	63.3/145%/7%		
	Ethylene Dibromide	69.9%/160%/8%		
	Dibromomethane	67.0%/153%/9%		
	1,2-Dichloroethane	62.9%/144%/6%		
	1,2-Dichloropropane	58.9%/135%/6%		
	trans-1,3-Dichloropropene	56.8%/130%/6%		
	2-Hexanone	143%/164%/0%		
	Methyl isobutyl ketone	178%/203%/14%		
	Styrene	3.31%/8%/36%	J/R	
	1,1,2,2-Tetrachloroethane	73.2%/168%/5%	Sample ND	
Toluene	53.9%/124%/8%			
1,1,2-Trichloroethane	64.8%/148%/10%			
Trichloroethene	31.1%/74%/48%	J/UJ		
Vinyl acetate	0%/0%/NC	R		

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

LCS ID	Compound	%R	Qualifier	Affected Samples
680-60553/3	Chloroethane	141%	None	Sample ND
680-60647/7	1,2-Dichloropropane	119%	None	
	Styrene	120%	None	
690-60866/4	Chloroethane	145%	None	

LCS ID	Compound	%R	Qualifier	Affected Samples
680-61180/2	Methyl isobutyl ketone	146%	None	Sample ND

Method Blank - The method blanks were free of contamination.

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

Blank ID	Compound	Conc. ug/L	Action Level ug/kg	Qualifier	Affected Samples
68TB02	Bromoform	1.0	5.0	None	All ND
	Chlorodibromomethane	0.85	4.25	None	
68TB03	None	ND	-	-	-
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	Toluene	6.9	69	None	All ND
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	Dichlorobromomethane	18	90	None	All ND
	Chlorodibromomethane	2.8	14	None	
	Chloroform	160	800	None	All ND

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

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

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

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

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

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/03/06	Isobutanol	RRF 0.023	J/R	20, 22

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

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/21/06	Acrolein	52% D	J/UJ	2
	3-Chloro-1-propene	35% D	J/UJ	
	2-Chloro-1,3-butadiene	76%	J/UJ	
	Isobutanol	RRF 0.038/34% D	J/R	
	Pentachloroethane	28% D	J/UJ	
	Chloroethane	42% D	J/UJ	
	Acetone	31% D	J/UJ	
	1,1,1-Trichloroethane	24% D	J/UJ	
	4-Methyl-2-Pentanone (misk)	20% D	J/UJ	
	2-Hexanone	25% D	J/UJ	
11/22/06	Acrolein	35% D	J/UJ	1, 3-6, 8, 11-13, 16-17
	Iodomethane	24% D	J/UJ	
	3-Chloro-1-propene	31% D	J/UJ	
	2-Chloro-1,3-Butadiene	48% D	J/UJ	
	Isobutanol	RRF 0.047	J/R	
	Methyl methacrylade	21% D	J/UJ	
	Pentachloroethane	45% D	J/UJ	
	Dichlorodifluoromethane	24% D	J/UJ	
	Acetone	21% D	J/UJ	
	2-Hexanone	25% D	J/UJ	
11/25/06	Acrolein	23% D	J/UJ	7, 9-10, 14-15, 18-19, 21
	Iodomethane	24% D	J/UJ	
	3-Chloro-1-propane	28% D	J/UJ	
	Isobutanol	RRF 0.0496	J/R	
	Pentachloroethane	35% D	J/UJ	
	Bromomethane	26% D	J/UJ	
	Chloroethane	29% D	J/UJ	
	Carbon disulfide	27% D	J/UJ	
	trans-1,2-Dichloroethene	23% D	J/UJ	
	4-Methyl-2-Pentanone	25% D	J/UJ	
2-Hexanone	33% D	J/UJ		
1,2-Dibromo-3-Chloropropane	26% D	J/UJ		
11/30/06	Acetone	55% D	None	Qualified due to HT
	2-Butanone	41% D	None	
	4-Methyl-2-pentanone	46% D	None	
	2-Hexanone	40% D	None	
	1,2-Dibromo-3-chloropropane	22% D	None	
	Acetonitrile	81% D	None	
	Acrylonitrile	32% D	None	
	Propionitrile	44% D	None	
	Methacrylonitrile	24% D	None	
	Isobutanol	RRF 0.046/102% D	None	Qualified due to ICAL
	Methyl methacrylate	31% D	None	Qualified due to HT
	Ethyl methacrylate	22% D	None	

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/30/06	trans-1,4-Dichloro-2-butene	43% D	None	Qualified due to HT
	Pentachloroethane	23% D	None	

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

Sample ID	Internal Standard	Area Count	Qualifier
8	IS1 1,2-Dichloroethane-d4	Low	J/UJ
	IS2 1,4-Difluorobenzene	Low	
	IS3 Chlorobenzene-d15	Low	

Field Duplicates - Field duplicate results are summarized below.

Compound	68SB10-00 ug/kg	68SB10-00D ug/kg	RPD	Qualifier
Acetone	150	180	18%	None
Methyl ethyl ketone	7.2	10	33%	

Compound	68SB10-01 ug/kg	68SB10-01D ug/kg	RPD	Qualifier
Acetone	25	25	0	None
Benzene	0.90	1.0	11%	
Methyl ethyl ketone	4.9	4.8	2%	
Iodomethane	2.7	2.5	8%	

SEMIVOLATILE ORGANIC COMPOUNDS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR22012-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 9, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB04-00	680-22012-1	Soil
2	68SB04-01	680-22012-2	Soil
3	68SB04-02	680-22012-3	Soil
4	68SB06-00	680-22012-4	Soil
5	68SB06-01	680-22012-5	Soil
6	68SB06-02	680-22012-6	Soil
7	68SB08-00	680-22012-7	Soil
8	68SB08-01	680-22012-8	Soil
9	68SB08-02	680-22012-9	Soil
10	68SB09-00	680-22012-10	Soil
11	68SB09-01	680-22012-11	Soil
12	68SB09-02	680-22012-12	Soil
13	68SB07-00	680-22012-15	Soil
14	68SB07-01	680-22012-16	Soil
15	68SB07-02	680-22012-17	Soil
16	68SB10-00	680-22012-18	Soil
17	68SB10-00D	680-22012-19	Soil
18	68SB10-01	680-22012-20	Soil
19	68SB10-01D	680-22012-21	Soil
20	68SB10-02	680-22012-23	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 sample exhibited acceptable %R and RPD values except the following.

MS/MSD Sample ID	Compound	MS/MSD %R/RPD	Qualifier
20	Hexachlorobutadiene	41%/OK/OK	J/UJ

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

Method Blank - The method blanks were free of contamination.

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

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

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/21/06	2-Picoline	20%	None	All ND
	a,a-Dimethylphenethylamine	30%	None	
	Methapyrilene	17%	None	
	Aramite, total	21%	None	
11/24/06	a,a-Dimethylphenethylamine	30%	None	Sample ND
	1,3,5-Trinitrobenzene	23%	None	4, 11, 18-20
	4-Nitroquinoline-1-oxide	RRF 0.032	J/R	
	Methapyrilene	35%	None	Sample ND

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

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/29/06	1,4-Dioxane	31% D	J/UJ	20
	2,4-Dinitrophenol	22% D	J/UJ	
	a,a-Dimethylphenethylamine	26% D	J/UJ	
	4-Nitroquinoline-1-oxide	RRF 0.034	None	Qualified due to ICAL
	0,0,0-Triethylphosphorothioate	25% D	J/UJ	20
	Phorate	34% D	J/UJ	
	Dimethoate	23% D	J/UJ	
11/30/06	2,4-Dinitrophenol	21% D	J/UJ	1-3, 5-10
	2-Picoline	40% D	J/UJ	
	n-Nitrosodiethylamine	26% D	J/UJ	
	Ethylmethanesulfonate	29% D	J/UJ	
	n-Nitrosomorpholine	30% D	J/UJ	
	a,a-Dimethylphenethylamine	45% D	J/UJ	
	4-Nitroquinoline-1-oxide	20% D	J/UJ	
	Methapyrilene	30% D	J/UJ	
	Hexachlorophene	32% D	J/UJ	
	Aramite	65% D	J/UJ	
12/01/06	2-Picoline	27% D	J/UJ	12, 13-17
	Diallate	20% D	J/UJ	
12/04/06	1,4-Dioxane	32% D	J/UJ	4, 11, 18, 19
	2,4-Dinitrophenol	26% D	J/UJ	
	2-Picoline	22% D	J/UJ	
	n-Nitrosodiethylamine	24% D	J/UJ	
	Hexachloropropene	33% D	J/UJ	
	a,a-Dimethylphenethylamine	52% D	J/UJ	
	4-Nitroquinoline-1-oxide	RRF 0.024/25%	None	Qualified due to ICAL
Hexachlorophene	37% D	J/UJ	4, 11, 18, 19	

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

Field Duplicates - Field duplicate results are summarized below.

Compound	68SB10-00 ug/kg	68SB10-00D ug/kg	RPD	Qualifier
None	ND	ND	-	-

Compound	68SB10-01 ug/kg	68SB10-01D ug/kg	RPD	Qualifier
None	ND	ND	-	-

POLYNUCLEAR AROMATIC HYDROCARBONS

USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR22012-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 10, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB04-00	680-22012-1	Soil
2	68SB04-01	680-22012-2	Soil
3	68SB04-02	680-22012-3	Soil
4	68SB06-00	680-22012-4	Soil
5	68SB06-01	680-22012-5	Soil
6	68SB06-02	680-22012-6	Soil
7	68SB08-00	680-22012-7	Soil
8	68SB08-01	680-22012-8	Soil
9	68SB08-02	680-22012-9	Soil
10	68SB09-00	680-22012-10	Soil
11	68SB09-01	680-22012-11	Soil
12	68SB09-02	680-22012-12	Soil
13	68SB07-00	680-22012-15	Soil
14	68SB07-01	680-22012-16	Soil
15	68SB07-02	680-22012-17	Soil
16	68SB10-00	680-22012-18	Soil
16 MS	68SB10-00 MS	680-22012-18 MS	Soil
16 MSD	68SB10-00 MSD	680-22012-18 MSD	Soil
17	68SB10-00D	680-22012-19	Soil
18	68SB10-01	680-22012-20	Soil
19	68SB10-01D	680-22012-21	Soil
20	68SB10-02	680-22012-23	Soil
20 MS	68SB10-02 MS	680-22012-23 MS	Soil
20 MSD	68SB10-02 MSD	680-22012-23 MSD	Soil

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

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

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

Surrogates - All samples exhibited acceptable surrogate recoveries.

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

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

Method Blank - The method blanks exhibited the following contamination.

Blank ID	Compound	Conc. ug/kg	Action Level ug/kg	Qualifier	Affected Samples
680-60649/20-AA	Naphthalene	5.0	50	U	20

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

Blank ID	Compound	Conc. ug/L	Action Level ug/kg	Qualifier	Affected Samples
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	None	ND	-	-	-
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	Fluoranthene	0.080	14	None	All 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 with the exception of the following.

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
12/06/06	Fluoranthene	21%	J/UJ	20
	Benzo (a) pyrene	25%	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	68SB10-00 ug/kg	68SB10-00D ug/kg	RPD	Qualifier
None	ND	ND	-	-

Compound	68SB10-01 ug/kg	68SB10-01D ug/kg	RPD	Qualifier
None	ND	ND	-	-

PCBs
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR22012-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 10, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB04-00	680-22012-1	Soil
2	68SB04-01	680-22012-2	Soil
3	68SB04-02	680-22012-3	Soil
4	68SB06-00	680-22012-4	Soil
5	68SB06-01	680-22012-5	Soil
6	68SB06-02	680-22012-6	Soil
7	68SB08-00	680-22012-7	Soil
8	68SB08-01	680-22012-8	Soil
9	68SB08-02	680-22012-9	Soil
10	68SB09-00	680-22012-10	Soil
11	68SB09-01	680-22012-11	Soil
12	68SB09-02	680-22012-12	Soil
13	68SB07-00	680-22012-15	Soil
14	68SB07-01	680-22012-16	Soil
15	68SB07-02	680-22012-17	Soil
16	68SB10-00	680-22012-18	Soil
16 MS	68SB10-00 MS	680-22012-18 MS	Soil
16 MSD	68SB10-00 MSD	680-22012-18 MSD	Soil
17	68SB10-00D	680-22012-19	Soil
18	68SB10-01	680-22012-20	Soil
19	68SB10-01D	680-22012-21	Soil
20	68SB10-02	680-22012-23	Soil
20 MS	68SB10-02 MS	680-22012-23 MS	Soil
20 MSD	68SB10-02 MSD	680-22012-23 MSD	Soil

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

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

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

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

Sample ID	Surrogate	% R	Qualifier
2	TCX	29%	J/UJ

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

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

Method Blank - The method blanks were free of contamination.

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

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

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

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

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	68SB10-00 ug/kg	68SB10-00D ug/kg	RPD	Qualifier
None	ND	ND	-	-

Compound	68SB10-01 ug/kg	68SB10-01D ug/kg	RPD	Qualifier
None	ND	ND	-	-

GASOLINE RANGE ORGANICS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR22012-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 10, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB04-00	680-22012-1	Soil
2	68SB04-01	680-22012-2	Soil
3	68SB04-02	680-22012-3	Soil
4	68SB06-00	680-22012-4	Soil
5	68SB06-01	680-22012-5	Soil
6	68SB06-02	680-22012-6	Soil
7	68SB08-00	680-22012-7	Soil
8	68SB08-01	680-22012-8	Soil
9	68SB08-02	680-22012-9	Soil
10	68SB09-00	680-22012-10	Soil
11	68SB09-01	680-22012-11	Soil
12	68SB09-02	680-22012-12	Soil
13	68SB07-00	680-22012-15	Soil
14	68SB07-01	680-22012-16	Soil
15	68SB07-02	680-22012-17	Soil
16	68SB10-00	680-22012-18	Soil
16 MS	68SB10-00 MS	680-22012-18 MS	Soil
16 MSD	68SB10-00 MSD	680-22012-18 MSD	Soil
17	68SB10-00D	680-22012-19	Soil
18	68SB10-01	680-22012-20	Soil
19	68SB10-01D	680-22012-21	Soil
20	68TB02	680-22012-22	Water
21	68SB10-02	680-22012-23	Soil
21 MS	68SB10-02 MS	680-22012-23 MS	Soil
21 MSD	68SB10-02 MSD	680-22012-23 MSD	Soil
22	68TB03	680-22012-24	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 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
2006ER01 (SDG 22060-3)	None	ND	ND	-	-
2006ER02 (SDG 22060-3)	None	ND	ND	-	-
2006FB01 (SDG 22060-3)	None	ND	ND	-	-
2006FB02 (SDG 22060-3)	None	ND	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	68SB10-00 mg/kg	68SB10-00D mg/kg	RPD	Qualifier
GRO C6-C10	0.12 J	0.12 J	0%	None

Compound	68SB10-01 mg/kg	68SB10-10D mg/kg	RPD	Qualifier
None	ND	ND	-	-

DIESEL RANGE ORGANICS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22012-1

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 10, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB04-00	680-22012-1	Soil
2	68SB04-01	680-22012-2	Soil
3	68SB04-02	680-22012-3	Soil
4	68SB06-00	680-22012-4	Soil
5	68SB06-01	680-22012-5	Soil
6	68SB06-02	680-22012-6	Soil
7	68SB08-00	680-22012-7	Soil
8	68SB08-01	680-22012-8	Soil
9	68SB08-02	680-22012-9	Soil
10	68SB09-00	680-22012-10	Soil
11	68SB09-01	680-22012-11	Soil
12	68SB09-02	680-22012-12	Soil
13	68SB07-00	680-22012-15	Soil
14	68SB07-01	680-22012-16	Soil
15	68SB07-02	680-22012-17	Soil
16	68SB10-00	680-22012-18	Soil
16 MS	68SB10-00 MS	680-22012-18 MS	Soil
16 MSD	68SB10-00 MSD	680-22012-18 MSD	Soil
17	68SB10-00D	680-22012-19	Soil
18	68SB10-01	680-22012-20	Soil
19	68SB10-01D	680-22012-21	Soil
20	68SB10-02	680-22012-23	Soil
20 MS	68SB10-02 MS	680-22012-23 MS	Soil
20 MSD	68SB10-02 MSD	680-22012-23 MSD	Soil

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

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

Holding Times - All samples were 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
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	None	ND	-	-	-
2006FB01 (SDG 22060-3)	DRO C10-C28	0.052	8.75	None	All ND
2006FB02 (SDG 22060-3)	None	ND	-	-	-

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

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

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

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

Field Duplicates - Field duplicate results are summarized below.

Compound	68SB10-00 mg/kg	68SB10-00D mg/kg	RPD	Qualifier
None	ND	ND	-	-

Compound	68SB10-01 mg/kg	68SB10-01D mg/kg	RPD	Qualifier
None	ND	ND	-	-

METALS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22012-1

Client: CH2M Hill, Inc./Baker Environmental, Inc. Date: January 10, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68SB04-00	680-22012-1	Soil
2	68SB04-01	680-22012-2	Soil
3	68SB04-02	680-22012-3	Soil
4	68SB06-00	680-22012-4	Soil
5	68SB06-01	680-22012-5	Soil
6	68SB06-02	680-22012-6	Soil
7	68SB08-00	680-22012-7	Soil
8	68SB08-01	680-22012-8	Soil
9	68SB08-02	680-22012-9	Soil
10	68SB09-00	680-22012-10	Soil
11	68SB09-01	680-22012-11	Soil
12	68SB09-02	680-22012-12	Soil
13	68SB07-00	680-22012-15	Soil
14	68SB07-01	680-22012-16	Soil
15	68SB07-02	680-22012-17	Soil
16	68SB10-00	680-22012-18	Soil
16 MS	68SB10-00 MS	680-22012-18 MS	Soil
16 MSD	68SB10-00 MSD	680-22012-18 MSD	Soil
17	68SB10-00D	680-22012-19	Soil
18	68SB10-01	680-22012-20	Soil
19	68SB10-01D	680-22012-21	Soil
20	68SB10-02	680-22012-23	Soil
20 MS	68SB10-02 MS	680-22012-23 MS	Soil
20 MSD	68SB10-02 MSD	680-22012-23 MSD	Soil

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

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

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

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

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

Compound	%R - High/Low	Qualifier	Affected Samples
RUN1 Tin 11/21-11/22	69% - Low	J/UJ	6, 8, 11
Zinc 11/21-11/22	55% - Low	None	All > 2X CRDL
RUN2 Tin 11/25-11/26	60% - Low	J/UJ	1-5, 7, 9-10, 12-20

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

Compound	Conc.	Action Level mg/kg	Qualifier	Affected Samples
RUN1 Copper 11/21-11/22	0.412 J ug/L	0.412	None	>CRDL
Copper PBS-2	0.0433 mg/kg	0.0433	None	All >CRDL
Mercury	0.0972 ug/L	0.0049	U	9, 11
RUN2 Nickel 11/25-11/26	0.033 J ug/L	0.033	U	2-3, 7, 14, 16, 17

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

Compound	% R	Qualifier	Affected Samples
Zinc	128%	J	6, 8, 11
Chromium	120.3%	None	Qualified due to MS/MSD
Zinc	125%/124%	J	1-5, 7, 9-10, 12-20

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

MS Sample ID	Compound	%R	Qualifier	Affected Samples
16	Antimony	OK/74%/OK	J/UJ	1-5, 7, 9-10, 12-20
20	Antimony	60%/60%/OK	J/UJ	
	Barium	94%/296%/81	J/R	
	Cobalt	6%/137%/40	J/R	
	Copper	OK/132%/OK	None	
	Mercury	136%/128%/OK	J	1-8, 10, 12-20

MS Sample ID	Compound	%R	Qualifier	Affected Samples
Reference 1	Chromium	69%/OK/OK	J/UJ	6, 8, 11
	Tin	184%/185%/OK	None	All ND

Field Duplicates - Field duplicate results are summarized below.

Compound	68SB10-00 mg/kg	68SB10-00D mg/kg	RPD or Difference	Qualifier
Arsenic	1.9 J	2.4 J	0.5	None
Barium	53	59	11%	
Beryllium	0.21 J	0.26 j	0.05	
Cadmium	0.39 J	0.57 J	0.18	
Chromium	20	22	10%	
Cobalt	12	13	1	
Copper	28	30	7%	
Lead	5.1	5.3	0.2	
Mercury	0.049	0.052	0.003	
Selenium	0.73 J	0.79 J	0.06	
Vanadium	85	94	10%	
Zinc	42	44	5%	

Compound	68SB10-01 mg/kg	68SB10D mg/kg	RPD or difference	Qualifier
Antimony	0.85 J	1.8 J	0.95	None
Barium	26	52	67%	None- qualified due to MS/MSD
Beryllium	0.34 J	0.36 J	0.02	None
Cadmium	1.1 U	0.087 J	NC	
Chromium	23	22	4%	None - Qualified due to MS/MSD
Cobalt	4.7	13	8.3	
Copper	32	34	6%	None
Lead	1.9	2.9	1	
Mercury	0.11	0.082	0.028	
Nickel	9.6	11	14%	
Selenium	2.2 U	0.22 J	NC	
Vanadium	98	130	28%	
Zinc	48	43	11%	

LCS - The LCS samples exhibited acceptable %R values.

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

ICP Sample ID	Compound	%D	Qualifier	Affected Samples
Reference 1	Barium	11.4	J	6, 8, 11
	Chromium	12.8	None	Qualified due to MS/MSD
	Vanadium	17.0	J	6, 8, 11

ICP Sample ID	Compound	%D	Qualifier	Affected Samples
Reference 1	Copper	10.4	None	Qualified due to FB

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

Blank ID	Compound	Conc. ug/L	Action Level ug/kg	Qualifier	Affected Samples
2006ER01 (SDG 22060-3)	None	ND	-	-	-
2006ER02 (SDG 22060-3)	Nickel	0.26 J	None	None	< CRDL
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	Copper	79	158	J	1-20
	Lead	0.69J	None	None	< CRDL

Compound Quantitation - All ICP MS analytes were analyzed at a 2X dilution

APPENDIX C.3
STL SAVANNAH SDG 22012-5

VOLATILE ORGANIC COMPOUNDS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO 121, Ceiba, PR SDG #: NAPR 22012-5

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 15, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68TW05	680-22012-13	Water
1 MS	68TW05 MS	680-22012-13 MS	Water
1 MSD	68TW05 MSD	680-22012-13 MSD	Water
2	68TW05D	680-22012-14	Water
3	68TW04	680-22060-10	Water
4	68TW07	680-22060-11	Water
5	68TW09	680-22060-12	Water
6	68TW01	680-22060-13	Water
7	68TW02	680-22060-14	Water
8	68TW08	680-22060-15	Water
9	68TW10	680-22060-16	Water
10	68TW06	680-22060-40	Water

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

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

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

Surrogates - All samples exhibited acceptable surrogate recoveries.

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

MS/MSD Sample ID	Compound	MS/MSD %R/RPD	Qualifier
1	Dichlorodifluoromethane	59%/59%/OK	J/UJ
	Methyl isobutyl ketone	134%/144%/OK	None - Sample ND
	1,1,1,2-Tetrachloroethane	111%/113%/OK	None - Sample ND
	1,1,2,2-Tetrachloroethane	OK/131%/OK	None - Sample ND
	1,1,2-Trichloroethane	OK/123%/OK	None - Sample ND

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

LCS ID	Compound	%R	Qualifier	Affected Samples
680-60932/2	Methyl isobutyl ketone	134%	None	All ND
	1,1,1,2-Tetrachloroethane	110%	None	
680-60979/2	Methyl isobutyl ketone	136%	None	
	1,1,1,2-Tetrachloroethane	109%	None	

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
2006ER04 (SDG 22060-3)	Toluene	2.2	22	None	All ND
68TB02	Bromoform	1.0	5.0	None	
	Chlorodibromomethane	0.85	4.25	None	
68TB03	None	ND	-	-	-
27TB01	None	ND	-	-	-

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

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

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

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

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

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/03/06	Isobutanol	0.023	J/R	1-10

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

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/27/06 1055	Isobutanol	RRF 0.030/31% D	None	Qualified due to ICAL
	Pentachloroethane	49% D	J/UJ	1-6, 8-10
11/27/06 1125	Dichlorodifluoromethane	43% D	J/UJ	2-6
	Bromomethane	41% D	J/UJ	1-6
	4-methyl-2-Pentanone	26%	J/UJ	
11/27/06 2220/2151	Dichlorodifluoromethane	38% D	J/UJ	7
	Bromomethane	28% D	J/UJ	
	4-Methyl-2-Pentanone	23% D	J/UJ	
	Isobutanol	RRF 0.032/42% D	None	Qualified due to ICAL
	trans-1,4-Dichloro-2-butene	29% D	J/UJ	7
	Pentachloroethane	59% 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	68TW05 ug/L	68TW05D ug/L	RPD	Qualifier
None	ND	ND	-	-

SEMIVOLATILE ORGANIC COMPOUNDS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22012-5

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 15, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68TW05	680-22012-13	Water
2	68TW05D	680-22012-14	Water
3	68TW04	680-22098-3	Water
4	68TW07	680-22098-5	Water
5	68TW08	680-22098-6	Water
6	68TW09	680-22098-7	Water
7	68TW10	680-22098-8	Water
8	68TW06	680-22060-40	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 except the following.

Sample ID	Surrogate	%R	Qualifier
7	2-Fluorophenol	54%	None for only 1 out

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

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

Method Blank - The method blanks were free of contamination.

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

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
2006FB01 (SDG 22060-3)	1,4-Dichlorobenzene	0.53	2.65	None	All ND
	Diethyl phthalate	0.69	6.9	U	6
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 with the exception of the following.

ICAL Date	Compound	%RSD/RRF	Qualifier	Affected Samples
11/24/06	a,a-Dimethyl phenethylamine	30% RSD	None	All ND
	1,3,5-Trinitrobenzene	23% RSD	None	
	4-Nitroquinoline-1-oxide	RRF 0.032	J/R	3-8
	Methapyrilene	35% RSD	None	All ND
11/18/06	2-Picoline	20% RSD	None	
	a,a-Dimethyl phenethylamine	30% RSD	None	
	Methapyrilene	17% RSD	None	
	Aramite, total	21% RSD	None	

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

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
11/28/06 (E) 0649/0714/0737	1,3,5-Trinitrobenzene	51% D	J/UJ	3, 4, 6, 7
	4-Nitroquinoline-1-oxide	RRF 0.025/21% D	None	Qualified due to ICAL
	Hexachlorophene	41% D	J/UJ	3, 4, 6, 7
	Phorate	33% D	J/UJ	
	Dimethoate	20% D	J/UJ	
11/29/06 (E)	1,4-Dioxane	31% D	J/UJ	5, 8
	2,4-Dinitrophenol	22% D	J/UJ	
	a,a-Dimethyl phenethylamine	26% D	J/UJ	
	o,o',o''-Triethylphosphorothioate	25% D	J/UJ	
	Phorate	34% D	J/UJ	
	Dimethoate	23% D	J/UJ	
11/24/06 (G)	2-Picoline	24% D	J/UJ	2
	a,a-Dimethyl phenethylamine	22% D	J/UJ	
	1,3,5-Trinitrobenzene	53% D	J/UJ	
11/25/06 (G) 0745/0818/0846	2-Picoline	28% D	J/UJ	1
	Methapyrilene	37% D	J/UJ	
	Aramite, total	36% D	J/UJ	
	Methyl parathion	29% 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	68TW05 ug/L	68TW05D ug/L ug/L	RPD	Qualifier
None	ND	ND	-	-

POLYNUCLEAR AROMATIC HYDROCARBONS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22012-5

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 15, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68TW05	680-22012-13	Water
1 MS	68TW05 MS	680-22012-13 MS	Water
1 MSD	68TW05 MSD	680-22012-13 MSD	Water
2	68TW05D	680-22012-14	Water
3	68TW02	680-22098-2	Water
4	68TW04	680-22098-3	Water
5	68TW07	680-22098-5	Water
6	68TW08	680-22098-6	Water
7	68TW09	680-22098-7	Water
8	68TW10	680-22098-8	Water
9	68TW06	680-22060-40	Water

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

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

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

Surrogates - All samples exhibited acceptable surrogate recoveries.

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

MS/MSD Sample ID	Compound	MS/MSD %R/RPD	Qualifier
68TW05	Benzo (b) pyrene	22%/Ok/103	UJ
	Benzo (b) fluoranthene	Ok/Ok/55	None for RPD alone
	Benzo (g,h,i) perylene	Ok/Ok/93	None for RPD alone
	Benzo (k) fluoranthene	Ok/Ok/68	None for RPD alone
	Dibenz (a,h) anthracene	21%/Ok/90	UJ
	Indeno (1,2,3-cd) pyrene	14%/Ok/90	

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

Method Blank - The method blanks exhibited the following contamination except the following.

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
680-60424/7-AA	Benzo (a) anthracene	0.036	0.18	None	All ND
	Fluoranthene	0.020	0.10	None	

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

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
2006FB01	None	ND	-	-	-
2006FB02	Fluoranthene	0.08	0.40	None	All ND
2006ER04	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	68TW05 ug/L	68TW05D ug/L	RPD	Qualifier
None	ND	ND	-	-

PCBs
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR22012-5

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 15, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68TW05	680-22012-13	Water
1 MS	68TW05 MS	680-22012-13 MS	Water
1 MSD	68TW05 MSD	680-22012-13 MSD	Water
2	68TW05D	680-22012-14	Water
3	68TW01	680-22098-1	Water
4	68TW04	680-22098-3	Water
5	68TW07	680-22098-5	Water
6	68TW08	680-22098-6	Water
7	68TW09	680-22098-7	Water
8	68TW10	680-22098-8	Water
9	68TW06	680-22060-40	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 14 days for soil samples and analyzed within 40 days.

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

Sample ID	Surrogate	% R	Qualifier
2	DCB	18%	J/UJ
3	DCB	22%	J/UJ
4	DCB	29%	J/UJ
5	DCB	22%	J/UJ

Sample ID	Surrogate	% R	Qualifier
7	DCB	27%	J/UJ

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

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

Method Blank - The method blanks were free of contamination.

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

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

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

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

Analytical Sequence Check - No discrepancies were identified.

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

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

Compound Quantitation - No discrepancies were identified.

Field Duplicates - Field duplicate results are summarized below.

Compound	68TW05 ug/L	68TW05D ug/L	RPD	Qualifier
None	ND	ND	-	-

GASOLINE RANGE ORGANICS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22012-5

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 15, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68TW05	680-22012-13	Water
1 MS	68TW05 MS	680-22012-13 MS	Water
1 MSD	68TW05 MSD	680-22012-13 MSD	Water
2	68TW05D	680-22012-14	Water
3	68TW04	680-22060-10	Water
4	68TW07	680-22060-11	Water
5	68TW09	680-22060-12	Water
6	68TW01	680-22060-13	Water
7	68TW02	680-22060-14	Water
8	68TW08	680-22060-15	Water
9	68TW10	680-22060-16	Water
10	68TW06	680-22060-40	Water

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

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

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

Surrogates - All samples exhibited acceptable surrogate recoveries.

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

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

Method Blank - The method blanks were free of contamination.

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

Blank ID	Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
2006FB01 (SDG 22060-3)	None	ND	-	-	-
2006FB02 (SDG 22060-3)	None	ND	-	-	-
2006ER04 (SDG 22060-3)	None	ND	-	-	-
68TB02	None	ND	-	-	-
68TB03	None	ND	-	-	-
27TB01	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	68TW05 ug/L	68TW05D ug/L	RPD	Qualifier
None	ND	ND	-	-

DIESEL RANGE ORGANICS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22012-5

Client: CH2M HILL, Inc./Baker Environmental, Inc. Date: January 16, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68TW05	680-22012-13	Water
1 MS	68TW05 MS	680-22012-13 MS	Water
1 MSD	68TW05 MSD	680-22012-13 MSD	Water
2	68TW05D	680-22012-14	Water
3	68TW01	680-22098-1	Water
4	68TW02	680-22098-2	Water
5	68TW04	680-22098-3	Water
6	68TW07	680-22098-5	Water
7	68TW08	680-22098-6	Water
8	68TW09	680-22098-7	Water
9	68TW10	680-22098-8	Water
10	68TW06	680-22060-10	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 extracted within 7 days for water samples and analyzed within 40 days.

Surrogates - All samples exhibited acceptable surrogate recoveries.

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

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

Method Blank - The method blanks were free of contamination.

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

Blank ID	Compound	Conc. mg/L	Action Level mg/L	Qualifier	Affected Samples
2006ER04	None	ND	-	-	-
2006FB01	DRO C10-C28	0.052	0.26	U	3-10
2006FB02	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	68TW05 ug/L	68TW05D ug/L	RPD	Qualifier
None	ND	ND	-	-

TOTAL AND DISSOLVED METALS
USEPA Region II - Level IV Review

Site: RCRA Facility Investigation, CTO-121, Ceiba, PR SDG #: NAPR 22012-5

Client: CH2M Hill, Inc./Baker Environmental, Inc. Date: January 16-17, 2007

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

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	68TW05	680-22012-13	Water
1F	68TW05F	680-22012-13F	Water
1F MS	68TW05F MS	680-22012-13F MS	Water
1F MSD	68TW05F MSD	680-22012-13F MSD	Water
2	68TW05D	680-22012-14	Water
2F	68TW05DF	680-22012-14F	Water
3	68TW01	680-22098-1	Water
3F	68TW01F	680-22098-1F	Water
4	68TW02F	680-22098-2F	Water
5	68TW04	680-22098-3	Water
5F	68TW04F	680-22098-3F	Water
6	68TW07	680-22098-5	Water
6F	68TW07F	680-22098-5F	Water
7	68TW08	680-22098-6	Water
7F	68TW08F	680-22098-6F	Water
8F	68TW09F	680-22098-7F	Water
9	68TW10	680-22098-8	Water
9F	68TW10F	680-22098-8F	Water
10	68TW06	680-22060-40	Water
10F	68TW06F	680-22060-40F	Water

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

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

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

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

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

Compound	%R - High/Low	Qualifier	Affected Samples
Tin 11/25	60% - Low	J/UJ	1-3, 5-7, 9-10
Tin 12/5-12/6	60% - Low	J/UJ	1F-10F
Mercury 11/28-11/29	145% - High	J	2

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

Compound	Conc. ug/L	Action Level ug/L	Qualifier	Affected Samples
Barium PBW-2	1.19 J	1.19	None	All > CRDL
Barium PBW-1	1.26 J	1.26	None	
Nickel PBW-1	0.22 J	0.22	U	1-3, 5-7, 9-10
Selenium 11/25	0.379 J	0.379	U	3, 5, 7, 9
Thallium 11/25	0.059	0.059	U	1
Thallium 12/5-12/6	0.064 J	0.064	U	1F-2F

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

Compound	%R	Qualifier	Affected Samples
Zinc total	125%	J	1-3, 5-7, 9-10
Cadmium dissolved	77%/78%	None	All ND
Silver dissolved	77%/75%	None	
Zinc dissolved	OK/129%	J	1F-10F

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

MS Sample ID	Compound	%R	Qualifier	Affected Samples
1	Barium	138%/162%/OK	J	1-3, 5-7, 9-10
	Vanadium	135%/175%/21	J	
	Chromium	OK/128%/OK	J	
	Cobalt	OK/128%/OK	J	
	Copper	OK/136%/OK	None	Qualified due to FB
	Zinc	OK/131%/OK	None	Qualified due to ICS interference

Field Duplicates - Field duplicate results are summarized below.

Compound	68TW05 ug/L	68TW05D ug/L	RPD or difference	Qualifier
Barium	62	84	30%	Qualified due to MS/MSD
Chromium	8.2 J	8.1 J	0.1	
Cobalt	3.9 J	8.5 J	4.6	
Lead	0.66 J	0.96 J	0.30	
Mercury	0.20 U	0.13 J	NC	
Vanadium	34	33	3%	
Zinc	21	22	5%	

Compound	68TW05F ug/L	68TW05F D ug/L	RPD or difference	Qualifier
Barium	39	40	3%	None
Cobalt	1.4 J	0.89 J	0.51	
Nickel	0.96 J	0.99 J	0.03	
Vanadium	3.7 J	3.8 J	0.1	
Zinc	4.8 J	5.4 J	0.60	

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
1	Cobalt	13% D	None	Qualified due to MS/MSD

Total versus dissolved - The following filtered results were greater than the total results.

Compound	68TW07 ug/L	68TW07F ug/L	%D	Action
Barium	68	74	9%	None <20%

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

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

Compound Quantitation - No discrepancies were identified.

APPENDIX C.4
PUERTO RICAN CHEMIST CERTIFICATION

PUERTO RICO CERTIFICATION

I Herby certify that I have reviewed the Quality Assurance Data for Project Number **680-22001-1**, and to the best of my knowledge, the results are correct and reliable.

Abraham Ortiz



PUERTO RICO CERTIFICATION

I Herby certify that I have reviewed the Quality Assurance Data for Project Number **680-22012-1**, and to the best of my knowledge, the results are correct and reliable.

Abraham Ortiz



PUERTO RICO CERTIFICATION

I Herby certify that I have reviewed the Quality Assurance Data for Project Number **680-22012-5**, and to the best of my knowledge, the results are correct and reliable.

Abraham Ortiz



DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

November 16, 2007
SDG# PRN-30548-3, Test America-Savannah
NAPR Base Landfill, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # PRN-30548-3. The data validation was performed in accordance with the SW-846 method utilized by the laboratory (6010B) and professional judgment. This method does not have an applicable Region II checklist SOP so worksheets were provided. Specific method requirements, Region II flagging conventions and professional judgment were used to validate the results. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	As
68SS01	680-30548-14	soil	X
68SS01 D	680-30548-15	soil	X
68SS02	680-30548-16	soil	X
68SS03	680-30548-17	soil	X
68SS04	680-30548-18	soil	X
68SS05	680-30548-19	soil	X
68ER01	680-30548-20	soil	X
68SS01MS	680-30548-14MS	soil	X
68SS01MSD	680-30548-14MSD	soil	X

The following quality control samples were provided with this SDG: sample 68ER01-equipment blank and sample 68SS01 D-field duplicate of sample 68SS01.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Technical Holding Times *
- Initial/Continuing Calibrations *
- CRDL Standards *
- ICSA/ICSAB Recoveries *
- Blanks *
- Laboratory Control Samples *

- Matrix Spike Recoveries *
- Matrix Duplicate RPDs *
- Field Duplicates *
- Identification/Quantitation *
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria.

Arsenic

No qualifications were required.

Specific Evaluation of Data

Data Completeness

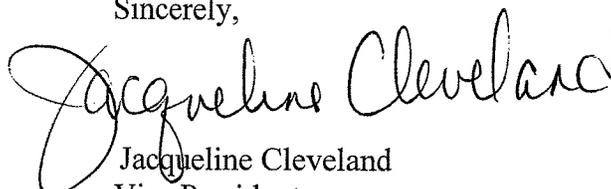
The SDG was received complete and intact.

Technical Holding Times

According to chain of custody records, sampling was performed on 09/27/07 and samples were received at the laboratory 09/28/07. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

There was no qualification of the data reported in this SDG required. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,


Jacqueline Cleveland
Vice President

Michael Baker, Jr., Inc.
NAPR Base Landfill, Puerto Rico
SDG #s PRN-30548-1 & PRN-30548-2

Summary of Data Qualifications

Arsenic

Sample ID	Analyte	Results	Q flag
No qualifications were required			

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
R	result is rejected; the presence or absence of the analyte cannot be verified
D	result value is based on dilution analysis result
NJ	analyte has been tentatively identified, estimated value
L	analyte present, biased low
UL	not detected, quantitation limit is probably higher
K	analyte present, biased high

Method/Preparation Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the sample RL and is greater than 5X (10X for common laboratory contaminants) the blank value. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U	The sample result for the blank contaminant is greater than the sample RL and is less than 5X (10X for common laboratory contaminants) the blank value.
CRQL	The sample result for the blank contaminant is less than the sample RL and is less than 5X (10X for common laboratory contaminants) the blank value.

General Abbreviations

RL	reporting limit
IDL	instrument detection limit
MDL	method detection limit
CRDL	contract required detection limit
CRQL	contract required quantitation limit
+	positive result
-	non-detect result

This SDG contains total metals analysis for Arsenic only using SW-846 method 6010B. Region II validation guidelines were used as applicable, however, the Region has not developed an SOP for this method so these worksheets are used as an alternative.

HOLDING TIMES

Sampling Date: 9/27
Received Date: 9/28 Cooler temps OK, receipt documentation present
Prep. Dates: 10/3 W, 10/5 S
Analysis Dates: 10/3 W, 10/9-10/07 S

All holding time requirements were met.

CALIBRATIONS

All initial calibration criteria were met for the methods noted above. All ICV and CCV criteria were met (90-110% for As). CRI standard criteria were met (70-130% for As). All ICSA/ICSAB results were within method criteria. Raw data was verified.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- See blank type specific validation guidelines noted below (taken from the Region II SOP for CLP metals and adapted to this project).
- Qualification/Action codes:

ICB/CCB/PB Action:

- No Action - The sample result is greater than the CRDL and greater than ten times (10X) the blank value.
- U - The sample result is greater than or equal to the MDL but less than or equal to the CRDL, result is reported as non-detect at the reported concentration, when the field blank result is less than the CRDL.
- R - Sample result is greater than the CRDL and less than the field blank value when the field blank result is greater than the CRDL.
- J/UJ - Sample result is less than 10X CRDL when blank result is below the negative MDL.
- J - Sample result is greater than the field blank value but less than 10X the field blank value when field blank result is greater than the CRDL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results. Do not use rinsate blank associated with soils to qualify water samples and vice versa.

DataQual

Worksheets –Arsenic only

- No Action - The sample result is greater than the CRDL and greater than ten times (10X) the blank value.
- U - The sample result is greater than or equal to the MDL but less than or equal to the CRDL when the field blank result is greater than the CRDL - result is reported as non-detect at the reported concentration.
- R - Sample result is greater than the CRDL and less than the field blank value when the field blank result is greater than the CRDL.
- J - Sample result is greater than the field blank value but less than 10X the field blank value when field blank result is greater than the CRDL.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	Q Flag
No qualifications			

See validation report for specific samples and qualifications. Only those analytes requiring action are listed here. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment. Field QC blank associations are determined using tracking provided by the client. Flags are applied to samples based on these associations. The concentration noted for the CCBs is the highest concentration in all the associated CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.

MATRIX SPIKE/DUPLICATE SUMMARY

The matrix spike of sample 68SS01 analyzed for soils exhibited compliant recoveries for arsenic. The batch QC spike pair submitted for the QC blank exhibited acceptable results.

All LCS results were within laboratory QC limits.

SERIAL DILUTIONS

The serial dilution analysis of sample 68SS01 exhibited acceptable %Ds for all analytes.

FIELD DUPLICATE SAMPLE SUMMARY

Note: All reported results are noted in the table below because the client requested that the MDL be used as reporting limit instead of the CRDL for this project. However, field duplicate results are assessed for qualification of results only if both results are above the CRDL.

Sample ID: 68SS01 Duplicate Sample ID: 68SS01

Analyte	Sample Conc.	Duplicate Conc.	RPD
arsenic	1.2	1.3	8%

Comments:

SAMPLE CALCULATION

EPA SAMPLE ID: 68SS05

COMPOUND: arsenic

CONCENTRATION: 1.9 mg/Kg

%Solids - 80.5

1.09g to 100 ml

Raw Data result: $16.81343 \text{ ug/L} * 0.100\text{L}/1.09\text{g} * 1/0.805 = 1.9162 \text{ mg/Kg}$

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments.

Reviewer

Jacqueline Cleveland

Date: 11/16/07

SWMU 3
PRN30548-3
Arsenic
Page 3 of 3

CASE NARRATIVE

Metals Fraction (6010B)

SDG: PRN30548-3

STL Lab Reference No.: 680-30548-3

Project: Base Landfill-Appendix I

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

- A. Sample Preparation: All holding times were met.
- B. Sample Analysis: All holding times were met.

III. METHODS

Preparation: SW-846 6010B

Cleanup: none

Analysis: SW-846 6010B

IV. PREPARATION

Sample preparation proceeded normally. Aqueous samples were prepared in batch 680-87200 for ICP metals (3005A). Soil/solid samples were prepared in batches 680-87473 for ICP metals (3050E).

V. ANALYSIS

- A. Calibration: All initial calibration criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Spikes: Laboratory control standards (LCS) for ICP metals were digested in prep batches 680-87200 and 680-87473 and analyzed with the samples in this package. All acceptance criteria were met.

Sample 680-30548-14 (68SS01) was the designated matrix spike/ matrix spike duplicate (MS/MSD) for the soil/solid ICP metals analysis. All acceptance criteria were met.

A non-client sample was used as the batch MS/MSD for the ICP metals analysis of batch 680-87200, and all acceptance criteria were met.

- D. Samples: Sample dilutions were not required for the samples in this sample delivery group.
- E. Other: Serial dilutions and analytical spikes were analyzed for the soil/solid and aqueous batches and all acceptance criteria were met.

APPENDIX C.6
STL SAVANNAH SDG # SWMU31377

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

December 10, 2007
SDG# SWMU31377, Test America-Savannah
NAPR Base Landfill, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # SWMU31377. The data validation was performed in accordance with the SW-846 method utilized by the laboratory (6010B) and professional judgment. This method does not have an applicable Region II checklist SOP so worksheets were provided. Specific method requirements, Region II flagging conventions and professional judgment were used to validate the results. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	Pb
68SS07	680-31377-1	soil	X
68SS08	680-31377-2	soil	X
68SS09	680-31377-3	soil	X
68SS09MD	680-31377-3MD	soil	X
68SS09MS	680-31377-3MS	soil	X
68SS09D	680-31377-4	soil	X
68SS10	680-31377-5	soil	X
68SS11	680-31377-6	soil	X
68SS12	680-31377-7	soil	X
68SS13	680-31377-8	soil	X
68SS15	680-31377-10	soil	X
68SS15MD	680-31377-10MD	soil	X
68SS15MS	680-31377-10MS	soil	X
68SS17	680-31377-12	soil	X
68SS06	680-31377-18	soil	X
68PBER01	680-31377-19	water	X
68PBFB01	680-31377-20	water	X

The following quality control samples were provided with this SDG: sample 68PBER01-equipment blank, sample 68PBFB01-field blank, and sample 68SS09D-field duplicate of sample 68SS09.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Technical Holding Times *
- Initial/Continuing Calibrations *

- CRDL Standards *
- ICSA/ICSAB Recoveries *
- Blanks *
- Laboratory Control Samples *
- Matrix Spike Recoveries *
- Matrix Duplicate RPDs *
- Field Duplicates *
- Identification/Quantitation *
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria.

Lead

There were no qualifications required. Please note the following:

All sample values were above the analyte RL of 0.57 mg/Kg. The preparation blank concentrations were between the MDL and the RL – so only results less than the RL of 0.57 mg/Kg (adjusted for sample aliquot and solids) required qualification based on Region II flagging conventions.

In the MS/MSD pairs slight non-compliance was noted in the MSD of one pair and the MS of the other pair spiked for the soil matrix. There was an acceptable spike recovery in the other spike aliquot of both pairs. Also, all LCS recoveries were acceptable. Therefore, the field sample results were not qualified.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact.

Technical Holding Times

According to chain of custody records, sampling was performed on 10/24/07 and samples were received at the laboratory 10/25/07. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Michael Baker, Jr., Inc.
 NAPR Base Landfill, Puerto Rico
 SDG #SWMU31377
 Page 2

There was no qualification of the data reported in this SDG required. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,


Jacqueline Cleveland
Vice President

Summary of Data Qualifications

Lead

Sample ID	Analyte	Results	Q flag
No qualifications were required			

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
R	result is rejected; the presence or absence of the analyte cannot be verified
D	result value is based on dilution analysis result
NJ	analyte has been tentatively identified, estimated value
L	analyte present, biased low
UL	not detected, quantitation limit is probably higher
K	analyte present, biased high

Method/Preparation Blank Qualification Flags (Q-Flags)

Metals ICB/CCB/PB Action:

No Action -	The sample result is greater than the CRDL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the CRDL, result is reported as non-detect at the reported concentration, when the blank result is less than the CRDL.
R -	Sample result is greater than the CRDL and less than the field blank value when the blank result is greater than the CRDL.
J/UJ -	Sample result is less than 10X CRDL when blank result is below the negative MDL.
J -	Sample result is greater than the blank value but less than 10X the blank value when blank result is greater than the CRDL.

General Abbreviations

RL	reporting limit
IDL	instrument detection limit
MDL	method detection limit
CRDL	contract required detection limit
CRQL	contract required quantitation limit
+	positive result
-	non-detect result

This SDG contains total metals analysis for Arsenic only using SW-846 method 6010B. Region II validation guidelines were used as applicable, however, the Region has not developed an SOP for this method so these worksheets are used as an alternative.

HOLDING TIMES

Sampling Date: 10/24
Received Date: 10/25
Prep. Dates: 10/29, 11/8
Analysis Dates: 11/2-11/3 & 11/8

Cooler temps OK, receipt documentation present

All holding time requirements were met.

CALIBRATIONS

All initial calibration criteria were met for the methods noted above. All ICV and CCV criteria were met (90-110% for Pb). CRI standard criteria were met (70-130% for Pb). All ICSA/ICSAB results were within method criteria. Raw data was verified.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- See blank type specific validation guidelines noted below (taken from the Region II SOP for CLP metals and adapted to this project).
- Qualification/Action codes:

ICB/CCB/PB Action:

- No Action - The sample result is greater than the CRDL and greater than ten times (10X) the blank value.
- U - The sample result is greater than or equal to the MDL but less than or equal to the CRDL, result is reported as non-detect at the reported concentration, when the blank result is less than the CRDL.
- R - Sample result is greater than the CRDL and less than the field blank value when the blank result is greater than the CRDL.
- J/UJ - Sample result is less than 10X CRDL when blank result is below the negative MDL.
- J - Sample result is greater than the blank value but less than 10X the blank value when blank result is greater than the CRDL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results. Do not use rinsate blank associated with soils to qualify water samples and vice versa.

- No Action - The sample result is greater than the CRDL and greater than ten times (10X) the blank value.

DataQual

Worksheets –Lead Only

- U - The sample result is greater than or equal to the MDL but less than or equal to the CRDL when the field blank result is greater than the CRDL - result is reported as non-detect at the reported concentration.
- R - Sample result is greater than the CRDL and less than the field blank value when the field blank result is greater than the CRDL.
- J - Sample result is greater than the field blank value but less than 10X the field blank value when field blank result is greater than the CRDL.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	Q Flag
No qualifications were required *			

See validation report for specific samples and qualifications. Only those analytes requiring action are listed here. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment. Field QC blank associations are determined using tracking provided by the client. Flags are applied to samples based on these associations. The concentration noted for the CCBs is the highest concentration in all the associated CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.

* All sample values were above the analyte RL of 0.57 mg/Kg. The preparation blank concentrations were between the MDL and the RL – so only results less than the RL of 0.57 mg/Kg (adjusted for sample aliquot and solids) required qualification based on Region II flagging conventions.

MATRIX SPIKE/DUPLICATE SUMMARY

The matrix spike pair of sample 68SS15 analyzed for soils exhibited a non-compliant recovery in the MSD for Pb (68%) and the matrix spike pair of sample 68SS09 analyzed for soils exhibited a non-compliant recovery in the MS for Pb (132%). Because the non-compliance was slight in both cases and there was an acceptable spike recovery in the other spike aliquot of both pairs the field sample results were not qualified. The batch QC spike pair submitted for the QC blank exhibited acceptable results.

All LCS results were within laboratory QC limits.

SERIAL DILUTIONS

The serial dilution analysis of samples 68SS09, 68SS15, and 68PBER01 exhibited acceptable %Ds for lead.

FIELD DUPLICATE SAMPLE SUMMARY

Note: All reported results are noted in the table below because the client requested that the MDL be used as reporting limit instead of the CRDL for this project. However, field duplicate results are assessed for qualification of results only if both results are above the CRDL.

Sample ID: 68SS09 Duplicate Sample ID: 68SS09

Analyte	Sample Conc.	Duplicate Conc.	RPD
lead	95	85	11%

Comments:

SAMPLE CALCULATION

EPA SAMPLE ID: 68SS10

COMPOUND: lead

CONCENTRATION: 66 mg/Kg

%Solids - 79.5

1.20g to 100 ml

Raw Data result: $628.46 \text{ ug/L} * 0.100\text{L}/1.20\text{g} * 1/0.795 = 65.876 \text{ mg/Kg}$

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments.

Reviewer

Regina A Cleveland

Date: 12/10/07

SWMU 3
SWMU31377
Lead
Page 3 of 3

CASE NARRATIVE

Metals Fraction (6010B)

SDG:SWMU31377

STL Lab Reference No.: 680-31377-1

Project: SWMU 68 Pb

I. RECEIPT

No receipt or storage anomalies were noted.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Preparation: SW-846 3005A/3050B

Cleanup: none

Analysis: SW-846 6010B

IV. PREPARATION

Sample preparation proceeded normally. Aqueous samples were prepared in batches 680-81558 and 680-89462 for ICP metals (3005A). Soil/ solid samples were prepared in batches 680-89522 and 680-90368 for ICP metals (3050b).

V. ANALYSIS

A. Calibration: All initial calibration criteria were met.

B. Blanks: Due to a result above the Method Detection Limit (MDL) in the preparation blank for batch 680-90368, all associated results were flagged with a "B" qualifier for lead.

C. Spikes: A laboratory control standard (LCS) for ICPMS metals was digested in each of the prep batches and analyzed with the samples in this package. All acceptance criteria were met.

Sample 680-31377-3 was the designated matrix spike/ matrix spike duplicate (MS/MSD) for the ICP metals analysis of batch 680-89522. The MS percent recovery was outside of control limits for lead. This is denoted by an "F" qualifier.

Sample 680-31377-10 was used as the batch MS/MSD for the ICP metals analysis of batch 680-90368. The MSD percent recovery was outside of control limits for lead. This is denoted by an "F" qualifier.

A non-client sample was used as the batch MS/MSD for the ICP metals analysis of batch 680-89462. All acceptance criteria were met.

D. Samples: All acceptance criteria were met.

E. Other: Sample 680-31377-3 was used as the batch serial dilution and post-digestion spike for the ICP metals analysis of batch 680-89522. All acceptance criteria were met.

Sample 680-31377-10 was used as the batch serial dilution and post-digestion spike for the ICP metals analysis of batch 680-90368. All acceptance criteria were met.

Sample 680-31377-19 was used as the batch serial dilution and post-digestion spike for the ICP metals analysis of batch 680-89462. All acceptance criteria were met.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

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

68 Pb 01

Alternate Laboratory Name/Location

Phone:
Fax:

**SEVERN
TRENT**

STL FedEx INT'L AIRBILL No.:
8480-2694 7499

PROJECT REFERENCE <i>Swmu 68 Pb</i>		PROJECT NO. <i>111626</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>1</i>	OF <i>2</i>							
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>		P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT,...)	TAL LEAD	TAL LEAD	- <i>H₂O₃</i>														STANDARD REPORT DELIVERY <input checked="" type="radio"/>	DATE DUE <i>28 day TAT</i>	
CLIENT (SPE) PM <i>Mark Kimes</i>		CLIENT PHONE <i>412 269 2009</i>	CLIENT FAX																		EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="radio"/>	DATE DUE _____	
CLIENT NAME <i>Michael Baker Jr, Inc.</i>		CLIENT E-MAIL <i>m.kimes@mbakercorp.com</i>																			NUMBER OF COOLERS SUBMITTED PER SHIPMENT:		
CLIENT ADDRESS <i>100 Airside Drive, Moon Twp., PA 15108</i>		COMPANY CONTRACTING THIS WORK (if applicable) <i>Baker</i>																					
SAMPLE		SAMPLE IDENTIFICATION																		NUMBER OF CONTAINERS SUBMITTED		REMARKS	
DATE	TIME																						
<i>10/24/07</i>	<i>1029</i>	<i>685507</i>	<i>G</i>	<i>X</i>			<i>1</i>																
	<i>1013</i>	<i>685508</i>	<i>G</i>	<i>X</i>			<i>1</i>																
	<i>1000</i>	<i>685509</i>	<i>G</i>	<i>X</i>			<i>1</i>																
	<i>1000</i>	<i>685509 D</i>	<i>G</i>	<i>X</i>			<i>1</i>																
	<i>1000</i>	<i>685509 MS/MSD</i>	<i>G</i>	<i>X</i>			<i>1</i>																
	<i>1105</i>	<i>685510</i>	<i>G</i>	<i>X</i>			<i>1</i>																
	<i>1117</i>	<i>685511</i>	<i>G</i>	<i>X</i>			<i>1</i>																
	<i>1115</i>	<i>685512</i>	<i>G</i>	<i>X</i>			<i>1</i>																
	<i>1113</i>	<i>685513</i>	<i>G</i>	<i>X</i>			<i>1</i>																
	<i>1036</i>	<i>685514</i>	<i>G</i>	<i>X</i>			<i>1</i>															<i>HOLD FOR ANALYSIS</i>	
	<i>1025</i>	<i>685515</i>	<i>G</i>	<i>X</i>			<i>1</i>															<i>HOLD FOR ANALYSIS</i>	
	<i>1020</i>	<i>685516</i>	<i>G</i>	<i>X</i>			<i>1</i>															<i>HOLD FOR ANALYSIS</i>	
RELINQUISHED BY: (SIGNATURE) <i>Mark E. K.</i>		DATE <i>10/24/07</i>	TIME <i>0900</i>	RELINQUISHED BY: (SIGNATURE) <i>Mark E. K.</i>		DATE <i>10/24/07</i>	TIME <i>1700</i>	RELINQUISHED BY: (SIGNATURE)		DATE	TIME	RELINQUISHED BY: (SIGNATURE)		DATE	TIME								
RECEIVED BY: (SIGNATURE) <i>Mark E. K.</i>		DATE <i>10/24/07</i>	TIME <i>0900</i>	RECEIVED BY: (SIGNATURE)		DATE	TIME	RECEIVED BY: (SIGNATURE)		DATE	TIME	RECEIVED BY: (SIGNATURE)		DATE	TIME								
LABORATORY USE ONLY																							
RECEIVED FOR LABORATORY BY: (SIGNATURE) <i>Brian Mitchell</i>		DATE <i>10-25-07</i>	TIME <i>1020</i>	CUSTODY INTACT YES <input type="radio"/> NO <input type="radio"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>680-31377</i>	LABORATORY REMARKS																

TEMP.: *10*

HOLD FOR ANALYSIS
HOLD FOR ANALYSIS
HOLD FOR ANALYSIS

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

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

SEVERN
TRENT
STL

Alternate Laboratory Name/Location
 Phone:
 Fax:

PROJECT REFERENCE <i>Sum 108 Pb</i>	PROJECT NO. <i>116276</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>2</i>	OF <i>2</i>		
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	TAL LEAD	TAL LEAD											STANDARD REPORT DELIVERY <input checked="" type="checkbox"/>	DATE DUE <i>28 DAY TAT</i>
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412 269-2009</i>	CLIENT FAX														EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="checkbox"/>	DATE DUE
CLIENT NAME <i>Michael Baker Jr, Inc.</i>	CLIENT E-MAIL <i>m.kimes@mbakercorp.com</i>															NUMBER OF COOLERS SUBMITTED PER SHIPMENT:	
CLIENT ADDRESS <i>100 Airside Dr., Moon Twp., PA 15108</i>	COMPANY CONTRACTING THIS WORK (if applicable) <i>Baker</i>																

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS		
DATE	TIME							1	2	3	4	5	6	7	8	9	10		11	12
<i>10/24/07</i>	<i>1008</i>	<i>685517</i>	<i>G</i>		<i>X</i>			<i>1</i>												<i>HOLD FOR ANALYSIS</i>
	<i>1008</i>	<i>685517D</i>	<i>G</i>		<i>X</i>			<i>1</i>												<i>HOLD FOR ANALYSIS</i>
	<i>1107</i>	<i>685518</i>	<i>G</i>		<i>X</i>			<i>1</i>												<i>HOLD FOR ANALYSIS</i>
	<i>1120</i>	<i>685519</i>	<i>G</i>		<i>X</i>			<i>1</i>												<i>HOLD FOR ANALYSIS</i>
	<i>1127</i>	<i>685520</i>	<i>G</i>		<i>X</i>			<i>1</i>												<i>HOLD FOR ANALYSIS</i>
	<i>1100</i>	<i>685521</i>	<i>G</i>		<i>X</i>			<i>1</i>												<i>HOLD FOR ANALYSIS</i>
	<i>1033</i>	<i>685506</i>	<i>G</i>		<i>X</i>			<i>1</i>												
	<i>0930</i>	<i>68 PbER01</i>	<i>G</i>		<i>X</i>									<i>1</i>						
	<i>0935</i>	<i>68 PbFB01</i>	<i>G</i>		<i>X</i>									<i>1</i>						

TEMP: *110*

RELINQUISHED BY: (SIGNATURE) <i>[Signature]</i>	DATE	TIME	RELINQUISHED BY: (SIGNATURE) <i>[Signature]</i>	DATE <i>10/24/07</i>	TIME <i>1700</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>[Signature]</i>	DATE <i>10/24/07</i>	TIME <i>0900</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

LABORATORY USE ONLY							
RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT: YES <input type="checkbox"/> NO <input type="checkbox"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>680-31377</i>	LABORATORY REMARKS	

3
024

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
 Airside Business Park
 100 Airside Drive
 Moon Township, PA 15108

February 24, 2008
 SDG# SWMU31377, Test America-Savannah
 NAPR Base Landfill, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # SWMU31377. The data validation was performed in accordance with the SW-846 method utilized by the laboratory (6010B) and professional judgment. This method does not have an applicable Region II checklist SOP so worksheets were provided. Specific method requirements, Region II flagging conventions and professional judgment were used to validate the results. All areas of concern are discussed in the body of the report and a summary of data qualifications is provided.

Sample ID	Lab ID	Matrix	Cu	Zn
68SS07	680-31377-1	soil	X	X
68SS08	680-31377-2	soil	X	X
68SS09	680-31377-3	soil	X	X
68SS09MSD	680-31377-3MSD	soil	X	X
68SS09MS	680-31377-3MS	soil	X	X
68SS09D	680-31377-4	soil	X	X
68SS10	680-31377-5	soil	X	X
68SS11	680-31377-6	soil	X	X
68SS12	680-31377-7	soil	X	X
68SS13	680-31377-8	soil	X	X
68SS15	680-31377-10	soil	X	X
68SS15MSD	680-31377-10MSD	soil	X	X
68SS15MS	680-31377-10MS	soil	X	X
68SS17	680-31377-12	soil	X	X
68SS06	680-31377-18	soil	X	X

The following quality control samples were provided with this SDG: sample 68SS09D-field duplicate of sample 68SS09.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Technical Holding Times *
- Initial/Continuing Calibrations *
- CRDL Standards *
- ICSA/ICSAB Recoveries *

- Blanks *
- Laboratory Control Samples *
- Matrix Spike Recoveries
- Matrix Duplicate RPDs *
- Serial Dilution *
- Field Duplicates *
- Identification/Quantitation *
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria.

Copper and Zinc

Although there was some blank contamination noted, all sample values were above the analyte RLs. The associated blank concentrations were between the MDL and the RL – so only results less than the RLs (adjusted for sample aliquot and solids) required qualification based on Region II flagging conventions.

In the MS/MSD pair of sample 68SS09 both the MS and the MSD exhibited low recoveries for Zn. Therefore, the field sample results were qualified as estimated J for Zn.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact.

Technical Holding Times

According to chain of custody records, sampling was performed on 10/24/07 and samples were received at the laboratory 10/25/07. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Matrix Spike Recoveries

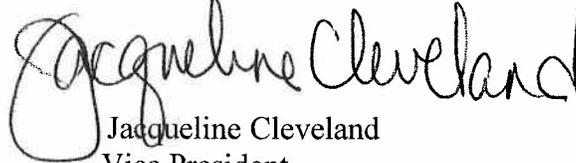
Copper & Zinc

The matrix spike analyses of the sample 68SS09 exhibited non-compliant %Rs (<75%) for the analyte zinc. Specific action is noted in the following table.

MS	Analytes	Samples Affected	%R	Q Flag
68SS09	zinc	all samples	55%/59%	J/UJ

Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,



Jacqueline Cleveland
Vice President

Summary of Data Qualifications

Copper & Zinc

Sample ID	Analyte	Results	Q flag
all samples	zinc	+/-	J/UJ

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
UJ	reported quantitation limit is qualified as estimated
R	result is rejected; the presence or absence of the analyte cannot be verified
D	result value is based on dilution analysis result
NJ	analyte has been tentatively identified, estimated value
L	analyte present, biased low
UL	not detected, quantitation limit is probably higher
K	analyte present, biased high

Method/Preparation Blank Qualification Flags (Q-Flags)

Metals ICB/CCB/PB Action:

No Action -	The sample result is greater than the CRDL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the CRDL, result is reported as non-detect at the reported concentration, when the blank result is less than the CRDL.
R -	Sample result is greater than the CRDL and less than the field blank value when the blank result is greater than the CRDL.
J/UJ -	Sample result is less than 10X CRDL when blank result is below the negative MDL.
J -	Sample result is greater than the blank value but less than 10X the blank value when blank result is greater than the CRDL.

General Abbreviations

RL	reporting limit
IDL	instrument detection limit
MDL	method detection limit
CRDL	contract required detection limit
CRQL	contract required quantitation limit
+	positive result
-	non-detect result

INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: 68SS07

Lab Sample ID: 680-31377-1

Lab Name: TestAmerica Savannah

Job No.: 680-31377-1

SDG ID.: SWMU31377

Matrix: Solid

Date Sampled: 10/24/2007 10:29

Reporting Basis: DRY

Date Received: 10/25/2007 10:20

% Solids: 75.8

CAS No.	Analyte	Conc.	RL	MDL	Units	C	Q	DIL	Method
7439-92-1	Lead	110	0.64	0.21	mg/Kg			1	6010B
7440-50-8	Copper	120	2.2	0.25	mg/Kg		B	1	6010B
7440-66-6	Zinc	92	2.2	0.40	mg/Kg		J	1	6010B

JAC
2/23/08
Cu & Zn Only

DataQual

Worksheets –Copper & Zinc Only

This SDG contains total metals analysis for copper and zinc using SW-846 method 6010B. Region II validation guidelines were used as applicable, however, the Region has not developed an SOP for this method so these worksheets are used as an alternative.

HOLDING TIMES

Sampling Date: 10/24

Received Date: 10/25

Cooler temps OK, receipt documentation present

Prep. Dates: 10/29, 11/8

Analysis Dates: 11/2-11/3 & 11/8-11/9

All holding time requirements were met.

CALIBRATIONS

All initial calibration criteria were met for the methods noted above. All ICV and CCV criteria were met (90-110%). CRI standard criteria were met. All ICSA/ICSAB results were within method criteria. Raw data was verified.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- See blank type specific validation guidelines noted below (taken from the Region II SOP for CLP metals and adapted to this project).
- Qualification/Action codes:

ICB/CCB/PB Action:

- No Action - The sample result is greater than the CRDL and greater than ten times (10X) the blank value.
- U - The sample result is greater than or equal to the MDL but less than or equal to the CRDL, result is reported as non-detect at the reported concentration, when the blank result is less than the CRDL.
- R - Sample result is greater than the CRDL and less than the field blank value when the blank result is greater than the CRDL.
- J/UJ - Sample result is less than 10X CRDL when blank result is below the negative MDL.
- J - Sample result is greater than the blank value but less than 10X the blank value when blank result is greater than the CRDL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results. Do not use rinsate blank associated with soils to qualify water samples and vice versa.

- No Action - The sample result is greater than the CRDL and greater than ten times (10X) the blank value.

DataQual

Worksheets –Copper & Zinc Only

- U - The sample result is greater than or equal to the MDL but less than or equal to the CRDL when the field blank result is greater than the CRDL - result is reported as non-detect at the reported concentration.
- R - Sample result is greater than the CRDL and less than the field blank value when the field blank result is greater than the CRDL.
- J - Sample result is greater than the field blank value but less than 10X the field blank value when field blank result is greater than the CRDL.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	Q Flag
No qualifications were required *			

See validation report for specific samples and qualifications. Only those analytes requiring action are listed here. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment. Field QC blank associations are determined using tracking provided by the client. Flags are applied to samples based on these associations. The concentration noted for the CCBs is the highest concentration in all the associated CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.

* All sample values were above the analyte RLs. The preparation blank concentrations were between the MDL and the RL – so only results less than the RL (adjusted for sample aliquot and solids) required qualification based on Region II flagging conventions.

MATRIX SPIKE/DUPLICATE SUMMARY

The matrix spike pair of sample 68SS15 analyzed for soils exhibited non-compliant recoveries in the MSD for Cu and Zn and the matrix spike pair of sample 68SS09 analyzed for soils exhibited non-compliant recoveries in the MS and the MSD for Zn. The analyte zinc was qualified as estimated J/UJ in all field samples. Copper did not require qualification. The batch QC spike pair submitted exhibited acceptable results. All matrix duplicate RPDs were within limits. All LCS results were within laboratory QC limits.

SERIAL DILUTIONS

The serial dilution analysis of samples 68SS09 and 68SS15 exhibited acceptable %Ds for lead.

FIELD DUPLICATE SAMPLE SUMMARY

Note: All reported results are noted in the table below because the client requested that the MDL be used as reporting limit instead of the CRDL for this project. However, field duplicate results are assessed for qualification of results only if both results are above the CRDL.

Sample ID: 68SS09 Duplicate Sample ID: 68SS09

Analyte	Sample Conc.	Duplicate Conc.	RPD
copper	40	38	5%
zinc	77	54	35%

Comments:

SAMPLE CALCULATION

EPA SAMPLE ID: 68SS07
COMPOUND: copper
CONCENTRATION: 120 mg/Kg
%Solids - 75.8

1.18g to 100 ml

Raw Data result: $1066.55517 \text{ ug/L} * 0.100\text{L}/1.18\text{g} * 1/0.758 = 119.243 \text{ mg/Kg}$

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments.

Reviewer

Laquella Cleveland

Date: 2/24/08

SWMU 3
SWMU31377
Copper & Zinc
Page 3 of 3

019

CASE NARRATIVE

Metals Fraction (6010B)

SDG:SWMU31377

STL Lab Reference No.: 680-31377-1

Project: SWMU 68 Pb

I. RECEIPT

No receipt or storage anomalies were noted.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHODS

Preparation: SW-846 3005A/3050B

Cleanup: none

Analysis: SW-846 6010B

IV. PREPARATION

Sample preparation proceeded normally. Aqueous samples were prepared in batch 680-89462 for ICP metals (3005A). Soil/ solid samples were prepared in batches 680-89522 and 680-90368 for ICP metals (3050b).

V. ANALYSIS

A. Calibration: All initial calibration criteria were met.

B. Blanks: Due to a result above the Method Detection Limit (MDL) in the preparation blank for batch 680-90368, all associated results were flagged with a "B" qualifier for lead. Due to a result above the MDL in the preparation blank for batch 680-89522, all associated results were flagged with a "B" qualifier for copper. Due to a J value that was greater than half of the Reporting Limit (RL) in the preparation blank for batch 680-90368, all associated results were flagged with a "B" qualifier for zinc.

C. Spikes: A laboratory control standard (LCS) for ICP metals was digested in each of the prep batches and analyzed with the samples in this package. All acceptance criteria were met.

Sample 680-31377-3 was the designated matrix spike/ matrix spike duplicate (MS/MSD) for the ICP metals analysis of batch 680-89522. The MS percent recoveries were outside of control limits for lead and zinc. The MSD percent recovery was outside of control limits for zinc. This is denoted by an "F" qualifier.

Sample 680-31377-10 was used as the batch MS/MSD for the ICP metals analysis of batch 680-90368. The MSD percent recoveries were outside of control limits for lead, copper, and zinc. This is denoted by an "F" qualifier.

A non-client sample was used as the batch MS/MSD for the ICP metals analysis of batch 680-89462. All acceptance criteria were met.

D. Samples: All acceptance criteria were met.

E. Other: Sample 680-31377-3 was used as the batch serial dilution and post-digestion spike for the ICP metals analysis of batch 680-89522. All acceptance criteria were met.

Sample 680-31377-10 was used as the batch serial dilution and post-digestion spike for the ICP metals analysis of batch 680-90368. All acceptance criteria were met.

Sample 680-31377-19 was used as the batch serial dilution and post-digestion spike for the ICP metals analysis of batch 680-89462. All acceptance criteria were met.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

**SEVERN
TRENT**

STL

FEDEx INT'L AIRBILL NO.:

8480-2694 7499

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

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

68 Pb 01

○ Alternate Laboratory Name/Location

Phone:
Fax:

PROJECT REFERENCE <i>Swmu 68 Pb</i>	PROJECT NO. <i>111626</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>1</i>	OF <i>2</i>				
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	TAL LEAD	TAL LEAD	- H ₂ O ₃												STANDARD REPORT DELIVERY <input checked="" type="checkbox"/>	DATE DUE <i>28 day TAT</i>
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412 269 2009</i>	CLIENT FAX																EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="checkbox"/>	DATE DUE _____
CLIENT NAME <i>Michael Baker Jr., Inc.</i>	CLIENT E-MAIL <i>mKimes@mbakercorp.com</i>																	NUMBER OF COOLERS SUBMITTED PER SHIPMENT:	
CLIENT ADDRESS <i>100 Airside Drive, Moon Twp., PA 15108</i>	COMPANY CONTRACTING THIS WORK (if applicable) <i>Baker</i>																		

SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS	
DATE	TIME																		
<i>10/24/07</i>	<i>1029</i>	<i>685507</i>	<i>G</i>	<i>X</i>			<i>1</i>												
	<i>1013</i>	<i>685508</i>	<i>G</i>	<i>X</i>			<i>1</i>												
	<i>1000</i>	<i>685509</i>	<i>G</i>	<i>X</i>			<i>1</i>												
	<i>1000</i>	<i>685509 D</i>	<i>G</i>	<i>X</i>			<i>1</i>												
	<i>1000</i>	<i>685509 MS/MSD</i>	<i>G</i>	<i>X</i>			<i>1</i>												
	<i>1105</i>	<i>685510</i>	<i>G</i>	<i>X</i>			<i>1</i>												
	<i>1117</i>	<i>685511</i>	<i>G</i>	<i>X</i>			<i>1</i>												
	<i>1115</i>	<i>685512</i>	<i>G</i>	<i>X</i>			<i>1</i>												
	<i>1113</i>	<i>685513</i>	<i>G</i>	<i>X</i>			<i>1</i>												
	<i>1036</i>	<i>685514</i>	<i>G</i>	<i>X</i>			<i>1</i>												<i>HOLD FOR ANALYSIS</i>
	<i>1025</i>	<i>685515</i>	<i>G</i>	<i>X</i>			<i>1</i>												<i>HOLD FOR ANALYSIS</i>
	<i>1020</i>	<i>685516</i>	<i>G</i>	<i>X</i>			<i>1</i>												<i>HOLD FOR ANALYSIS</i>

TEMP: *7.0*

RELINQUISHED BY: (SIGNATURE) <i>[Signature]</i>	DATE <i>10/24/07</i>	TIME <i>1700</i>	RELINQUISHED BY: (SIGNATURE) <i>[Signature]</i>	DATE <i>10/24/07</i>	TIME <i>1700</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>[Signature]</i>	DATE <i>10/24/07</i>	TIME <i>0900</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

RECEIVED FOR LABORATORY BY: (SIGNATURE) <i>[Signature]</i>	DATE <i>10-25-07</i>	TIME <i>1020</i>	CUSTODY INTACT YES <input type="checkbox"/> NO <input type="checkbox"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>680-31377</i>	LABORATORY REMARKS
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021

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404

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

68P609

Alternate Laboratory Name/Location

Phone:
Fax:

SEVERN
TRENT

STL

PROJECT REFERENCE <i>Swmu 68 Pb</i>	PROJECT NO. <i>111626</i>	PROJECT LOCATION (STATE) <i>PR</i>	MATRIX TYPE	REQUIRED ANALYSIS										PAGE <i>2</i>	OF <i>2</i>		
STL (LAB) PROJECT MANAGER <i>Kathy Smith</i>	P.O. NUMBER	CONTRACT NO.	COMPOSITE (C) OR GRAB (G) INDICATE AQUEOUS (WATER) SOLID OR SEMISOLID AIR NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	TAL LEAD	TAL LEAD	STANDARD REPORT DELIVERY <input checked="" type="checkbox"/>										DATE DUE <i>28 DAY TAT</i>	
CLIENT (SITE) PM <i>Mark Kimes</i>	CLIENT PHONE <i>412 269-2009</i>	CLIENT FAX				EXPEDITED REPORT DELIVERY (SURCHARGE) <input type="checkbox"/>										DATE DUE _____	
CLIENT NAME <i>Michael Baker Jr, Inc.</i>	CLIENT E-MAIL <i>m.kimes@mbakercorp.com</i>					NUMBER OF COOLERS SUBMITTED PER SHIPMENT:											
CLIENT ADDRESS <i>100 Airside Dr., Moon Twp., PA 15108</i>						COMPANY CONTRACTING THIS WORK (if applicable) <i>Baker</i>											

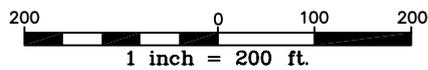
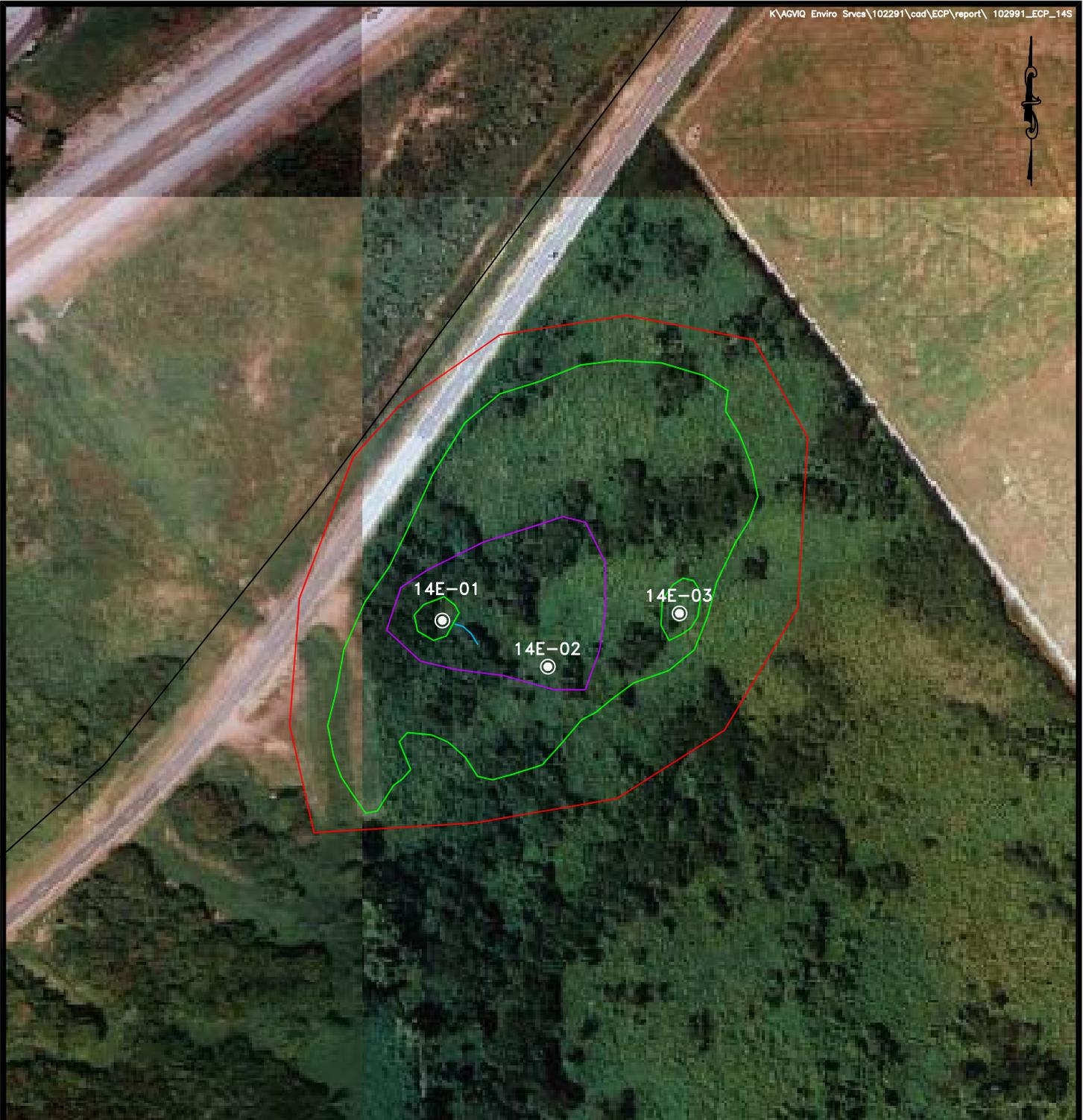
SAMPLE		SAMPLE IDENTIFICATION	COMPOSITE (C) OR GRAB (G) INDICATE	AQUEOUS (WATER)	SOLID OR SEMISOLID	AIR	NONAQUEOUS LIQUID (OIL, SOLVENT, ...)	NUMBER OF CONTAINERS SUBMITTED										REMARKS		
DATE	TIME							1	2	3	4	5	6	7	8	9	10		11	12
<i>10/24/07</i>	<i>1008</i>	<i>685517</i>	<i>G</i>	<i>X</i>			<i>1</i>													<i>HOLD FOR ANALYSIS</i>
	<i>1008</i>	<i>685517D</i>	<i>G</i>	<i>X</i>			<i>1</i>													<i>HOLD FOR ANALYSIS</i>
	<i>1107</i>	<i>685518</i>	<i>G</i>	<i>X</i>			<i>1</i>													<i>HOLD FOR ANALYSIS</i>
	<i>1120</i>	<i>685519</i>	<i>G</i>	<i>X</i>			<i>1</i>													<i>HOLD FOR ANALYSIS</i>
	<i>1127</i>	<i>685520</i>	<i>G</i>	<i>X</i>			<i>1</i>													<i>HOLD FOR ANALYSIS</i>
	<i>1100</i>	<i>685521</i>	<i>G</i>	<i>X</i>			<i>1</i>													<i>HOLD FOR ANALYSIS</i>
	<i>1033</i>	<i>685506</i>	<i>G</i>	<i>X</i>			<i>1</i>													
	<i>0930</i>	<i>68P6ER01</i>	<i>G</i>	<i>X</i>									<i>1</i>							<i>TEMP: 110</i>
	<i>0935</i>	<i>68P6FB01</i>	<i>G</i>	<i>X</i>									<i>1</i>							

RELINQUISHED BY: (SIGNATURE) <i>Mark E. Kimes</i>	DATE <i>10/24/07</i>	TIME <i>0900</i>	RELINQUISHED BY: (SIGNATURE) <i>Mark E. Kimes</i>	DATE <i>10/24/07</i>	TIME <i>1700</i>	RELINQUISHED BY: (SIGNATURE)	DATE	TIME
RECEIVED BY: (SIGNATURE) <i>Mark E. Kimes</i>	DATE <i>10/24/07</i>	TIME <i>0900</i>	RECEIVED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)	DATE	TIME

RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE	TIME	CUSTODY INTACT YES <input type="checkbox"/> NO <input type="checkbox"/>	CUSTODY SEAL NO.	STL SAVANNAH LOG NO. <i>680-31377</i>	LABORATORY REMARKS
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022

APPENDIX D
ECP RESULTS FOR SWMU 68



LEGEND

-  - 1961 POLYGON FEATURE
-  - 1961 DRAINAGE
-  - 1964 POLYGON FEATURE
-  - SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION
-  - ECP SITE BOUNDARY

FIGURE 4-13
ECP SITE 14-FORMER SOUTHERN
FIRE TRAINING AREA
SAMPLE LOCATION MAP

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

NAVAL ACTIVITY PUERTO RICO

TABLE 5-47

SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
 ECP SITE 14 - FORMER SOUTHERN FIRE TRAINING AREA
 PHASE II ECP REPORT
 NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	EPA Region III	EPA Region III	14E-01	14E-02	14E-03	14E-03	Number Exceeding EPA Region III	Range Exceeding EPA Region III	Number Exceeding EPA Region III	Range Exceeding EPA Region III	Location of Maximum Detection
Sample ID	Industrial RBCs	Residential RBCs	14E-SS01	14E-SS02	14E-SS03	14E-SS03D	Industrial RBCs	Industrial RBCs	Residential RBCs	Residential RBCs	
Sample Date			05/08/04	05/08/04	05/08/04	05/08/04					
Sample Depth (ft bgs)	(ug/kg)	(ug/kg)	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00					
Volatile Organic Compounds (ug/kg)											
Tetrachloroethene	5,300	1,200	3.6 J	2.2 J	3.2 J	4.7 J	0/4		0/4		14E-SS03D
Chlorobenzene	2,000,000	160,000	2.5 J	1.8 J	3.5 J	5 J	0/4		0/4		14E-SS03D
Semivolatile Organic Compounds (ug/kg)											
Not Detected											
Total Petroleum Hydrocarbons (mg/kg)											
Diesel Range Organics	NE	NE	6.2	4 J	4.9	4.5	NE		NE		14E-SS01

Notes:

J - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.

NE - Not Established.

ft bgs - feet below ground surface.

ug/kg - micrograms per kilogram.

mg/kg - milligrams per kilogram

TABLE 5-48

SUMMARY OF INORGANIC DETECTIONS IN SURFACE SOIL
 ECP SITE 14 - FORMER SOUTHERN FIRE TRAINING AREA
 PHASE II ECP REPORT
 NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	EPA	EPA	<u>2x Average</u> <u>Detected</u> <u>Background</u>	14E-01	14E-02	14E-03	14E-03	Number	Range	Number	Range	<u>Number</u> <u>Exceeding</u> <u>2x Average</u> <u>Detected</u> <u>Background</u>	<u>Range</u> <u>Exceeding</u> <u>2x Average</u> <u>Detected</u> <u>Background</u>	Location of Maximum Detection
	Region III Industrial RBCs	Region III Residential RBCs						Exceeding EPA Region III Industrial RBCs	Exceeding EPA Region III Industrial RBCs	Exceeding EPA Region III Residential RBCs	Exceeding EPA Region III Residential RBCs			
Appendix IX Inorganics (mg/kg)														
Silver	510	39	0.37	1.2 U	1.2 U	0.23 B	0.16 B	0/4		0/4		0/4		14E-SS03
Arsenic	1.9	0.43	2.4	1.5	1.6	1.6	1.3 U	0/4		3/4	1.5 - 1.6	0/4		14E-SS02, 14E-SS03
Barium	7,200	550	181	120	56	54	52	0/4		0/4		0/4		14E-SS01
Beryllium	200	16	0.45	0.2 B	0.18 B	0.19 B	0.18 B	0/4		0/4		0/4		14E-SS01
Cadmium	100	7.8	0.27	<u>2.6</u>	0.58 U	<u>5.2</u>	<u>4.9</u>	0/4		0/4		3/4	2.6 - 5.2	14E-SS03
Cobalt	2,000	160	44.0	13	10	8.6	8.2	0/4		0/4		0/4		14E-SS01
Chromium	310	23	59.3	25	17	23	21	0/4		1/4	25	0/4		14E-SS01
Copper	4,100	310	234.2	100 *	28 *	<u>250</u> *	200 *	0/4		0/4		1/4	250*	14E-SS03
Nickel	2,000	160	16.55	6.5	6.2	9.6	8.9	0/4		0/4		0/4		14E-SS03
Lead	400 ⁽¹⁾	400 ⁽¹⁾	15.25	<u>230</u>	<u>17</u>	<u>150</u>	<u>140</u>	0/4		0/4		4/4	17 - 230	14E-SS01
Antimony	41	3.1	2.3	1.2 BN	2.3 UN	1.4 BN	1.1 BN	0/4		0/4		0/4		14E-SS03
Tin	61,000	4,700	2.43	<u>3.7</u> B	<u>3.4</u> B	<u>4.6</u> B	<u>4.5</u> B	0/4		0/4		4/4	3.4B - 4.6B	14E-SS03
Vanadium	100	7.8	354.5	74	77	65	61	0/4		4/4	61 - 77	0/4		14E-SS02
Zinc	31,000	2,300	125.2	<u>130</u>	48	120	120	0/4		0/4		1/4	130	14E-SS01
Mercury	31 ⁽²⁾	2.3 ⁽²⁾	0.11	0.042	0.046	0.056	0.053	0/4		0/4		0/4		14E-SS03

Notes:
 B - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.
 N - The matrix spike recovery is not within control limits.
 U - The compound was analyzed for, but was not detected at or above the MDL/PQL.
 * - Duplicate analysis is not within control limits.
⁽¹⁾ - 1996 Soil Screening Guidance.
⁽²⁾ - Value based on the RBC for Mercuric Chloride.
 NE - Not Established.
 ft bgs - feet below ground surface.
 mg/kg - milligrams per kilogram.

TABLE 5-49

**SUMMARY OF ORGANIC DETECTIONS IN SUBSURFACE SOIL
ECP SITE 14 - FORMER SOUTHERN FIRE TRAINING AREA
PHASE II ECP REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	EPA Region III Industrial RBCs (ug/kg)	EPA Region III Residential RBCs (ug/kg)	14E-01 14E-SB01-04 05/08/04 7.00 - 9.00	14E-02 14E-SB02-02 05/08/04 3.00 - 5.00	14E-03 14E-SB03-02 05/08/04 3.00 - 5.00	Number Exceeding EPA Region III Industrial RBCs	Range Exceeding EPA Region III Industrial RBCs	Number Exceeding EPA Region III Residential RBCs	Range Exceeding EPA Region III Residential RBCs	Location of Maximum Detection
Volatile Organic Compounds (ug/kg)										
Not Detected										
Semivolatile Organic Compounds (ug/kg)										
Not Detected										
Total Petroleum Hydrocarbons (mg/kg)										
Diesel Range Organics	NE	NE	2.6 J	2.2 J	2.6 J	NE		NE		14E-SB01-04, 14E-SB03-02

Notes:

- J - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.
- NE - Not Established.
- ft bgs - feet below ground surface.
- ug/kg - micrograms per kilogram.
- mg/kg - milligrams per kilogram

TABLE 5-50

SUMMARY OF INORGANIC DETECTIONS IN SUBSURFACE SOIL
 ECP SITE 14 - FORMER SOUTHERN FIRE TRAINING AREA
 PHASE II ECP REPORT
 NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	EPA Region III Industrial RBCs (mg/kg)	EPA Region III Residential RBCs (mg/kg)	<u>2x Average</u> <u>Detected</u> <u>Background</u> (mg/kg)	14E-01	14E-02	14E-03	Number Exceeding EPA Region III Industrial RBCs	Range Exceeding EPA Region III Industrial RBCs	Number Exceeding EPA Region III Residential RBCs	Range Exceeding EPA Region III Residential RBCs	<u>Number</u> <u>Exceeding</u> <u>2x Average</u> <u>Detected</u> <u>Background</u>	<u>Range</u> <u>Exceeding</u> <u>2x Average</u> <u>Detected</u> <u>Background</u>	Location of Maximum Detection
Appendix IX Inorganics (mg/kg)													
Barium	7,200	550	222	170	51	40	0/3		0/3		0/3		14E-SB01-04
Beryllium	200	16	0.74	0.36 B	0.29 B	0.26 B	0/3		0/3		0/3		14E-SB01-04
Cobalt	2,000	160	30.0	<u>38</u>	7.3	6.6	0/3		0/3		1/3	38	14E-SB01-04
Chromium	310	23	133	16	28	19	0/3		1/3	28	0/3		14E-SB02-02
Copper	4,100	310	193	26 *	48 *	33 *	0/3		0/3		0/3		14E-SB02-02
Nickel	2,000	160	31.9	13	11	6.8	0/3		0/3		0/3		14E-SB01-04
Lead	400 ⁽¹⁾	400 ⁽¹⁾	8.68	2.1	1.7	1.9	0/3		0/3		0/3		14E-SB01-04
Tin	61,000	4,700	2.96	1.7 B	2 B	2.7 B	0/3		0/3		0/3		14E-SB03-02
Vanadium	100	7.8	462	78	140	120	2/3	120 - 140	3/3	78 - 140	0/3		14E-SB02-02
Zinc	31,000	2,300	88.6	61	54	38	0/3		0/3		0/3		14E-SB01-04
Mercury	31 ⁽²⁾	2.3 ⁽²⁾	0.093	0.022	0.029	0.033	0/3		0/3		0/3		14E-SB03-02

Notes:

B - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.

* - Duplicate analysis is not within control limits.

⁽¹⁾ - 1996 Soil Screening Guidance.

⁽²⁾ - Value based on the RBC for Mercuric Chloride.

NE - Not Established.

ft bgs - feet below ground surface.

mg/kg - milligrams per kilogram.

APPENDIX E
IDENTIFICATION OF BIOACCUMULATIVE CHEMICALS

APPENDIX E

IDENTIFICATION OF BIOACCUMULATIVE CHEMICALS

Only those organic chemicals with a log octanol-water partition coefficient (K_{ow}) value greater than or equal to 3.0 will be considered a bioaccumulative chemical. Justification for defining bioaccumulative organic chemicals as those with log K_{ow} values greater than or equal to 3.0 is provided below.

- The potential for organic chemicals to accumulate in organisms has been shown to correlate well with the K_{ow} . USEPA (1985), as cited in USEPA/ACOE (1998), recommends that only chemicals for which the log K_{ow} is greater than 3.5 be considered for evaluation of bioaccumulation potential since chemicals with log K_{ow} values less than 3.5 are not likely to bioaccumulate to a significant degree.
- Although organic chemicals with log K_{ow} values in the 2 to 7 range have at least some potential to bioconcentrate (Connell, 1990), significant bioconcentration does not generally occur for chemicals with log K_{ow} values less than 3.0 (Maki and Duthie, 1978) to 5.0 (Gobas and Mackay, 1990). Most work with bioconcentration (uptake from the surrounding medium, such as water) and bioaccumulation (uptake from all exposure routes, including via food) of organic chemicals has concerned chemicals with log K_{ow} values of 3.0 or more (USEPA, 1995a), since organic chemicals with lower log K_{ow} values generally have little potential for significant bioaccumulation.
- The USEPA has developed a number of scoring algorithms to evaluate the relative hazard of chemicals to human or ecological receptors. All of these algorithms have a component that addresses bioaccumulation potential. The evaluation of bioaccumulation potential is generally based on measured or estimated (using log K_{ow} values) BCFs or BAFs, or less commonly using log K_{ow} itself. For example, USEPA (1980) developed a bioaccumulation potential scoring system that considered organics with BCF values of less than 100 (equivalent to a log K_{ow} of approximately 3.0) to have negligible potential to bioaccumulate in aquatic food webs, while organic chemicals with BCFs in the 100 to 1,000 range (equivalent to log K_{ow} values of about 3.0 to 4.3) are considered to have low bioaccumulation potential. The more recent Scoring and Ranking Assessment Model (SCRAM), developed by EPA Region 5 for the Great Lakes, has similar bioaccumulation scoring cut-offs (USEPA, 2000a).
- The proposed categorization of persistent, bioaccumulative, and toxic (PBT) chemicals under the Toxic Substances Control Act (TSCA) defines chemicals with a tendency to accumulate in organisms as those with a BCF or BAF of greater than 1,000 (Federal Register 63(192):53417; 10/5/98). Using the equation listed below (USEPA, 1995b), a BCF/BAF of 1,000 equates to a log K_{ow} value of approximately 4.3.

$$\text{Log BCF} = [(0.79)(\text{log } K_{ow}) - 0.40] \quad (\text{Equation E-1})$$

- The Beta Test Version 1.0 of the EPA Waste Minimization Prioritization Tool (WMPT), used to develop a list of PBTs for the Resource Conservation and Recovery Act (RCRA) program, defined organic chemicals with a low potential to bioaccumulate as those with log K_{ow} values of less than 3.5 and those with a high potential to bioaccumulate as those with log K_{ow} values greater than 5.0 (USEPA, 1998). The 1998 version of the EPA WMPT defines bioaccumulation potential based on BCF or BAF values (rather than on log K_{ow} values directly), with a scoring “fenceline” for organic chemicals with a low

bioaccumulation potential defined as a BCF or BAF of less than 250. Although the tool no longer uses $\log K_{ow}$ directly, $\log K_{ow}$ values can be used to estimate a BCF or BAF value. Using Equation E-1, a BCF/BAF of 250 equates to a $\log K_{ow}$ value of approximately 3.5.

- Garten and Trabalka (1983) have reviewed terrestrial food web data and concluded that only organic chemicals with $\log K_{ow}$ values greater than 3.5 have the potential to significantly bioaccumulate from food to birds to mammals.

The information listed above indicates that a $\log K_{ow}$ of 3.0 to 3.5 is a reasonable, non-arbitrary parameter value to use in defining an organic chemical with the potential to bioaccumulate. For conservatism, the low end (3.0) of this $\log K_{ow}$ range will be used to define a bioaccumulative organic chemical. Table 5-3 lists $\log K_{ow}$ values (range and recommended value) for organic chemicals detected in surface soil collected from SWMU 68. $\log K_{ow}$ values were primarily obtained from the USEPA (1995c and 1996). The recommended value from these sources generally represents a “high-end” or best estimate from empirical data. The organic chemicals evaluated by the dietary intake models are those with a $\log K_{ow}$ value of greater than or equal to 3.0. For conservatism, the maximum value in the $\log K_{ow}$ range is used for this determination, not the recommended value.

Inorganic chemicals were not quantitatively screened for bioaccumulation potential since $\log K_{ow}$ values are not available for these chemicals. Although all detected Appendix IX metals are retained for evaluation in the upper trophic level food chain models (arsenic, barium, cobalt, copper, lead, tin, and zinc), only arsenic, copper, lead, and zinc generally have the potential to bioaccumulate significantly (USEPA, 2000b). Barium, cobalt, and tin are retained by default.

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APPENDIX F
ProUCL VERSION 4.00.02 CALCULATIONS

Arsenic

General Statistics

Number of Valid Data	18	Number of Detected Data	17
Number of Distinct Detected Data	14	Number of Non-Detect Data	1
		Percent Non-Detects	5.56%

Raw Statistics

Minimum Detected	0.82
Maximum Detected	3.4
Mean of Detected	1.565
SD of Detected	0.655
Minimum Non-Detect	1.2
Maximum Non-Detect	1.2

Log-transformed Statistics

Minimum Detected	-0.198
Maximum Detected	1.224
Mean of Detected	0.376
SD of Detected	0.381
Minimum Non-Detect	0.182
Maximum Non-Detect	0.182

UCL Statistics

Normal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.875
5% Shapiro Wilk Critical Value	0.892

**Data not Normal
at 5% Significance Level**

Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.967
5% Shapiro Wilk Critical Value	0.892

**Data appear Lognormal
at 5% Significance Level**

Assuming Normal Distribution

DL/2 Substitution Method	
Mean	1.511
SD	0.675
95% DL/2 (t) UCL	1.788

Assuming Lognormal Distribution

DL/2 Substitution Method	
Mean	0.327
SD	0.424
95% H-Stat (DL/2) UCL	1.804

Maximum Likelihood Estimate(MLE) Methc

Mean	1.477
SD	0.717
95% MLE (t) UCL	1.771
95% MLE (Tiku) UCL	1.782

Log ROS Method

Mean in Log Scale	0.35
SD in Log Scale	0.386
Mean in Original Scale	1.528
SD in Original Scale	0.654
95% Percentile Bootstrap UCL	1.802
95% BCA Bootstrap UCL	1.84

Gamma Distribution Test with

Detected Values Only

k star (bias corrected)	5.942
Theta Star	0.263
nu star	202
A-D Test Statistic	0.319
5% A-D Critical Value	0.74
K-S Test Statistic	0.74
5% K-S Critical Value	0.209

**Data appear Gamma Distributed
at 5% Significance Level**

Data Distribution Test with

Detected Values Only

**Data appear Gamma Distributed
at 5% Significance Level**

Nonparametric Statistics

Kaplan-Meier (KM) Method	
Mean	1.528
SD	0.636
SE of Mean	0.155
95% KM (t) UCL	1.797
95% KM (z) UCL	1.782
95% KM (jackknife) UCL	1.796
95% KM (bootstrap t) UCL	1.908

Assuming Gamma Distribution

Gamma ROS Statistics using Extrapolated Minimum	0.82
---	------

Maximum	3.4	95% KM (BCA) UCL	1.778
Mean	1.527	95% KM (Percentile Bootstrap) UCL	1.802
Median	1.4	95% KM (Chebyshev) UCL	2.201
SD	0.655	97.5% KM (Chebyshev) UCL	2.493
k star	5.767	99% KM (Chebyshev) UCL	3.066
Theta star	0.265		
Nu star	207.6		
AppChi2	175.3		
95% Gamma Approximate UCL	1.809		
95% Adjusted Gamma UCL	1.839		
Note: DL/2 is not a recommended method.		Potential UCLs to Use:	
		95% KM (BCA) UCL	1.778

Barium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	13
------------------------------	----	---------------------------------	----

Raw Statistics

Minimum	54
Maximum	260
Mean	92.46
Median	76
SD	54.46
Coefficient of Variation	0.589
Skewness	2.76

Log-transformed Statistics

Minimum of Log Data	3.989
Maximum of Log Data	5.561
Mean of log Data	4.425
SD of log Data	0.425

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.657
Shapiro Wilk Critical Value	0.866

**Data not Normal
at 5% Significance Level**

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.852
Shapiro Wilk Critical Value	0.866

**Data not Lognormal
at 5% Significance Level**

Assuming Normal Distribution

95% Student's-t UCL	119.4
95% UCLs (Adjusted for Skewness)	
95% Adjusted-CLT UCL	129.7
95% Modified-t UCL	121.3

Assuming Lognormal Distribution

95% H-UCL	117.3
95% Chebyshev (MVUE) UCL	138.3
97.5% Chebyshev (MVUE) UCL	158.9
99% Chebyshev (MVUE) UCL	199.3

Gamma Distribution Test

k star (bias corrected)	3.941
Theta Star	23.46
nu star	102.5
Approximate Chi Square Value (.05)	80.11
Adjusted Level of Significance	0.0301
Adjusted Chi Square Value	77.3

Data Distribution

**Data Follow Appr. Gamma Distribution
at 5% Significance Level**

Anderson-Darling Test Statistic	0.901
Anderson-Darling 5% Critical Value	0.736
Kolmogorov-Smirnov Test Statistic	0.203
Kolmogorov-Smirnov 5% Critical Value	0.237

Nonparametric Statistics

95% CLT UCL	117.3
95% Jackknife UCL	119.4
95% Standard Bootstrap UCL	116.4
95% Bootstrap-t UCL	157.4
95% Hall's Bootstrap UCL	213.4
95% Percentile Bootstrap UCL	118.4
95% BCA Bootstrap UCL	131.2
95% Chebyshev(Mean, Sd) UCL	158.3
97.5% Chebyshev(Mean, Sd) UCL	186.8
99% Chebyshev(Mean, Sd) UCL	242.7
99% Chebyshev(Mean, Sd) UCL	242.7

**Data follow Appr. Gamma Distribution
at 5% Significance Level**

Assuming Gamma Distribution

95% Approximate Gamma UCL	118.3
95% Adjusted Gamma UCL	122.6

Potential UCL to Use:

Use 95% Approximate Gamma UCL 118.3

Cobalt

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	9
------------------------------	----	---------------------------------	---

Raw Statistics

Minimum	8.6
Maximum	47
Mean	17.66
Median	13
SD	10.86
Coefficient of Variation	0.615
Skewness	1.978

Log-transformed Statistics

Minimum of Log Data	2.152
Maximum of Log Data	3.85
Mean of log Data	2.743
SD of log Data	0.492

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.755
Shapiro Wilk Critical Value	0.866

**Data not Normal
at 5% Significance Level**

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.866

**Data appear Lognormal
at 5% Significance Level**

Assuming Normal Distribution

95% Student's-t UCL	23.03
95% UCLs (Adjusted for Skewness)	
95% Adjusted-CLT UCL	24.38
95% Modified-t UCL	23.31

Assuming Lognormal Distribution

95% H-UCL	23.64
95% Chebyshev (MVUE) UCL	27.94
97.5% Chebyshev (MVUE) UCL	32.52
99% Chebyshev (MVUE) UCL	41.52

Gamma Distribution Test

k star (bias corrected)	3.17
Theta Star	5.572
nu star	82.41
Approximate Chi Square Value (.05)	62.49
Adjusted Level of Significance	0.0301
Adjusted Chi Square Value	60.02

Data Distribution

**Data appear Lognormal
at 5% Significance Level**

Anderson-Darling Test Statistic	0.804
Anderson-Darling 5% Critical Value	0.737
Kolmogorov-Smirnov Test Statistic	0.253
Kolmogorov-Smirnov 5% Critical Value	0.238

Nonparametric Statistics

95% CLT UCL	22.62
95% Jackknife UCL	23.03
95% Standard Bootstrap UCL	22.34
95% Bootstrap-t UCL	27.66
95% Hall's Bootstrap UCL	41.75
95% Percentile Bootstrap UCL	22.82
95% BCA Bootstrap UCL	24.08
95% Chebyshev(Mean, Sd) UCL	30.79
97.5% Chebyshev(Mean, Sd) UCL	36.48
99% Chebyshev(Mean, Sd) UCL	47.64

**Data not Gamma Distributed
at 5% Significance Level**

Assuming Gamma Distribution

95% Approximate Gamma UCL	23.29
95% Adjusted Gamma UCL	24.25

Potential UCL to Use:

Use 95% Student's-t UCL	23.03
or 95% Modified-t UCL	23.31
or 95% H-UCL	23.64

Copper

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18
------------------------------	----	---------------------------------	----

Raw Statistics

Minimum	16
Maximum	250
Mean	52.83
Median	35
SD	49.79
Coefficient of Variation	0.943
Skewness	3.167

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.613
Shapiro Wilk Critical Value	0.914

**Data not Normal
at 5% Significance Level**

Assuming Normal Distribution

95% Student's-t UCL	70.65
95% UCLs (Adjusted for Skewness)	
95% Adjusted-CLT UCL	77.23
95% Modified-t UCL	71.8

Gamma Distribution Test

k star (bias corrected)	2.022
Theta Star	26.12
nu star	93.01
Approximate Chi Square Value (.05)	71.77
Adjusted Level of Significance	0.0389
Adjusted Chi Square Value	70.42

Anderson-Darling Test Statistic	1.433
Anderson-Darling 5% Critical Value	0.753
Kolmogorov-Smirnov Test Statistic	0.195
Kolmogorov-Smirnov 5% Critical Value	0.183

**Data not Gamma Distributed
at 5% Significance Level**

Assuming Gamma Distribution

95% Approximate Gamma UCL	68.46
95% Adjusted Gamma UCL	69.77

Potential UCL to Use:

Log-transformed Statistics

Minimum of Log Data	2.773
Maximum of Log Data	5.521
Mean of log Data	3.733
SD of log Data	0.623

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.903
Shapiro Wilk Critical Value	0.914

**Data not Lognormal
at 5% Significance Level**

Assuming Lognormal Distribution

95% H-UCL	67.01
95% Chebyshev (MVUE) UCL	80.44
97.5% Chebyshev (MVUE) UCL	93.49
99% Chebyshev (MVUE) UCL	119.1

Data Distribution

**Data do not follow a Discernable
Distribution (0.05)**

Nonparametric Statistics

95% CLT UCL	69.9
95% Jackknife UCL	70.65
95% Standard Bootstrap UCL	69.2
95% Bootstrap-t UCL	91.25
95% Hall's Bootstrap UCL	138
95% Percentile Bootstrap UCL	70.48
95% BCA Bootstrap UCL	80.26
95% Chebyshev(Mean, Sd) UCL	98.08
97.5% Chebyshev(Mean, Sd) UCL	117.7
99% Chebyshev(Mean, Sd) UCL	156.1

Use 95% Chebyshev (Mean, Sd) UCL 98.08

Lead

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	21
------------------------------	----	---------------------------------	----

Raw Statistics

Minimum	1.7
Maximum	230
Mean	37.16
Median	8.2
SD	58.15
Coefficient of Variation	1.565
Skewness	2.215

Log-transformed Statistics

Minimum of Log Data	0.531
Maximum of Log Data	5.438
Mean of log Data	2.519
SD of log Data	1.546

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.665
Shapiro Wilk Critical Value	0.914

**Data not Normal
at 5% Significance Level**

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical Value	0.914

**Data appear Lognormal
at 5% Significance Level**

Assuming Normal Distribution

95% Student's-t UCL	57.98
95% UCLs (Adjusted for Skewness)	
95% Adjusted-CLT UCL	63.08
95% Modified-t UCL	58.91

Assuming Lognormal Distribution

95% H-UCL	122.5
95% Chebyshev (MVUE) UCL	101
97.5% Chebyshev (MVUE) UCL	128.7
99% Chebyshev (MVUE) UCL	183

Gamma Distribution Test

k star (bias corrected)	0.523
Theta Star	71.04
nu star	24.06
Approximate Chi Square Value (.05)	13.89
Adjusted Level of Significance	0.0389
Adjusted Chi Square Value	13.33

Data Distribution

**Data appear Lognormal
at 5% Significance Level**

Anderson-Darling Test Statistic	1.036
Anderson-Darling 5% Critical Value	0.799
Kolmogorov-Smirnov Test Statistic	0.192
Kolmogorov-Smirnov 5% Critical Value	0.191

Nonparametric Statistics

95% CLT UCL	57.1
95% Jackknife UCL	57.98
95% Standard Bootstrap UCL	56.93
95% Bootstrap-t UCL	69.38
95% Hall's Bootstrap UCL	68.46
95% Percentile Bootstrap UCL	58.4
95% BCA Bootstrap UCL	62.05
95% Chebyshev(Mean, Sd) UCL	90.01
97.5% Chebyshev(Mean, Sd) UCL	112.9
99% Chebyshev(Mean, Sd) UCL	157.8

**Data not Gamma Distributed
at 5% Significance Level**

Assuming Gamma Distribution

95% Approximate Gamma UCL	64.34
95% Adjusted Gamma UCL	67.04

Potential UCL to Use

Use 95% Chebyshev (MVUE) UCL 101

Zinc

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19
------------------------------	----	---------------------------------	----

Raw Statistics

Minimum	34
Maximum	130
Mean	57.48
Median	48
SD	25.92
Coefficient of Variation	0.451
Skewness	1.762

Log-transformed Statistics

Minimum of Log Data	3.526
Maximum of Log Data	4.868
Mean of log Data	3.976
SD of log Data	0.376

Relevant UCL Statistics

Normal Distribution Test

Shapiro Wilk Test Statistic	0.777
Shapiro Wilk Critical Value	0.914

**Data not Normal
at 5% Significance Level**

Lognormal Distribution Test

Shapiro Wilk Test Statistic	0.892
Shapiro Wilk Critical Value	0.914

**Data not Lognormal
at 5% Significance Level**

Assuming Normal Distribution

95% Student's-t UCL	66.76
95% UCLs (Adjusted for Skewness)	
95% Adjusted-CLT UCL	68.49
95% Modified-t UCL	67.09

Assuming Lognormal Distribution

95% H-UCL	66.45
95% Chebyshev (MVUE) UCL	76.91
97.5% Chebyshev (MVUE) UCL	85.52
99% Chebyshev (MVUE) UCL	102.4

Gamma Distribution Test

k star (bias corrected)	5.925
Theta Star	9.701
nu star	272.5
Approximate Chi Square Value (.05)	235.3
Adjusted Level of Significance	0.0389
Adjusted Chi Square Value	232.8

Data Distribution

**Data do not follow a Discernable
Distribution (0.05)**

Anderson-Darling Test Statistic	1.192
Anderson-Darling 5% Critical Value	0.746
Kolmogorov-Smirnov Test Statistic	0.203
Kolmogorov-Smirnov 5% Critical Value	0.182

Nonparametric Statistics

95% CLT UCL	66.37
95% Jackknife UCL	66.76
95% Standard Bootstrap UCL	66.09
95% Bootstrap-t UCL	71.14
95% Hall's Bootstrap UCL	71.1
95% Percentile Bootstrap UCL	66.39
95% BCA Bootstrap UCL	67.91
95% Chebyshev(Mean, Sd) UCL	81.04
97.5% Chebyshev(Mean, Sd) UCL	91.23
99% Chebyshev(Mean, Sd) UCL	111.3

**Data not Gamma Distributed
at 5% Significance Level**

Assuming Gamma Distribution

95% Approximate Gamma UCL	66.57
95% Adjusted Gamma UCL	67.29

Potential UCL to Use:

Use 95% Student's-t UCL	66.76
or 95% Modified-t UCL	67.09

APPENDIX G
PRELIMINARY HUMAN HEALTH RISK
CALCULATIONS FOR ARSENIC

TABLE G-1

**TOTAL SOIL DATA AND COPC SELECTION SUMMARY
SWMU 68 (FORMER SOUTHERN FIRE TRAINING AREA)
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Contaminant	Criteria ⁽¹⁾	Contaminant Frequency / Range / Location			COPC Selection		Exposure Concentration Selection		
	Region IX Residential Soil PRG Values	No. of Positive Detects / No. of Samples	Range of Positive Detections	Location of Maximum Detection	Selected as a COPC?	Rationale for Selection or Deletion	95% UCL ⁽³⁾ (ProUCL)	Exposure Concentration	Rationale for Concentration Selection
Arsenic	0.390 C	26/30	0.8 J - 2.7	68SB01-01	YES	ASL	1.48 (NP)	1.48	95% KM (BCA) UCL

Notes:

UCL - Upper Confidence Limit ug/kg - microgram per kilogram J - Analyte present - Reported value is estimated
 PRG - Preliminary Remediation Goal mg/kg - milligram per kilogram
 COPC - Chemical of Potential Concern C = Carcinogenic

Rationale Codes:

(ASL) Above Screening Level

Shaded constituents were identified as COPCs for quantitative risk evaluation.

- (1) All non-carcinogenic criteria were divided by 10 to account for potential additive effects of chemicals.
USEPA Region IX Residential Soil COC Screening Value (derived from USEPA Region IX PRG Table)
- (2) ProUCL was used to calculate the 95% UCL and distribution (>4 samples):

**TABLE G-2
SUMMARY OF EXPOSURE PARAMETERS - SWMU 68
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Parameter	Units	Future Adult Residents	Future Young Child Residents
		RME	RME
Soil			
Ingestion Rate of Soil (IR-S)	mg/day	100 USEPA, 1991	200 USEPA, 1991
Fraction Ingested from Source (Fi)	NA	1 Prof Judge	1 Prof Judge
Exposure Frequency (EF)	days/year	350 USEPA, 1991	350 USEPA, 1991
Exposure Duration (ED)	years	24 USEPA, 1997	6 USEPA, 1997
Exposure Time (ET)	hours/day	24 Prof Judge	24 Prof Judge
Surface Area Available for Contact (SA)	cm ² /day	5,700 USEPA, 1997	2,800 USEPA, 1997
Respiration Rate (RR)	m ³ /hour	1.27 USEPA, 1997	0.69 USEPA, 1997
Conversion Factor (CF)	kg/mg	1.00E-06 USEPA, 1989	1.00E-06 USEPA, 1989
Averaging Time (Non-Cancer) (AT-N)	days	8,760 USEPA, 1989	2,190 USEPA, 1989
Other Parameters			
Body Weight (BW)	kg	70 USEPA, 1997	15 USEPA, 1997
Soil to Skin Adherence Factor (AF)	mg/cm ²	0.07 USEPA, 1997	0.2 USEPA, 1997
Particulate Emission Factor (PEF)	m ³ /kg	1.32E+09 Cowherd, et al., 1995	1.32E+09 Cowherd, et al., 1995
Averaging Time (Cancer) (AT-C)	days	25,550 USEPA, 1989	25,550 USEPA, 1989

Notes:

RME - Reasonable Maximum Exposure

ABS - Absorption Factors

USEPA, 2004: Risk Assessment Guidance for Superfund Vol 1, Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment). EPA/540/R-99/005.

The following USEPA Region III default absorbance factors will be applied in the absence of reference values from USEPA, 2001 to estimate dermal intake of COPCs in soil and sediment (USEPA, 1995):

0.05% and 3.0% - VOAs (chemical specific)

1.0% - Inorganics

3.0% - Dioxins / Furans

Prof Judge - Professional Judgment

Cowherd, et al., 1995: Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination. OHEA. EPA/600/8-85/002.

USEPA, 1989. Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part A) Interim Final.

USEPA, 1991. Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual Supplemental Guidance. "Standard Default Exposure Factors."

USEPA, 1997. Exposure Factors Handbook. Vol. 1: General Factors. ORD. EPA/600/P-95/002Fa.

TABLE G-3
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS
REASONABLE MAXIMUM EXPOSURE
SWMU 68 (FORMER SOUTHERN FIRE TRAINING AREA)
RCRA FACILITY INVESTIGATION
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Scenario Timeframe: Future Receptor Population: Residents Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient							
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total			
Total Soil	Total Soil	Total Soil	Arsenic	1.0E-06	--	1.2E-07	--	1.2E-06	Skin / CVS	<0.01	--	<0.01	<0.01			
			Chemical Total	1.0E-06	--	1.2E-07	--	1.2E-06		<0.01	--	<0.01	<0.01			
			Exposure Point Total							1.2E-06						
	Exposure Medium Total								1.2E-06							
	Air	Fugative Dust		Arsenic	--	2.4E-09	--	--	2.4E-09	NA	--	--	--	--		
				Chemical Total	--	2.4E-09	--	--	2.4E-09		--	--	--	--		
				Exposure Point Total							2.4E-09					
				Exposure Medium Total								2.4E-09				
	Total Soil Total							1.17E-06						<0.01		
	Adult Residents Total							1.17E-06						<0.01		

Total Risk Across Total Soil 1.2E-06
Total Risk Across All Media and All Exposure Routes 1.2E-06

Total Hazard Index Across Total Soil <0.01
ross All Media and All Exposure Routes 0.0

Notes:
Target Organ Abbreviations:
CVS = Cardiovascular System

Oral and Dermal Exposure Routes:
Oral / Dermal Cardiovascular System HI = <0.01
Oral / Dermal Skin HI = <0.01

TABLE G-4
 SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
 REASONABLE MAXIMUM EXPOSURE
 SWMU 68 (FORMER SOUTHERN FIRE TRAINING AREA)
 RCRA FACILITY INVESTIGATION
 NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Scenario Timeframe: Future Receptor Population: Residents Receptor Age: Young Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Total Soil	Total Soil	Total Soil	Arsenic	2.4E-06	--	2.0E-07	--	2.6E-06	Skin / CVS	0.06	--	<0.01	0.07		
			Chemical Total	2.4E-06	--	2.0E-07	--	2.6E-06		0.06	--	<0.01	0.07		
			Exposure Point Total						2.6E-06						0.07
	Exposure Medium Total												2.6E-06	0.07	
	Air	Fugative Dust	Arsenic	--	1.5E-09	--	--	1.5E-09	NA	--	--	--	--		
			Chemical Total	--	1.5E-09	--	--	1.5E-09		--	--	--	--		
			Exposure Point Total						1.5E-09						--
			Exposure Medium Total												1.5E-09
	Total Soil Total								2.64E-06					0.07	
	Young Child Residents Total								2.64E-06					0.07	

Total Risk Across Total Soil 2.6E-06
 Total Risk Across All Media and All Exposure Routes 2.6E-06

Total Hazard Index Across Total Soil 0.1
 across All Media and All Exposure Routes 0.1

Notes:
 Target Organ Abbreviations:
 CVS = Cardiovascular System

Oral and Dermal Exposure Routes:
 Oral / Dermal Cardiovascular System HI = 0.1
 Oral / Dermal Skin HI = 0.1