



**FINAL
PHASE I RCRA FACILITY INVESTIGATION
REPORT
SWMU 57 – POL DRUM STORAGE AREA**



***For* NAVAL ACTIVITY PUERTO RICO
EPA I.D. No. PR2170027203
CEIBA, PUERTO RICO**



Prepared for:

**Department of the Navy
NAVFAC SOUTHEAST**
North Charleston, South Carolina



Prepared by:

Baker

Michael Baker Jr., Inc.
Moon Township, PA

Contract No. N62470-10-D-3000
DO JM01

November 24, 2010

**IQC for A/E Services for Multi-Media Environmental Compliance
Engineering Support**

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DELIVERY ORDER JM01**

Prepared by:

**MICHAEL BAKER JR., INC.
Moon Township, Pennsylvania**

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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Title: BRAC Env. Coordinator

Date: November 24, 2010

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LIST OF ACRONYMS AND ABBREVIATIONS

AFWTF	Atlantic Fleet Weapons Training Facility
APA	Aerial Photography Analysis
Baker	Michael Baker Jr., Inc.
bgs	below ground surface
BRAC	Base Realignment and Closure
CADD	Computer Aided Design and Drafting
CCC	Continuous Criteria Concentration
CCME	Canadian Council of Ministers of the Environment
CERCLA	Comprehensive Environmental Recovery, Compensation, and Liabilities Act
CERFA	Community Environmental Response Facilitation Act
CMS	Corrective Measures Study
CRQL	Contract Required Quantitation Limit
CSF	Cancer Slope Factors
DGPS	Differential Global Positioning System
DI	Deionized
DPT	Direct Push Technology
DRO	Diesel Range Organics
EC ₅₀	Effective Concentration
ECP	Environmental Condition of Property
ECO-SSL	Ecological Soil Screening Level
EPA	Environmental Protection Agency
ESL	Ecological Screening Levels
FCV	Final Chronic Values
GIS	Geographic Information System
GPS	Global Positioning System
GRO	Gasoline Range Organics
HM	Hazardous Materials
HQ	Hazard Quotient
HSA	Hollow-Stem Augers
IAS	Initial Assessment Study
IDW	Investigation-Derived Waste
ILCR	Incremental Lifetime Cancer Risk
IUR	Inhalation Unit Risk
Kg	Kilograms
LANTDIV	Naval Facilities Engineering Command, Atlantic Division
LC ₅₀	Lethal Concentration
LLPAH	Low-Level Polynuclear Aromatic Hydrocarbon
LOEC	Lowest Observed Effect Concentration
LOEL	Lowest Observable Effect Levels

LIST OF ACRONYMS AND ABBREVIATIONS

(continued)

MATC	Maximum Acceptable Toxicant Concentration
MC	Macro-Core®
MCL	Maximum Containment Level
MGD	Million Gallons per Day
MHSPE	Ministry of Housing, Spatial Planning and Environment
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NAD	North American Datum
NAPR	Naval Activity Puerto Rico
NAVFAC	Naval Facilities Engineering Command
NAWQC	National Ambient Water Quality Criteria
NEESA	Naval Energy and Environmental Support Activity
NOAA	National Oceanic and Atmospheric Administration
NOEC	No Observed Effect Concentration
NOEL	No Observed Effect Level
NSRR	Naval Station Roosevelt Roads
OP	Organophosphorus
PAH	Polyaromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PI	Photo Identified
PID	Photoionization Detector
PMO	Program Management Office
POL	Petroleum, Oils, and Lubricant
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
RAGS	Risk Assessment Guidance for Superfund
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RfC	Reference Concentration
RfD	Reference Dose
RFI	RCRA Facility Investigation
RTK	Real-Time Kinematic
SCV	Secondary Chronic Values
SDG	Sample Delivery Group
SE	Southeast
SL	Screening Level
SOP	Standard Operating Procedure
SQUIRT	Screening Quick Reference Tables
SVOC	Semi-Volatile Organic Compound
SWMU	Solid Waste Management Unit

LIST OF ACRONYMS AND ABBREVIATIONS
(continued)

TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TPH DRO	Total Petroleum Hydrocarbons Diesel Range Organics
TPH GRO	Total Petroleum Hydrocarbons Gasoline Range Organics
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This document presents the results of the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) for Solid Waste Management Unit (SWMU) 57 (Facility No. 278 Petroleum, Oils, and Lubricant [POL] Drum Storage Area) at Naval Activity Puerto Rico, Ceiba, Puerto Rico. This report has been prepared by Michael Baker Jr., Inc. (Baker), for the Navy Base Realignment and Closure (BRAC) Program Management Office (PMO) Southeast (SE) office under contract with the Naval Facilities Engineering Command (NAVFAC), SE (Contract Number N62470-10-D-3000, Delivery Order [DO] JM01).

In anticipation of operational closure of Naval Station Roosevelt Roads (NSRR), currently designated as Naval Activity Puerto Rico (NAPR), the Naval Facilities Engineering Command, Atlantic Division (LANTDIV) prepared Phase I/Phase II Environmental Condition of Property (ECP) Reports to document the environmental condition of NSRR (LANTDIV, 2004). Section 8132 of the Fiscal Year 2004 Defense Appropriations Act, signed into law on September 30, 2003, directed that NSRR be disestablished within 6 months, and that the real estate disposal/transfer be carried out in accordance with procedures contained in the BRAC Act of 1990. This legislation requires that base closure be conducted in accordance with the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), as amended by the Community Environmental Response Facilitation Act (CERFA).

The United States Environmental Protection Agency (USEPA) issued a RCRA 7003 Administrative Order on Consent (Environmental Protection Agency [EPA] Docket No. RCRA-02-2007-7301 [USEPA, 2007]), identifying SWMU 57 (formerly referred to as ECP Site 3) as having numerous small spills and releases throughout the usage period of approximately 1958 through 1995. The Final Phase I RCRA Facility Investigation (RFI) Work Plan (Baker, 2007) was approved by USEPA on December 20, 2007. This Phase I RFI Report presents the results of the Phase I RFI field investigation conducted during January 2010.

1.1 Purpose of Report

A Phase I RFI is required as outlined in the NAPR RCRA § 7003 Administrative Order on Consent (USEPA, 2007). The RCRA Order provides for the development of a work plan, field investigation, and reporting on the findings of the investigation with recommendations of follow-up actions necessary to ensure protection of human health and the environment. This report has been prepared to document the findings of the January 2010 Phase I RFI field investigation for SWMU 57 and serves as the basis for determining the nature of impacts from the potential release of hazardous constituents at the site.

1.2 Objectives

The objectives of the SWMU 57 RFI are to:

- Further characterize impacts to the environment through the collection and analysis of soil, groundwater and concrete wipe and chip samples as described in the EPA approved 2007 RFI Work Plan (Baker, 2007);
- Perform a surface and subsurface soil sampling program to further characterize and delineate volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and one surface soil detection of polychlorinated biphenyl (PCB) detected during the Phase II ECP investigation;

- Perform a groundwater sampling program to further characterize VOCs and metals detected during the Phase II ECP investigation; and
- Determine if past releases from items stored on the concrete pad occurred through the collection and analyses of concrete wipe and chip samples and analyses for Appendix IX SVOCs, PCBs, total metals, low level polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) diesel range organics (DRO);

Specific elements of the 2010 field effort performed to support this RFI included:

- Twelve surface soil samples collected from seven boring locations and five discrete locations;
- Fourteen subsurface soil samples collected from the seven boring locations;
- Six groundwater samples collected from the five newly installed permanent monitoring wells and one existing permanent well within the SWMU 9 Area C site boundary (13GW07). Note that existing permanent well 13GW11, also located within the SWMU 9 Area C site boundary, was proposed to be sampled but could not be located and consequently was not sampled; and
- Four concrete wipe and four concrete chip samples collected from the concrete pad.

1.3 Organization of the Phase I RFI Report

This report is organized into eight sections. Section 1.0 of this document discusses the purpose and objectives of this RFI. Section 2.0 presents a brief summary of the background of NAPR and the history and previous investigations at SWMU 57. Section 3.0 discusses the climatology, topography and regional geology, hydrology and hydrogeology for NAPR. The scope of the field investigation is provided in Section 4.0. Section 5.0 presents and discusses the physical characteristics of the study area observed during this Phase I RFI investigation including the site geology and hydrogeology. Section 6.0 presents the laboratory analytical results performed on the environmental samples and quality assurance/quality control (QA/QC) samples collected during the Phase I RFI with a comparison to appropriate human health and ecological screening values and background values. Section 7.0 presents the conclusions and recommendations derived from the RFI and Section 8.0 lists report references.

2.0 SITE BACKGROUND

This section provides the history and description of current conditions at NAPR and SWMU 57. This section also includes a summary of the results of previous investigations conducted at SWMU 57.

2.1 NAPR Description and History

NAPR occupies over 8,800 acres on the northern side 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, as presented on Figure 2-2. 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 (see Figure 2-1).

The facility was commissioned in 1943 as a Naval Operations Base, and re-designated as a Naval Station in 1957. NSRR operated as a Naval Station from 1957 until March 31, 2004. NSRR was one of the largest naval facilities in the world with more than 100 miles of paved roads, approximately 1,300 buildings, a large scale airfield (Ofstie Field), a deep water port and over 30 tenant commands. NSRR played a major role in providing communication support to the Atlantic and Caribbean areas and also served as a major training site for fleet exercises.

Section 8132 of Fiscal Year 2004 Defense Appropriations Act, signed into law on September 30, 2003, directed that NSRR be disestablished within 6 months, and that the real estate disposal/transfer be carried out in accordance with procedures contained in the BRAC Act of 1990. This legislation required that the base closure be conducted in accordance with the CERCLA, as amended by the CERFA. NSRR has undergone operational closure as of March 31, 2004 and has been designated as NAPR. The 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. NAPR will continue until the real estate disposal/transfer is completed.

In anticipation of operational closure of NSRR, the Naval Facilities Engineering Command, Atlantic Division (LANTDIV) prepared Phase I/Phase II ECP Reports to document the environmental condition of NSRR. The Draft Phase I Environmental Condition of Property Report dated March 31, 2004 (LANTDIV, 2004) identified new sites at NAPR based on the results of a review of records, an analysis of historic aerial photographs, physical site inspections, and interviews with persons familiar with past and current operations and activities. The new ECP sites had not been previously identified or investigated under existing environmental program areas. A Phase II ECP field investigation was performed in 2004 to conduct environmental sampling to determine if a release/disposal actually occurred at any of the Phase I ECP sites recommended for further evaluation in the Phase I ECP and, if so, whether any potential risk to human health was present. The Final Phase II Environmental Condition of Property Report recommended additional sampling (to be undertaken as part of the RCRA Program) at several sites to permit a more detailed assessment (NAVFAC Atlantic, 2005).

The final ECP report recommended completion of RCRA facility investigation of SWMU 57, which was the basis for the Phase I RFI and this report.

2.2 SWMU 57 Description and History

SWMU 57 is located at Facility No. 278 Petroleum, Oils, and Lubricant [POL] Drum Storage Area, which is a rectangular concrete pad approximately 170 by 100 feet in size. The Aerial Photography Analysis (APA) conducted during the Phase I ECP identified this area as photo identified (PI) Site 4, due to the observation of drum storage and staining on a concrete pad and surrounding soil from 1958-1995 (see Figure 2-3, the 1958 aerial photograph). The records review conducted during the Phase I ECP confirmed the area as the POL drum storage facility from the 1950s to the 1990s, and the Phase I ECP physical site inspections observed staining on the pad but no significant stressed vegetation immediately surrounding the pad. Phase I ECP interviews confirmed that POL and potentially other hazardous materials (HM) were stored at the site, with numerous small spills and releases throughout the usage period.

Some small miscellaneous debris including small cylinders and equipment were observed on the concrete pad during the Phase II ECP investigation. Miscellaneous debris was observed in the northeastern portion of the pad, while the cylinders were observed near the southwestern edge of the pad. There were no signs of stressed vegetation observed during the Phase II ECP investigation.

A detailed description of the current site conditions is given in Section 5.1.

2.3 Previous Investigations

The Phase I/II ECP investigation performed in 2004 noted some small miscellaneous debris, including small cylinders and equipment, on the concrete pad (NAVFAC Atlantic, 2005). There were no signs of stains or stressed vegetation observed during the investigation. Figure 2-4 shows the ECP sample locations on the 2000 aerial photograph.

The area surrounding the concrete slab utilized for POL Drum storage was investigated during the ECP investigation. Analytical data from the Phase I/II ECP (Tables B-1 to B-6) are presented in Appendix A, including comparisons to human health screening criteria used at that time. The tables also include comparison to the applicable facility background levels for metals utilized at that time.

Six soil borings were advanced at SWMU 57 during the ECP investigation to profile surface and subsurface conditions. SWMU 57 is underlain by thin residuum, which generally consists of sand, silt, and/or clay. Residuum was observed to be 0.2-feet thick at location 3E-04 to more than 5-feet thick at location 3E-06 (see Figures 2-3 and 2-4). Weathered bedrock was observed beneath the residuum. Groundwater was not observed in residuum. Six surface soil and six subsurface soil samples were collected and analyzed for Appendix IX VOCs, SVOCs, pesticides/PCBs, organophosphorus (OP)-pesticides, chlorinated herbicides, and metals.

A groundwater program followed the soil-sampling program as part of the ECP investigation, with the installation of two temporary monitoring wells based on the field screening results of the subsurface soil. At SWMU 57, depth to groundwater was observed approximately 13- to 20-feet below ground surface (bgs) in bedrock fractures (NAVFAC Atlantic, 2005). One groundwater sample was collected from each temporary well and analyzed for Appendix IX VOCs, SVOCs, pesticides/PCBs, chlorinated herbicides, and metals.

Comparisons to criteria (in effect at the time the Phase I/II ECP Report was prepared) for the various media are given in Tables B-1 to B-6 of the Phase I/II ECP Report provided Appendix A. Results indicated SWMU 57 has locations with detections of fuel and chlorinated compounds exceedences of USEPA Region III Residential RBCs for Aroclor-1260 (surface soil), arsenic (soil), chromium (soil), and vanadium (soil and groundwater). VOCs and three other metals were detected in the groundwater, but only vanadium exceeded its RBC. Arsenic was the only metal that exceeded twice the average detected background concentration in the surface soil matrix.

From the detections of fuel and chlorinated compounds and exceedence of criteria for Aroclor-1260 and arsenic, it was concluded that the soil at this site had been impacted by previous activities. Based on the limited groundwater investigation and observations noted during the field event, it was tentatively concluded that the groundwater had not been impacted by previous activities. The Phase II ECP Report noted the limited nature of the investigation and added that higher concentrations may be present due to its past use as a hazardous waste storage area.

3.0 PHYSICAL CHARACTERISTICS OF STUDY AREA

The physical setting of NAPR was documented in the 1984 Initial Assessment Study (IAS) (Naval Energy and Environmental Support Activity [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 present the description of the geologic, hydrologic, and hydrogeologic conditions across NAPR. These are generally applicable, but may or may not be specifically-applicable, to the SWMU 57 area. Site specific geologic, hydrologic, and hydrogeologic information can be found in sections 5.2.1 and 5.2.2.

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 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 the 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 Hangar 379 and adjacent apron areas. This condition has been alleviated by the construction of a new highway (Route 3) immediately outside the fence and the realignment of Boxer Drive both with attendant storm water management features.

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

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

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

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

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

NAPR has been served for over 30 years by the present water 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 Regional Hydrogeology

In 2004, Baker conducted a Phase II ECP investigation involving 20 sites throughout NAPR (LANTDIV, 2004). Some consistent stratigraphic trends were observed during the ECP, which is discussed in this subsection. 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 the 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 overlies 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 overlies the residuum in some areas, particularly the airfield, and generally consists of sand and gravel with lesser amounts of silt and clay.

4.0 PHASE I RCRA FACILITY INVESTIGATION ACTIVITIES

This section summarizes the Phase I RFI field work, analytical, and data validation activities that were associated with the January 2010 field investigation. Field activities performed to support this RFI included:

- Twelve surface soil samples collected from seven boring locations and five discrete locations;
- Fourteen subsurface soil samples collected from the seven boring locations;
- Six groundwater samples collected from the five newly installed permanent monitoring wells and one existing permanent well within the SWMU 9 Area C site boundary (13GW07). Note that existing permanent well 13GW11, also located within the SWMU 9 Area C site boundary, was proposed to be sampled but could not be located and consequently was not sampled; and
- Four concrete wipe and four concrete chip samples collected from the concrete pad.

The investigation was generally conducted in accordance with the Final Phase I RCRA RFI Work Plan for SWMU 57 (Baker, 2007). The sampling program proposed in the EPA approved work plan was implemented in order to further characterize and delineate the site based on the results of the Phase I/II ECP investigations. Deviations from the Work Plan are described within the appropriate subsequent section(s). Refer to Figure 4-2 for surface soil sample, soil boring, and monitoring well locations. Additional field activities conducted in support of the investigation consisted of utility clearance, site clearing, surveying, and management of investigation-derived wastes (IDW).

The environmental and QA/QC samples collected from the site were analyzed at a fixed-base laboratory (see Section 4.12) and the data was validated by an independent third party (see Section 4.13). A summary matrix listing the primary environmental samples collected and the analyses conducted on each sample is shown in Table 4-1. Field duplicates and matrix spike/matrix spike duplicate samples and the analyses conducted on these samples are also shown in Table 4-1. Other Quality Assurance (QA)/Quality Control (QC) samples (trip blanks, field blanks, and equipment rinsates) collected and the analyses conducted on these samples are shown in Table 4-2. The list of analytical parameters under the analytical program and the Contract Required Quantitation Limits (CRQLs) are provided in Table 4-3.

Field notes containing descriptions of the site activities, site photographs (including a photograph location map), soil boring logs, and chain-of-custody records are presented in Appendix B. Appendix C provides a reference figure from the SWMU 9 Corrective Measures Study (CMS) Investigation Report (Hill and Baker, 2003). Laboratory analytical results for surface soil, subsurface soil, groundwater, QA/QC, and IDW are presented in Appendix D. Data Validation report summaries are provided in Appendix E.

4.1 Surface Soil Sampling

Surface soil samples (57SB01-00 through 57SB07-00) were collected from the seven soil boring locations shown on Figure 4-2. The surface soil samples associated with soil boring locations were collected at the locations proposed in the work plan with the exception of 57BS01 (soil boring and monitoring well) and 57SB06 (soil boring only). The rationale for relocating these soil boring locations and associated surface soil samples are provided in Section 4.2.

Additionally, based on reconnaissance and evaluation of SWMU 57, five additional, discrete surface soil samples (57SS08 through 57SS12) were collected (see Figure 4-1). These five surface soil samples were not included in the Work Plan. One surface soil sample (57SS12) was collected in the topographic downgradient vicinity of the loading dock area and four surface soil samples (57SS08 through 57SS11) were collected from the area southwest of the pad where surface debris was observed. Surface debris and hummocky soil mounding indicative of possible placement of materials (i.e., soil) scrapped from the pad exists in the area southwest of the pad (Figure 4-1) (Appendix B, Photos 8, 9, and 10). In addition, two field duplicates (57SB07-00D and 57SS09D) were also collected.

Surface soil samples were collected from a depth of 0 to 1 foot bgs using decontaminated stainless steel bucket augers. The samples were transferred directly into pre-labeled, laboratory provided sample jars and placed on ice. The samples were shipped in coolers with chain-of-custody forms (provided in Appendix B) to the fixed-base analytical laboratory for analysis. All surface soil samples were analyzed for Appendix IX VOCs, SVOCs with low-level polynuclear aromatic hydrocarbons (LLPAHs), PCBs, total petroleum hydrocarbons (TPH) gasoline range organics (GRO)/ diesel range organics (DRO), and metals as outlined in the Work Plan and on Table 4-1.

It should be noted that all five additional soil samples (57SS08 through 57SS12) were recollected (for VOCs only) on February 2, 2010 due to unforeseen courier shipping delays. Also, on May 20, 2010 all five additional soil samples were recollected (for GRO only) due to an inadvertent laboratory mistake (see Section 4.11.2 for details).

4.2 Subsurface Soil Sampling

Fourteen subsurface soil samples were collected from the seven soil boring locations (57SB01 through 57SB07) shown on Figure 4-1. Table 4-4 summarizes the soil boring and monitoring well specifications and construction information. The soil borings and associated monitoring wells were installed at the locations proposed in the work plan with the exception of 57BS01 (soil boring and monitoring well) and 57SB06 (soil boring only). The rationale for relocating these data stations include:

- Soil boring and monitoring well 57SB01 was moved from its proposed up and sidegradient location northeast of the concrete pad to a downgradient location northwest of the pad since photoionization detector (PID) readings above background were observed at 57SB05 (i.e., upgradient of relocated 57SB01) and monitoring well 13GW11 could not be located in the field.
- Soil boring 57SB06 was moved from its proposed upgradient location due to direct push technology (DPT) drill rig inaccessibility; a steep and bedrock exposed hill lies immediately adjacent to the southeast side of the concrete pad. Soil Boring 57SB06 was moved to a location in the downgradient vicinity of the surface debris located southwest of the pad and a suspected disposal pit for sludge material generated during SWMU 9 tank cleaning. Figure 2-5 of the Final CMS Investigation Report for SWMU 9 (Hill and Baker, 2003) identifies an area at the northwest corner of the pad as a suspected disposal pit location. Figure 2-5 of the SWMU 9 CMS Investigation Report is provided in Appendix C. According to the Final CMS Investigation Report, SWMU 9 tanks were cleaned of sludge material approximately every five years until 1978. The sludge material was reportedly disposed of onsite in unlined earthen pits. Since 1978, sludge materials generated during tank cleaning activities have been removed and disposed off-

site by a licensed contractor. Note that a SWMU 9 Area A/B investigation is being conducted independently from SWMU 57.

Soil borings were advanced using a track-mounted DPT rig (Geoprobe 6610 DT rig operated by JFA Geological & Environmental Scientist, P.S.C., of Aguadilla, Puerto Rico) and samples were collected using a 4-foot Geoprobe Macro-Core® (MC) Sampler and disposable, clear acetate liners. Soil boring logs are presented in Appendix B.

Soil samples were field-screened for non-specific, total VOCs using a PID equipped with an 11.7 eV probe and calibrated to isobutylene. The PID readings were recorded on the drilling logs for each boring (Appendix B). The field screening procedure for soils collected using the DPT MC Sampler involved making a longitudinal cut along the entire length of the MC liner, separating the two edges of the liner, and screening the entire length of the soil core with a PID at approximately 0.5 foot intervals. Measurable organic vapors above background levels were not observed in any of the seven boreholes or during the general PID air monitoring with the exception of soil boring 57SB05. Elevated PID readings ranging in the double digit values, with a peak value of approximately 400 parts per million (ppm), were observed through the interval of 15 to 20 feet bgs. Subsurface soil samples were not collected because it was thought that this zone was below the top of groundwater (i.e., potentiometric surface). These PID readings may represent a smear zone (i.e., an interval where free product may have occurred in the soil or on the water table and was smeared across the soil when the water table fluctuated between historic high and low water table elevations). Note that 57GW05 is also located in the vicinity of the suspected disposal pit for tank cleaning sludge material.

Two subsurface soil samples were collected from each boring for a total of 14 environmental samples. In addition, one field duplicate (57SB05-01D) and one MS/MSD (57SB07-01MS/MSD) were also collected.

Subsurface soil samples were collected from the 1 to 3 foot interval and 9 to 11 foot interval bgs. The samples were transferred directly into pre-labeled, laboratory provided sample jars and placed on ice. The samples were shipped in coolers with chain-of-custody forms (provided in Appendix B) to the fixed-base analytical laboratory for analysis. All subsurface soil samples were analyzed for Appendix IX VOCs, SVOCs with LLPAHs, PCBs, TPH GRO/DRO, and metals as outlined in the Work Plan and on Table 4-1.

4.3 Monitoring Well Installation and Groundwater Sampling

Permanent monitoring wells were installed in five (57SB01, 57SB02, 57SB04, 57SB05, and 57SB07) of the seven soil borings using hollow-stem augers (HSAs). Refer to Figure 4-1 for soil boring and monitoring well locations and Table 4-4 for soil boring and monitoring well specifications and construction information. The monitoring well array was proposed in order to delineate potential impacts to groundwater from former SWMU 57 activities. The monitoring wells were installed at the locations proposed in the work plan with the exception of 57SB01. The rationale for relocating 57SB01 was previously discussed in Section 4.2.

Monitoring wells were constructed of 2.0-inch ID, Schedule 40 polyvinyl chloride (PVC), with flush joint threads. Each well was provided with 10-foot long well screens and attempts were made to install the screens to straddle the water table. The well screen and bottom cap were set at the bottom of the borehole and the screen was connected to a threaded, flush-joint, riser. The annular space around the well screen was backfilled with a well-graded, fine to medium sand as the augers were withdrawn from the borehole. The sand was extended to approximately two feet above the top of the screened interval. An approximately two-foot thick sodium bentonite seal

was placed above the sand pack. The bentonite was hydrated with potable water. The annular space above the bentonite seal was backfilled with a cement/bentonite grout to prevent surface water from infiltrating into the screened groundwater monitoring zone. An expandable, water tight locking cap with a vent hole was placed at the top of the casing. The wells were completed at the surface with approximately three feet of four-inch square protective casing. The protective casing was placed over the riser and surrounded by an approximate 2 feet by 2 feet (length x width) and 6 inches thick concrete pad. Four steel bollards were installed around the concrete pad in areas of high vehicular traffic (57GW02 and 57GW05) as additional protection and painted a bright color to aid in visibility.

Monitoring well development consisted of surge and bail using a decontaminated bailer. A minimum of three well volumes were bailed from each of the newly installed wells and existing well 13GW07 with the exception of well 57GW02. Well 57GW02 was dry (water production ceased) after removing approximately 2.5 well volumes. Note that DPT refusal was encountered at a depth of 15 feet bgs at 57GW02, indicating a transition to more competent bedrock, and the borehole was advanced to its total depth using HSAs without soil sampling.

The groundwater was sampled using a decontaminated bladder pump and low-flow sampling techniques at each well with the exception of well 57GW02 due to its insufficient groundwater yield. An attempt to sample well 57SB02 occurred on January 31, 2010; however, due to insufficient groundwater yield the required sample volume was not available. As per USEPA low flow purging and sampling procedures for wells with insufficient yield, the remaining required volume of groundwater was collected on February 1, 2010 once the well had recovered sufficiently to allow for groundwater collection (USEPA, 1998). Field parameters of pH, temperature, turbidity, conductivity, dissolved oxygen, and oxidation-reduction potential were measured and recorded in the field logbooks for the remaining wells sampled according to low-flow procedures. The sampling criteria were met as there were no significant deviations of the required sample purge field parameters. The groundwater samples were placed into appropriate laboratory supplied containers. The groundwater samples were filtered in the field for the dissolved metals analyses. The groundwater sample designations correspond to the representative soil boring location. For example, the groundwater sample collected from soil boring location 57SB01 was designated 57GW01. Following completion of sampling and surveying, each well was secured with a padlock.

Six groundwater monitoring wells, including the five newly installed wells and existing well 13GW07, were sampled and analyzed for Appendix IX VOCs, SVOCs with LLPAs, PCBs, and total and dissolved metals, PAHs, and TPH GRO/DRO. Note that existing permanent well 13GW11, also located within the SWMU 9 Area C site boundary, was proposed to be sampled but was not located and consequently not sampled.

4.4 Groundwater Level Measurements

Depth to groundwater measurements were collected from each of the newly installed monitoring wells shortly after installation and prior to and after well development and sampling activities. Additionally, groundwater measurements were collected from the five newly installed monitoring wells and existing wells 13GW07 and 74VP6Cb at the end of the field investigation on February 2, 2010, on February 26, 2010 during the SWMU 61 field investigation, and on April 20, 2010 during the SWMU 57 field investigation to allow for groundwater equilibration in the respective wells. All groundwater level measurements are provided on Table 4-4 and in the field logbooks in Appendix B. Note that well 13GW11 was not located during the SWMU 57 field investigation.

Groundwater levels were measured from the top of the PVC riser and the groundwater elevations were calculated from the surveyed elevation of the top of riser. A discussion of the survey activities are provided in Section 4.10. The groundwater level measurements were used during well development and sampling activities (e.g., calculate well volumes and monitor draw down) and to develop a potentiometric surface/groundwater contour map. The potentiometric surface map for SWMU 57 was developed using the April 20, 2010 groundwater level data and is discussed in Section 5.2.2.

4.5 Concrete Wipe Sampling

The rectangular concrete pad was evaluated and the number and locations of wipe samples were determined in the field based on visual observations. Although visible chemical staining was not evident, slight depressions were observed where rain water would collect and later evaporate. Based on this observation, wipe samples were collected within these small, isolated depressions. A total of four wipe samples (57WS01, 57WS02, 57WS03, and 57WS04) were collected from the concrete pad (Appendix B, Photo 7). In addition, one field duplicate (57WS04D) and one MS/MSD (57SW04MS/MSD) were also collected. It should be noted that all wipe samples were collected on completely dry concrete surfaces.

The wipe samples were collected utilizing laboratory-supplied containers with gauze pads soaked in the appropriate solution based on the analysis requested. The pads were rubbed up/down and left/right within a template square that measured approximately 10-cm x 10-cm in size. Each analytical parameter required an untouched surface, therefore, four templates were placed side-by-side at each sample location based on the analysis of Appendix IX SVOCS with LLPAHs, Appendix IX PCBs, Appendix IX metals, and TPH DRO. After collection, each wipe area was marked and later surveyed using a mapping grade differential (satellite Differential Global Positioning System [DGPS] corrections from Omnistar or “real-time”) GPS unit.

Samples were placed on ice and shipped in coolers with chain-of-custody forms (provided in Appendix B), to the fixed-base analytical laboratory for analysis. All concrete wipe samples were analyzed for Appendix IX low-level SVOCS, PCBs, metals, and TPH DRO as outlined on Table 4-1.

4.6 Concrete Chip Sampling

A similar evaluation of the rectangular concrete pad was completed for the concrete chip sampling locations as it was for the concrete wipe sampling described in the previous section. Although significant physical degradation of the concrete was not evident, minor pits and surface cracks were observed on the surface of the pad. Since significant degradation and/or staining were not evident, the concrete chip sample locations were spatially distributed on the pad considering the storage possibilities over the entire period of reported use. A total of four chip samples (57CC01, 57CC02, 57CC03, and 57CC04) were collected from the concrete pad (Appendix B, Photo 7). In addition, one field duplicate (57CC04D) and one MS/MSD (57CC04MS/MSD) were also collected.

The chip samples were collected using a chisel and mini sledge hammer. The chisel was decontaminated prior to use at each sample location. In accordance with the approved work plan (Baker, 2007); the concrete chip samples were collected to a depth of approximately ½ inch. Once the sample was collected, a determination was made whether or not contamination may have penetrated deeper than the top ½ inch. However, evidence of contamination (i.e., chemical staining) below ½ inch was not encountered; therefore no additional concrete chip samples were collected. After collection, each chip area was marked and later surveyed using a mapping grade

differential (satellite Differential Global Positioning System [DGPS] corrections from Omnistar or “real-time”) GPS unit. Photographs of the sample locations are provided in Appendix B.

Samples were placed on ice and shipped in coolers with chain-of-custody forms (provided in Appendix B), to the fixed-base analytical laboratory for analysis. All concrete chip samples were analyzed for Appendix IX SVOCS with LLPAHs, PCBs, metals, and TPH DRO as outlined on Table 4-1.

4.7 Utility Clearance

As per the approved Work Plan, all proposed boring locations were first checked for the presence of subsurface utilities. Base utility mapping did not indicate the presence of utilities within the SWMU 57 boundary or vicinity; although, it is known that the SWMU 74 fuel pipeline runs along the north side of the access road to SWMU 57 and SWMU 9 Area C. The sampling locations were field-located using a Global Positioning System (GPS), and the absence of subsurface utilities was field verified to the extent possible. Underground utilities were not encountered during drilling activities.

4.8 Site Clearing

Once utility clearance was achieved and the proposed sample locations were located using a GPS unit, site clearing activities were performed to provide access routes for the drill rig to the proposed sample locations. Due to the dense vegetation present on site, an ASV RC-100 skidsteer equipped with a Magnum Systems Inc. mulcher (operated by Right Way Environmental Contractors, Inc. [RWEC Inc.]) was used for site clearing. The proposed sample locations were located and marked with wooden stakes and survey flagging.

4.9 Decontamination and Investigation Derived Waste

Disposable sampling tools were used for soil and groundwater sampling to the extent practicable, in order to minimize the generation of liquid IDW from decontamination. Non-disposable sampling equipment (i.e., stainless steel spoons, stainless steel bucket augers, and chisel) were decontaminated according to Standard Operating Procedure (SOP) F502 Decontamination of Sampling and Monitoring Equipment. The bladder pump was decontaminated according to procedures described in the USEPA groundwater sampling procedures for low flow purging and sampling (USEPA, 1998). IDW associated with soil sampling and monitoring well installation, including soil cuttings, groundwater, and decontamination fluids, was containerized and stored in 55-gallon drums. However, the soil cuttings from the soil borings in which no wells were installed, were placed back into the boring from which they came, as contamination was not observed. As much as possible, soils last out of the hole were returned first, thereby, approximating original stratigraphy.

Two IDW samples were collected. One composite aqueous sample (57IDW01) was collected from drums containing decontamination fluid (from sampling equipment and drill rig), and one composite soil sample (57IDW02) was collected from drums containing drill cuttings. The soil IDW samples were analyzed for toxicity characteristic leaching procedure (TCLP) VOCs and metals, ignitability, reactive sulfide, reactive cyanide, and pH. The water IDW samples were analyzed for Appendix IX VOCs, total Appendix IX metals, ignitability, reactive sulfide, reactive cyanide, and pH. The IDW analytical data is presented in Appendix D. The drums were moved and stored at a secure location on base following the field work completion. Arrangements to

remove and properly disposed the IDW by an approved vendor was ongoing at the submittal of this report.

4.10 Surveying

Prior to entering the field, an electronic "shape file" (which included each proposed soil boring location) was uploaded to the GPS data collector. Once in the field, the GPS unit was used to navigate to each sample location. Each sample location was flagged and identified using the numbering system as described in the soil sampling and analysis section of the work plan.

Certain features identified during the investigation including the earthen drainage feature, centerline of the access road, and corners of the concrete pad were surveyed using a mapping grade differential (satellite DGPS corrections from Omnistar or "real-time") GPS unit. The coordinate system used to record these positions was U.S. State Plane 1983, Puerto Rico/Virgin Island 5200, and the North American Datum (NAD) 1983, with units in feet.

As a sub-consultant to Baker, the Transystem Corporation conducted a multi-site survey at NAPR on March 30, 31, and April 1, 2010 at SWMUs 57, 61, 67, and 75. At SWMU 57, after the permanent monitoring wells were installed, their coordinates were more accurately surveyed using a combination (where appropriate) of Real-Time Kinematic (RTK) GPS and conventional survey methods. RTK GPS surveying employs a GPS base station and a GPS rover that reads satellite carrier phase signals. Where areas of the site were open to satellites, the RTK survey method was utilized. In contrast, conventional survey methods were used where portions of the site were covered by a vegetative canopy and hindered satellite signal. RTK GPS and conventional surveying were selected specifically because of the accuracy of data they provide to produce groundwater contour mapping:

RTK GPS:
+/- 0.08 Vertical
+/- 0.05 Horizontal

Conventional:
+/- 0.01 Vertical
+/- 0.05 Horizontal

Each permanent monitoring well at SWMU 57 was surveyed. In addition, existing monitoring wells 13GW07 (associated with SWMU 9) and 74VP6Cb (associated with SWMU 74) were surveyed. An elevation was obtained from the top of PVC riser for water level elevation calculations and a spot ground surface elevation was also obtained. All survey data was submitted to Baker for use in office application software such as Auto Computer Aided Design and Drafting (CADD). Coordinates were obtained and input into a CADD/Geographic Information System (GIS) to produce the maps used in this RFI report.

In addition to the monitoring well survey, soil borings (57SB03 and 57SB06), surface soil samples (57SS08 through 57SS12), and concrete chip and concrete wipe sample locations were also surveyed by Transystem Corporation. The coordinate system used for the survey was U.S. State Plane 1983, Puerto Rico/Virgin Island 5200, and the NAD 1983, with units in U.S. survey feet.

4.11 QA/QC Sampling

The following QA/QC samples were collected during the investigation of this site:

- Field Duplicates
- Trip Blanks
- Matrix Spike/Matrix Spike Duplicates (MS/MSDs)
- Field Blank
- Equipment Rinsate Blanks

4.11.1 Field Duplicates

Field duplicates were collected at a minimum rate of approximately 10 percent of primary environmental samples in accordance with the work plan. A total of 26 soil samples (21 soil boring - surface and subsurface samples; and an additional five surface soil samples) were collected as part of this investigation. Three field duplicates collected (57SB07-00D, 57SB05-01D, and 57SS09D) correspond to the 26 soil samples.

The field duplicates collected for the remaining sample media are as follows: One field duplicate groundwater sample (57GW07D) was collected corresponding to six groundwater samples; one field duplicate concrete chip sample (57CC04D) was collected corresponding to four concrete chip samples; and one field duplicate concrete wipe sample (57WS04D) was collected corresponding to four concrete wipe samples. Field duplicates were analyzed for the same parameters as the primary samples and the results were used to evaluate the field sampling methodology.

4.11.2 Trip Blanks

One trip blank sample was included in each cooler containing the samples from the site intended for VOC and/or GRO analysis to evaluate whether cross contamination occurred during shipping of samples. A total of seven trip blanks (57TB01, 57TB02, 57TB03, 57TB04, 57TB05, 57TB06, and 57TB07) accompanied samples from this site. Trip blanks 57TB01, 57TB02, 57TB03, and 57TB05 were analyzed for Appendix IX VOCs and TPH GRO. 57TB04 was analyzed for VOCs only, while 57TB06 and 57TB07 were analyzed only for TPH GRO. Clarification regarding trip blank analysis is provided below.

Initially, trip blank 57TB04 (dated January 29, 2010) was analyzed for Appendix IX VOCs and TPH GRO. However, the VOC analysis for 57TB04 (dated January 29, 2010), and surface soil samples 57SS08 through 57SS12, and 57ER04 were canceled due to an unforeseen sample shipment delay from the courier service used at NAPR. On February 1, 2010 surface soil samples 57SS08 – 57SS12 were re-sampled and shipped the following day. For consistency, the original trip blank designation (57TB04) used on January 29, 2010 was also used for shipment on February 2, 2010. It should also be noted that groundwater sample 57GW05 was included with this shipment. Trip blank 57TB04 is associated with the VOC analysis for 57GW05, while TPH GRO analysis for 57GW05 is associated with 57TB06.

After the February 2, 2010 shipment was received by the analytical laboratory, Baker field staff learned that the original GRO samples (from the January 29, 2010 shipment) were inadvertently discarded by the analytical laboratory. On May 20, 2010 all five additional surface soil samples

(57SS08 – 57SS12) and 57ER08 were recollected (for GRO only). 57TB07 (dated May 20, 2010) was included in the cooler with the re-sampled GRO's for shipment to the laboratory.

4.11.3 Matrix Spike/Matrix Spike Duplicates

Matrix spike and matrix spike duplicates (MS/MSD) were collected at a minimum rate of approximately 4 percent of primary environmental samples from the surface and subsurface soil, groundwater, concrete chip, and concrete wipe samples. A total of 26 soil samples (21 soil boring - surface and subsurface samples; and an additional five surface soil samples) were collected as part of this investigation. One MS/MSD (57SB07-01MS/MSD) was collected and corresponds to 26 soil samples.

Additional MS/MSD sets collected for the remaining sample media are as follows: One MS/MSD groundwater sample (57GW01MS and MSD) was collected corresponding to six groundwater samples; One MS/MSD concrete chip sample (57CC04MS/MSD) was collected corresponding to four concrete chip samples; and One MS/MSD concrete wipe sample (57WS04MS/MSD) was collected corresponding to four concrete wipe samples. The MS/MSD samples were analyzed for the same parameters as the primary environmental samples and the results were used to evaluate the effect of each type of matrix on the analytical method.

4.11.4 Field Blanks

A total of two field blank samples were collected. Field blank sample 57FB01 was collected from laboratory-grade deionized (DI) water used as the source water for the equipment rinse samples and field blank sample 57FB02 was collected from store bought distilled water used for decontamination purposes. The field blank samples were analyzed for Appendix IX VOCs, Appendix IX SVOCs (with LLPAHs), Appendix IX PCBs, TPH GRO and DRO, and metals, to determine whether the water used for generating the equipment rinsates and for decontamination was free of chemicals at levels of concern for the site.

4.11.5 Equipment Rinsates

One equipment rinse was collected per day for one piece of sampling equipment (i.e., stainless steel spoon, stainless steel bucket auger, chisel, groundwater sampling tubing or macro core liners) and the selected analysis for the rinse samples corresponds to the sampling and analytical program developed for SWMU 57. Equipment rinse samples 57ER01, 57ER02, and 57ER03 were collected from disposable acetate Macro-Core® Liners used on January 26, 27, and 28, 2010. Equipment rinse sample 57ER05 was collected from a chisel used on January 30, 2010 for concrete chip samples. Equipment rinse samples 57ER06 and 57ER07 were collected from Teflon lined groundwater sampling tubing used on January 31, 2010 and February 1, 2010. Equipment Rinse samples 57ER01, 57ER02, 57ER03, 57ER06, and 57ER07 were analyzed for Appendix IX VOCs, Appendix IX SVOCs (with LLPAHs), PCB's, TPH GRO and DRO, and metals. 57ER05 was analyzed for Appendix IX SVOCs (with LLPAHs), PCB's, TPH DRO, and metals.

As noted above in Section 4.11.2, the VOC analysis for 57TB04 (dated January 29, 2010), additional surface soil samples (57SS08 through 57SS12), and 57ER04 were canceled due to an unforeseen sample shipment delay from the courier service used at NAPR. The additional surface soil samples were re-sampled for VOCs only. As such, equipment rinse 57ER04 was also re-collected (for VOCs only) on February 2, 2010 from a stainless steel bucket auger. After the February 2, 2010 shipment was received by the analytical laboratory, Baker field staff learned that the original GRO samples (from the January 29, 2010 shipment) were inadvertently

discarded by the analytical laboratory. On May 20, 2010 all five additional surface soil samples (57SS08 – 57SS12) and 57ER08 were recollected (for GRO only). 57TB07 (dated May 20, 2010) was included in the cooler with the re-sampled GRO's for shipment to the laboratory.

4.12 Laboratory Analysis

Fixed-base laboratory analysis was conducted by CompuChem Laboratories, Cary, North Carolina. The list of parameters under the analytical program and the CRQLs are provided in Table 4-3. The laboratory analytical results are provided as Appendix D.

4.13 Data Validation

All fixed-base laboratory data was validated by DataQual Environmental Services, LLC. of St. Louis Missouri, an independent third party. The USEPA Region II Data Validation Standard Operating Procedures were followed. Data Validation Summaries for each Sample Delivery Group (SDG) and the Puerto Rican Chemist Certifications are provided as Appendix E.

5.0 PHYSICAL RESULTS

The following sections provide a brief discussion of the current site conditions at SWMU 57 at the time of the Phase I RFI field investigation conducted from January 25 to February 2, 2010. The site geology and hydrogeology, as ascertained from the soil boring program and other available information, is described herein.

5.1 Current Conditions

SWMU 57 is approximately 1.3 acres in size and includes a gravel access road, rectangular concrete pad (170 by 100 feet in size), and loading dock area. The access road bisects the northwestern most portion of the SWMU with the concrete pad located immediately adjacent (southeast). A steep vegetated hillside surrounds the concrete pad to its northeast, south, and southwest; while the opposite (western) side of the access road is generally flat. Ground elevations range between approximately 15 and 35 feet mean sea level (msl) (i.e., 115 and 135 feet datum; note that the datum plan used is the Mean Low Water plus 100.00 foot as established by the U.S. Navy Survey Section [November 1941]). The concrete pad is located at an approximate elevation of 23 feet msl (123 feet datum). The majority of the concrete pad is in relatively good condition aside from a few cracks and pits. The pad was clear of small miscellaneous debris including small cylinders and equipment that were observed during the Phase II ECP investigation. A 7-inch concrete containment curb surrounds the entire outer perimeter of the pad. The curb is also in good condition; no sections were observed to be broken, missing, or seriously distressed.

Although the pad itself was clear of debris, miscellaneous debris and hummocky soil mounding were observed immediately adjacent to the pad, between existing surface and subsurface soil sample 3E-06 and boring 57SB05, in the southwestern portion of SWMU 57 (Figure 4-1). Additional surface soil samples (57SS08 through 57SS12) were collected from this area, and the general boundary was surveyed with mapping-grade GPS. The miscellaneous debris observed included electrical wire, plastic containers, scrap metal, the housing to a small watercraft engine, and one deteriorated and rusted 55-gallon drum (Appendix B, Photos 8, 9, and 10).

One earthen drainage feature was identified at SWMU 57 (Appendix B, Photo 12). This feature is approximately 140 linear feet and conveys runoff around the northeastern portion of the concrete pad, but terminates before reaching the access road (Figure 4-1). The earthen drainage feature traverses an area upgradient of the concrete pad; releases to the concrete pad or load dock cannot migrate to the earthen drainage feature due to its upgradient location. This drainage feature was dry at the time of the investigation, contained little or no stream substrate, and terminated before the access road (see Figure 4-1). As such, this feature does not appear to support aquatic organisms such as benthic macroinvertebrates. Upland vegetative species (such as guinea grass) were noted within the ditch. No other watercourses or aquatic natural resources (i.e., wetlands) were observed at or in the immediate vicinity to SWMU 57.

For SWMU 57, dominant vegetation within the herbaceous layer includes guinea grass (*Urochloa maxima*), ocean blue morning glory (*Ipomea indica*), flatleaf flatsedge (*Cyperus planifolius*), crack open (*Casearia sylvestris*), and knotgrass (*Paspalum distichum*). Dominant trees and shrubs identified include white lead tree (*Leucaena leucocephala*), white indigo berry (*Randia aculeata*), gumbo limbo (*Bursera simaruba*), and *Erythroxylum sp.*

5.2 Geology/Hydrogeology

The following sections discuss the geology and hydrogeology in the vicinity of SWMU 57.

5.2.1 Geology

SWMU 57 is located in an upland area within the Forrester Area of the base. The upland areas of NAPR include 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 the 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 clay, silt, and/or sand.

Seven soil borings were advanced at SWMU 57 during the Phase I RFI field investigation to profile surface and subsurface conditions. Geologic cross sections were prepared to depict the shallow subsurface conditions at SWMU 57. The cross section locations are provided on Figure 5-1 and cross sections A-A' and B-B' are shown on Figures 5-2 and 5-3, respectively. Boring logs are provided in Appendix B. Note that the datum plan used is the Mean Low Water plus 100.00 foot as established by the U.S. Navy Survey Section (November 1941).

A large portion of SWMU 57 is underlain by residuum generally consisting of clay, silt, and/or sand (57SB01, 57SB03, 57SB04, and 57SB05). Other areas in the vicinity of the concrete pad are underlain by fill material (57SB02 and 57SB06) including varying combinations of clay to gravel or highly weathered bedrock (57SB07). This variability of shallow subsurface materials (i.e., residuum, fill, or highly weathered bedrock) is not unusual considering the cut and fill construction methods typically employed in hilly areas similar to the upland areas of NAPR. Residuum thickness was observed to range between approximately 2.0 feet at 57SB04 and 8.0 feet at 57SB01. The fill thickness was approximately 4.0 feet at 57SB02 and 3.2 feet at 57SB06. Weathered bedrock was observed beneath the residuum or fill. DPT refusal, indicating a transition to more competent bedrock was encountered at locations 57SB02 (15.0 feet bgs), 57SB04 (23.5 feet bgs), and 57SB05 (21.0 feet bgs). Groundwater was not observed in residuum or fill.

5.2.2 Hydrogeology

The collection of groundwater measurements for SWMU 57 is discussed in Section 4.4. A groundwater contour map developed from the April 20, 2010 groundwater level data is shown on Figure 5-4. Note that the datum plan used is the Mean Low Water plus 100.00 foot as established by the U.S. Navy Survey Section (November 1941). The groundwater flow at upland area SWMU 57 is toward the north northwest with a gentle hydraulic gradient of approximately 0.00035 feet per foot. The groundwater flow direction is generally consistent with the anticipated flow for SWMU 57 and the flow direction observed at adjacent SWMU 9 Area C (i.e., toward Los Machos Mangrove Forest). Note that the groundwater elevation datum for well 57SB02 was not included in the development of the potentiometric surface shown on Figure 5-4. Groundwater elevations for 57SB02 are consistently lower than expected. DPT refusal was encountered at a depth of 15 feet bgs and well 57SB02 revealed a very low yield and recharge rate (i.e., the well went dry during development and the yield was insufficient to be sampled using low flow procedures). The borehole for well 57SB02 was advanced to its total depth using HSAs without soil sampling. Sampling details for well 57SB02 are provided in Section 4.3.

6.0 ANALYTICAL RESULTS

This section discusses the analytical results of environmental samples collected from SWMU 57 during the January 2010 Phase I RFI investigation. The validated analytical data tables for the Phase I RFI field effort are included in Appendix D. Relevant portions of the data validation reports for the Phase I RFI Sample Delivery Groups (SDGs) are provided in Appendix E.

6.1 Human Health and Ecological Screening Values

Detected compounds for each media are compared to applicable regulatory and background criteria. The rationale for using criteria for a specific medium are described in detail below.

6.1.1 Human Health Screening Values

Applicable human health criteria for soils include USEPA Regional Industrial Screening Levels (SLs) and USEPA Regional Residential SLs (USEPA, 2010), while applicable human health criteria for groundwater are USEPA Regional Tap Water SLs and Federal Drinking Water Maximum Contaminant Levels (MCLs) (USEPA, 2009).

6.1.1.1 Regional Screening Levels

The Regional SLs were developed by the USEPA to support the risk assessment screening process, while improving consistency across USEPA Regions and incorporating updated guidance in a timely manner. The Regional SL Table was developed with the Department of Energy's Oak Ridge National Laboratory under an Interagency Agreement as an update of the individual screening tables that had previously been maintained by Regions 3, 4, and 9. As recommended by the USEPA, these Regional SLs are to replace all other screening values.

The Regional SL Table contains risk-based screening levels derived from standardized equations (representing ingestion, dermal contact, and inhalation exposure pathways), calculated using the latest toxicity values, default exposure assumptions and physical and chemical properties. The SLs contained in the Regional SL Table are generic; they are calculated without site-specific information. Regional SLs should be viewed as Agency guidelines, not legally enforceable standards. The SLs for potentially carcinogenic chemicals are based on a target Incremental Lifetime Cancer Risk (ILCR) of 1×10^{-6} . The SLs for noncarcinogens are based on a target hazard quotient (HQ) of 1.0. However, in order to account for cumulative risk from multiple chemicals in a medium, the noncarcinogenic SLs were divided by a factor of ten, yielding a target HQ of 0.1. For potential carcinogens, the toxicity criteria applicable to the derivation of SL values are oral Cancer Slope Factors (CSFs) and inhalation unit risk (IUR) factors; for noncarcinogens, they are chronic oral reference doses (RfDs) and inhalation reference concentrations (RfCs). These toxicity criteria are subject to change as more updated information and results from the most recent toxicological/epidemiological studies become available. The Regional SL Table is updated periodically to reflect such changes. It should be noted that the most recent Regional SL Table update available at this time is from May 2010 (USEPA, 2010).

6.1.1.2 Federal Drinking Water MCLs

Federal Drinking Water MCLs are enforceable standards for public water supplies promulgated under the Safe Drinking Water Act and are designed for the protection of human health. MCL Goals are calculated based on laboratory or epidemiological studies and apply to drinking water supplies consumed by a minimum of 25 persons. They are designed for prevention of human health effects associated with a lifetime exposure (70-year lifetime) of an average adult (70

kilograms [kg]) consuming 2 liters of water per day. MCLs consider both the MCL Goal and the technical feasibility of removing the contaminant from the public water supply. Accordingly, MCLs are established as close to the MCL Goal as technically feasible (USEPA, 2009).

6.1.1.3 Puerto Rico Water Quality Standards

Puerto Rico Water Quality Standards (PRWQS) are regulations designed to enhance maintain and preserve the quality of the waters of Puerto Rico. Rule 1303 establishes water quality standards and use classifications promulgated for the protection of the uses assigned to the classifications of the coastal, surface, estuarine, wetlands, and ground waters of the Commonwealth. In Rules 1303.1 (I) (1), 1303.1 (I) (2), 1303.1 (I) (3), 1303.1 (I) (4), and 1303.1 (I) (5) specific substances are identified for which numeric water quality standards have been established (PREQB, 2010).

Puerto Rico Water Quality Standards for Class SG (groundwater intended for use as a source of drinking water supply and agricultural uses including irrigation) listed in the PRWQS regulation amended March 31, 2010 are also included as groundwater screening values. PRWQS values will be used in place of the Federal Drinking Water Quality Standards, when more stringent.

6.1.2 Ecological Screening Values

The sections that follow describe the various criteria and toxicological benchmarks that were used as ecological-based media-specific screening values for chemicals in soil (surface and subsurface soil) and groundwater.

6.1.2.1 Soil Screening Values

USEPA ecological soil screening levels (Eco-SSLs) (documentation available at <http://www.epa.gov/ecotox/ecossl/>) were preferentially used as soil screening values. Eco-SSLs have been developed for eight receptor groups: plants, soil invertebrates, avian herbivores, avian ground insectivores, avian carnivores, mammalian herbivores, mammalian ground insectivores, and mammalian carnivores. For a given chemical, the lowest Eco-SSL value for plants, soil invertebrates, avian herbivores, avian ground insectivores, avian carnivores, mammalian herbivores was selected as the soil screening value. Eco-SSLs for mammalian ground insectivores were not considered for soil screening value development because there are no mammalian ground insectivores in Puerto Rico (mammalian insectivores are limited to aerial insectivores [i.e., bats]). As discussed in Guidelines for Developing Ecological Soil Screening Levels (USEPA, 2005), aerial and arboreal insectivorous birds and mammals were excluded from Eco-SSL development because they are considered inappropriate (i.e., they do not have a clear or indirect exposure pathway link to soil [indirect exposure pathways involve ingestion of prey that have direct contact with soil]). Eco-SSLs for mammalian carnivores also were not considered for soil screening value development because there are no carnivorous mammals on Puerto Rico. With the exception of bats, the terrestrial mammals represented by potentially complete exposure pathways are limited to nonindigenous, nuisance species (i.e., Norway rat, black rat, and mongoose) that have been implicated in the decline of native reptilian and bird populations (Mac et al., 1998 and United States Fish and Wildlife Service [USFWS], 1996). Eco-SSLs for mammalian herbivores are considered appropriate for soil screening value development based on the presence of fruit-eating and nectivorous bats in Puerto Rico.

For those chemicals lacking plant, soil invertebrate, avian herbivore, avian ground insectivore, avian carnivore, or mammalian herbivore Eco-SSLs, 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)

Identical to the Eco-SSLs, when more than one screening value was available for a given chemical from Efroymson et al. (1997a and 1997b), the lowest value was selected as the soil screening value. For those chemicals lacking plant, soil invertebrate, avian herbivore, avian ground insectivore, avian carnivore, or mammalian herbivore Eco-SSL and 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)
- Canadian soil quality guidelines (agricultural land use) developed by the Canadian Council of Ministers of the Environment (CCME, 2007)

Soil screening values based on MHSPE soil standards represent an average of the target and intervention soil standards. Values are based on a default organic carbon content of 2.0 percent, which represents the minimum adjustment range (2.0 to 30.0 percent). Soil screening values developed by CCME soil quality guidelines were given the lowest preference since many are background-based interim guidelines that do not represent effect-based concentrations.

6.1.2.2 Groundwater Screening Values

Chronic saltwater National Ambient Water Quality Criteria (NAWQC) (USEPA, 2009b) were preferentially used as groundwater screening values since the receiving water body for SWMU 57 groundwater is marine (i.e., Los Machos Mangrove Forest). For those chemicals lacking a saltwater NAWQC, groundwater screening values were identified from the following information listed in their order of decreasing preference:

- Final Chronic Values (FCVs) for saltwater contained in ECO Update Volume 3, Number 2 (USEPA, 1996)
- USEPA Region 4 chronic screening values for saltwater contained in Ecological Risk Assessment Bulletins – Supplement to Risk Assessment Guidance for Superfund (RAGS) (USEPA 2001)
- Minimum chronic toxicity test endpoints (No Observed Effect Concentration [NOEC], No Observed Effect Level [NOEL], and Maximum Acceptable Toxicant Concentration [MATC] values) for marine species reported in the ECOTOX Database System (USEPA, 2007b)
- Chronic Lowest Observable Effect Levels (LOELs) for saltwater contained in National Oceanic and Atmospheric Administration (NOAA) Screening Quick Reference Tables (SQUIRTs) (Buchman, 2008) with a safety factor of 10 (Wentzel et al., 1996)

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 the

above-mentioned FCVs, USEPA Region 4 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, 2008)
- Acute toxicity test endpoints (NOEC, NOEL, LOEL, Lowest Observed Effect Concentration [LOEC], median lethal concentration [LC₅₀], and median effective concentration [EC₅₀] values) for marine species contained in the ECOTOX Database System (USEPA, 2007b)
- LC₅₀ values for marine species contained in Superfund Chemical Matrix (USEPA, 2004)

Chronic-based screening values were extrapolated from acute NOEC, NOEL, LOEC, LOEL, LC₅₀, and EC₅₀ values as follows:

- An uncertainty factor of 30 was used to convert an acute NOEC or NOEL a chronic-based screening value (Wentzel et al., 1996)
- An uncertainty factor of 50 was used to convert an Acute LOEC or LOEL to a chronic-based screening value (Wentzel et al., 1996)
- An uncertainty factor of 100 was used to convert an EC₅₀ or LC₅₀ to a chronic-based screening value (Wentzel et al., 1996)

When acute toxicity data were used to extrapolate a chronic screening value, NOECs/NOELs 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.

The screening values used for arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc are USEPA saltwater NAWQC (i.e., continuous criteria concentrations [CCCs]). The USEPA saltwater CCC values for these nine metals can be expressed as dissolved or total recoverable concentrations (USEPA, 2009b). Because groundwater samples were analyzed for total recoverable and dissolved metals, the total recoverable CCC values for these nine metals were converted to dissolved screening values by multiplying the total recoverable CCC values by the following conversion factors (USEPA, 2009b):

- Arsenic: 1.000
- Cadmium: 0.994
- Chromium: 0.993
- Copper: 0.830
- Lead: 0.951
- Mercury: 0.850
- Nickel: 0.990
- Selenium: 0.998
- Zinc: 0.946

Total recoverable screening values were conservatively used to screen the dissolved analytical data for those metals lacking screening values expressed as dissolved concentrations (i.e., antimony, barium, beryllium, cobalt, silver, thallium, tin, and vanadium).

For those chemicals lacking saltwater toxicological thresholds and literature values, surface water screening values were identified or developed from the literature-based freshwater values listed below in their order of decreasing preference.

- Chronic freshwater NAWQC (USEPA, 2009b)
- FCVs for freshwater contained in ECO Update Volume 3, Number 2 (USEPA, 1996)
- USEPA Region 4 chronic screening values for freshwater contained in Ecological Risk Assessment Bulletins – Supplement to RAGS (USEPA, 2001) and USEPA Region 5 ecological screening levels (ESLs) (<http://www.epa.gov/reg5rcra/ca/ESL.pdf>) (USEPA, 2003)
- Minimum chronic toxicity test endpoints (NOEC, NOEL, and MATC values) for freshwater species reported in the ECOTOX Database System (USEPA, 2007b)
- Great Lakes basin Tier II Secondary Chronic Values (SCVs) listed in the Great Lakes Initiative Toxicity Data Clearinghouse (<http://www.epa.gov/gliclearinghouse/>) (USEPA, 2007c)
- Chronic LOELs for freshwater contained in NOAA SQUIRTs (Buchman, 2008) with a safety factor of 10 (Wentzel et al., 1996).

Identical to saltwater-based values, the order of preference was selected based on their level of protection. It is noted that USEPA Region 4 and Region 5 screening values were given equal preference. When a value was available from both sources, the minimum value was selected as the surface water screening value. In the absence of the above-mentioned freshwater FCVs, freshwater USEPA Region 4 and Region 5 screening values, freshwater chronic test endpoints, and freshwater chronic LOELs, screening values were derived from the acute literature values listed below:

- Acute LOELs for freshwater contained in NOAA SQUIRTs (Buchman, 2008)
- Acute toxicity test endpoints (NOEC, NOEL, LOEL, LOEC, LC₅₀, EC₅₀ values) for freshwater species contained in the ECOTOX Database System (USEPA, 2007b)
- LC₅₀ values for freshwater species contained in Superfund Chemical Matrix (USEPA, 2004)

Chronic-based screening values were extrapolated from acute NOEC, NOEL, LOEC, LOEL, LC₅₀, and EC₅₀ values using the safety factors from Wentzel et al. (1996) identified above.

In some cases, acute and/or chronic saltwater LOELs for chemical classes (e.g., PAHs) were available from the literature (Buchman, 2008). A saltwater LOEL based on a chemical class was used as the groundwater screening value only if that chemical lacked freshwater and saltwater literature-based benchmarks and/or toxicity test endpoints.

6.1.3 Background Screening Values

For a given medium (i.e., soil and groundwater), analytical data for inorganic chemicals exceeding one or more of the screening values (human health or ecological) will be compared to NAPR background screening values (i.e., upper limit of the mean [ULM] background

concentrations). The ULM background concentrations used in the evaluations are those derived from the inorganic data sets contained in the Revised Final II Summary Report for Environmental Background Concentrations of Inorganic Compounds, (Baker, 2010). The ULM background concentrations, as well as the ecological and human health screening values, will be compared to the Full RFI analytical data to determine if the proposed sampling effort delineated the extent of soil contamination detected during the Phase I RFI.

6.2 Surface Soil

Twelve surface soil samples (57SB01-00 through 57SB07-00 and 57SS08 through 57SS12) and two field duplicate samples (57SB07-00D and 57SS09D) were collected and analyzed during the Phase I RFI. All surface soil samples were analyzed for Appendix IX VOCs, SVOCs with LLPAHs, PCBs, TPH GRO/ DRO, and metals. A detected results table for the combined surface soil data set is presented in Table 6-1. Results are compared to appropriate media specific criteria as described in Section 6.1.

One VOC (carbon disulfide) was detected in the surface soil at low, estimated concentrations, well below the listed criteria.

Nineteen SVOCs with LLPAHs (which include a combination of low and high molecular weight PAHs) were detected in the surface soil at SWMU 57; none exceeded the screening criteria.

One PCB (Aroclor-1260) was found in samples 57SB07-00, 57SB07-00D, 57SS08, 57SS09, 57SS09D, 57SS10, and 57SS12. 57SB07-00D, 57SS10, and 57SS12 exhibited Aroclor-1260 detections in the surface soil, below the listed criteria. However, as shown on Figure 6-1, detections in 57SB07-00, 57SS08, and 57SS09D exceeded the USEPA Regional Residential SL; while 57SS09 exceeded both the USEPA Regional Residential and Industrial SLs.

DRO was detected at nearly all surface soil samples (excluding 57SB01-00). However, none exceeded the screening criteria. GRO was not detected in any of the surface soil samples.

Seventeen inorganic compounds were detected in the surface soil at SWMU 57. Thirteen inorganic parameters exceeded one or more of the screening criteria:

- Arsenic
- Barium
- Cadmium
- Chromium
- Cobalt
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Thallium
- Vanadium
- Zinc

Arsenic exceeded the regional screening level for residential soil at ten of the twelve surface soil sample locations; arsenic also exceeded the regional screening level for industrial soil at four of the nine locations. However, arsenic only exceeded the background screening level at 57SS08.

Barium slightly exceeded the NAPR basewide background concentration at one location, 57SS11; barium did not exceed other screening criteria. Cadmium exceeded the selected ecological surface soil screening values and NAPR basewide background concentration at four locations (57SS08, 57SS09, 57SS10, and 57SS11). Chromium exceeded the selected ecological surface soil screening values at six surface soil sample locations; however, chromium only exceeded the background screening level at 57SB04. Cobalt exceeded the selected ecological surface soil screening values and regional screening level for residential soil at all but one (57SS12) of the surface soil sample locations; and the regional screening level for industrial soil were exceeded at six of the twelve surface soil sample locations. Cobalt concentrations exceeded background and the other screening criteria in three surface soil samples (57SB02-00, 57SB07-00D, and 57SS11). Copper was detected in all samples at a concentration in excess of the selected ecological surface soil screening value; however, this detection did not exceed the background screening value or residential or industrial soil screening values for copper. Lead exceeded the selected ecological surface soil screening values and background screening values at six (57SB01, 57SS08, 57SS09, 57SS10, 57SS11, and 57SS12) of the twelve locations. Mercury exceeded the selected ecological surface soil screening values and background screening values in three samples (57SB02, 57SS09, and 57SS09D). Both the ecological and background screening values for nickel were exceeded in surface soil sample 57SB04-00; while 57SS09 exceeded only background. The duplicate sample for selenium at 57SS09 exceeded only the selected ecological surface soil screening value. Thallium exceeded the selected ecological surface soil screening value at all twelve sample locations; although, no other human health or background screening criteria for thallium were exceeded in the surface soil. Vanadium exceeded the ecological and human health screening criteria at all twelve sample locations. However, none of the background screening criteria for vanadium were exceeded at any surface soil sample location. Although the ecological screening criteria for zinc were exceeded at eleven surface soil sample locations; only three of the twelve locations (57SB05, 57SS08, and 57SS09) also exceeded background screening criteria. Antimony, beryllium, silver, and tin did not exceed any of the screening criteria or background. Selenium was rejected in six of the twelve surface soil samples constituting a data gap. Figure 6-2 presents the locations of inorganic parameters that exceeded ecological and/or human health screening criteria and NAPR basewide background values for the 2010 Phase I RFI data.

Based on the exceedences of background and regulatory screening criteria in the surface soil, it appears that PCB (Aroclor-1260) and metals contamination may have occurred in the surface soil due to past activities at SWMU 57. Information obtained to date indicates that the lateral extent of contamination has not been fully defined.

6.3 Subsurface Soil

Fourteen primary subsurface soil samples were collected and analyzed during the Phase I RFI for Appendix IX VOCs, SVOCs with LLPAs, PCBs, TPH DRO/GRO, and metals. Detected results for the subsurface soil data set are presented in Table 6-2.

There were no VOC detections in any of the subsurface soil samples.

A total of eighteen SVOCs with LLPAs (which include a combination of low and high molecular weight PAHs) were detected at low, estimated concentrations as part of the subsurface soil sampling program. However, only one SVOC with LLPAs (benzo(a)pyrene) at 57SB04 exceeded the regional residential SL. No other SVOCs with LLPAs exceeded the regional industrial SL or background screening criteria.

One PCB (Aroclor-1260) was detected in 57SB07-01, but did not exceed any of the established screening criteria.

TPH DRO was detected in eleven of the 14 samples, but none exceeded any screening criteria. GRO was not detected in any of the subsurface soil samples.

Seventeen inorganic compounds were detected in the subsurface soil at SWMU 57. Thirteen inorganic parameters exceeded one or more of the criteria. They are:

- Arsenic
- Barium
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Copper
- Lead
- Mercury
- Nickel
- Thallium
- Vanadium
- Zinc

Arsenic exceeded the regional screening level for residential soil in thirteen primary subsurface soil samples; arsenic also exceeded the regional screening level for industrial soil and the NAPR basewide background screening criteria in subsurface soil sample 57SB02-01 (The industrial soil and the NAPR basewide background screening criteria were also exceeded for the duplicate sample 57SB05-01D). Barium exceeded the NAPR basewide background concentration at four locations. Barium also exceeded the selected ecological surface soil screening value and NAPR basewide background concentration at one location, 57SB04, at a depth of 9 to 11 feet bgs (note that the ecological soil screening values are not applicable to samples collected from depths greater than 3 feet bgs). Beryllium was detected at a concentration in excess of background at three locations (57SB02, 57SB04, and 57SB06-05); beryllium did not exceed any of the other screening criteria. Cadmium exceeded the NAPR basewide background concentration at three locations. Cadmium also exceeded the selected ecological surface soil screening value and NAPR basewide background concentration at one location, in the duplicate sample for 57SB05, at a depth of 1 to 3 feet bgs. Chromium was detected in excess of the selected ecological soil screening values in six subsurface soil sample locations. However, no other screening criteria for chromium were exceeded in the subsurface soil. For cobalt, residential or industrial soil SLs and ecological soil screening values (excluding sample 57SB04-01) or background screening criteria were exceeded at all seven locations. Copper exceeded the selected ecological subsurface soil screening values at all seven locations, in all subsurface soil samples (including the duplicate sample 57SB05-01D, but did not exceed any other screening criteria. Lead exceeded the selected ecological soil screening values and background screening criteria at all seven locations. In samples 57SB02-01 and 57SB05-01D, lead exceeded the regional residential SL. The ecological soil screening value and background screening criteria for mercury were exceeded only at 57SB05-01. Nickel exceeded the NAPR basewide background concentration at three locations. Nickel also exceeded the selected ecological surface soil screening value and NAPR basewide background concentration at one location, 57SB04, at a depth of 9 to 11 feet bgs. There are no established residential or industrial soil screening level criteria for thallium. However, thallium exceeded the selected ecological surface soil screening values and NAPR basewide background concentrations at all seven locations, for all subsurface soil samples collected. Vanadium exceeded the regional screening level for residential soil and the selected ecological soil

screening values at all sample locations. At six of the seven locations, zinc exceeded the selected ecological surface soil screening values and NAPR basewide background concentrations. However, at only one location (57SB02) did zinc exceed the ecological and background concentrations within the 1 to 3 foot depth interval. Antimony, selenium, silver, and tin did not exceed any of the screening criteria or background. Selenium was rejected in twelve of the fourteen subsurface soil samples constituting a data gap. Figure 6-3 presents the locations of inorganic parameters that exceeded ecological and/or human health screening criteria and NAPR basewide background values for the 2010 Phase I RFI data.

Based on the exceedences of background and regulatory screening concentrations in the subsurface soil, it appears that arsenic, barium, cadmium, cobalt, lead, thallium, vanadium, and zinc contamination may have occurred in the subsurface soil due to past activities at SWMU 57.

6.4 Groundwater

Six groundwater samples (57GW01, 57GW02, 57GW04, 57GW05, 57GW07, and 13GW07) and one duplicate sample (57GW07D) were collected and analyzed during the 2010 Phase I RFI investigation at SWMU 57. All groundwater samples were analyzed for VOCs, SVOCs with LLPAHs, PCBs, TPH DRO/GRO, and total and dissolved metals as outlined on Table 4-1. The detected results for the groundwater data set are provided in Table 6-3. Figure 6-4 presents the location of detected organic compounds above the Regional Tap Water SL, or the ecological groundwater screening values; while Figure 6-5 presents the location of detected inorganic compounds above the Regional Tap Water SL, and/or the ecological groundwater screening values, and the NAPR basewide background values. The complete data set is provided in Appendix D.

Three VOCs (carbon disulfide, chloroform, and methyl Iodide) were detected in the groundwater. Only the tap water Regional SLs for chloroform was exceeded in sample 57GW02.

Thirteen SVOCs with LLPAHs were detected at relatively low concentrations. At 57SB05, benzo(a)anthracene, benzo(a)pyrene (BaP), and benzo(b)fluoranthene exceeded their tap water Regional SLs; while benzo(a)anthracene also exceeded the selected ecological groundwater screening values. Pyrene only exceeded the selected ecological groundwater screening value. The remaining SVOCs with LLPAHs were detected at relatively low concentrations at various locations but did not exceed corresponding human health or ecological screening values at any other location.

Note that PCBs were not detected and TPH DRO/GRO did not exceed screening criteria for any of the groundwater samples collected.

Dissolved Inorganics:

Eleven dissolved metals were detected in the groundwater samples. Five exceeded one or more of the criteria including:

- Cobalt
- Lead
- Mercury
- Nickel
- Vanadium

As shown on Table 6-3, dissolved cobalt exceeded only its Tap Water Regional SL at all sample locations. Dissolved lead exceeded the selected ecological groundwater screening and NAPR basewide background screening values in sample 57GW05. Dissolved mercury exceeded background and one or more of the groundwater screening criteria at four locations. Dissolved nickel exceeded the selected ecological groundwater screening criteria in one sample (57GW02). The regional tap water screening values for vanadium were exceeded in all samples. At 13GW07, 57SB02, and 57SB04, vanadium exceeded the regional tap water, selected ecological groundwater, and NAPR basewide background screening values.

Total Inorganics:

Thirteen total metals were detected in the groundwater samples. Seven exceeded one or more of the criteria including:

- Antimony
- Cobalt
- Copper
- Lead
- Mercury
- Thallium
- Vanadium

As shown on Table 6-3, antimony exceeded its tap water regional SL at 57SB04. Total cobalt exceeded its tap water regional SL at all sample locations (not including the duplicate sample for 57GW07D). In samples 57GW02 and 57GW05, the selected ecological groundwater screening values for total copper were exceeded. However, no other screening values were exceeded for total copper. Total lead exceeded the selected ecological groundwater and regional tap water screening values in sample 57GW05. Total mercury exceeded background, and one or more of the groundwater screening criteria at four locations (13GW07, 57SB01, 57SB04, and 57SB07). The regional tap water screening value for vanadium was exceeded in all samples and the selected ecological groundwater screening value was exceeded in all samples except sample 75GW01 and duplicated sample 57GW07D.

Groundwater samples collected during this investigation resulted in exceedences of SVOCs with LLPAHs (at 57SB05) and inorganic exceedences at all groundwater sample locations. Although SVOC with LLPAH exceedences are evident at 57SB05; the samples collected downgradient (57GW01 and 57GW04) do not indicate exceedences of these compounds. Therefore, these compounds in groundwater have been delineated. However, the inorganic exceedences in groundwater have not been delineated.

6.5 Concrete Chip

Four concrete chip samples (57CC01, 57CC02, 57CC03, and 57CC04) and one duplicate sample (57CC04D) were collected and analyzed during the 2010 Phase I RFI investigation at SWMU 57. All concrete chip samples were analyzed for SVOCs with LLPAHs, PCBs, TPH DRO, and total metals as outlined on Table 4-1. Although there are no established screening criteria available to compare detected concrete chip sample results to; the detected results for the concrete chip data set are provided in Table 6-4, while the complete data set is provided in Appendix D. A discussion of the concrete chip detections is as follows:

Analysis of the four concrete chip samples (including the duplicate sample 57CC04D) resulted in the detection of two SVOCs with LLPAHs bis-(2-ethylhexyl) phthalate (BEHP) and

isophorone)), diesel range organics, and eleven metals (arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc).

6.6 Surface Wipe Samples

Four concrete surface wipe samples (57WS01, 57WS02, 57WS03, and 57WS04) and one duplicate sample (57WS04D) were collected and analyzed during the 2010 Phase I RFI investigation at SWMU 57. All concrete wipe samples were analyzed for SVOCs with LLPAHs, PCBs, TPH DRO, and total metals as outlined on Table 4-1. Although there are no established screening criteria available to compare detected concrete wipe sample results to; the detected results for the wipe sample data set are provided in Table 6-5, while the complete data set is provided in Appendix D.

A discussion of the concrete surface wipe sample detections is as follows:

Analysis of the four concrete surface wipe samples (including the duplicate sample 57SW04D) resulted in the detection of five SVOCs with LLPAHs (4-chloro-3-methylphenol, acenaphthene, acenaphthylene, fluorine, and phenanthrene), diesel range organics, and nine metals (antimony, chromium, cobalt, copper, lead, nickel, selenium, tin, and zinc).

6.7 Laboratory Data Validation Summary

A discussion of the compounds detected in the field QA/QC samples is presented in Section 6.7.1. A summary of the data validation findings is provided in Section 6.7.2. Data validation reports are included in Appendix E. In addition, the Puerto Rican Chemist Certification for each STL SDG also is presented in Appendix E.

6.7.1 Summary of Detected Compounds in Field QA/QC Samples

Field generated QA/QC samples for the Phase I RFI field effort consisted of field blanks, trip blanks, and equipment rinsates. Trip blanks were only analyzed for VOCs and/or GRO. Other blanks were analyzed for all fractions requested in this investigation including VOCs, SVOCs with LLPAHs, PCBs, TPH DRO/GRO, and total metals. Table 6-6 presents the detected compounds found in the trip blanks, equipment rinsates, and field blanks.

Detections in field blank FB01 included five VOCs (2-butanone, acetone, chloroform, methylene chloride, and toluene), and GRO. Detections in field blank FB02 included seven VOCs (2-butanone, acetone, bromodichloromethane, bromoform, chloroform, dibromochloromethane, and methylene chloride), three SVOCs with LLPAHs (2-methylnaphthalene, benzyl alcohol, and naphthalene), GRO, and two metals (beryllium and zinc).

GRO was detected in nearly all of the trip blank samples (GRO was not analyzed for 57TB05). The highest concentration detected in trip blank sample 57TB01 (0.051 ug/L).

Analysis of the eight equipment rinsate samples resulted in the detection of seven VOCs (2-Butanone, acetone, acetonitrile, chloroform, chloromethane, methylene chloride, and toluene), eleven SVOCs with LLPAHs (2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(g,h,i)perylene, chrysene, fluorine, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene), gasoline range organics, and four metals (copper, lead, nickel, and zinc). It should be noted that VOCs were not analyzed (NA) for 57ER05 and 57ER08; GRO was not analyzed for 57ER05; and SVOCs with LLPAHs and total metals were not analyzed for 57ER08.

6.7.2 Validation Summary

Laboratory analyses were performed by CompuChem, a Division of Liberty Analytical Corporation located in Cary, North Carolina. Validation services were provided by DataQual Environmental Services, LLC located in St. Louis, Missouri. There were a total of eleven SDGs for SWMU 57, including two SDGs for IDW water and soil (1002031 and 1002032) that were not validated. Validation conclusions are provided in Appendix E. Each SDG is certified by a Puerto Rican Chemist, these certifications are included as part of Appendix E.

The validation indicated that most sample preparation and analysis was performed within Region II and/or method holding time requirements, exceptions are discussed below. Changes in the results due to the application of the data validation objectives did not significantly compromise the data quality objectives for this SWMU. The data, as qualified by the validator is acceptable for its intended use. Discussions of samples that had holding time exceptions and rejected analytical results are discussed below.

For samples 57SS08 through 57SS12 the original receipt of VOC analysis was delayed because of courier shipment. The samples were re-collected for VOCs and analytical results were included with the results of the other constituents requested as part of SDG 1001181, although the VOCs were collected on 2/2/2009. For the sample IDs, TPH GRO had to be resampled in May 2009 because of a laboratory error; the SDGs for these analytical results are 1005168/1005169.

In SDG 1001159 VOCs for sample 57SB02-00 exhibited below 25 percent internal standards area recoveries for all standards; therefore all positive results were qualified as estimated (J) and non-detect results were qualified as rejected (R). In addition, selenium was rejected because the matrix spike analysis submitted in the SDG exhibited non-compliant percent recoveries requiring rejection qualification for selenium.

GRO holding time in SDG 1001160 for samples 57ER01, 57FB01 and 57TB02 exceeded the holding time by one day; therefore the positive result exhibited in all samples were qualified as estimated (J).

In SDG 1001181 sample 57SS09D was analyzed four days out of the 14-day holding time for VOCs; therefore all positive results were qualified as estimated (J) and all non-detected results were rejected.

Sample 57GW05 (SDG 1002019) exhibited a pH of 7 and exceeded the seven day holding for water samples with greater than pH of 2 by five days; therefore for VOCs all positive results were qualified as estimated (J) and non detect results were rejected. In addition, total and dissolved Barium were rejected because of an unfavorable comparison between total and dissolved metals.

In SDG 1002021 due to recoveries below 10 percent for LCS samples in SVOCs, all associated sample non-detect results were qualified as rejected for several compounds (see data validation narrative) for concrete chip samples 57CC01 through 57CC04.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

The analysis of samples obtained during the Phase I RFI investigation indicates that surface soil, subsurface soil, and groundwater have been impacted from past activities at SWMU 57. Comparison of the analytical results to the project screening criteria revealed the following primary impacts based on exceedances of background and one or more of the project criteria (note that for constituents which do not have established background criteria, impacts are indicated by the exceedance of at least one of the project criteria):

Surface Soil

- One PCB, Aroclor-1260, was reported for samples 57SB07 (and duplicate), 57SS08, 57SS09 (and duplicate), 57SS10, and 57SS12. Samples 57SB07-00, 57SS08, and 57SS09D exceeded the USEPA Regional Residential SL and sample 57SS09 exceeded both the USEPA Regional Residential and Industrial SLs. These samples are located in the area southwest of the pad where surface debris was observed. Surface debris and hummocky soil mounding indicative of possible placement of materials (i.e., soil) scrapped from the pad exists in this area southwest of the pad.
- Arsenic, cadmium, cobalt, lead, mercury, and zinc were reported at concentrations exceeding one or more of the screening criteria and background for samples located in the area southwest of the pad, where surface debris was observed, and in its topographic downgradient vicinity (57SS08 through 57SS11, 57SB01, and 57SB05 through 57SB07) and in the topographic downgradient vicinity of the loading dock (57SS12). Isolated exceedences of arsenic, cobalt, and mercury at 57SB02; arsenic and cobalt at 57SB03; and chromium, cobalt, and nickel at 57SB04 were reported.
- Selenium was rejected in six of the twelve surface soil samples constituting a data gap.

Subsurface Soil – 1 to 3 foot interval

- Arsenic at 57SB02 and the duplicate sample from location 57SB05 were reported at concentrations exceeding the associated background and the industrial regional screening level criteria.
- Lead was reported at concentrations exceeding one or more of the project comparison criteria and background for shallow subsurface soil samples at each of the seven soil borings advanced during the Phase I RFI.
- Thallium was reported at concentrations exceeding one or more of the project comparison criteria and background for shallow subsurface soil samples at each of the seven soil borings advanced during the Phase I RFI.
- Cobalt was reported at concentrations exceeding one or more of the project comparison criteria and background for shallow subsurface soil samples at each of the soil borings advanced during the Phase I RFI with the exception of 57SB04.
- Mercury at 57SB05 and zinc at 57SB02 were reported at concentrations exceeding the associated background and ecological screening criteria.

- Selenium was rejected in six of the fourteen subsurface soil samples (within the 1 to 3 foot depth interval) constituting a data gap.

Subsurface Soil – 9 to 11 foot interval

- Cobalt was reported at concentrations exceeding one or more of the project comparison criteria for soil samples at 57SB02, 57SB04, 57SB05, and 57SB06.
- Selenium was rejected in six of the fourteen subsurface soil samples (within the 9 to 11 foot depth interval) constituting a data gap.

Groundwater

- Benzo(a)anthracene, benzo(a)pyrene (BaP), and benzo(b)fluoranthene exceeded their tap water Regional SLs while benzo(a)anthracene also exceeded the associated ecological groundwater screening values for groundwater sample 57GW05. Pyrene exceeded only the selected ecological groundwater screening value for groundwater sample 57GW05. Elevated PID readings ranging in the double digit values, with a peak value of approximately 400 parts per million (ppm), were observed through the interval of 15 to 20 feet bgs at 57SB05. Well 57SB05 is located in the downgradient vicinity of the suspected disposal pit for sludge material generated during SWMU 9 tank cleaning.
- Lead was reported at concentrations exceeding the ecological screening and background criteria for the dissolved analyses of sample 57GW05.
- Mercury was reported at concentrations exceeding background and one or more of the project comparison criteria for both the total and dissolved analyses of samples 57GW01, 57GW04, 57GW07, and 13GW07.
- Vanadium was reported at concentrations exceeding each of the three project comparison criterion for the dissolved analyses of samples 57GW02, 57GW04, and 13GW07.

Concrete

- A number of organic compounds and inorganic constituents were detected for the concrete wipe and chip samples. Screening criteria is not available for concrete wipe and chip samples.

7.2 Recommendations

Impacts to the environment have occurred at SWMU 57. Information obtained to date indicates that the lateral extent of contamination has not been fully defined. Consequently, a Full RFI Investigation is recommended to characterize the nature and extent of impacts to the surface soil, subsurface soil, and groundwater at SWMU 57 and the adjacent topographic downgradient vicinity.

8.0 REFERENCES

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TABLES

TABLE 4-1

**SUMMARY OF SAMPLING AND ANALYTICAL PROGRAM - ENVIRONMENTAL SAMPLES
SWMU 57 - FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample Media	Site ID	Sample ID	Sample Depth	Sample Date	Fixed Based Analytical Lab Analysis							Comment
					App IX VOCs	SVOCs with low-level PAHs	App IX PCBs	App IX Metals (Total)	App IX Metals (Dissolved)	TPH DRO	TPH GRO	
Surface Soil	57SB01	57SB01-00	0.0 - 1.0	1/28/10	X	X	X	X		X	X	
	57SB02	57SB02-00	0.0 - 1.0	1/26/10	X	X	X	X		X	X	
	57SB03	57SB03-00	0.0 - 1.0	1/26/10	X	X	X	X		X	X	
	57SB04	57SB04-00	0.0 - 1.0	1/28/10	X	X	X	X		X	X	
	57SB05	57SB05-00	0.0 - 1.0	1/27/10	X	X	X	X		X	X	
	57SB06	57SB06-00	0.0 - 1.0	1/28/10	X	X	X	X		X	X	
	57SB07	57SB07-00	0.0 - 1.0	1/27/10	X	X	X	X		X	X	
		57SB07-00D	0.0 - 1.0	1/27/10	X	X	X	X		X	X	Duplicate
	57SS08	57SS08	0.0 - 1.0	1/29/10		X	X	X		X	X	
		57SS09	0.0 - 1.0	1/29/10		X	X	X		X	X	
	57SS09	57SS09	0.0 - 1.0	1/29/10		X	X	X		X	X	
		57SS09D	0.0 - 1.0	1/29/10		X	X	X		X	X	Duplicate
	57SS10	57SS10	0.0 - 1.0	1/29/10		X	X	X		X	X	
	57SS11	57SS11	0.0 - 1.0	1/29/10		X	X	X		X	X	
	57SS12	57SS12	0.0 - 1.0	1/29/10		X	X	X		X	X	
	57SS08	57SS08	0.0 - 1.0	2/2/10	X							
	57SS09	57SS09	0.0 - 1.0	2/2/10	X							
		57SS09D	0.0 - 1.0	2/2/10	X							
	57SS10	57SS10	0.0 - 1.0	2/2/10	X							
	57SS11	57SS11	0.0 - 1.0	2/2/10	X							
	57SS12	57SS12	0.0 - 1.0	2/2/10	X							
	57SS08	57SS08	0.0 - 1.0	5/20/10							X	GRO recollected 5/20/10
	57SS09	57SS09	0.0 - 1.0	5/20/10							X	GRO recollected 5/20/10
		57SS09D	0.0 - 1.0	5/20/10							X	GRO recollected 5/20/10
57SS10	57SS10	0.0 - 1.0	5/20/10							X	GRO recollected 5/20/10	
57SS11	57SS11	0.0 - 1.0	5/20/10							X	GRO recollected 5/20/10	
57SS12	57SS12	0.0 - 1.0	5/20/10							X	GRO recollected 5/20/10	

TABLE 4-1

**SUMMARY OF SAMPLING AND ANALYTICAL PROGRAM - ENVIRONMENTAL SAMPLES
SWMU 57 - FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample Media	Site ID	Sample ID	Sample Depth	Sample Date	Fixed Based Analytical Lab Analysis							Comment
					App IX VOCs	SVOCs with low-level PAHs	App IX PCBs	App IX Metals (Total)	App IX Metals (Dissolved)	TPH DRO	TPH GRO	
Subsurface Soil	57SB01	57SB01-01	1.0 - 3.0	1/28/10	X	X	X	X		X	X	
		57SB01-05	9.0 - 11.0	1/28/10	X	X	X	X		X	X	
	57SB02	57SB02-01	1.0 - 3.0	1/26/10	X	X	X	X		X	X	
		57SB02-05	9.0 - 11.0	1/26/10	X	X	X	X		X	X	
	57SB03	57SB03-01	1.0 - 3.0	1/26/10	X	X	X	X		X	X	
		57SB03-05	9.0 - 11.0	1/26/10	X	X	X	X		X	X	
	57SB04	57SB04-01	1.0 - 3.0	1/28/10	X	X	X	X		X	X	
		57SB04-05	9.0 - 11.0	1/28/10	X	X	X	X		X	X	
	57SB05	57SB05-01	1.0 3.0	1/27/10	X	X	X	X		X	X	
		57SB05-01D	1.0 3.0	1/27/10	X	X	X	X		X	X	Duplicate
		57SB05-05	9.0 11.0	1/27/10	X	X	X	X		X	X	
	57SB06	57SB06-01	1.0 - 3.0	1/28/10	X	X	X	X		X	X	
		57SB06-05	9.0 - 11.0	1/28/10	X	X	X	X		X	X	
	57SB07	57SB07-01	1.0 - 3.0	1/27/10	X	X	X	X		X	X	
		57SB07-01 MS/MSD	1.0 - 3.0	1/27/10	X	X	X	X		X	X	Matrix Spike/Matrix Spike Duplicate
57SB07-05		9.0 - 11.0	1/27/10	X	X	X	X		X	X		

TABLE 4-1

**SUMMARY OF SAMPLING AND ANALYTICAL PROGRAM - ENVIRONMENTAL SAMPLES
SWMU 57 - FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample Media	Site ID	Sample ID	Sample Depth	Sample Date	Fixed Based Analytical Lab Analysis							Comment
					App IX VOCs	SVOCs with low-level PAHs	App IX PCBs	App IX Metals (Total)	App IX Metals (Dissolved)	TPH DRO	TPH GRO	
Groundwater	13SB07	13GW07	NA	1/31/10	X	X	X	X	X	X	X	
	57SB01	57GW01	NA	2/1/10	X	X	X	X	X	X	X	
		57GW01MS/MSD	NA	2/1/10	X	X	X	X	X	X	X	Matrix Spike/Matrix Spike Duplicate
	57SB02	57GW02	NA	1/31/10	X	X	X	X	X	X	X	
	57SB04	57GW04	NA	1/31/10	X	X	X	X	X	X	X	
	57SB05	57GW05	NA	2/1/10	X	X	X	X	X	X	X	
	57SB07	57GW07	NA	1/31/10	X	X	X	X	X	X	X	X
57GW07D		NA	1/31/10	X	X	X	X	X	X	X	X	Duplicate
Concrete Wipe	57WS01	57WS01	NA	1/30/10		X	X	X		X		
	57WS02	57WS02	NA	1/30/10		X	X	X		X		
	57WS03	57WS03	NA	1/30/10		X	X	X		X		
	57WS04	57WS04	NA	1/30/10		X	X	X		X		
		57WS04D	NA	1/30/10		X	X	X		X		Duplicate
57WS04MS/MSD	NA	1/30/10		X	X	X		X			Matrix Spike/Matrix Spike Duplicate	
Concrete Chip	57CC01	57CC01	0.0 - 0.5	1/30/10		X	X	X		X		
	57CC02	57CC02	0.0 - 0.5	1/30/10		X	X	X		X		
	57CC03	57CC03	0.0 - 0.5	1/30/10		X	X	X		X		
	57CC04	57CC04	0.0 - 0.5	1/30/10		X	X	X		X		
		57CC04D	0.0 - 0.5	1/30/10		X	X	X		X		Duplicate
57CC04MS/MSD	0.0 - 0.5	1/30/10		X	X	X		X			Matrix Spike/Matrix Spike Duplicate	

Notes:

ft bgs - feet below ground surface.

NA - Not Applicable.

TABLE 4-2

SUMMARY OF SAMPLING AND ANALYTICAL PROGRAM - QA/QC AND IDW SAMPLES
 SWMU 57 - FACILITY NO. 278 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Media	Sample ID	Sample Date	Aqueous Samples Analysis Requested									Solid Samples Analysis Requested			Comment	
			App IX VOCs	SVOCs with low-level PAHs	App IX PCBs	App IX Metals (Total)	TPH DRO	TPH GRO	TCLP Volatiles	TCLP RCRA Metals	RCI	TCLP Volatiles	TCLP Metals	RCI		
Trip Blanks	57TB01	1/26/2010	X					X								
	57TB02	1/27/2010	X					X								
	57TB03	1/28/2010	X					X								
	57TB04	2/1/2010	X													
	57TB05	2/1/2010	X													
	57TB06	2/2/2010						X								
	57TB07	5/20/2010						X								
Equipment Rinsate Blanks	57ER01	1/26/2010	X	X	X	X	X	X								Macro-Core® Liner
	57ER02	1/27/2010	X	X	X	X	X	X								Macro-Core® Liner
	57ER03	1/28/2010	X	X	X	X	X	X								Macro-Core® Liner
	57ER04	1/29/2010		X	X	X	X									Stainless Steel Bucket Auger
	57ER04	2/1/2010	X													Stainless Steel Bucket Auger
	57ER05	1/30/2010		X	X	X	X									Chisel
	57ER06	1/31/2010	X	X	X	X	X	X								Teflon Lined Tubing
	57ER07	2/1/2010	X	X	X	X	X	X								Teflon Lined Tubing
57ER08	5/20/2010						X								Stainless Steel Bucket Auger	
Field Blanks	57FB01	1/26/2010	X	X	X	X	X	X								Lab Grade Deionized Water
	57FB02	2/1/2010	X	X	X	X	X	X								Store Bought Distilled Water
IDW	57IDW01	2/2/2010			X					X	X	X				Aqueous
	57IDW02	2/2/2010			X								X	X	X	Solid

TABLE 4-3
METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 57 - POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

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

TABLE 4-3
METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 57 - POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Volatiles (Cont.)	Low Level Quantitation Limits*		Method Number
	Water (µg/L)	Low Soil (µg/kg)	
Toluene	1.0	5.0	8260B (5030B)(low level)
1,1,1-Trichloroethane	1.0	5.0	8260B (5030B)(low level)
1,1,2-Trichloroethane	1.0	5.0	8260B (5030B)(low level)
Trichloroethene	1.0	5.0	8260B (5030B)(low level)
Trichlorofluoromethane	1.0	5.0	8260B (5030B)(low level)
1,2,3-Trichloropropane	1.0	5.0	8260B (5030B)(low level)
Vinyl Acetate	2.0	10	8260B (5030B)(low level)
Vinyl Chloride	1.0	10	8260B (5030B)(low level)
Xylene	2.0	10	8260B (5030B)(low level)
Semivolatiles	Low Level Quantitation Limits*		Method Number
	Water (µg/L)	Low Soil (µg/kg)	
Acenaphthene	0.2	6.7	8270C
Acenaphthylene	0.2	6.7	8270C
Acetophenone	1	33	8270C
2-Acetylaminofluorene	1	33	8270C
4-Aminobiphenyl	5	66	8270C
Aniline	2	66	8270C
Anthracene	0.2	6.7	8270C
Aramite	1.5	66	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
Benzyl alcohol	1	33	8270C
Bis(2-chloroethoxyl)methane	1	33	8270C
Bis(2-chloroethyl)ether	1	33	8270C
Bis(2-ethylhexyl)phthalate	2	33	8270C
4-Bromophenyl phenyl ether	1	33	8270C
Butylbenzylphthalate	1	33	8270C
4-Chloroaniline	2	66	8270C
4-Chloro-3-methylphenol	1	33	8270C
2-Chloronaphthalene	1	33	8270C
2-Chlorophenol	1	33	8270C
4-Chlorophenyl phenyl ether	1	33	8270C
Chrysene	0.2	6.7	8270C
3&4 Methylphenol	2	33	8270C
2-Methylphenol	2	33	8270C
Diallate	1	33	8270C
Dibenzofuran	1	33	8270C
Di-n-butyl phthalate	1	170	8270C
Dibenzo(a,h)anthracene	0.2	6.7	8270C
o-Dichlorobenzene	1	33	8270C
m-Dichlorobenzene	1	33	8270C
p-Dichlorobenzene	1	33	8270C

TABLE 4-3
METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 57 - POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Semivolatiles (Cont.)	Low Level Quantitation Limits*		Method Number
	Water (µg/L)	Low Soil (µg/kg)	
3,3'-Dichlorobenzidine	20	66	8270C
2,4-Dichlorophenol	1	33	8270C
2,6-Dichlorophenol	1	33	8270C
Diethylphthalate	1	33	8270C
p-(Dimethylamino)azobenzene	5	33	8270C
7,12-Dimethyl benz(a)anthracene	1	33	8270C
3,3-Dimethyl benzidine	20	660	8270C
2,4-Dimethylphenol	2	66	8270C
alpha, alpha-Dimethylphenethylamine	10	67,000	8270C
Dimethyl phthalate	1	33	8270C
m-Dinitrobenzene	1	33	8270C
4,6-Dinitro-2-methylphenol	5	170	8270C
2,4-Dinitrophenol	10	330	8270C
2,4-Dinitrotoluene	1	33	8270C
2,6-Dinitrotoluene	1	33	8270C
Di-n-octylphthalate	1	33	8270C
1,4-Dioxane	2	33	8270C
Dinoseb	2	66	8270C
Ethylmethanesulfonate	2	66	8270C
Fluoranthene	0.2	6.7	8270C
Fluorene	0.2	6.7	8270C
Hexachlorobenzene	1	33	8270C
Hexachlorobutadiene	1	33	8270C
Hexachlorocyclopentadiene	2	66	8270C
Hexachloroethane	1	33	8270C
Hexachlorophene	500	17,000	8270C
Hexachloropropene	1	33	8270C
Indeno(1,2,3-cd)pyrene	0.2	6.7	8270C
Isophorone	1	33	8270C
Isosafrole	1	33	8270C
Methapyrilene	200	6,700	8270C
3-Methylcholanthrene	1	33	8270C
Methyl methanesulfonate	2	33	8270C
2-Methylnaphthalene	0.2	6.7	8270C
Naphthalene	0.2	6.7	8270C
1,4-Naphthoquinone	1	33	8270C
1-Naphthylamine	5	66	8270C
2-Naphthylamine	10	330	8270C
2-Nitroaniline	1	170	8270C
3-Nitroaniline	5	170	8270C
4-Nitroaniline	5	170	8270C
Nitrobenzene	1	33	8270C
2-Nitrophenol	1	33	8270C
4-Nitrophenol	5	170	8270C
4-Nitroquinoline-1-oxide	2	33	8270C
n-Nitrosodi-n-butylamine	1	33	8270C

TABLE 4-3

METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 57 - POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Semivolatiles (Cont.)	Low Level Quantitation Limits*		Method Number
	Water (µg/L)	Low Soil (µg/kg)	
n-Nitrosodiethylamine	1	33	8270C
n-Nitrosodimethylamine	1	33	8270C
n-Nitrosodiphenylamine	1	33	8270C
n-Nitrosodi-n-propylamine	1	33	8270C
n-Nitrosomethylethylamine	2	33	8270C
n-Nitrosomorpholine	1	33	8270C
n-Nitrosopiperidine	1	33	8270C
n-Nitrosopyrrolidine	1	33	8270C
5-Nitro-o-toluidine	1	33	8270C
bis-(2-chloroisopropyl)ether	1	33	8270C
Pentachlorobenzene	1	33	8270C
Pentachloronitrobenzene	1	33	8270C
Pentachlorophenol	5	170	8270C
Phenacetin	1	33	8270C
Phenanthrene	0.2	6.7	8270C
Phenol	1	33	8270C
1,4-Phenylenediamine	20	170	8270C
2-Picolin	2	66	8270C
Pronamide	1	33	8270C
Pyrene	0.2	6.7	8270C
Pyridine	5	33	8270C
Safrole	1	33	8270C
1,2,4,5-Tetrachlorobenzene	1	33	8270C
2,3,4,6-Tetrachlorophenol	1	33	8270C
o-Toluidine	1	33	8270C
1,2,4-Trichlorobenzene	1	33	8270C
2,4,5-Trichlorophenol	1	33	8270C
2,4,6-Trichlorophenol	1	33	8270C
1,3,5-Trinitrobenzene	1	33	8270C
PCBs	Quantitation Limits*		Method Number
	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
	Water (µg/L)	Low Soil (µg/kg)	
TPH DRO	100	3300	8015B
TPH GRO	50	250	8015B

TABLE 4-3
METHOD PERFORMANCE LIMITS
APPENDIX IX COMPOUND LIST AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQL)
SWMU 57 - POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Inorganics	Method Number	Quantitation Limits*		Method Description
		Water (µg/L)	Low Soil (mg/kg)	
Antimony	6010B	20	2.0	Inductively Coupled Plasma
Arsenic	6010B	10	1.0	Inductively Coupled Plasma
Barium	6010B	10	1.0	Inductively Coupled Plasma
Beryllium	6010B	4.0	0.4	Inductively Coupled Plasma
Cadmium	6010B	5.0	0.5	Inductively Coupled Plasma
Chromium	6010B	10	1.0	Inductively Coupled Plasma
Cobalt	6010B	10	1.0	Inductively Coupled Plasma
Copper	6010B	20	2.0	Inductively Coupled Plasma
Lead	6010B	5.0	0.5	Inductively Coupled Plasma
Mercury	7470A/7471A	0.2	0.02	Cold Vapor AA
Nickel	6010B	40	4.0	Inductively Coupled Plasma
Selenium	6010B	10	1.0	Inductively Coupled Plasma
Silver	6010B	10	1.0	Inductively Coupled Plasma
Thallium	6010B	10	1.0	Inductively Coupled Plasma
Tin	6010B	10	5.0	Inductively Coupled Plasma
Vanadium	6010B	10	1.0	Inductively Coupled Plasma
Zinc	6010B	20	2.0	Inductively Coupled Plasma
RCRA Metals	Method Number	Quantitation Limits*		Method Description
		Soil (mg/kg)	Water (µg/L)	
Arsenic	6010B(3050B/3010A)	1.0	10	Inductively Coupled Plasma
Barium	6010B(3050B/3010A)	1.0	10	Inductively Coupled Plasma
Cadmium	6010B(3050B/3010A)	0.50	5	Inductively Coupled Plasma
Chromium	6010B(3050B/3010A)	1.0	10	Inductively Coupled Plasma
Lead	6010B(3050B/3010A)	0.50	5.0	Inductively Coupled Plasma
Mercury	7470A/7471A	0.020	0.20	Cold Vapor AA
Selenium	6010B(3050B/3010A)	1.0	10	Inductively Coupled Plasma
Silver	6010B(3050B/3010A)	1.0	10	Inductively Coupled Plasma

Notes:

* 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.

mg/kg - milligrams per kilogram.

µg/kg - micrograms per kilogram.

TABLE 4-4

**SUMMARY OF SOIL BORING AND MONITORING WELL SPECIFICATIONS
SWMU 57 - POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO
CEIBA, PUERTO RICO**

Monitoring Well No.	Date Installed	Ground Elevation (ft. datum)	Top of PVC Elevation (ft. datum)	Borehole Depth		Well Depth		Screened Interval		Groundwater Level February 2, 2010		Groundwater Level February 26, 2010		Groundwater Level April 20, 2010	
				Feet (approx bgs)	Elev. (ft. datum)	Feet (approx bgs)	Elev. (ft. datum)	Feet (approx bgs)	Elev. (ft. datum)	Feet (below top of PVC casing)	Elev. (ft. datum)	Feet (below top of PVC casing)	Elev. (ft. datum)	Feet (below top of PVC casing)	Elev. (ft. datum)
57SB01	1/28/2010	115.4	118.42	24.0	91.4	22.0	93.4	12-22	103.4 to 93.4	15.95	102.47	16.47	101.95	16.90	101.52
57SB02	1/26/2010	121.9	124.62	26.0	95.9	25.0	96.9	15-25	106.9 to 96.9	22.87	101.75	22.90	101.72	23.30	101.32
57SB03	1/26/2010	118.4	NA	12.0	106.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
57SB04	1/28/2010	116.4	119.26	23.5	92.9	22.0	94.4	12-22	104.4 to 94.4	16.88	102.38	17.38	101.88	17.82	101.44
57SB05	1/27/2010	118.1	121.02	21.0	97.1	21.0	97.1	11-21	107.1 to 97.1	18.46	102.56	19.00	102.02	19.43	101.59
57SB06	1/28/2010	117.2	NA	12.0	105.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
57SB07	1/27/2010	121.3	124.19	30.0	91.3	29.0	92.3	19-29	102.3 to 92.3	21.58	102.61	22.13	102.06	22.55	101.64
13GW07	(1)	118.9	121.67	30.0	88.9	32.9	86.0	(1)	(1)	19.40	102.27	19.88	101.79	20.30	101.37
74VP6Cb	5/12/2008	117.9	120.8	20.0	97.9	20.0	97.9	10-20	107.9 to 97.9	18.56	102.19	19.08	101.67	19.43	101.32

Notes:

POL = Petroleum, Oils, and Lubricant

NA = Not Applicable; soil boring only

bgs = Below Ground Surface

SWMU 57 Phase I RFI field program implemented January 25 through February 3, 2010.

The datum plan used is the Mean Low Water + 100.00 foot as established by the U.S. Navy Survey Section (November 1941).

(1) Well installation date and screened interval are unknown. It is suspected that this information is provided in an Investigation Report for Site 13 (circa mid-1990s); this report is currently unavailable.

TABLE 6-1

**SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	Regional	<i>Regional</i>	Selected		57SB01	57SB02	57SB03	57SB04	57SB05
Sample ID	Screening	<i>Screening</i>	Ecological		57SB01-00	57SB02-00	57SB03-00	57SB04-00	57SB05-00
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/28/2010	1/26/2010	1/26/2010	1/28/2010	1/27/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>					
Volatiles (ug/kg)									
Carbon Disulfide	82,000 ⁽²⁾	370,000 ⁽²⁾	NE	NE	2.4 J	5.1 R	4.7 U	3.7 U	5.3 U
Semivolatiles (ug/kg)									
2-Methylnaphthalene	31,000 ⁽²⁾	410,000 ⁽²⁾	NE	NE	3.1 J	11 U	10 U	3.6 J	12 U
Acenaphthene	340,000 ⁽²⁾	3,300,000 ⁽²⁾	NE	NE	0.93 J	11 U	10 U	1.3 J	12 U
Acenaphthylene	340,000 ⁽²⁾⁽³⁾	3,300,000 ⁽²⁾⁽³⁾	NE	NE	3.3 J	11 U	10 U	3.6 J	12 U
Acetophenone	780,000 ⁽²⁾	10,000,000 ⁽²⁾	NE	NE	220 U	220 U	200 U	200 U	250 U
Anthracene	1,700,000 ⁽²⁾	17,000,000 ⁽²⁾	NE	NE	2.5 J	11 U	10 U	7.1 J	12 U
Benzo(a)anthracene	150	2,100	NE	NE	8.2 J	11 U	10 U	8.9 J	12 U
Benzo(a)pyrene (BaP)	15.0	210	NE	NE	6.6 J	11 U	10 U	6.2 J	0.63 J
Benzo(b)fluoranthene	150	2,100	NE	NE	4.5 J	11 U	10 U	3.6 J	1.5 J
Benzo(g,h,i)perylene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	2.6 J	11 U	10 U	1.7 J	0.65 J
Benzo(k)fluoranthene	1,500	21,000	NE	NE	5.3 J	11 U	10 U	4.9 J	0.9 J
Bis(2-ethylhexyl) Phthalate (BEHP)	35,000	120,000	6,010 ⁽⁷⁾⁽⁸⁾	NE	160 J	110 J	97 J	200 U	250 U
Chrysene	15,000	210,000	NE	NE	8.1 J	11 U	10 U	8.6 J	1.1 J
Dibenz(a,h)anthracene	15.0	210	NE	NE	0.75 J	11 U	10 U	0.71 J	12 U
Fluoranthene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	11 U	11 U	10 U	12	12 U
Fluorene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	0.97 J	11 U	10 U	1.5 J	12 U
Indeno(1,2,3-cd)pyrene	150	2,100	NE	NE	3.5 J	11 U	10 U	2.5 J	0.8 J
Naphthalene	3,600	18,000	NE	NE	11 UJ	1.1 J	1.2 J	9.9 UJ	12 U
Phenanthrene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	7.3 J	11 U	10 U	15	12 U
Pyrene	170,000 ⁽²⁾	1,700,000 ⁽²⁾	NE	NE	13	11 U	10 U	17	0.9 J
PAH totals (ug/kg)									
Low molecular weight PAHs	NE	NE	29,000 ⁽⁹⁾⁽¹⁰⁾	NE	40.1	78.1	71.2	54	96
High molecular weight PAHs	NE	NE	18,000 ⁽⁹⁾⁽¹¹⁾	NE	52.55	99	90	54.11	30.48

TABLE 6-1

SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	Regional	<i>Regional</i>	Selected		57SB01	57SB02	57SB03	57SB04	57SB05
Sample ID	Screening	<i>Screening</i>	Ecological		57SB01-00	57SB02-00	57SB03-00	57SB04-00	57SB05-00
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/28/2010	1/26/2010	1/26/2010	1/28/2010	1/27/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>					
PCBs (ug/kg)									
Aroclor-1260	220	740	NE	NE	38 U	39 U	36 U	36 U	43 U
TPH (mg/kg)									
Diesel Range Organics (DRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	10 U	6.9 J	5.5 J	4.1 J	9.2 J
Gasoline Range Organics (GRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	0.63 U	0.65 U	0.6 U	0.6 U	0.72 U
Total TPH	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	10.63 U	7.55 J	6.1 J	4.7 J	9.92 J
Inorganics (mg/kg)									
Antimony	3.10 ⁽²⁾	41.0 ⁽²⁾	10.0 ⁽¹²⁾	3.17	0.75 U	1.3 J	0.95 J	1.2 J	1.5 J
Arsenic	0.390	1.60	18.0 ⁽¹³⁾	2.65	0.74 U	1.4	1.4	0.34 U	2
Barium	1,500 ⁽²⁾	19,000 ⁽²⁾	330 ⁽¹⁴⁾	199	82.8 J	90.8	55.6	67.1	72
Beryllium	16.0 ⁽²⁾	200 ⁽²⁾	21.0 ⁽¹⁵⁾	0.590	0.26 J	0.45 U	0.1 U	0.03 U	0.16 U
Cadmium	7.0 ⁽²⁾	80.0 ⁽²⁾	0.770 ⁽¹⁶⁾	1.02	0.75	0.25 U	0.26 U	0.17 U	0.58 U
Chromium	12,000 ⁽²⁾⁽⁶⁾	150,000 ⁽²⁾⁽⁶⁾	26.0 ⁽¹⁷⁾	49.8	28.5	24.2	16.9	108	29.1
Cobalt	2.30 ⁽²⁾	30.0 ⁽²⁾	13.0 ⁽¹⁸⁾	46.2	27.2	52.7	14.5	38.7	16.4
Copper	310 ⁽²⁾	4,100 ⁽²⁾	28.0 ⁽¹⁹⁾	168	92.1	63.7 J	49.4 J	127 J	86.3 J
Lead	40.0	80.0	11.0 ⁽²⁰⁾	22.0	52.5	19.1 J	9.2 J	10.3 J	20.6 J
Mercury	0.560 ⁽²⁾	3.40 ⁽²⁾	0.10 ⁽²¹⁾	0.109	0.04 J	0.13	0.026 J	0.019 U	0.04 J
Nickel	150 ⁽²⁾	2,000 ⁽²⁾	38.0 ⁽²²⁾	20.7	19.4	14.7	10	39.2	10.7
Selenium	39.0 ⁽²⁾	510 ⁽²⁾	0.520 ⁽²³⁾	1.48	0.23 U	0.45 R	0.4 R	0.43 R	0.51 R
Silver	39.0 ⁽²⁾	510 ⁽²⁾	4.20 ⁽²³⁾	NE	0.12 U	0.26 J	0.15 J	0.23 J	0.22 J
Thallium	NE	NE	1.0 ⁽²⁴⁾	NE	8.3	3.6	1.1 J	4	1.4 J
Tin	4,700 ⁽²⁾	61,000 ⁽²⁾	50.0 ⁽²⁵⁾	3.76	1.9 J	1.7 J	1.6 J	2.3 J	2.3 J
Vanadium	0.550 ⁽²⁾	7.20 ⁽²⁾	7.80 ⁽²⁶⁾	259	155	184	74.9	154	149
Zinc	2,300 ⁽²⁾	31,000 ⁽²⁾	46.0 ⁽²⁷⁾	115	99.5	45.7	67.2	74.6	155

TABLE 6-1

SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	Regional	<i>Regional</i>	Selected		57SB06	57SB07	57SB07	57SS08	57SS09
Sample ID	Screening	<i>Screening</i>	Ecological		57SB06-00	57SB07-00	57SB07-00D	57SS08	57SS09
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/28/2010	1/27/2010	1/27/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>					
Volatiles (ug/kg)									
Carbon Disulfide	82,000 ⁽²⁾	370,000 ⁽²⁾	NE	NE	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Semivolatiles (ug/kg)									
2-Methylnaphthalene	31,000 ⁽²⁾	410,000 ⁽²⁾	NE	NE	1.7 J	12 U	12 U	6 J	2.3 J
Acenaphthene	340,000 ⁽²⁾	3,300,000 ⁽²⁾	NE	NE	9.9 U	12 U	12 U	1.9 J	0.91 J
Acenaphthylene	340,000 ⁽²⁾⁽³⁾	3,300,000 ⁽²⁾⁽³⁾	NE	NE	1.3 J	12 U	12 U	1.8 J	1.4 J
Acetophenone	780,000 ⁽²⁾	10,000,000 ⁽²⁾	NE	NE	200 U	39 J	250 U	240 U	230 U
Anthracene	1,700,000 ⁽²⁾	17,000,000 ⁽²⁾	NE	NE	2.1 J	1.3 J	12 U	3.7 J	2.1 J
Benzo(a)anthracene	150	2,100	NE	NE	3.3 J	0.98 J	12 U	5.9 J	2.9 J
Benzo(a)pyrene (BaP)	15.0	210	NE	NE	2.3 J	12 U	12 U	12 UJ	11 U
Benzo(b)fluoranthene	150	2,100	NE	NE	1.9 J	12 UJ	12 U	12 UJ	11 UJ
Benzo(g,h,i)perylene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	9.9 UJ	12 U	12 U	12 UJ	11 UJ
Benzo(k)fluoranthene	1,500	21,000	NE	NE	1.8 J	12 U	12 U	12 UJ	11 U
Bis(2-ethylhexyl) Phthalate (BEHP)	35,000	120,000	6,010 ⁽⁷⁾⁽⁸⁾	NE	110 J	71 J	54 J	240 U	230 U
Chrysene	15,000	210,000	NE	NE	3.3 J	1 J	12 U	6.7 J	3.1 J
Dibenz(a,h)anthracene	15.0	210	NE	NE	9.9 U	12 U	12 U	12 UJ	11 U
Fluoranthene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	9.9 U	2.5 J	12 U	16	11 UJ
Fluorene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	0.71 J	12 U	12 U	1.7 J	0.64 J
Indeno(1,2,3-cd)pyrene	150	2,100	NE	NE	9.9 U	12 U	12 U	12 UJ	11 U
Naphthalene	3,600	18,000	NE	NE	9.9 UJ	1.6 J	12 U	12 U	11 U
Phenanthrene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	5 J	2.4 J	12 U	7.7 J	4.9 J
Pyrene	170,000 ⁽²⁾	1,700,000 ⁽²⁾	NE	NE	9.9 U	2 J	12 U	16	11 UJ
PAH totals (ug/kg)									
Low molecular weight PAHs	NE	NE	29,000 ⁽⁹⁾⁽¹⁰⁾	NE	40.51	55.8	96	50.8	34.25
High molecular weight PAHs	NE	NE	18,000 ⁽⁹⁾⁽¹¹⁾	NE	52.2	75.98	108	100.6	83

TABLE 6-1

SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	Regional	<i>Regional</i>	Selected		57SB06	57SB07	57SB07	57SS08	57SS09
Sample ID	Screening	<i>Screening</i>	Ecological		57SB06-00	57SB07-00	57SB07-00D	57SS08	57SS09
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/28/2010	1/27/2010	1/27/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>					
PCBs (ug/kg)									
Aroclor-1260	220	740	NE	NE	36 U	310 J	130 J	550	760
TPH (mg/kg)									
Diesel Range Organics (DRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	7 J	13 J	16	70	72 J
Gasoline Range Organics (GRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	0.6 U	0.74 U	0.74 U	0.6 UJ	0.6 UJ
Total TPH	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	7.6 J	13.74 J	16.74	70.6	72.6 J
Inorganics (mg/kg)									
Antimony	3.10 ⁽²⁾	41.0 ⁽²⁾	10.0 ⁽¹²⁾	3.17	1.2 J	1.1 J	1.7 J	1 J	0.85 U
Arsenic	0.390	1.60	18.0 ⁽¹³⁾	2.65	1.2	0.83 J	1.3 J	5.2	1.6
Barium	1,500 ⁽²⁾	19,000 ⁽²⁾	330 ⁽¹⁴⁾	199	45.8	95 J	161 J	163 J	190 J
Beryllium	16.0 ⁽²⁾	200 ⁽²⁾	21.0 ⁽¹⁵⁾	0.590	0.14 U	0.53 U	0.64 U	0.3 J	0.34 J
Cadmium	7.0 ⁽²⁾	80.0 ⁽²⁾	0.770 ⁽¹⁶⁾	1.02	0.49 U	0.28 U	0.31 U	5.3	1.1
Chromium	12,000 ⁽²⁾⁽⁶⁾	150,000 ⁽²⁾⁽⁶⁾	26.0 ⁽¹⁷⁾	49.8	20.7	29.3	39.7	38.5	26.5
Cobalt	2.30 ⁽²⁾	30.0 ⁽²⁾	13.0 ⁽¹⁸⁾	46.2	22.3	31.7	49.3	30.3	34
Copper	310 ⁽²⁾	4,100 ⁽²⁾	28.0 ⁽¹⁹⁾	168	65.8 J	75.5 J	85.6 J	71.2	92.3
Lead	40.0	80.0	11.0 ⁽²⁰⁾	22.0	10.2 J	17.6 J	21.1 J	116	29.6 J
Mercury	0.560 ⁽²⁾	3.40 ⁽²⁾	0.10 ⁽²¹⁾	0.109	0.041	0.023 U	0.023 U	0.051	0.15 J
Nickel	150 ⁽²⁾	2,000 ⁽²⁾	38.0 ⁽²²⁾	20.7	13.7	13.9	16.1	18.8	27.8 J
Selenium	39.0 ⁽²⁾	510 ⁽²⁾	0.520 ⁽²³⁾	1.48	0.42 R	0.51 R	0.49 R	0.25 U	0.26 UJ
Silver	39.0 ⁽²⁾	510 ⁽²⁾	4.20 ⁽²³⁾	NE	0.23 J	0.18 J	0.24 J	0.14 J	0.13 U
Thallium	NE	NE	1.0 ⁽²⁴⁾	NE	2.1	1.5 J	3.2 J	8.5	8.8
Tin	4,700 ⁽²⁾	61,000 ⁽²⁾	50.0 ⁽²⁵⁾	3.76	0.97 J	1.9 J	1.5 J	2.4 J	2.1 J
Vanadium	0.550 ⁽²⁾	7.20 ⁽²⁾	7.80 ⁽²⁶⁾	259	120	170	240	141	180
Zinc	2,300 ⁽²⁾	31,000 ⁽²⁾	46.0 ⁽²⁷⁾	115	94.9	73.5	77.4	183	136

TABLE 6-1

**SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	Regional	<i>Regional</i>	Selected		57SS09	57SS10	57SS11	57SS12
Sample ID	Screening	<i>Screening</i>	Ecological		57SS09D	57SS10	57SS11	57SS12
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/29/2010	1/29/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>				
Volatiles (ug/kg)								
Carbon Disulfide	82,000 ⁽²⁾	370,000 ⁽²⁾	NE	NE	5 R	5.5 U	4.9 U	4.3 U
Semivolatiles (ug/kg)								
2-Methylnaphthalene	31,000 ⁽²⁾	410,000 ⁽²⁾	NE	NE	2.3 J	1.9 J	1 J	2 J
Acenaphthene	340,000 ⁽²⁾	3,300,000 ⁽²⁾	NE	NE	2.4 J	1.8 J	10 U	0.82 J
Acenaphthylene	340,000 ⁽²⁾⁽³⁾	3,300,000 ⁽²⁾⁽³⁾	NE	NE	14 J	1.7 J	10 UJ	0.86 J
Acetophenone	780,000 ⁽²⁾	10,000,000 ⁽²⁾	NE	NE	240 U	200 U	210 U	200 U
Anthracene	1,700,000 ⁽²⁾	17,000,000 ⁽²⁾	NE	NE	7.9 J	2.7 J	0.67 J	3.8 J
Benzo(a)anthracene	150	2,100	NE	NE	30 J	17	2.9 J	1.3 J
Benzo(a)pyrene (BaP)	15.0	210	NE	NE	12 UJ	10 UJ	10 U	9.5 UJ
Benzo(b)fluoranthene	150	2,100	NE	NE	12 UJ	10 UJ	10 U	9.5 UJ
Benzo(g,h,i)perylene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	12 UJ	10 UJ	10 UJ	9.5 UJ
Benzo(k)fluoranthene	1,500	21,000	NE	NE	12 UJ	10 UJ	10 U	9.5 UJ
Bis(2-ethylhexyl) Phthalate (BEHP)	35,000	120,000	6,010 ⁽⁷⁾⁽⁸⁾	NE	240 U	70 J	50 J	1800
Chrysene	15,000	210,000	NE	NE	27 J	26	3.4 J	1.4 J
Dibenz(a,h)anthracene	15.0	210	NE	NE	12 UJ	10 UJ	10 U	9.5 UJ
Fluoranthene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	41 J	47	10 U	9.5 U
Fluorene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	1.8 J	1.3 J	10 UJ	0.8 J
Indeno(1,2,3-cd)pyrene	150	2,100	NE	NE	12 UJ	10 UJ	10 U	9.5 UJ
Naphthalene	3,600	18,000	NE	NE	12 U	10 UJ	10 UJ	9.5 U
Phenanthrene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	9.4 J	34	3 J	2.5 J
Pyrene	170,000 ⁽²⁾	1,700,000 ⁽²⁾	NE	NE	63 J	69	10 U	9.5 U
PAH totals (ug/kg)								
Low molecular weight PAHs	NE	NE	29,000 ⁽⁹⁾⁽¹⁰⁾	NE	90.8	100.4	54.67	29.78
High molecular weight PAHs	NE	NE	18,000 ⁽⁹⁾⁽¹¹⁾	NE	192	172	76.3	69.2

TABLE 6-1

**SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	Regional	<i>Regional</i>	Selected		57SS09	57SS10	57SS11	57SS12
Sample ID	Screening	<i>Screening</i>	Ecological		57SS09D	57SS10	57SS11	57SS12
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/29/2010	1/29/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>				
PCBs (ug/kg)								
Aroclor-1260	220	740	NE	NE	610	39 J	38 U	46
TPH (mg/kg)								
Diesel Range Organics (DRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	37 J	28	25	13
Gasoline Range Organics (GRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	0.68 UJ	0.57 UJ	0.62 UJ	0.56 UJ
Total TPH	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	37.68 J	28.57	25.62	13.56
Inorganics (mg/kg)								
Antimony	3.10 ⁽²⁾	41.0 ⁽²⁾	10.0 ⁽¹²⁾	3.17	0.85 U	0.7 U	0.73 U	0.67 U
Arsenic	0.390	1.60	18.0 ⁽¹³⁾	2.65	1.8	1.2	1.4	2.4
Barium	1,500 ⁽²⁾	19,000 ⁽²⁾	330 ⁽¹⁴⁾	199	88.9 J	98.1 J	<u>200 J</u>	42.2 J
Beryllium	16.0 ⁽²⁾	200 ⁽²⁾	21.0 ⁽¹⁵⁾	0.590	0.27 J	0.27 J	0.32 J	0.07 J
Cadmium	7.0 ⁽²⁾	80.0 ⁽²⁾	0.770 ⁽¹⁶⁾	1.02	<u>1.4</u>	<u>1.3</u>	<u>1.1</u>	0.76
Chromium	12,000 ⁽²⁾⁽⁶⁾	150,000 ⁽²⁾⁽⁶⁾	26.0 ⁽¹⁷⁾	49.8	<u>27.7</u>	19.2	24.9	11
Cobalt	2.30 ⁽²⁾	30.0 ⁽²⁾	13.0 ⁽¹⁸⁾	46.2	29.4	24.9	64.8	8.2
Copper	310 ⁽²⁾	4,100 ⁽²⁾	28.0 ⁽¹⁹⁾	168	86.7	85.1	80.9	35.8
Lead	40.0	80.0	11.0 ⁽²⁰⁾	22.0	46.4 J	60.6	33.7	30.5
Mercury	0.560 ⁽²⁾	3.40 ⁽²⁾	0.10 ⁽²¹⁾	0.109	<u>0.45 J</u>	0.037 J	0.058	0.018 U
Nickel	150 ⁽²⁾	2,000 ⁽²⁾	38.0 ⁽²²⁾	20.7	14.8 J	15	15.4	4.9
Selenium	39.0 ⁽²⁾	510 ⁽²⁾	0.520 ⁽²³⁾	1.48	<u>0.93 J</u>	0.21 U	0.22 U	0.21 U
Silver	39.0 ⁽²⁾	510 ⁽²⁾	4.20 ⁽²³⁾	NE	0.13 U	0.11 U	0.15 J	0.11 U
Thallium	NE	NE	1.0 ⁽²⁴⁾	NE	<u>7.1</u>	<u>7.6</u>	<u>7.7</u>	<u>3.1</u>
Tin	4,700 ⁽²⁾	61,000 ⁽²⁾	50.0 ⁽²⁵⁾	3.76	2.2 J	1.5 J	1.5 J	1.8 J
Vanadium	0.550 ⁽²⁾	7.20 ⁽²⁾	7.80 ⁽²⁶⁾	259	150	118	141	44.4
Zinc	2,300 ⁽²⁾	31,000 ⁽²⁾	46.0 ⁽²⁷⁾	115	<u>143</u>	<u>96.9</u>	<u>79.7</u>	<u>49.4</u>

TABLE 6-1

**SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Notes/Qualifiers:

Analytical results for VOCs for samples 57SS08 through 57SS12 were collected on 2/2/2010; GRO was collected on 5/20/2010

U - Undetected at the Method Detection Limit	ft bgs - feet below ground surface
UJ - Reported quantitation limit is qualified as estimated	ug/kg - micrograms per kilogram
J - Estimated: The analyte was positively identified; the quantitation is an estimation	mg/kg - milligrams per kilogram
R - Rejected data; data is not usable	NAPR - Naval Activity Puerto Rico
NA - Not Analyzed	PCB - Polychlorinated Biphenyls
NE - Not Established	TPH - Total Petroleum Hydrocarbons

- (1) NAPR basewide background surface soil screening value (upper limit of the means concentration [mean plus two standard deviations]) (Baker, 2010)
- (2) Noncarcinogenic Regional Screening Levels based on a target hazard quotient of 0.1 for conservative screening purposes.
- (3) Value for acenaphthene used as a surrogate.
- (4) Value for pyrene used as a surrogate.
- (5) Puerto Rico specific value - Puerto Rico Environmental Quality Board (PREQB)
- (6) Value for chromium III used as a surrogate.
- (7) 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).
- (8) The value represents a total concentration for all phthalates. [MHSPE 2000]
- (9) Ecological soil screening level for soil invertebrates [USEPA 2007a]
- (10) Low molecular weight PAHs are defined by the USEPA (2007a) as PAH compounds composed of fewer than four rings. The low molecular weight PAH compounds analyzed for in SWMU 56 soil were 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, and phenanthrene.
- (11) High molecular weight PAHs are defined by the USEPA (2007a) as PAH compounds composed of four or more rings. The high molecular weight PAH compounds analyzed for in SWMU 56 soil were benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and pyrene.
- (12) Ecological soil screening level for mammalian herbivores [USEPA 2005a]
- (13) Ecological soil screening level for plants [USEPA 2005b]
- (14) Ecological soil screening level for soil invertebrates [USEPA 2005c]
- (15) Ecological soil screening level for mammalian herbivores [USEPA 2005d]
- (16) Ecological soil screening level for avian ground insectivores [USEPA 2005e]
- (17) Ecological soil screening level for avian ground insectivores [USEPA 2008]
- (18) Ecological soil screening level for plants [USEPA 2005f]
- (19) Ecological soil screening level for avian ground insectivores [USEPA 2007b]
- (20) Ecological soil screening level for avian ground insectivores [USEPA 2005g]
- (21) Toxicological threshold for earthworms [Efroymson et al. 1997a]
- (22) Ecological soil screening level for plants [USEPA 2007c]
- (23) Ecological soil screening level for plants [USEPA 2007d]
- (24) Ecological soil screening level for avian ground insectivores [USEPA 2006]
- (25) Toxicological threshold for plants [Efroymson et al. 1997b]
- (26) Ecological soil screening level for avian ground insectivores [USEPA 2005h]
- (27) Ecological soil screening level for avian ground insectivores [USEPA 2007e]

TABLE 6-1

**SUMMARY OF DETECTED LABORATORY RESULTS - SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Table References:

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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.

USEPA. 2006. Ecological Soil Screening Levels for Silver (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWEER Directive 9285.7-77.

USEPA. 2005a. Ecological Soil Screening Levels for Antimony (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-61.

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

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

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

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

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

USEPA. 2005h. Ecological Soil Screening Levels for Vanadium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-75.

TABLE 6-2

**SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	Regional	<i>Regional</i>	Selected		57SB01	57SB01	57SB02	57SB02	57SB03
Sample ID	Screening	<i>Screening</i>	Ecological		57SB01-01	57SB01-05	57SB02-01	57SB02-05	57SB03-01
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/28/2010	1/28/2010	1/26/2010	1/26/2010	1/26/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>					
Semivolatiles (ug/kg)									
2-Methylnaphthalene	31,000 ⁽²⁾	410,000 ⁽²⁾	NE	NE	1.2 J	2.8 J	10 U	9.3 U	11 U
Acenaphthene	340,000 ⁽²⁾	3,300,000 ⁽²⁾	NE	NE	11 U	0.79 J	10 U	9.3 U	11 U
Acenaphthylene	340,000 ⁽²⁾⁽³⁾	3,300,000 ⁽²⁾⁽³⁾	NE	NE	11 UJ	1.4 J	10 U	9.3 U	11 U
Anthracene	1,700,000 ⁽²⁾	17,000,000 ⁽²⁾	NE	NE	0.68 J	2.1 J	10 U	9.3 U	11 U
Benzo(a)anthracene	150	2,100	NE	NE	1.5 J	4.2 J	10 U	9.3 U	11 U
Benzo(a)pyrene (BaP)	15.0	210	NE	NE	0.74 J	3.1 J	10 U	9.3 U	11 U
Benzo(b)fluoranthene	150	2,100	NE	NE	0.89 J	1.9 J	0.74 J	9.3 U	11 U
Benzo(g,h,i)perylene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	11 UJ	1 J	10 U	9.3 U	11 U
Benzo(k)fluoranthene	1,500	21,000	NE	NE	0.8 J	2.3 J	10 U	9.3 U	11 U
Bis(2-ethylhexyl) Phthalate (BEHP)	35,000	120,000	6,010 ⁽⁷⁾⁽⁸⁾	NE	58 J	100 J	60 J	190 U	140 J
Chrysene	15,000	210,000	NE	NE	1.6 J	4.2 J	10 U	9.3 U	11 U
Dibenz(a,h)anthracene	15.0	210	NE	NE	11 U	11 U	10 U	9.3 U	11 U
Fluoranthene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	11 U	11 U	1.9 J	9.3 U	11 U
Fluorene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	11 UJ	0.93 J	10 U	9.3 U	11 U
Indeno(1,2,3-cd)pyrene	150	2,100	NE	NE	0.5 J	1.3 J	10 U	9.3 U	11 U
Naphthalene	3,600	18,000	NE	NE	11 UJ	11 UJ	1.1 J	0.92 J	11 U
Phenanthrene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	2.2 J	5 J	2.9 J	9.3 U	11 U
Pyrene	170,000 ⁽²⁾	1,700,000 ⁽²⁾	NE	NE	11 U	11 U	1.1 J	9.3 U	11 U
PAH totals (ug/kg)									
Low molecular weight PAHs	NE	NE	29,000 ⁽⁹⁾⁽¹⁰⁾	NE	59.08	35.02	55.9	66.02	88
High molecular weight PAHs	NE	NE	18,000 ⁽⁹⁾⁽¹¹⁾	NE	39.03	40	71.84	83.7	99
PCBs (ug/kg)									
Aroclor-1260	220	740	NE	NE	38 U	38 U	38 U	34 U	39 U

TABLE 6-2

**SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	Regional	<i>Regional</i>	Selected		57SB01	57SB01	57SB02	57SB02	57SB03
Sample ID	Screening	<i>Screening</i>	Ecological		57SB01-01	57SB01-05	57SB02-01	57SB02-05	57SB03-01
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/28/2010	1/28/2010	1/26/2010	1/26/2010	1/26/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>					
TPH (mg/kg)									
Diesel Range Organics (DRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	10 U	10 U	3.5 J	11 U	6.7 J
Gasoline Range Organics (GRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	0.64 U	0.64 U	0.63 U	0.56 U	0.66 U
Total TPH	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	10.64 U	10.64 U	4.13 J	11.56 U	7.36 J
Inorganics (mg/kg)									
Antimony	3.10 ⁽²⁾	41.0 ⁽²⁾	10.0 ⁽¹²⁾	NE	0.79 U	0.78 U	2.1 J	1.7 J	1.4 J
Arsenic	0.390	1.60	18.0 ⁽¹³⁾	1.59	1.2 J	0.77 U	2.4	0.4 J	1.5
Barium	1,500 ⁽²⁾	19,000 ⁽²⁾	330 ⁽¹⁴⁾	220	79.3 J	10.4 J	<u>290</u>	21.8	97.2
Beryllium	16.0 ⁽²⁾	200 ⁽²⁾	21.0 ⁽¹⁵⁾	0.596	0.44 J	0.44 J	<u>0.61</u>	0.02 U	0.53 U
Cadmium	7.0 ⁽²⁾	80.0 ⁽²⁾	0.770 ⁽¹⁶⁾	0.539	<u>0.71</u>	0.3 J	0.17 U	0.11 U	0.19 U
Chromium	12,000 ⁽²⁾⁽⁶⁾	150,000 ⁽²⁾⁽⁶⁾	26.0 ⁽¹⁷⁾	114	33.4	10.1	30.3	50.4	30.6
Cobalt	2.30 ⁽²⁾	30.0 ⁽²⁾	13.0 ⁽¹⁸⁾	26.9	37.5	18.2	97	28.8	33.6
Copper	310 ⁽²⁾	4,100 ⁽²⁾	28.0 ⁽¹⁹⁾	246	81.3	83.4	95.3 J	81.6 J	76.6 J
Lead	40.0	80.0	11.0 ⁽²⁰⁾	6.29	27.7	<u>15.2</u>	44.1 J	3.3 J	21.2 J
Mercury	0.560 ⁽²⁾	3.40 ⁽²⁾	0.10 ⁽²¹⁾	0.108	0.067	0.02 U	0.021 U	0.018 U	0.021 U
Nickel	150 ⁽²⁾	2,000 ⁽²⁾	38.0 ⁽²²⁾	24.7	14.3	8.2	<u>25.9</u>	<u>30.5</u>	13.6
Selenium	39.0 ⁽²⁾	510 ⁽²⁾	0.520 ⁽²³⁾	5.94	0.44 J	0.36 J	0.44 R	0.37 R	0.47 R
Silver	39.0 ⁽²⁾	510 ⁽²⁾	4.20 ⁽²³⁾	NE	0.12 U	0.12 U	0.33 J	0.25 J	0.24 J
Thallium	NE	NE	1.0 ⁽²⁴⁾	0.924	10.2	<u>6.1</u>	8.6	<u>4.6</u>	2
Tin	4,700 ⁽²⁾	61,000 ⁽²⁾	50.0 ⁽²⁵⁾	3.56	2 J	1.4 J	0.62 U	1.3 J	1.9 J
Vanadium	0.550 ⁽²⁾	7.20 ⁽²⁾	7.80 ⁽²⁶⁾	434	217	129	237	193	225
Zinc	2,300 ⁽²⁾	31,000 ⁽²⁾	46.0 ⁽²⁷⁾	88.1	58	<u>223</u>	<u>96.2</u>	78.9	55.4

TABLE 6-2

SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	Regional	<i>Regional</i>	Selected		57SB03	57SB04	57SB04	57SB05	57SB05
Sample ID	Screening	<i>Screening</i>	Ecological		57SB03-05	57SB04-01	57SB04-05	57SB05-01	57SB05-01D
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/26/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	1.0 - 3.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>					
Semivolatiles (ug/kg)									
2-Methylnaphthalene	31,000 ⁽²⁾	410,000 ⁽²⁾	NE	NE	11 U	3.4 J	11 U	9.8 U	11 U
Acenaphthene	340,000 ⁽²⁾	3,300,000 ⁽²⁾	NE	NE	11 U	1.3 J	11 U	9.8 U	11 U
Acenaphthylene	340,000 ⁽²⁾⁽³⁾	3,300,000 ⁽²⁾⁽³⁾	NE	NE	11 U	6.8 J	11 UJ	9.8 U	11 U
Anthracene	1,700,000 ⁽²⁾	17,000,000 ⁽²⁾	NE	NE	11 U	4.2 J	11 UJ	9.8 U	11 U
Benzo(a)anthracene	150	2,100	NE	NE	11 U	20	0.96 J	9.8 U	11 U
Benzo(a)pyrene (BaP)	15.0	210	NE	NE	11 U	17	0.59 J	9.8 U	11 U
Benzo(b)fluoranthene	150	2,100	NE	NE	11 U	9.6 J	11 U	9.8 U	11 U
Benzo(g,h,i)perylene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	11 U	5.7 J	11 UJ	9.8 U	11 U
Benzo(k)fluoranthene	1,500	21,000	NE	NE	11 U	11	0.65 J	9.8 U	11 U
Bis(2-ethylhexyl) Phthalate (BEHP)	35,000	120,000	6,010 ⁽⁷⁾⁽⁸⁾	NE	60 J	56 J	230 U	200 U	220 U
Chrysene	15,000	210,000	NE	NE	11 U	20	1.1 J	9.8 U	11 U
Dibenz(a,h)anthracene	15.0	210	NE	NE	11 U	1.8 J	11 U	9.8 U	11 U
Fluoranthene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	11 U	18	11 U	9.8 U	11 U
Fluorene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	11 U	1.6 J	11 UJ	9.8 U	11 U
Indeno(1,2,3-cd)pyrene	150	2,100	NE	NE	11 U	7 J	11 U	9.8 U	11 U
Naphthalene	3,600	18,000	NE	NE	11 U	10 UJ	11 UJ	0.9 J	11 U
Phenanthrene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	11 U	9.2 J	11 U	9.8 U	11 U
Pyrene	170,000 ⁽²⁾	1,700,000 ⁽²⁾	NE	NE	11 U	28	11 U	9.8 U	11 U
PAH totals (ug/kg)									
Low molecular weight PAHs	NE	NE	29,000 ⁽⁹⁾⁽¹⁰⁾	NE	88	54.5	88	69.5	88
High molecular weight PAHs	NE	NE	18,000 ⁽⁹⁾⁽¹¹⁾	NE	99	120.1	58.3	88.2	99
PCBs (ug/kg)									
Aroclor-1260	220	740	NE	NE	38 U	37 U	40 U	35 U	39 U

TABLE 6-2

**SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	Regional Screening Levels Residential Soil	<i>Regional Screening Levels Industrial Soil</i>	Selected Ecological Soil Screening Values	<u>NAPR</u> <u>Basewide</u> <u>Background⁽¹⁾</u>	57SB03 57SB03-05 1/26/2010 9.0 - 11.0	57SB04 57SB04-01 1/28/2010 1.0 - 3.0	57SB04 57SB04-05 1/28/2010 9.0 - 11.0	57SB05 57SB05-01 1/27/2010 1.0 - 3.0	57SB05 57SB05-01D 1/27/2010 1.0 - 3.0
TPH (mg/kg)									
Diesel Range Organics (DRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	3.8 J	4.2 J	3.7 J	7.9 J	6.5 J
Gasoline Range Organics (GRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	0.64 U	0.61 U	0.67 U	0.59 U	0.66 U
Total TPH	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	4.44 J	4.81 J	4.37 J	8.49 J	7.16 J
Inorganics (mg/kg)									
Antimony	3.10 ⁽²⁾	41.0 ⁽²⁾	10.0 ⁽¹²⁾	NE	1.2 J	1.2 J	1.3 J	1 J	1.7 J
Arsenic	0.390	1.60	18.0 ⁽¹³⁾	1.59	0.52 J	1 J	1.4	0.97 J	1.7 J
Barium	1,500 ⁽²⁾	19,000 ⁽²⁾	330 ⁽¹⁴⁾	220	72.8	36.7	<u>1240</u>	131 J	<u>228 J</u>
Beryllium	16.0 ⁽²⁾	200 ⁽²⁾	21.0 ⁽¹⁵⁾	0.596	0.23 U	0.41 U	<u>0.92</u>	0.4 U	0.61 U
Cadmium	7.0 ⁽²⁾	80.0 ⁽²⁾	0.770 ⁽¹⁶⁾	0.539	0.15 U	0.12 U	0.35 U	<u>0.7</u>	<u>0.81</u>
Chromium	12,000 ⁽²⁾⁽⁶⁾	150,000 ⁽²⁾⁽⁶⁾	26.0 ⁽¹⁷⁾	114	15.4	23.1	44.9	24.9	30
Cobalt	2.30 ⁽²⁾	30.0 ⁽²⁾	13.0 ⁽¹⁸⁾	26.9	23.7	12.9	149	43.2	73.9
Copper	310 ⁽²⁾	4,100 ⁽²⁾	28.0 ⁽¹⁹⁾	246	87.3 J	56.2 J	104 J	52.9 J	68.7 J
Lead	40.0	80.0	11.0 ⁽²⁰⁾	6.29	5.7 J	<u>16.5 J</u>	5.3 J	<u>39.6 J</u>	<u>56 J</u>
Mercury	0.560 ⁽²⁾	3.40 ⁽²⁾	0.10 ⁽²¹⁾	0.108	0.02 U	0.019 U	0.02 U	<u>0.11 J</u>	0.061 J
Nickel	150 ⁽²⁾	2,000 ⁽²⁾	38.0 ⁽²²⁾	24.7	15.5	10.8	<u>41.4</u>	17.9	14.2
Selenium	39.0 ⁽²⁾	510 ⁽²⁾	0.520 ⁽²³⁾	5.94	0.45 R	0.41 R	0.47 R	0.4 R	0.46 R
Silver	39.0 ⁽²⁾	510 ⁽²⁾	4.20 ⁽²³⁾	NE	0.26 J	0.19 J	0.4 J	0.37 J	0.43 J
Thallium	NE	NE	1.0 ⁽²⁴⁾	0.924	<u>2.8</u>	2	<u>7.3</u>	3.5	5
Tin	4,700 ⁽²⁾	61,000 ⁽²⁾	50.0 ⁽²⁵⁾	3.56	1.3 J	1.7 J	1.7 J	0.91 J	1.6 J
Vanadium	0.550 ⁽²⁾	7.20 ⁽²⁾	7.80 ⁽²⁶⁾	434	198	155	263	172	220
Zinc	2,300 ⁽²⁾	31,000 ⁽²⁾	46.0 ⁽²⁷⁾	88.1	70.6	35.1	<u>92</u>	59.3	77

TABLE 6-2

SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Site ID	Regional	<i>Regional</i>	Selected		57SB05	57SB06	57SB06	57SB07	57SB07
Sample ID	Screening	<i>Screening</i>	Ecological		57SB05-05	57SB06-01	57SB06-05	57SB07-01	57SB07-05
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/27/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>					
Semivolatiles (ug/kg)									
2-Methylnaphthalene	31,000 ⁽²⁾	410,000 ⁽²⁾	NE	NE	10 U	1.1 J	0.94 J	11 U	10 U
Acenaphthene	340,000 ⁽²⁾	3,300,000 ⁽²⁾	NE	NE	10 U	10 U	9.7 U	11 U	10 U
Acenaphthylene	340,000 ⁽²⁾⁽³⁾	3,300,000 ⁽²⁾⁽³⁾	NE	NE	10 U	0.98 J	0.7 J	11 U	10 U
Anthracene	1,700,000 ⁽²⁾	17,000,000 ⁽²⁾	NE	NE	10 U	1.3 J	0.8 J	11 U	10 U
Benzo(a)anthracene	150	2,100	NE	NE	10 U	3 J	1.6 J	11 U	10 U
Benzo(a)pyrene (BaP)	15.0	210	NE	NE	10 U	10 U	0.93 J	11 U	10 U
Benzo(b)fluoranthene	150	2,100	NE	NE	10 U	10 U	1 J	11 U	10 U
Benzo(g,h,i)perylene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	10 U	10 UJ	9.7 UJ	11 U	10 U
Benzo(k)fluoranthene	1,500	21,000	NE	NE	10 U	10 U	0.82 J	11 U	10 U
Bis(2-ethylhexyl) Phthalate (BEHP)	35,000	120,000	6,010 ⁽⁷⁾⁽⁸⁾	NE	210 U	58 J	270	220 U	210 U
Chrysene	15,000	210,000	NE	NE	10 U	2.9 J	1.7 J	11 U	10 U
Dibenz(a,h)anthracene	15.0	210	NE	NE	10 U	10 U	9.7 U	11 U	10 U
Fluoranthene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	10 U	10 U	9.7 U	11 U	10 U
Fluorene	230,000 ⁽²⁾	2,200,000 ⁽²⁾	NE	NE	10 U	10 UJ	9.7 UJ	11 U	10 U
Indeno(1,2,3-cd)pyrene	150	2,100	NE	NE	10 U	10 U	9.7 U	11 U	10 U
Naphthalene	3,600	18,000	NE	NE	0.96 J	10 UJ	9.7 UJ	11 U	10 U
Phenanthrene	170,000 ⁽²⁾⁽⁴⁾	1,700,000 ⁽²⁾⁽⁴⁾	NE	NE	10 U	3.1 J	2.3 J	11 U	10 U
Pyrene	170,000 ⁽²⁾	1,700,000 ⁽²⁾	NE	NE	10 U	10 U	9.7 U	11 U	10 U
PAH totals (ug/kg)									
Low molecular weight PAHs	NE	NE	29,000 ⁽⁹⁾⁽¹⁰⁾	NE	70.96	46.48	43.54	88	80
High molecular weight PAHs	NE	NE	18,000 ⁽⁹⁾⁽¹¹⁾	NE	90	75.9	44.85	99	90
PCBs (ug/kg)									
Aroclor-1260	220	740	NE	NE	38 U	37 U	35 U	34 J	37 U

TABLE 6-2

**SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	Regional	<i>Regional</i>	Selected		57SB05	57SB06	57SB06	57SB07	57SB07
Sample ID	Screening	<i>Screening</i>	Ecological		57SB05-05	57SB06-01	57SB06-05	57SB07-01	57SB07-05
Sample Date	Levels	<i>Levels</i>	Soil	<u>NAPR</u>	1/27/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	Residential	<i>Industrial</i>	Screening	<u>Basewide</u>	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0
	Soil	<i>Soil</i>	Values	<u>Background⁽¹⁾</u>					
TPH (mg/kg)									
Diesel Range Organics (DRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	5.1 J	4.7 J	4.1 J	11 J	10 J
Gasoline Range Organics (GRO)	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	0.62 U	0.62 U	0.58 U	0.66 UJ	0.61 U
Total TPH	100 ⁽⁵⁾	100 ⁽⁵⁾	NE	NE	5.72 J	5.32 J	4.68 J	11.66 J	10.61 J
Inorganics (mg/kg)									
Antimony	3.10 ⁽²⁾	41.0 ⁽²⁾	10.0 ⁽¹²⁾	NE	1.2 J	0.97 J	1.5 J	1.4 J	1.4 J
Arsenic	0.390	1.60	18.0 ⁽¹³⁾	1.59	0.42 J	0.77 J	1.1 J	1.1 J	0.55 J
Barium	1,500 ⁽²⁾	19,000 ⁽²⁾	330 ⁽¹⁴⁾	220	81.3	47.2	<u>302</u>	115	10.7 J
Beryllium	16.0 ⁽²⁾	200 ⁽²⁾	21.0 ⁽¹⁵⁾	0.596	0.24 U	0.39 U	<u>1.2</u>	0.57 U	0.21 U
Cadmium	7.0 ⁽²⁾	80.0 ⁽²⁾	0.770 ⁽¹⁶⁾	0.539	0.2 U	0.44 U	<u>0.63</u>	0.22 U	0.27 U
Chromium	12,000 ⁽²⁾⁽⁶⁾	150,000 ⁽²⁾⁽⁶⁾	26.0 ⁽¹⁷⁾	114	22.3	21.9	10.8	29.3	21.4
Cobalt	2.30 ⁽²⁾	30.0 ⁽²⁾	13.0 ⁽¹⁸⁾	26.9	33	34.4	104	38	13.8
Copper	310 ⁽²⁾	4,100 ⁽²⁾	28.0 ⁽¹⁹⁾	246	72.8 J	67.5 J	147 J	74.6 J	58.7 J
Lead	40.0	80.0	11.0 ⁽²⁰⁾	6.29	4.5 J	17.4 J	7.4 J	20.3 J	5.7 J
Mercury	0.560 ⁽²⁾	3.40 ⁽²⁾	0.10 ⁽²¹⁾	0.108	0.02 U	0.043	0.018 U	0.05	0.02 U
Nickel	150 ⁽²⁾	2,000 ⁽²⁾	38.0 ⁽²²⁾	24.7	<u>25.8</u>	16.2	17	13.5	18.7
Selenium	39.0 ⁽²⁾	510 ⁽²⁾	0.520 ⁽²³⁾	5.94	0.45 R	0.43 R	0.41 R	0.47 R	0.42 R
Silver	39.0 ⁽²⁾	510 ⁽²⁾	4.20 ⁽²³⁾	NE	0.14 J	0.42 J	0.22 J	0.18 J	0.12 J
Thallium	NE	NE	1.0 ⁽²⁴⁾	0.924	<u>3.4</u>	<u>2</u>	<u>4.1</u>	<u>2.3</u>	<u>1.9</u>
Tin	4,700 ⁽²⁾	61,000 ⁽²⁾	50.0 ⁽²⁵⁾	3.56	1.6 J	1.1 J	0.72 J	1.7 J	0.92 J
Vanadium	0.550 ⁽²⁾	7.20 ⁽²⁾	7.80 ⁽²⁶⁾	434	136	149	215	184	121
Zinc	2,300 ⁽²⁾	31,000 ⁽²⁾	46.0 ⁽²⁷⁾	88.1	<u>98.9</u>	<u>69.3</u>	<u>246</u>	<u>70.1</u>	<u>103</u>

TABLE 6-2

**SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
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NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Notes/Qualifiers:

U - Undetected at the Method Detection Limit	ft bgs - feet below ground surface
UJ - Reported quantitation limit is qualified as estimated	ug/kg - micrograms per kilogram
J - Estimated: The analyte was positively identified; the quantitation is an estimation	mg/kg - milligrams per kilogram
R - Rejected data; data is not usable	NAPR - Naval Activity Puerto Rico
NE - Not Established	PCB - Polychlorinated Biphenyls
	TPH - Total Petroleum Hydrocarbons

- (1) NAPR basewide bkg subsurface soil screening value for clay [Table 3-4] (upper limit of the means concentration [mean plus two standard deviations]) (Baker, 2010)
- (2) Noncarcinogenic Regional Screening Levels based on a target hazard quotient of 0.1 for conservative screening purposes.
- (3) Value for acenaphthene used as a surrogate.
- (4) Value for pyrene used as a surrogate.
- (5) Puerto Rico specific value
- (6) Value for chromium III used as a surrogate.
- (7) 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).
- (8) The value represents a total concentration for all phthalates. [MHSPE 2000]
- (9) Ecological soil screening level for soil invertebrates [USEPA 2007a]
- (10) Low molecular weight PAHs are defined by the USEPA (2007a) as PAH compounds composed of fewer than four rings. The low molecular weight PAH compounds analyzed for in SWMU 56 soil were 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, fluoranthene, fluorene, naphthalene, and phenanthrene.
- (11) High molecular weight PAHs are defined by the USEPA (2007a) as PAH compounds composed of four or more rings. The high molecular weight PAH compounds analyzed for in SWMU 56 soil were benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and pyrene.
- (12) Ecological soil screening level for mammalian herbivores [USEPA 2005a]
- (13) Ecological soil screening level for plants [USEPA 2005b]
- (14) Ecological soil screening level for soil invertebrates [USEPA 2005c]
- (15) Ecological soil screening level for mammalian herbivores [USEPA 2005d]
- (16) Ecological soil screening level for avian ground insectivores [USEPA 2005e]
- (17) Ecological soil screening level for avian ground insectivores [USEPA 2008]
- (18) Ecological soil screening level for plants [USEPA 2005f]
- (19) Ecological soil screening level for avian ground insectivores [USEPA 2007b]
- (20) Ecological soil screening level for avian ground insectivores [USEPA 2005g]
- (21) Toxicological threshold for earthworms [Efroymson et al. 1997a]
- (22) Ecological soil screening level for plants [USEPA 2007c]
- (23) Ecological soil screening level for plants [USEPA 2007d]
- (24) Ecological soil screening level for avian ground insectivores [USEPA 2006]
- (25) Toxicological threshold for plants [Efroymson et al. 1997b]
- (26) Ecological soil screening level for avian ground insectivores [USEPA 2005h]
- (27) Ecological soil screening level for avian ground insectivores [USEPA 2007e]

TABLE 6-2

**SUMMARY OF DETECTED LABORATORY RESULTS - SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

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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.

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

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

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

USEPA. 2005h. Ecological Soil Screening Levels for Vanadium (Interim Final). Office of Solid Waste and Emergency Response, Washington, D.C. OSWER Directive 9285.7-75.

TABLE 6-3

Revised: 11/24/2010

**SUMMARY OF DETECTED LABORATORY RESULTS - GROUNDWATER
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	Regional	Selected	<i>Puerto Rico</i>		13GW07	57SB01	57SB02	57SB04	57SB05	57SB07	57SB07
Sample ID	Tap Water	Ecological	<i>Water</i>	<u>NAPR</u>	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07D
Sample Date	Screening	Groundwater	<i>Quality</i>	<u>Basewide</u>	1/31/2010	2/1/2010	1/31/2010	1/31/2010	2/1/2010	1/31/2010	1/31/2010
	Levels	Screening Values	<i>Standards</i>	<u>Background⁽¹⁾</u>							
Volatiles (ug/L)											
Carbon Disulfide	100 ⁽²⁾	15.0 ⁽⁸⁾⁽⁹⁾	NE	NE	0.5 U	0.5 U	1.8	0.25 J	1.3 R	0.16 J	0.19 J
Chloroform	0.190	815 ⁽¹⁰⁾	57	NE	0.5 U	0.5 U	5	3.2 U	1.4 R	0.5 U	0.5 U
Methyl Iodide	NE	NE	NE	NE	0.5 U	0.5 U	0.2 J	0.5 U	1.3 R	0.5 UJ	0.5 UJ
Semivolatiles (ug/L)											
Acenaphthene	220 ⁽²⁾	9.70 ⁽¹⁰⁾	670	NE	0.21 U	0.21 U	0.2 U	0.2 U	0.41	0.2 U	0.21 U
Acenaphthylene	220 ⁽²⁾⁽³⁾	6.0 ⁽¹¹⁾	670	NE	0.21 U	0.21 U	0.03 J	0.2 U	0.011 J	0.2 U	0.21 U
Anthracene	1,100 ⁽²⁾	5.35 ⁽¹²⁾	8,300	NE	0.21 U	0.21 U	0.2 U	0.2 U	0.55	0.2 U	0.21 U
Benzo(a)anthracene	0.0290	0.0250 ⁽⁹⁾⁽¹³⁾	0.038	NE	0.21 U	0.21 U	0.2 U	0.2 U	0.18 J	0.2 U	0.21 U
Benzo(a)pyrene (BaP)	0.00290	10.0 ⁽¹⁴⁾	0.038	NE	0.21 U	0.21 U	0.2 U	0.2 U	0.023 J	0.2 U	0.21 U
Benzo(b)fluoranthene	0.0290	6.0 ⁽¹⁵⁾	0.038	NE	0.21 U	0.21 U	0.2 U	0.2 U	0.031 J	0.2 U	0.21 U
Benzo(g,h,i)perylene	110 ⁽²⁾⁽⁴⁾	6.0 ⁽¹⁵⁾	NE	NE	0.011 J	0.21 U	0.2 U	0.2 U	0.012 J	0.2 U	0.21 U
Benzo(k)fluoranthene	0.290	6.0 ⁽¹⁵⁾	0.038	NE	0.21 UJ	0.21 UJ	0.2 UJ	0.2 UJ	0.025 J	0.2 UJ	0.21 UJ
Chrysene	2.90	10.0 ⁽¹⁴⁾	0.038	NE	0.018 J	0.21 U	0.2 U	0.2 U	0.19 J	0.2 U	0.017 J
Diethyl Phthalate (DEP)	2,900 ⁽²⁾	75.9 ⁽¹⁰⁾	17,000	NE	5.1 U	5.3 U	5 U	5 U	0.6 J	5 U	5.3 U
Fluoranthene	150 ⁽²⁾	11.0 ⁽¹⁶⁾	130	NE	0.21 U	0.21 U	0.2 U	0.2 U	2.4	0.2 U	0.21 U
Phenanthrene	110 ⁽²⁾⁽⁴⁾	8.30 ⁽¹⁶⁾	830	NE	0.06 J	0.21 U	0.2 U	0.2 U	0.049 J	0.2 U	0.078 J
Pyrene	110 ⁽²⁾	0.248 ⁽¹²⁾	830	NE	0.21 U	0.21 U	0.2 U	0.2 U	1.9	0.2 U	0.21 U
PCBs (ug/kg)											
<i>Not Detected</i>											
TPH (mg/L)											
Diesel Range Organics (DRO)	50.0 ⁽⁵⁾	NE	NE	NE	0.53 U	0.51 U	0.5 U	0.56 U	0.5 U	0.5 U	0.56 U
Gasoline Range Organics (GRO)	50.0 ⁽⁵⁾	NE	NE	NE	0.5 U	0.5 UJ	0.5 U	0.5 U	2.1	0.5 U	0.5 U
Total TPH	50.0 ⁽⁵⁾	NE	NE	NE	1.03 U	1.01 UJ	1 U	1.06 U	2.6	1 U	1.06 U

TABLE 6-3

Revised: 11/24/2010

**SUMMARY OF DETECTED LABORATORY RESULTS - GROUNDWATER
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	Regional	Selected	<i>Puerto Rico</i>		13GW07	57SB01	57SB02	57SB04	57SB05	57SB07	57SB07
Sample ID	Tap Water	Ecological	<i>Water</i>	<u>NAPR</u>	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07D
Sample Date	Screening	Groundwater	<i>Quality</i>	<u>Basewide</u>	1/31/2010	2/1/2010	1/31/2010	1/31/2010	2/1/2010	1/31/2010	1/31/2010
	Levels	Screening Values	<i>Standards</i>	<u>Background⁽¹⁾</u>							
Total Inorganics (ug/L)											
Antimony	1.50 ⁽²⁾	500 ⁽²⁴⁾	5.6	12.2	2.9 U	2.9 U	2.9 U	3.7 J	2.9 U	2.9 U	2.9 U
Barium	730 ⁽²⁾	16,667 ⁽¹⁸⁾	2000 ⁽²⁶⁾	686	30 J	17.3 R	83.8 J	26.9 J	24.8 J	17.9 J	18.2 J
Cadmium	1.80 ⁽²⁾	8.85 ⁽²⁵⁾	5	16.6	0.34 U	0.34 U	0.85 J	0.34 U	0.34 U	0.91 J	0.4 J
Cobalt	1.10 ⁽²⁾	45.0 ⁽²⁰⁾	NE	633	3.2 J	1.5 J	9.5 J	1.3 J	3 J	2.1 J	0.83 J
Copper	150 ⁽²⁾	3.73 ⁽²⁵⁾	1,300	324	2.8 J	1.5 U	6.5	2.5 J	5 J	2.9 J	3 J
Lead	15.0 ⁽⁷⁾	8.52 ⁽²⁵⁾	15	26.3	1.8 U	2 U	2.7 U	1.8 U	17.7	2.2 U	2.3 U
Mercury	0.0570 ⁽²⁾	1.11 ⁽²⁵⁾	0.5	0.15	0.97	1.4	0.1 U	0.19 J	0.1 U	0.13 J	0.22
Selenium	18.0 ⁽²⁾	71.1 ⁽²⁵⁾	50	29.88	3.6 UJ	3.9 J	3.6 UJ	3.6 UJ	3.6 UJ	3.6 UJ	4.5 J
Silver	18.0 ⁽²⁾	2.24 ⁽¹⁰⁾	NE	18.31	1 J	1.3 J	1.2 U	0.96 U	0.96 U	0.96 U	0.96 U
Thallium	2.0 ⁽⁷⁾	21.3 ⁽¹⁰⁾	0.24	NE	5.3 U	5.3 U	5.6 J	5.3 U	5.3 U	5.3 U	5.3 U
Tin	2,200 ⁽²⁾	180 ⁽⁹⁾⁽¹³⁾	NE	9.4	7.9 J	5.5 J	8 J	6.2 J	6.3 J	8.8 J	5.1 U
Vanadium	0.260 ⁽²⁾	12.0 ⁽⁹⁾⁽¹³⁾	NE	484.66	24.4	6.5 J	37.5	29.6	15.5 J	13.6 J	11.8 J
Zinc	1,100 ⁽²⁾	85.6 ⁽²⁵⁾	NE	547.53	5.7 U	9.4 U	28	10.1 U	9.5 U	11 U	10.6 U
Dissolved Inorganics (ug/L)											
Barium	730 ⁽²⁾	16,667 ⁽¹⁷⁾⁽¹⁸⁾	2000 ⁽²⁶⁾	260.0	25.7 J	28 R	93.1 J	25.7 J	22.5 J	16.3 J	16.3 J
Chromium	5,500 ⁽²⁾⁽⁶⁾	50 ⁽¹⁹⁾	100	6.5	0.95 U	1.2 J	0.95 U	2.9 J	0.95 U	3 J	3.6 J
Cobalt	1.10 ⁽²⁾	45.0 ⁽¹⁷⁾⁽²⁰⁾	NE	580.5	3.6 J	3.5 J	12.8 J	2.2 J	3.7 J	1.6 J	3.3 J
Copper	150 ⁽²⁾	3.10 ⁽²¹⁾	1,300	29.0	1.6 J	1.6 U	2.8 J	1.9 J	1.5 U	1.5 U	1.6 J
Lead	15.0 ⁽⁷⁾	8.10 ⁽²¹⁾	15	1.3	2.7 U	1.8 U	2 U	2.1 U	14.9	1.8 U	1.8 U
Mercury	0.0570 ⁽²⁾	0.940 ⁽²¹⁾	0.5	0.157	1.1	1.2	0.1 U	0.28	0.1 U	0.1 U	0.17 J
Nickel	73.0 ⁽²⁾	8.20 ⁽²²⁾	610	84.1	1.3 J	5.4 J	17.4 J	4.3 J	2.2 U	5.7 J	6.5 J
Silver	18.0 ⁽²⁾	2.24 ⁽¹⁷⁾⁽²¹⁾	NE	3.67	1 J	1.1 U	0.96 U	0.96 U	0.96 U	0.96 U	1.4 J
Tin	2,200 ⁽²⁾	180 ⁽⁹⁾⁽¹³⁾⁽¹⁷⁾	NE	84.1	9.5 J	5.1 J	6.2 J	5.1 U	5.1 U	5.2 J	5.1 U
Vanadium	0.260 ⁽²⁾	12.0 ⁽⁹⁾⁽¹³⁾⁽¹⁷⁾	NE	20.96	23.8	8.6 J	28.3	28.1	9.2 J	10.7 J	11.5 J
Zinc	1,100 ⁽²⁾	81.0 ⁽²³⁾	NE	360.64	5.3 U	12.5 U	23.3	11.1 U	5.5 U	5.7 U	7.8 U

TABLE 6-3

Revised: 11/24/2010

**SUMMARY OF DETECTED LABORATORY RESULTS - GROUNDWATER
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Notes/Qualifiers:

U - Undetected at the Method Detection Limit
 UJ - Reported quantitation limit is qualified as estimated
 J - Estimated: The analyte was positively identified; the quantitation is an estimation
 R - Rejected data; data is not usable
 NE - Not Established
 PRWQS - Puerto Rico Water Quality Standards

ug/L - micrograms per liter
 mg/L - milligrams per liter
 NAPR - Naval Activity Puerto Rico
 USEPA - United States Environmental Protection Agency
 TPH - Total Petroleum Hydrocarbons
 MCL - Maximum Contaminant Level

- (1) NAPR basewide background groundwater screening value (upper limit of the means concentration [mean plus two standard deviations]) (Baker, 2008)
- (2) Noncarcinogenic Regional Screening Levels based on a target hazard quotient of 0.1 for conservative screening purposes.
- (3) Value for acenaphthene used as a surrogate.
- (4) Value for pyrene used as a surrogate.
- (5) Puerto Rico specific value
- (6) Value for chromium III used as a surrogate.
- (7) Value for MCL
- (8) The safety factors applied to acute endpoints (i.e., LC₅₀, EC₅₀, NOEC, and LOEL values) and chronic endpoints (i.e., LOELs) are those recommended by Wentsel et al. (1996).
- (9) USEPA Region 5 ecological screening level [USEPA 2003]
- (10) USEPA Region 4 chronic screening value [USEPA 2001]
- (11) Acute LOEL for chemical class with a safety factor of 50 (value for low molecular weight PAHs) [Buchman 2008]
- (12) Minimum acute value (48-hr LC50 for *Americamysis bahia* [opossum shrimp]) with a safety factor of 100 [USEPA 2007]
- (13) The chemical lacks a marine/estuarine surface water screening value/literature-based toxicity value. The value shown is a freshwater screening value/toxicity value.
- (14) Acute value (LC50) with a safety factor of 100 [USEPA 2004]
- (15) Acute LOEL for chemical class with a safety factor of 50 (value for high molecular weight PAHs) [Buchman 2008]
- (16) Final Chronic Value [USEPA 1996]
- (17) The chemical lacks a screening value expressed as a dissolved concentration. The value shown is expressed as a total recoverable concentration.
- (18) Minimum acute value (96-hr NOEC for *Cyprinodon variegatus* [sheepshead minnow]) with a safety factor of 30 [USEPA 2007]
- (19) Dissolved Criteria Continuous Concentration for hexavalent chromium [USEPA 2009]
- (20) Minimum acute value (96-hr LC50 for *Nitocra spinipes* [Harpacticoid copepod]) with a safety factor of 100 [USEPA 2007]
- (21) Criteria Continuous Concentration based on Final Residual Value/Puerto Rico Water Quality Standard [USEPA 2009/PREQB 2003]
- (22) Dissolved Criteria Continuous Concentration [USEPA 2009]
- (23) Dissolved Criteria Continuous Concentration/Puerto Rico Water Quality Standard [USEPA 2009/PREQB 2003]
- (24) Proposed Criteria Continuous Concentration [Buchman 2008]
- (25) Total recoverable Criteria Continuous Concentration [USEPA 2009]
- (26) MCL was used; there is not a PRWQS value established

TABLE 6-3

Revised: 11/24/2010

**SUMMARY OF DETECTED LABORATORY RESULTS - GROUNDWATER
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Table References:

PREQB, 2010, Puerto Rico Water Quality Standards Regulation. Puerto Rico Environmental Quality Board.

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TABLE 6-4

**SUMMARY OF DETECTED LABORATORY RESULTS - CONCRETE CHIP
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57CC01	57CC02	57CC03	57CC04	57CC04
Sample ID	57CC01	57CC02	57CC03	57CC04	57CC04D
Sample Date	1/30/2010	1/30/2010	1/30/2010	1/30/2010	1/30/2010
Semivolatiles (ug/kg)					
Bis(2-ethylhexyl) Phthalate	8100 U	5200 U	5400 U	1400 J	5200 U
Isophorone	48000	1200 J	6000	11000	1700 J
TPH (mg/kg)					
Diesel Range Organics	20 J	200	72	130	70
Inorganics (mg/kg)					
Arsenic	2.3	1.7	3.1	1.5	1.4
Barium	184	81.1	150	109	94.4
Beryllium	0.55	0.22 J	0.37 J	0.39 J	0.28 J
Cadmium	2.8 J	0.2 J	1.3 J	2.9 J	1.5 J
Chromium	13.3	7.2	19.1	8.1	7
Cobalt	1.4	1.9	2.5	1.5	1.8
Copper	12.1 J	13.3 J	31.2 J	23 J	12.9 J
Lead	13.4	7.6	8.3	6.6 J	4.5 J
Nickel	5.3	3.6 J	12.8	5.2	4.1
Vanadium	17.6	18.5	18.6	18	16.5
Zinc	16.7 J	17.3 J	23.2 J	19.2 J	27.4 J

Notes:

U - Not detected

J - Analyte present - Reported value is estimated

TPH - Total Petroleum Hydrocarbons

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

TABLE 6-5

**SUMMARY OF DETECTED LABORATORY RESULTS - CONCRETE WIPE
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57WS01	57WS02	57WS03	57WS04	57WS04
Sample ID	57WS01	57WS02	57WS03	57WS04	57WS04D
Sample Date	1/30/2010	1/30/2010	1/30/2010	1/30/2010	1/30/2010
Semivolatiles (ug/wipe)					
4-Chloro-3-methylphenol	330 U	28 J	330 U	660 U	660 U
Acenaphthene	1.4 J	2.1 J	1 J	1.6 J	1.5 J
Acenaphthylene	8.3 U	8.3 U	0.89 J	17 U	17 U
Fluorene	1 J	1.4 J	0.73 J	0.96 J	1.2 J
Phenanthrene	2.8 J	3.7 J	1.7 J	2.8 J	2.9 J
TPH (mg/wipe)					
Diesel Range Organics	2.1	1.9	1.9	1.8	2.2
Inorganics (ug/wipe)					
Antimony	0.29 U	0.48 J	0.29 U	0.29 U	0.29 J
Chromium	0.56 J	0.76 J	1.4	0.55 J	0.49 J
Cobalt	0.08 U	0.08 U	0.13 J	0.08 U	0.08 U
Copper	0.45 J	0.87 J	2	0.56 J	0.49 J
Lead	0.8 J	0.96 J	1.5 J	1.3 J	0.87 J
Nickel	0.1 J	0.23 J	23.1	0.1 U	0.1 J
Selenium	0.36 U	0.36 U	0.5 J	0.47 J	0.36 U
Tin	1.3 J	1.8 J	1.4 J	1.3 J	1.8 J
Zinc	4.9	7.3	6.5	10.6 J	5.5 J

Notes:

U - Not detected

J - Analyte present - Reported value is estimated

TPH - Total Petroleum Hydrocarbons

ug/wipe - micrograms per wipe

mg/wipe - milligrams per wipe

TABLE 6-6

SUMMARY OF DETECTED LABORATORY RESULTS - QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID Sample Date	Equipment Rinsates								Field Blanks	
	57ER01 1/26/2010	57ER02 1/27/2010	57ER03 1/28/2010	57ER04 ⁽¹⁾ 1/29/2010	57ER05 1/30/2010	57ER06 1/31/2010	57ER07 2/1/2010	57ER08 5/20/2010	57FB01 1/26/2010	57FB02 2/1/2010
Volatiles (ug/L)										
2-Butanone	2.2 J	1.4 J	1.3 J	0.61 J	NA	0.67 J	0.94 J	NA	1.8 J	4 J
Acetone	4.6	4	3.7	3 J	NA	2.9 J	2.5 J	NA	5.7	8.3 J
Acetonitrile	0.26 J	0.5 U	0.32 J	0.23 J	NA	0.5 U	0.26 J	NA	0.5 U	0.5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	1.1
Bromoform	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	2.1
Chloroform	0.19 J	0.19 J	0.16 J	0.17 J	NA	0.2 J	0.18 J	NA	0.18 J	4.8
Chloromethane	0.46 J	0.5 U	0.31 J	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	0.5 U
Dibromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U	NA	0.5 U	1.2
Methylene Chloride	13	14	13	12	NA	14	13	NA	12	0.58
Toluene	5.1	4.8	3.7	3.3	NA	4.5	4.8	NA	4.9	0.5 U
Semivolatiles (ug/L)										
2-Methylnaphthalene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.068 J	NA	0.21 U	0.019 J
Acenaphthene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.08 J	NA	0.21 U	0.2 U
Acenaphthylene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.011 J	NA	0.21 U	0.2 U
Anthracene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.085 J	NA	0.21 U	0.2 U
Benzo(a)anthracene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.044 J	NA	0.21 U	0.2 U
Benzo(g,h,i)perylene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.013 J	NA	0.21 U	0.2 U
Benzyl Alcohol	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U	NA	5.1 U	0.6 J
Chrysene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.039 J	NA	0.21 U	0.2 U
Fluorene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.06 J	NA	0.21 U	0.2 U
Indeno(1,2,3-cd)pyrene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.011 J	NA	0.21 U	0.2 U
Naphthalene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.2 U	NA	0.21 U	0.067 J
Phenanthrene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.25	NA	0.21 U	0.2 U
Pyrene	0.21 U	0.21 U	0.028 J	0.22 U	0.21 U	0.21 U	0.12 J	NA	0.21 U	0.2 U
TPH (mg/L)										
Gasoline Range Organics	0.048 J	0.038 J	0.043 J	0.03 J	NA	0.029 J	0.035 J	0.04 J	0.048 J	0.03 J

TABLE 6-6

SUMMARY OF DETECTED LABORATORY RESULTS - QUALITY ASSURANCE / QUALITY CONTROL
 SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID Sample Date	Equipment Rinsates								Field Blanks	
	57ER01 1/26/2010	57ER02 1/27/2010	57ER03 1/28/2010	57ER04 ⁽¹⁾ 1/29/2010	57ER05 1/30/2010	57ER06 1/31/2010	57ER07 2/1/2010	57ER08 5/20/2010	57FB01 1/26/2010	57FB02 2/1/2010
Total Inorganics (ug/L)										
Beryllium	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	NA	0.23 U	0.28 J
Copper	1.5 U	1.5 U	1.5 J	1.5 U	1.5 U	1.5 U	1.6 J	NA	1.5 U	1.5 U
Lead	2.2 J	1.8 J	1.8 U	2.9 J	1.8 U	2.5 J	2.7 J	NA	1.8 U	1.8 U
Nickel	0.96 U	0.96 U	2.1 J	0.96 U	0.96 U	0.96 U	0.96 U	NA	0.96 U	0.96 U
Zinc	1.3 J	7.8 J	2.9 J	1.2 J	1.7 J	6.8 J	34.5	NA	0.53 U	0.96 J

TABLE 6-6

SUMMARY OF DETECTED LABORATORY RESULTS - QUALITY ASSURANCE / QUALITY CONTROL
 SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

Sample ID	Trip Blanks						
	57TB01	57TB02	57TB03	57TB04	57TB05	57TB06	57TB07
Sample Date	1/26/2010	1/26/2010	1/27/2010	1/29/2010	2/1/2010	2/2/2010	5/20/2010
Volatiles (ug/L)							
2-Butanone	2.5 R	2.5 R	2.5 R	2.5 R	2.5 R	NA	NA
Acetone	3.5 U	3.5 U	3.5 R	3.5 R	3.5 R	NA	NA
Acetonitrile	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Bromoform	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Chloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Dibromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Methylene Chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Semivolatiles (ug/L)							
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA
TPH (mg/L)							
Gasoline Range Organics	0.051 J	0.031 J	0.034 J	0.036 J	NA	0.029 J	0.036 J

TABLE 6-6

**SUMMARY OF DETECTED LABORATORY RESULTS - QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID Sample Date	Trip Blanks						
	57TB01 1/26/2010	57TB02 1/26/2010	57TB03 1/27/2010	57TB04 1/29/2010	57TB05 2/1/2010	57TB06 2/2/2010	57TB07 5/20/2010
Total Inorganics (ug/L)							
Beryllium	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA

Notes:

- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable
- NA - Not Analyzed
- TPH - Total Petroleum Hydrocarbons

ug/L - micrograms per liter
mg/L - milligrams per liter

⁽¹⁾ The VOCs are from 2/2/2010; the TPH GRO results are from 5/20/2010

FIGURES

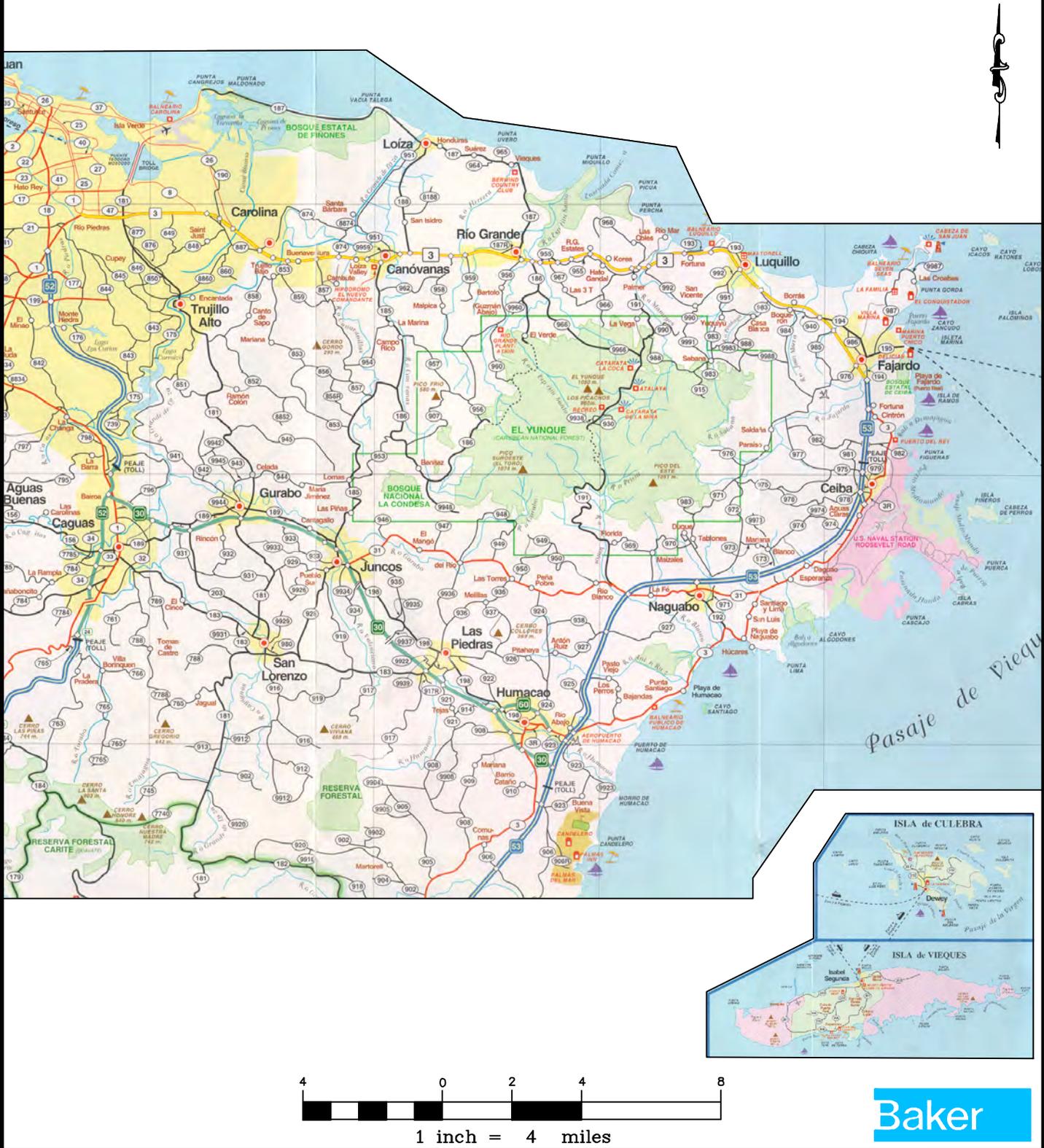
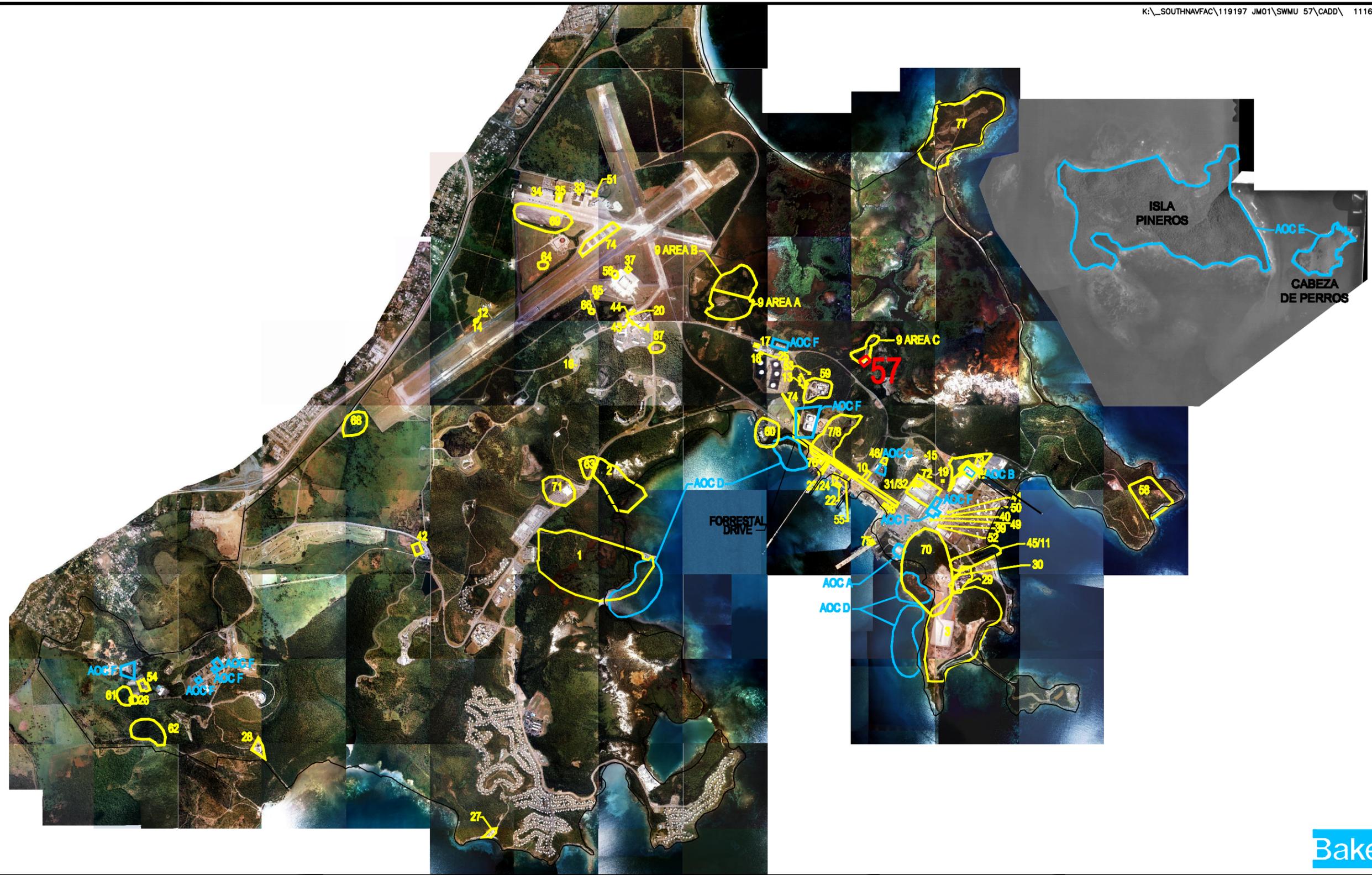


FIGURE 2-1
 REGIONAL LOCATION MAP
 SWMU 57-FACILITY NO. 278 POL DRUM STORAGE AREA
 PHASE I RFI REPORT



Baker

LEGEND

-  - SWMUs
 -  - AREA TO WHICH THIS INVESTIGATION PERTAINS
 -  - AOCs
- SOURCE: GEO-MARINE, INC., SEPTEMBER 6, 2000.

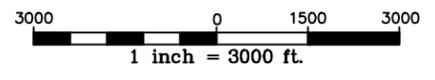


FIGURE 2-2
 SWMU/AOC LOCATION MAP
 SWMU 57-FACILITY NO. 278 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO

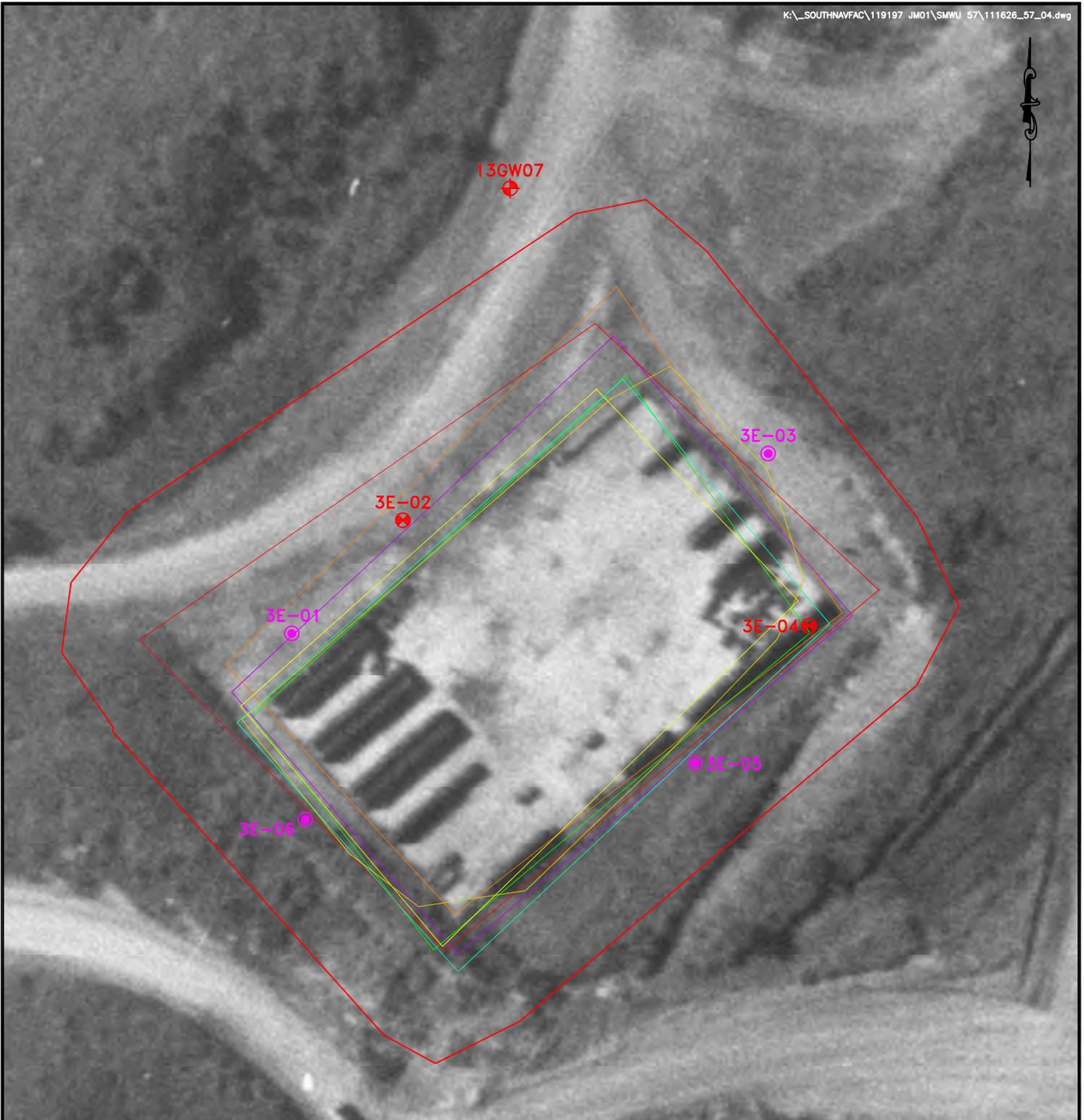


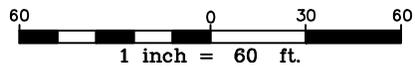
FIGURE NOT TO SCALE



LEGEND	
	-1958 POLYGON FEATURE
	-1961 POLYGON FEATURE
	-1964 POLYGON FEATURE
	-1976 POLYGON FEATURE
	-1977 POLYGON FEATURE
	-1985 POLYGON FEATURE
	-1995 POLYGON FEATURE
	- EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP 2004)
	- EXISTING SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLE LOCATION (PHASE II ECP 2004)
	- EXISTING MONITORING WELL FROM SWMU 9
	- SWMU BOUNDARY

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

FIGURE 2-3
 SITE LAYOUT AND ECP SAMPLE LOCATION MAP
 1958 AERIAL PHOTOGRAPH
 SWMU 57-FACILITY NO. 278
 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO



- | | |
|--|---|
| <ul style="list-style-type: none"> -1958 POLYGON FEATURE -1961 POLYGON FEATURE -1964 POLYGON FEATURE -1976 POLYGON FEATURE - SWMU BOUNDARY ● - EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP 2004) ⊕ - EXISTING SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLE LOCATION (PHASE II ECP 2004) ⊕ - EXISTING MONITORING WELL FROM SWMU 9 | <p>LEGEND</p> <ul style="list-style-type: none"> -1977 POLYGON FEATURE -1985 POLYGON FEATURE -1995 POLYGON FEATURE |
|--|---|

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

FIGURE 2-4
 SITE LAYOUT AND ECP SAMPLE LOCATION MAP
 2000 AERIAL PHOTOGRAPH
 SWMU 57-FACILITY NO. 278
 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO



SOURCE: USGS, NOV. 2006.



LEGEND

- | |
|--|
| <ul style="list-style-type: none"> — -1958 POLYGON FEATURE — -1961 POLYGON FEATURE — -1964 POLYGON FEATURE — -1976 POLYGON FEATURE — -1977 POLYGON FEATURE — -1985 POLYGON FEATURE — -1995 POLYGON FEATURE - SWMU BOUNDARY - EARTHEN DRAINAGE FEATURE ● - EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP 2004) ⊕ - EXISTING SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLE LOCATION (PHASE II ECP 2004) ⊕ - EXISTING MONITORING WELL FROM SWMU 9 ⊙ - PHASE I RFI SURFACE AND SUBSURFACE SAMPLING LOCATIONS ⊕ - PHASE I RFI SURFACE, SUBSURFACE AND GROUNDWATER SAMPLE LOCATION ⊙ - PHASE I RFI CONCRETE CHIP SAMPLING LOCATIONS ⊙ - PHASE I RFI CONCRETE WIPE SAMPLING LOCATIONS ⊙ - PHASE I RFI SURFACE SOIL SAMPLING LOCATIONS |
|--|

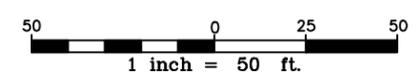
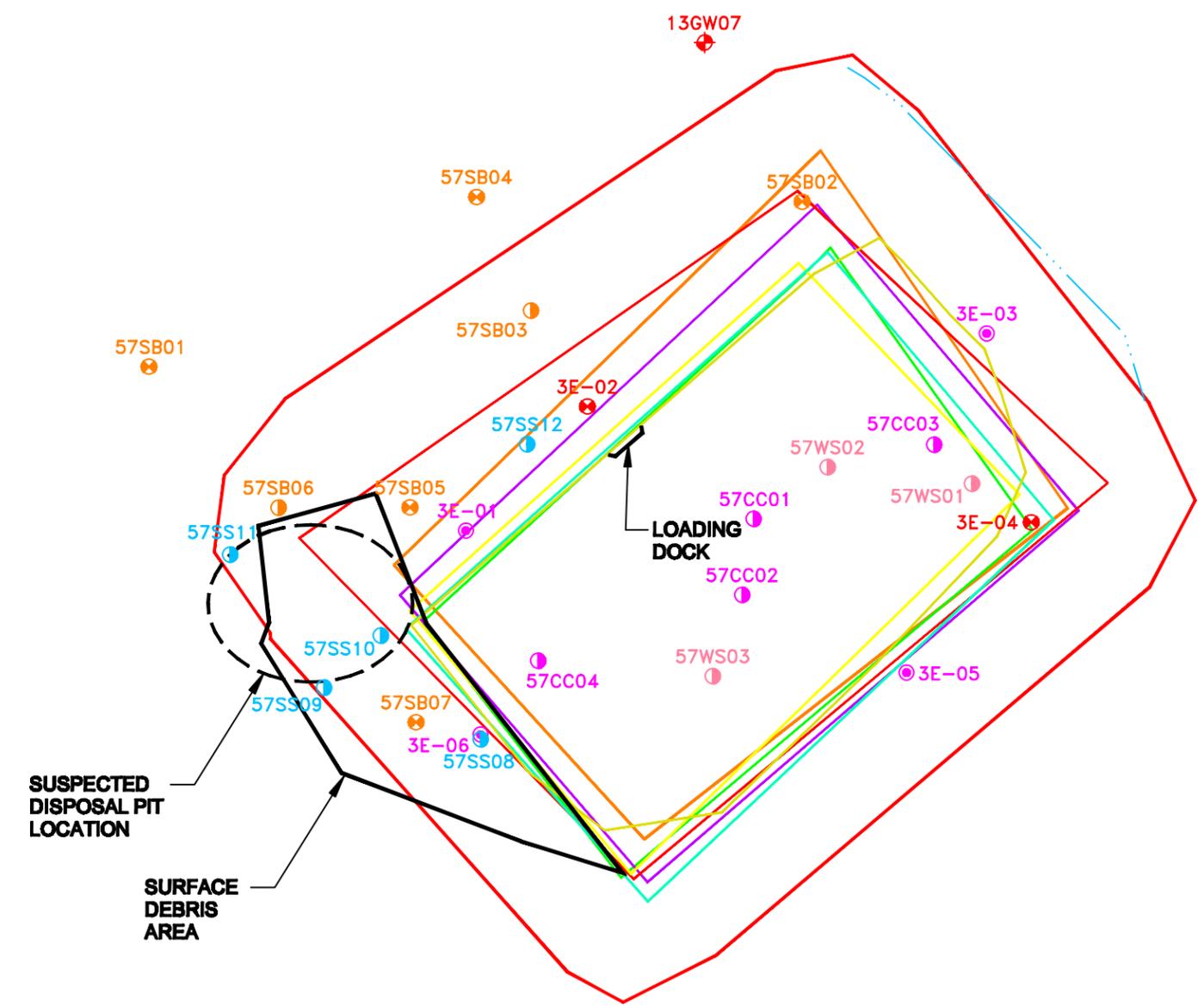


FIGURE 4-1
 SAMPLE LOCATION MAP-2006 AERIAL PHOTOGRAPH
 SWMU 57-FACILITY NO. 278
 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO



SOURCE: USGS, NOV. 2006.



LEGEND

- | | |
|--|--|
| <ul style="list-style-type: none"> — -1958 POLYGON FEATURE — -1961 POLYGON FEATURE — -1964 POLYGON FEATURE — -1976 POLYGON FEATURE — -1977 POLYGON FEATURE — -1985 POLYGON FEATURE — -1995 POLYGON FEATURE - SWMU BOUNDARY — - EARTHEN DRAINAGE FEATURE ● - EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP 2004) | <ul style="list-style-type: none"> ⊕ - EXISTING SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLE LOCATION (PHASE II ECP 2004) ⊕ - EXISTING MONITORING WELL FROM SWMU 9 ● - PHASE I RFI SURFACE AND SUBSURFACE SAMPLING LOCATIONS ⊕ - PHASE I RFI SURFACE, SUBSURFACE AND GROUNDWATER SAMPLE LOCATION ● - PHASE I RFI CONCRETE CHIP SAMPLING LOCATIONS ⊕ - PHASE I RFI CONCRETE WIPE SAMPLING LOCATIONS ● - PHASE I RFI SURFACE SOIL SAMPLING LOCATIONS |
|--|--|

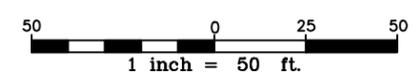


FIGURE 4-2
SAMPLE LOCATION MAP
 SWMU 57-FACILITY NO. 278
 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO



LEGEND

-  - PHASE I RFI SURFACE, SUBSURFACE AND GROUNDWATER SAMPLING LOCATIONS
-  - CROSS SECTION LOCATION
-  - EARTHEN DRAINAGE FEATURE

SOURCE: USGS, NOV. 2006.

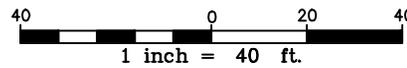
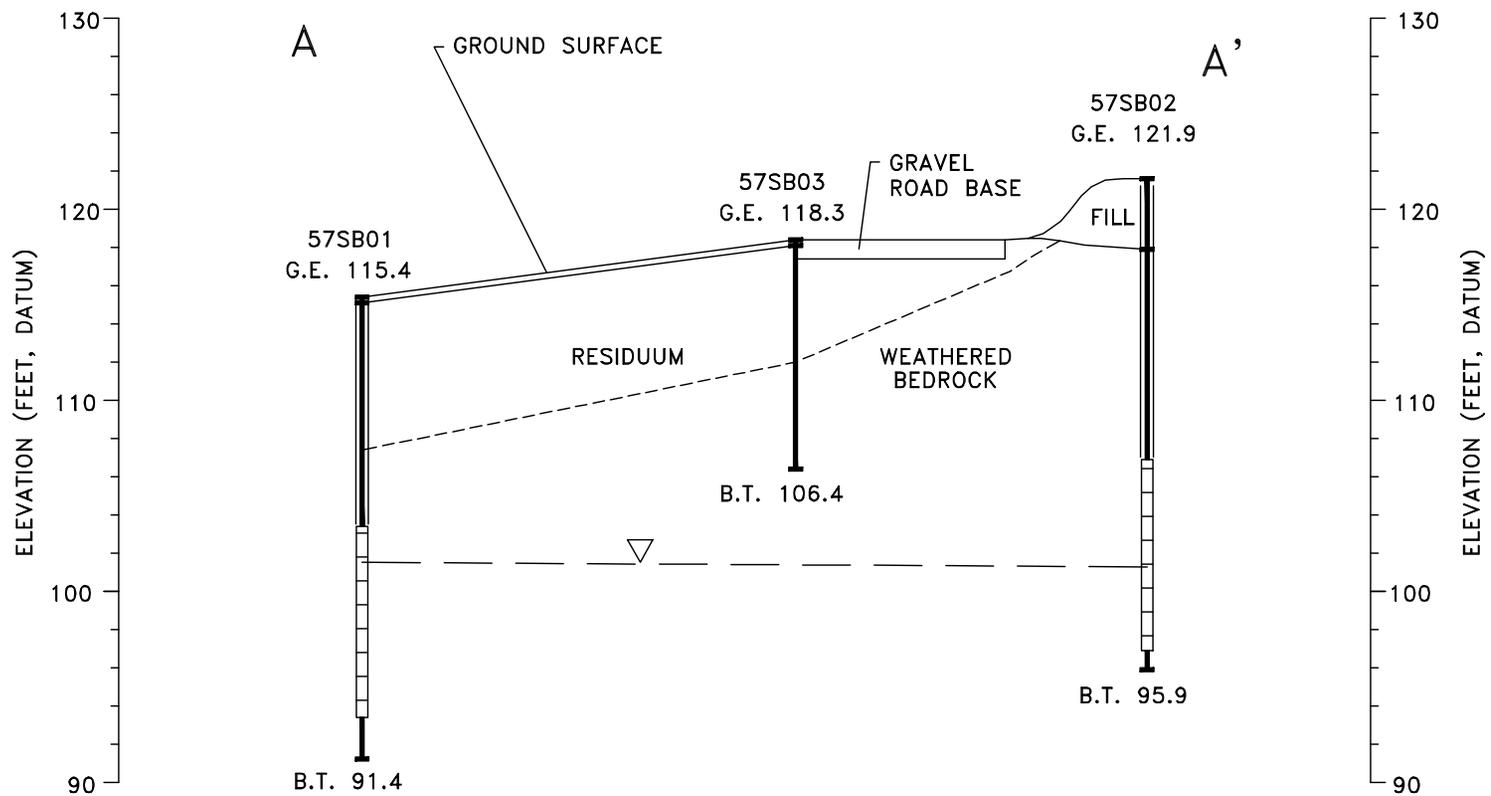
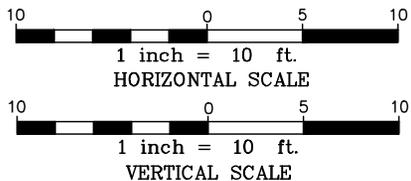


FIGURE 5-1
 GEOLOGIC CROSS SECTION LOCATION MAP
 SWMU 57-FACILITY NO. 278
 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO



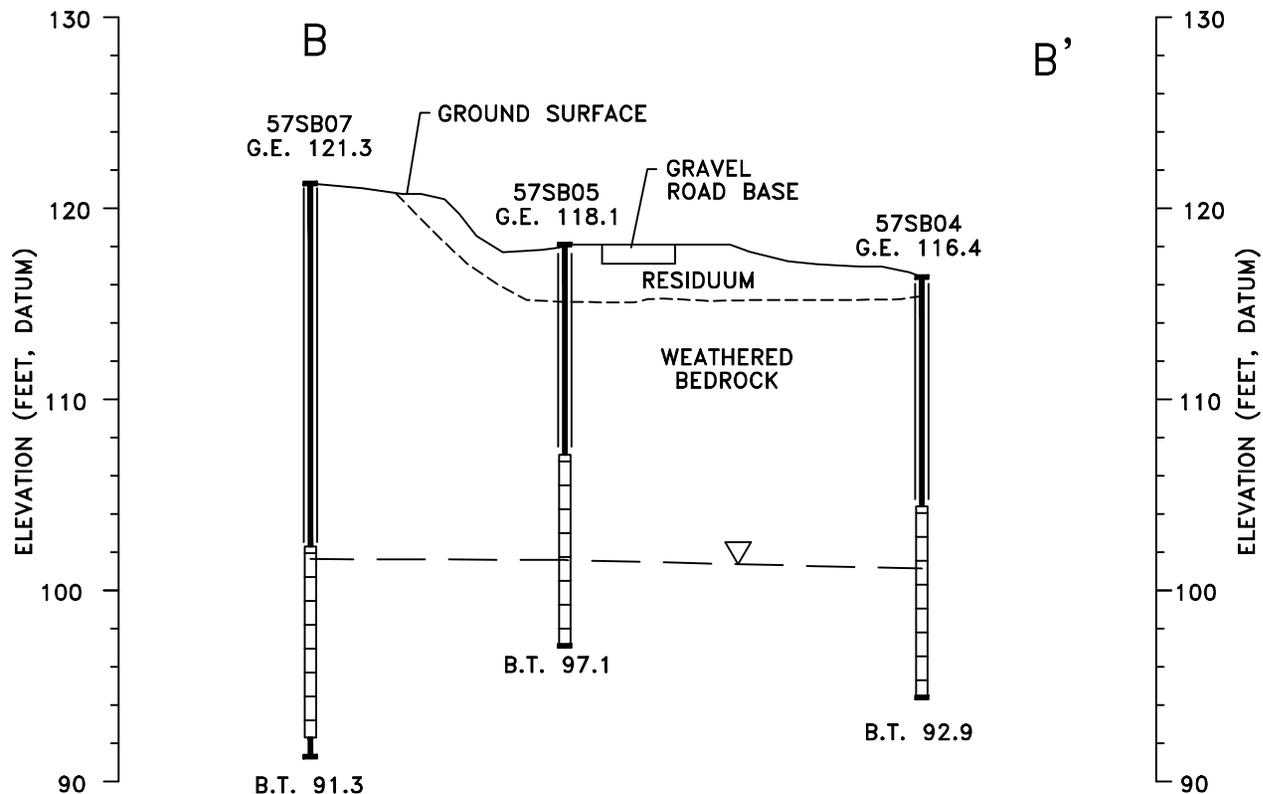
THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

NOTE: DATUM PLAN USED IS THE MEAN LOW WATER +100.00 FOOT AS ESTABLISHED BY THE U.S. NAVY SECTION (NOVEMBER 1941).



LEGEND	
---▽---	-ESTIMATED/PROJECTED CONTACT
---▽---	-ESTMATED TOP OF GROUNDWATER
—	-BORING
—	-BORING AND RISER
□	-SCREEN
G.E. 115.4	-GROUND ELEVATION, DATUM ELEVATION
B.T. 91.4	-BORING TERMINATED, DATUM ELEVATION

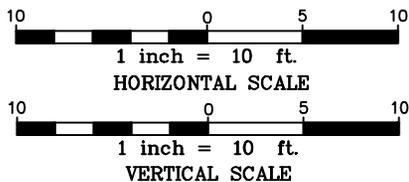
FIGURE 5-2
GEOLOGIC CROSS SECTION A-A'
SWMU 57
POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO



THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

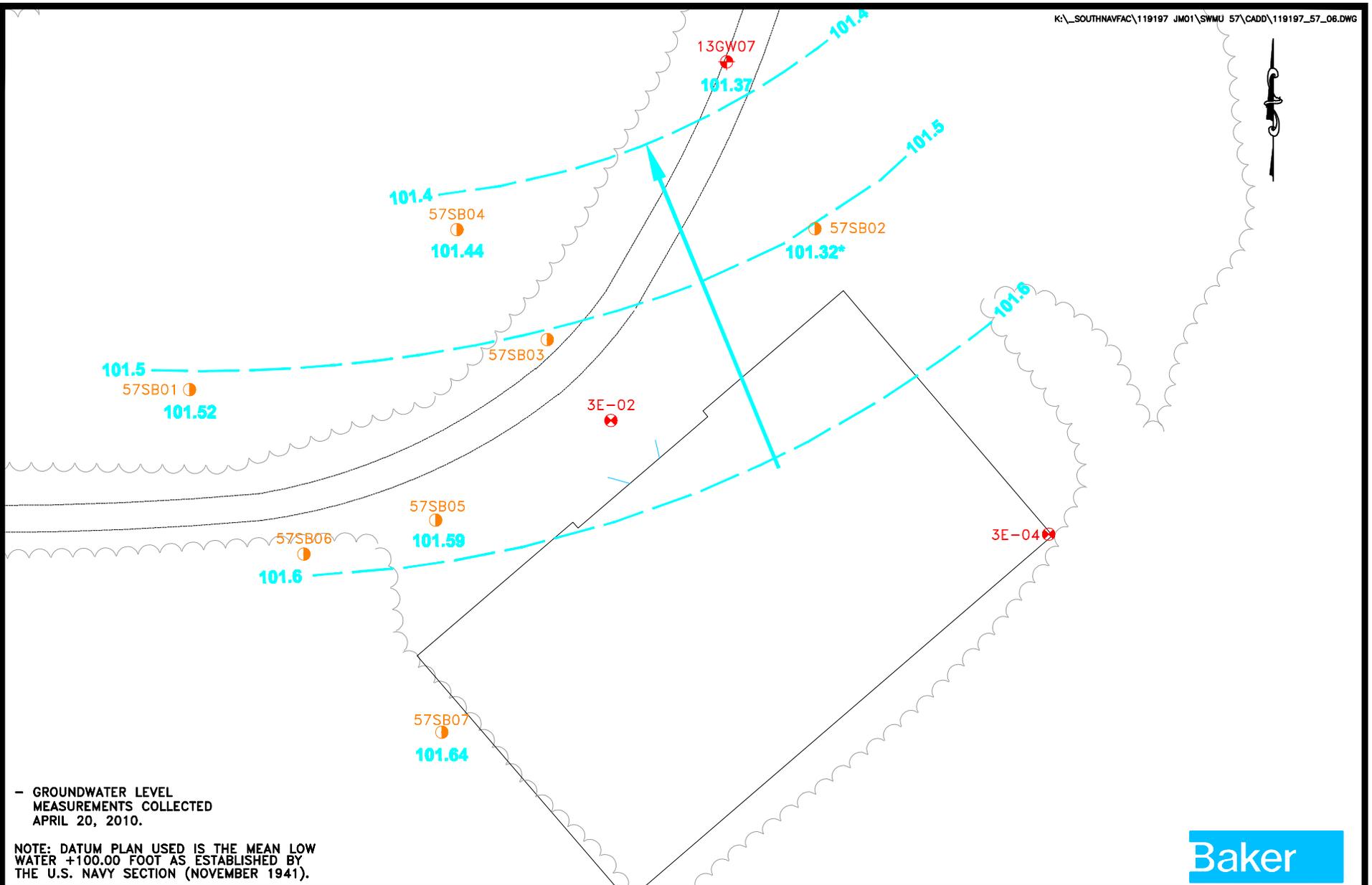
NOTE: DATUM PLAN USED IS THE MEAN LOW WATER +100.00 FOOT AS ESTABLISHED BY THE U.S. NAVY SECTION (NOVEMBER 1941).

Baker



LEGEND	
---△---	-ESTIMATED/PROJECTED CONTACT
---▽---	-ESTIMATED TOP OF GROUNDWATER
	-BORING
	-BORING AND RISER
□	-SCREEN
G.E. 121.3	-GROUND ELEVATION, DATUM ELEVATION
B.T. 91.3	-BORING TERMINATED, DATUM ELEVATION

FIGURE 5-3
GEOLOGIC CROSS SECTION B-B'
SWMU 57
POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO



- GROUNDWATER LEVEL MEASUREMENTS COLLECTED APRIL 20, 2010.

NOTE: DATUM PLAN USED IS THE MEAN LOW WATER +100.00 FOOT AS ESTABLISHED BY THE U.S. NAVY SECTION (NOVEMBER 1941).



LEGEND

- ⊗ - EXISTING SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLE LOCATION (PHASE II ECP 2004)
- ⊕ - EXISTING MONITORING WELL FROM SWMU 9
- - PHASE I RFI SURFACE AND SUBSURFACE SAMPLING LOCATIONS
- ⊗ - PHASE I RFI SURFACE, SUBSURFACE AND GROUNDWATER SAMPLE LOCATION
- 101.64 - GROUNDWATER ELEVATION
- - - - GROUNDWATER CONTOUR LINE (ESTIMATED)
- ← - GROUNDWATER FLOW DIRECTION
- * - VALUE NOT USED FOR CONTOURING

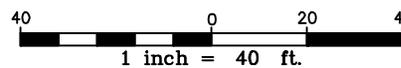
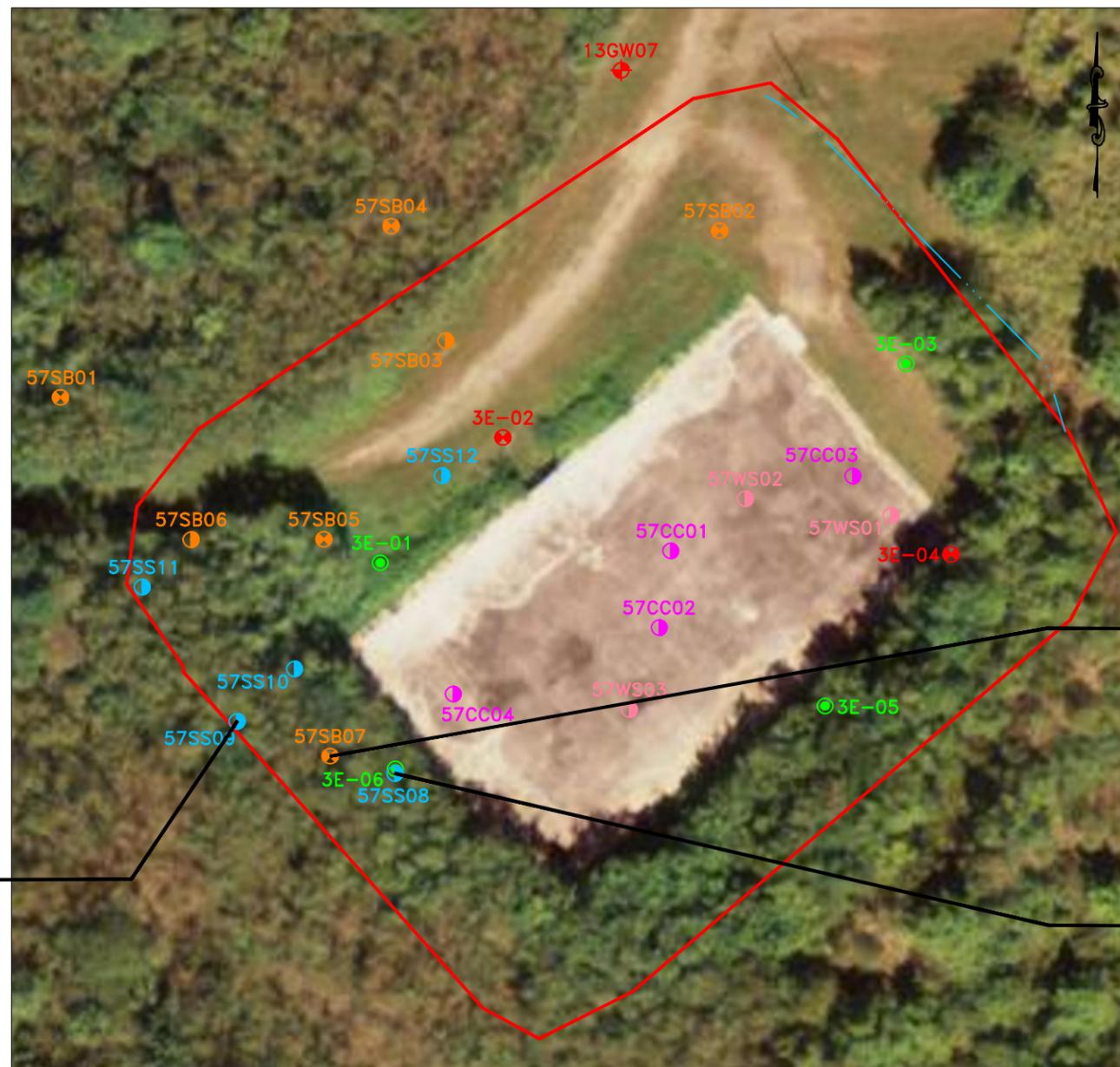


FIGURE 5-4
GROUNDWATER CONTOUR MAP
SWMU 57-FACILITY NO. 278
POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO

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



Site ID	57SS09
Sample ID	57SS09
Sampling Date	1/29/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Aroclor-1200	700

Site ID	57SS09
Sample ID	57SS09-D
Sampling Date	1/29/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Aroclor-1200	610

Site ID	57SB07
Sample ID	57SB07-00D
Sampling Date	1/27/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Aroclor-1200	310J

Site ID	57SS08
Sample ID	57SS08
Sampling Date	1/29/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Aroclor-1200	550

SOURCE: USGS, NOV. 2006.



J:	Estimated: The analyte was positively identified; the quantitation is an estimation	LEGEND
	Exceeds Ecological Soil Screening Values	● - EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP 2004)
BOLD	Exceeds Regional Screening Levels, Residential soil	⊕ - EXISTING SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLE LOCATION (PHASE II ECP 2004)
<i>ITALIC</i>	Exceeds Regional Screening Levels, Industrial soil	⊕ - EXISTING MONITORING WELL FROM SWMU 9
<u>UNDERLINE</u>	Exceeds Basewide Background	○ - PHASE I RFI SURFACE AND SUBSURFACE SAMPLING LOCATIONS
Depth Range	Feet Below Ground Surface	● - PHASE I RFI CONCRETE CHIP SAMPLING LOCATIONS
—	EARTHEN DRAINAGE FEATURE	● - PHASE I RFI CONCRETE WIPE SAMPLING LOCATIONS
⊕	PHASE I RFI SURFACE, SUBSURFACE AND GROUNDWATER SAMPLE LOCATION	● - PHASE I RFI SURFACE SOIL SAMPLING LOCATIONS
		□ - SWMU BOUNDARY

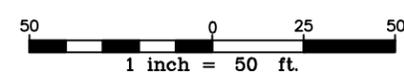


FIGURE 6-1
 DETECTED ORGANICS IN EXCESS OF HUMAN HEALTH SCREENING CRITERIA IN SURFACE SOIL
 SWMU 57-FACILITY NO. 278
 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO

Site ID	57SB04
Sample ID	57SB04-00
Sampling Date	1/28/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Chromium	108
Nickel	39.2

Site ID	57SB02
Sample ID	57SB02-00
Sampling Date	1/26/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Cobalt	52.7
Mercury	0.13

Site ID	57SB01
Sample ID	57SB01-00
Sampling Date	1/28/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Lead	52.5

Site ID	57SS12
Sample ID	57SS12
Sampling Date	1/29/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Lead	30.5

Site ID	57SB05
Sample ID	57SB05-00
Sampling Date	1/27/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Zinc	155

Site ID	57SS11
Sample ID	57SS11
Sampling Date	1/29/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Cadmium	1.1
Cobalt	64.8
Lead	33.7

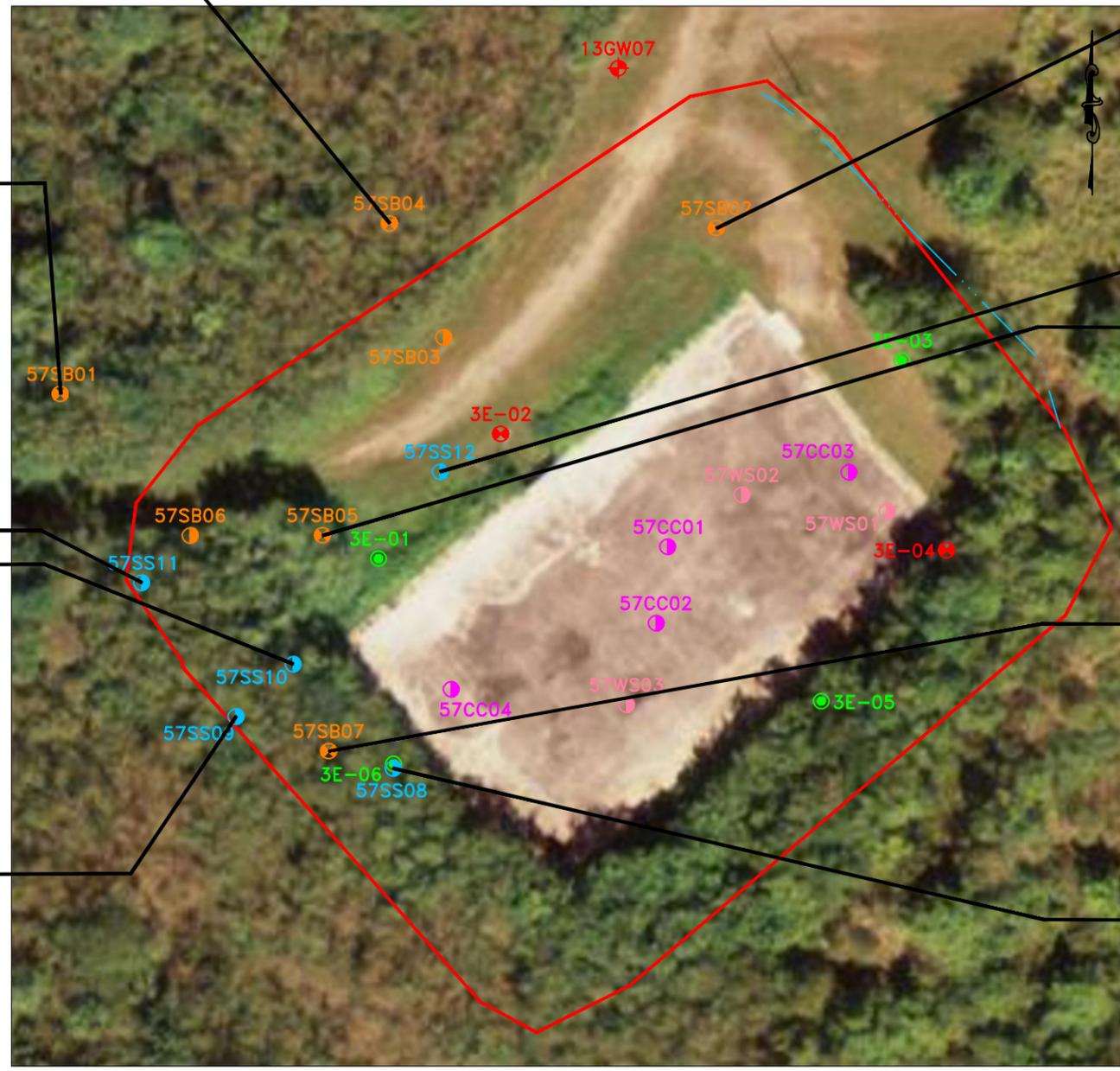
Site ID	57SS10
Sample ID	57SS10
Sampling Date	1/29/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Cadmium	1.3
Lead	60.6

Site ID	57SB07
Sample ID	57SB07-00D
Sampling Date	1/27/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Cobalt	49.3

Site ID	57SS09
Sample ID	57SS09
Sampling Date	1/29/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Cadmium	1.1
Lead	29.6J
Mercury	0.15J
Zinc	136

Site ID	57SS09
Sample ID	57SS09-D
Sampling Date	1/29/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Cadmium	1.4
Lead	48.4J
Mercury	0.45J
Zinc	143

Site ID	57SS08
Sample ID	57SS08
Sampling Date	1/29/2010
Depth (feet bgs)	0.0-1.0
Inorganics (mg/kg)	
Arsenic	5.2
Cadmium	5.3
Lead	116
Zinc	183



SOURCE: USGS, NOV. 2006.



J:	Estimated: The analyte was positively identified; the quantitation is an estimation	LEGEND
	Exceeds Ecological Soil Screening Values	
BOLD	Exceeds Regional Screening Levels, Residential soil	● - EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP 2004)
<i>ITALIC</i>	Exceeds Regional Screening Levels, Industrial soil	⊕ - EXISTING SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLE LOCATION (PHASE II ECP 2004)
<u>UNDERLINE</u>	Exceeds Basewide Background	⊕ - EXISTING MONITORING WELL FROM SWMU 9
Depth Range	Feet Below Ground Surface	○ - PHASE I RFI SURFACE AND SUBSURFACE SAMPLING LOCATIONS
—	EARTHEN DRAINAGE FEATURE	● - PHASE I RFI CONCRETE CHIP SAMPLING LOCATIONS
⊕	SWMU BOUNDARY	● - PHASE I RFI CONCRETE WIPE SAMPLING LOCATIONS
⊕	PHASE I RFI SURFACE, SUBSURFACE AND GROUNDWATER SAMPLE LOCATION	● - PHASE I RFI SURFACE SOIL SAMPLING LOCATIONS

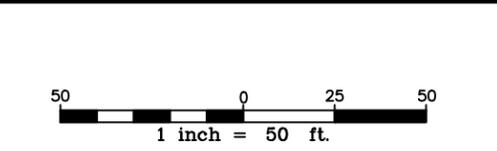


FIGURE 6-2
 DETECTED INORGANICS IN EXCESS OF HUMAN HEALTH AND/OR ECOLOGICAL AND BACKGROUND SCREENING CRITERIA IN SURFACE SOIL
 SWMU 57-FACILITY NO. 278
 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO

Site ID	57SB04
Sample ID	57SB04-01
Sampling Date	1/28/2010
Depth (feet bgs)	1.0-3.0
Inorganics (mg/kg)	
Lead	<u>16.5J</u>
Thallium	<u>2</u>

Site ID	57SB04
Sample ID	57SB04-05
Sampling Date	1/28/2010
Depth (feet bgs)	9.0-11.0
Inorganics (mg/kg)	
Cobalt	<u>142</u>

Site ID	57SB02
Sample ID	57SB02-01
Sampling Date	1/26/2010
Depth (feet bgs)	1.0-3.0
Inorganics (mg/kg)	
Arsenic	<u>24</u>
Cobalt	<u>97</u>
Lead	<u>44.1J</u>
Thallium	<u>8.6</u>
Zinc	<u>96.2</u>

Site ID	57SB02
Sample ID	57SB02-05
Sampling Date	1/26/2010
Depth (feet bgs)	9.0-11.0
Inorganics (mg/kg)	
Cobalt	<u>28.8</u>

Site ID	57SB03
Sample ID	57SB03-01
Sampling Date	1/26/2010
Depth (feet bgs)	1.0-3.0
Inorganics (mg/kg)	
Cobalt	<u>33.6</u>
Lead	<u>21.2J</u>
Thallium	<u>2</u>

Site ID	57SB01
Sample ID	57SB01-01
Sampling Date	1/28/2010
Depth (feet bgs)	1.0-3.0
Inorganics (mg/kg)	
Cobalt	<u>37.5</u>
Lead	<u>27.7</u>
Thallium	<u>10.2</u>

Site ID	57SB05
Sample ID	57SB05-01
Sampling Date	1/27/2010
Depth (feet bgs)	1.0-3.0
Inorganics (mg/kg)	
Cobalt	<u>43.2</u>
Lead	<u>39.6J</u>
Mercury	<u>0.11J</u>
Thallium	<u>3.5</u>

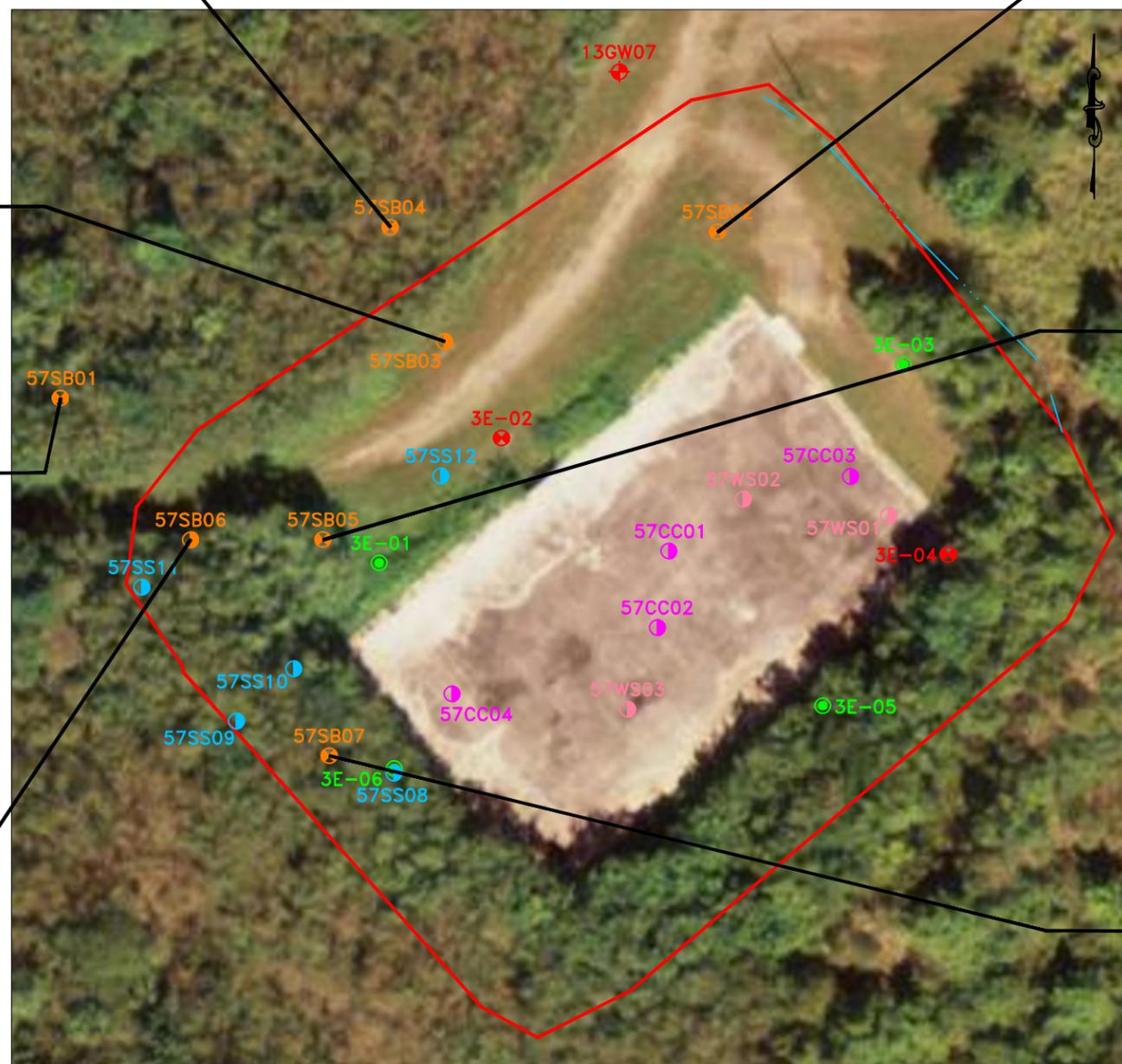
Site ID	57SB05
Sample ID	57SB05-01D
Sampling Date	1/27/2010
Depth (feet bgs)	1.0-3.0
Inorganics (mg/kg)	
Arsenic	<u>1.7</u>
Cadmium	0.81
Cobalt	<u>73.9</u>
Lead	<u>56J</u>
Thallium	<u>5</u>

Site ID	57SB05
Sample ID	57SB05-05
Sampling Date	1/27/2010
Depth (feet bgs)	9.0-11.0
Inorganics (mg/kg)	
Cobalt	<u>33</u>

Site ID	57SB06
Sample ID	57SB06-01
Sampling Date	1/28/2010
Depth (feet bgs)	1.0-3.0
Inorganics (mg/kg)	
Cobalt	<u>34.4</u>
Lead	<u>17.4J</u>
Thallium	<u>2</u>

Site ID	57SB06
Sample ID	57SB06-05
Sampling Date	1/28/2010
Depth (feet bgs)	9.0-11.0
Inorganics (mg/kg)	
Cobalt	<u>104</u>

Site ID	57SB07
Sample ID	57SB07-01
Sampling Date	1/27/2010
Depth (feet bgs)	1.0-3.0
Inorganics (mg/kg)	
Cobalt	<u>38</u>
Lead	<u>20.3J</u>
Thallium	<u>2.3</u>



SOURCE: USGS, NOV. 2006.



J:	Estimated: The analyte was positively identified; the quantitation is an estimation
<u> </u>	Exceeds Ecological Soil Screening Values
 	Exceeds Regional Screening Levels, Residential soil
<i> </i>	Exceeds Regional Screening Levels, Industrial soil
<u> </u>	Exceeds Basewide Background
Depth Range	Feet Below Ground Surface
	- EARTHEN DRAINAGE FEATURE
	- SWMU BOUNDARY
	- PHASE I RFI SURFACE, SUBSURFACE AND GROUNDWATER SAMPLE LOCATION

	- EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP 2004)
	- EXISTING SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLE LOCATION (PHASE II ECP 2004)
	- EXISTING MONITORING WELL FROM SWMU 9
	- PHASE I RFI SURFACE AND SUBSURFACE SAMPLING LOCATIONS
	- PHASE I RFI CONCRETE CHIP SAMPLING LOCATIONS
	- PHASE I RFI CONCRETE WIPE SAMPLING LOCATIONS
	- PHASE I RFI SURFACE SOIL SAMPLING LOCATIONS

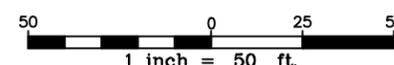
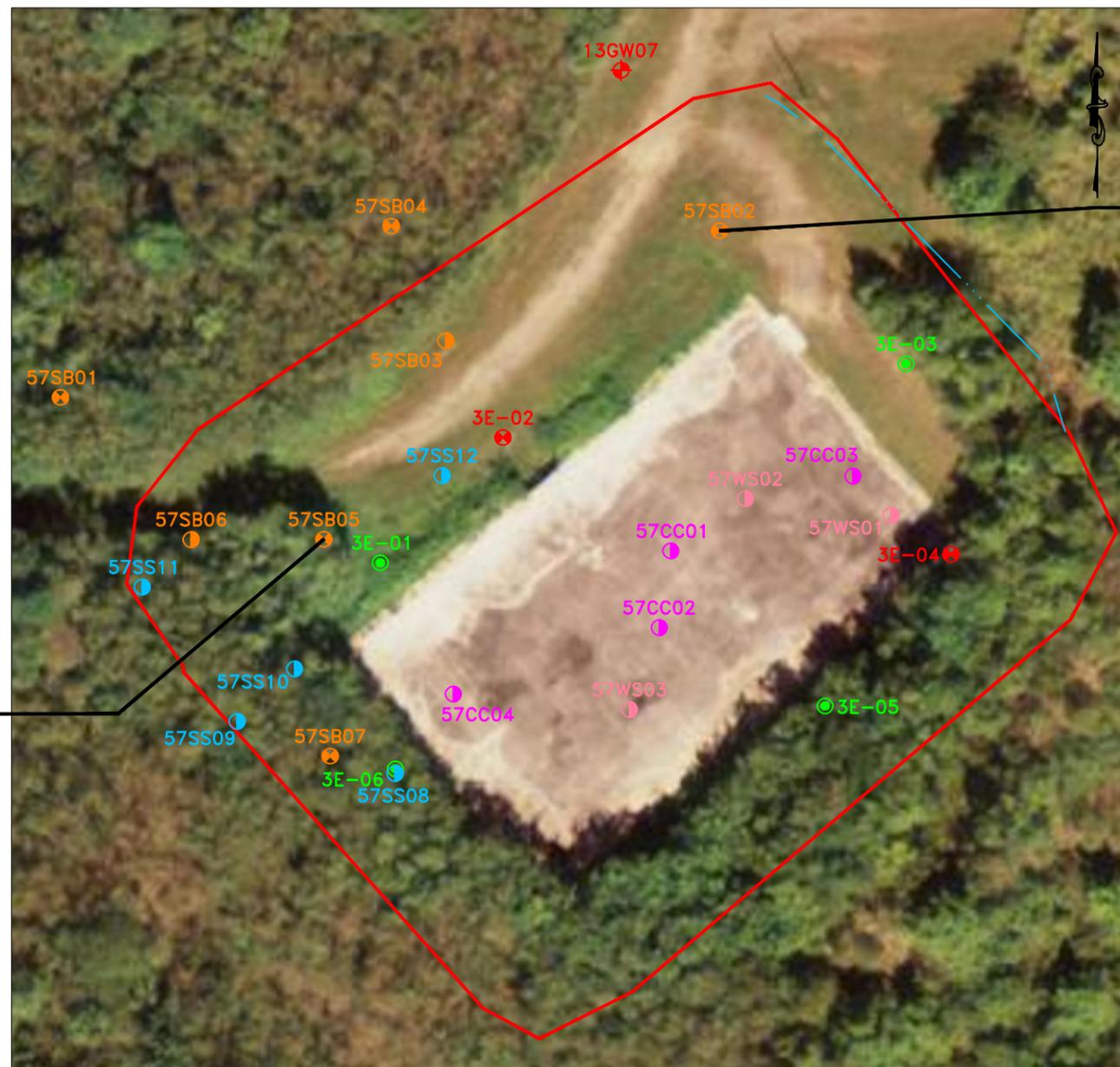


FIGURE 6-3
DETECTED INORGANICS IN EXCESS OF HUMAN HEALTH AND/OR ECOLOGICAL AND BACKGROUND SCREENING CRITERIA IN SUBSURFACE SOIL SWMU 57-FACILITY NO. 278 POL DRUM STORAGE AREA PHASE I RFI REPORT NAVAL ACTIVITY PUERTO RICO



Site ID	57SB02
Sample ID	57GW02
Sampling Date	1/31/2010
Dissolved Inorganics (ug/L)	
Chloroform	5

Site ID	57SB05
Sample ID	57GW05
Sampling Date	2/1/2010
Semivolatiles (ug/L)	
Benzo(a)anthracene	0.16J
Benzo(a)pyrene	0.02J
Benzo(a)fluoranthene	0.03J
Pyrene	1.9



SOURCE: USGS, NOV. 2006.

LEGEND

- J: Estimated: The analyte was positively identified; the quantitation is an estimation
- Exceeds Ecological Groundwater Screening Values**
- BOLD** Exceeds Regional TAP Water Screening Levels
- Exceeds Basewide Background
- Depth Range Feet Below Ground Surface
- EARTHEN DRAINAGE FEATURE
- SWMU BOUNDARY
- PHASE I RFI SURFACE, SUBSURFACE AND GROUNDWATER SAMPLE LOCATION
- EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP 2004)
- EXISTING SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLE LOCATION (PHASE II ECP 2004)
- EXISTING MONITORING WELL FROM SWMU 9
- PHASE I RFI SURFACE AND SUBSURFACE SAMPLING LOCATIONS
- PHASE I RFI CONCRETE CHIP SAMPLING LOCATIONS
- PHASE I RFI CONCRETE WIPE SAMPLING LOCATIONS
- PHASE I RFI SURFACE SOIL SAMPLING LOCATIONS

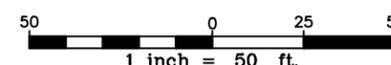


FIGURE 6-4
 DETECTED ORGANICS IN EXCESS OF HUMAN HEALTH AND/OR
 ECOLOGICAL AND BACKGROUND SCREENING CRITERIA IN GROUNDWATER
 SWMU 57-FACILITY NO. 278
 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO

Site ID	57SB04
Sample ID	57GW04
Sampling Date	1/31/2010
Total Inorganics (ug/L)	
Mercury	0.19
Dissolved Inorganics (ug/L)	
Mercury	0.28
Vanadium	28.1

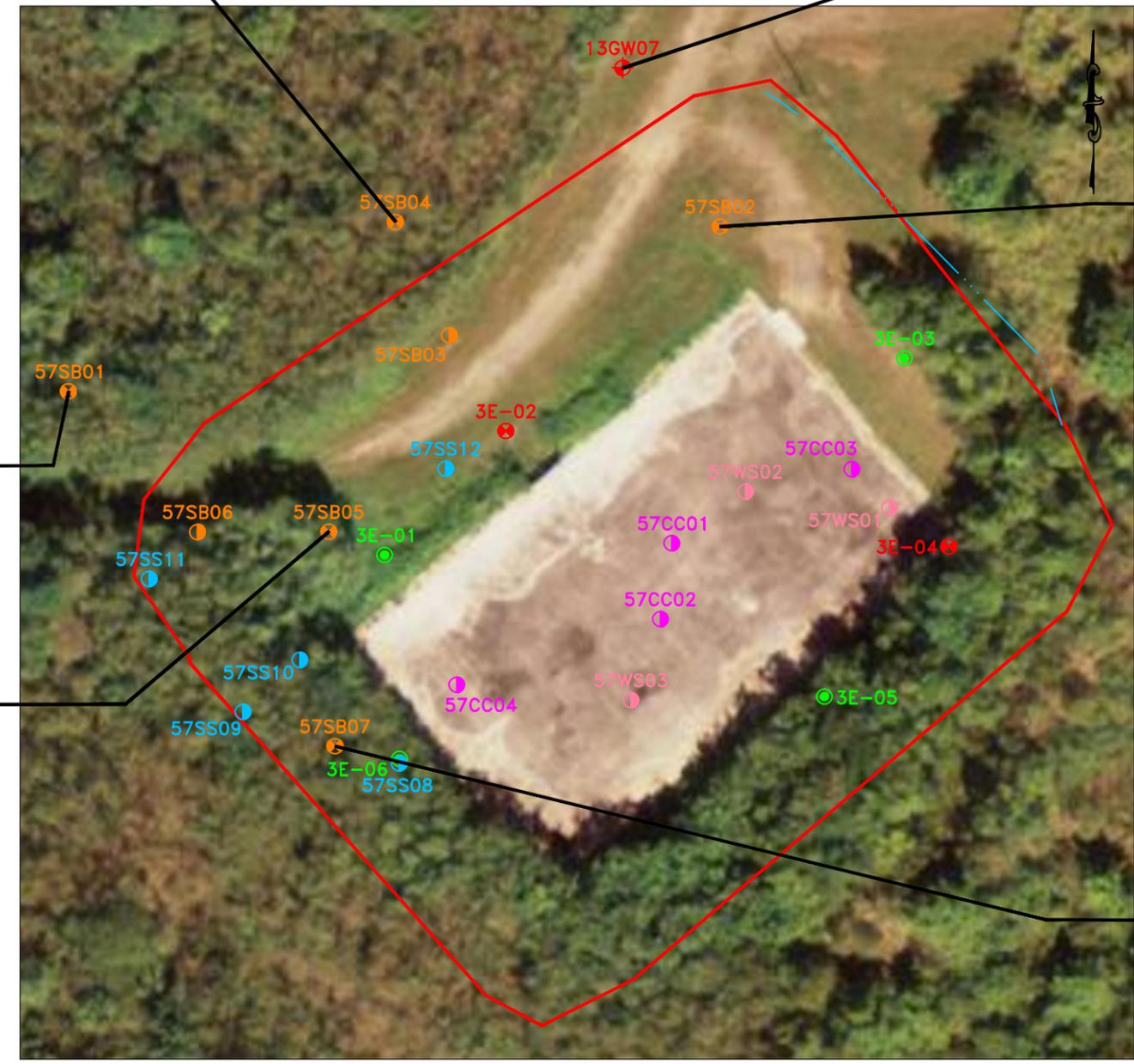
Site ID	13GW07
Sample ID	13GW07
Sampling Date	1/31/2010
Total Inorganics (ug/L)	
Mercury	0.97
Dissolved Inorganics (ug/L)	
Mercury	1.1
Vanadium	23.8

Site ID	57SB01
Sample ID	57GW01
Sampling Date	2/1/2010
Total Inorganics (ug/L)	
Mercury	1.4
Dissolved Inorganics (ug/L)	
Mercury	1.2

Site ID	57SB02
Sample ID	57GW02
Sampling Date	1/31/2010
Dissolved Inorganics (ug/L)	
Vanadium	28.3

Site ID	57SB05
Sample ID	57GW05
Sampling Date	2/1/2010
Dissolved Inorganics (ug/L)	
Lead	14.9

Site ID	57SB07
Sample ID	57GW07-D
Sampling Date	1/31/2010
Total Inorganics (ug/L)	
Mercury	0.22
Dissolved Inorganics (ug/L)	
Mercury	0.17



SOURCE: USGS, NOV. 2006.



LEGEND

- J: Estimated: The analyte was positively identified; the quantitation is an estimation
- Exceeds Ecological Groundwater Screening Values**
- BOLD** Exceeds Regional TAP Water Screening Levels
- Exceeds Basewide Background
- Depth Range Feet Below Ground Surface
- EARTHEN DRAINAGE FEATURE
- SWMU BOUNDARY
- PHASE I RFI SURFACE, SUBSURFACE AND GROUNDWATER SAMPLE LOCATION
- — EXISTING SURFACE AND SUBSURFACE SOIL SAMPLE LOCATION (PHASE II ECP 2004)
- ⊕ — EXISTING SURFACE SOIL, SUBSURFACE SOIL, AND GROUNDWATER SAMPLE LOCATION (PHASE II ECP 2004)
- ⊕ — EXISTING MONITORING WELL FROM SWMU 9
- — PHASE I RFI SURFACE AND SUBSURFACE SAMPLING LOCATIONS
- — PHASE I RFI CONCRETE CHIP SAMPLING LOCATIONS
- — PHASE I RFI CONCRETE WIPE SAMPLING LOCATIONS
- — PHASE I RFI SURFACE SOIL SAMPLING LOCATIONS

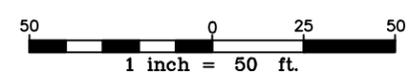


FIGURE 6-5
 DETECTED INORGANICS IN EXCESS OF HUMAN HEALTH AND/OR
 ECOLOGICAL AND BACKGROUND SCREENING CRITERIA IN GROUNDWATER
 SWMU 57-FACILITY NO. 278
 POL DRUM STORAGE AREA
 PHASE I RFI REPORT
 NAVAL ACTIVITY PUERTO RICO

APPENDIX A
SUMMARY OF ANALYTICAL RESULTS FROM PHASE II ECP

TABLE B-1

Revised: December 20, 2007

**SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID	EPA Region III	EPA Region III	3E-01	3E-01	3E-02	3E-03	3E-04	3E-05	3E-05	3E-06	Number Exceeding EPA Region III Industrial RBCs
Sample ID	Industrial	Residential	3E-SS01	3E-SS01D	3E-SS02	3E-SS03	3E-SS04	3E-SS05	3E-SS05D	3E-SS06	
Sample Date	RBCs	RBCs	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	
Sample Depth (ft bgs)	(ug/kg)	(ug/kg)	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	
Volatile Organic Compounds (ug/kg)											
Carbon tetrachloride	22,000	4,900	4 J	8.8	2.4 J	5.7 J	6.5 U	3 J	7.3 U	7.3 U	0/8
Chlorobenzene	2,000,000	160,000	5.9 U	4.3 J	5.5 U	4.5 J	6.5 U	7.2 U	7.3 U	7.3 U	0/8
Chloroform	1,000,000	78,000	1.9 J	4.3 J	5.5 U	2.9 J	6.5 U	7.2 U	7.3 U	7.3 U	0/8
Ethylbenzene	10,000,000	780,000	5.9 U	2.3 J	5.5 U	2.4 J	6.5 U	7.2 U	7.3 U	7.3 U	0/8
Tetrachloroethene	5,300	1,200	5.9 U	5.7 J	5.5 U	6	6.5 U	4.2 J	7.3 U	7.3 U	0/8
Xylene	20,000,000	1,600,000	12 U	12 J	11 U	12	13 U	14 U	15 U	15 U	0/8
Semivolatile Organic Compounds (ug/kg)											
Benzo(b)fluoranthene	3,900	870	460 U	500 U	390 U	440 U	480 U	480 U	550 U	95 J	0/8
Benzo(a)anthracene	3,900	870	460 U	500 U	390 U	440 U	480 U	480 U	550 U	79 J	0/8
Benzo(k)fluoranthene	39,000	8,700	460 U	500 U	390 U	440 U	480 U	480 U	550 U	76 J	0/8
bis(2-Ethylhexyl)phthalate	200,000	46,000	460 U	500 U	52 J	440 U	480 U	480 U	550 U	130 J	0/8
Chrysene	390,000	87,000	460 U	500 U	390 U	440 U	480 U	480 U	550 U	110 J	0/8
Benzo(a)pyrene	390	87	460 U	500 U	390 U	440 U	480 U	480 U	550 U	77 J	0/8
Fluoranthene	4,100,000	310,000	460 U	500 U	390 U	440 U	480 U	480 U	550 U	120 J	0/8
Indeno(1,2,3-cd)pyrene	3,900	870	77 J	500 U	390 U	440 U	480 U	480 U	550 U	51 J	0/8
Benzo(g,h,i)perylene	NE	NE	97 J	500 U	390 U	440 U	480 U	480 U	550 U	67 J	NE
Phenanthrene	NE	NE	460 U	500 U	390 U	440 U	480 U	480 U	550 U	70 J	NE
Pyrene	3,100,000	230,000	35 J	500 U	390 U	440 U	480 U	480 U	550 U	160 J	0/8
Pesticides/PCBs (ug/kg)											
4,4'-DDD	12,000	2,700	4.6 U	5 U	3.9 U	4.4 U	4.8 U	4.8 U	5.5 U	9.4 JP	0/8
4,4'-DDE	8,400	1,900	4.6 U	5 U	3.9 U	4.4 U	1.4 J	4.8 U	5.5 U	11	0/8
4,4'-DDT	8,400	1,900	4.6 U	5 U	3.9 U	4.4 U	2.3 J	1.1 J	1.1 J	33	0/8
Aroclor-1260	1,400	320	46 U	50 U	55	44 U	18 J	48 U	55 U	330	0/8

TABLE B-1

Revised: December 20, 2007

**SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID	EPA Region III	EPA Region III	3E-01	3E-01	3E-02	3E-03	3E-04	3E-05	3E-05	3E-06	Number Exceeding EPA Region III Industrial RBCs
Sample ID	Industrial	Residential	3E-SS01	3E-SS01D	3E-SS02	3E-SS03	3E-SS04	3E-SS05	3E-SS05D	3E-SS06	
Sample Date	RBCs	RBCs	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	
Sample Depth (ft bgs)	(ug/kg)	(ug/kg)	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	
OP-Pesticides (ug/kg)											
Not Detected											
Chlorinated Herbicides (ug/kg)											
2,4,5-TP	NE	NE	1.5 J	12 U	9.8 U	11 U	12 U	12 U	14 U	14 U	NE

- Notes:**
- J - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.
 - U - The compound was analyzed for, but was not detected at or above the MDL/PQL.
 - P - The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two GC columns or HPLC detectors.
 - NE - Not Established.
 - ft bgs - feet below ground surface.
 - ug/kg - micrograms per kilogram.

Bold indicates exceedance of EPA Region III Residential RBCs

TABLE B-1

Revised: December 20, 2007

**SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID Sample ID Sample Date Sample Depth (ft bgs)	EPA Region III Industrial RBCs (ug/kg)	EPA Region III Residential RBCs (ug/kg)	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)						
Carbon tetrachloride	22,000	4,900		0/8		3E-SS01D
Chlorobenzene	2,000,000	160,000		0/8		3E-SS03
Chloroform	1,000,000	78,000		0/8		3E-SS01D
Ethylbenzene	10,000,000	780,000		0/8		3E-SS03
Tetrachloroethene	5,300	1,200		0/8		3E-SS03
Xylene	20,000,000	1,600,000		0/8		3E-SS03
Semivolatile Organic Compounds (ug/kg)						
Benzo(b)fluoranthene	3,900	870		0/8		3E-SS06
Benzo(a)anthracene	3,900	870		0/8		3E-SS06
Benzo(k)fluoranthene	39,000	8,700		0/8		3E-SS06
bis(2-Ethylhexyl)phthalate	200,000	46,000		0/8		3E-SS06
Chrysene	390,000	87,000		0/8		3E-SS06
Benzo(a)pyrene	390	87		0/8		3E-SS06
Fluoranthene	4,100,000	310,000		0/8		3E-SS06
Indeno(1,2,3-cd)pyrene	3,900	870		0/8		3E-SS01
Benzo(g,h,i)perylene	NE	NE		NE		3E-SS01
Phenanthrene	NE	NE		NE		3E-SS06
Pyrene	3,100,000	230,000		0/8		3E-SS06
Pesticides/PCBs (ug/kg)						
4,4'-DDD	12,000	2,700		0/8		3E-SS06
4,4'-DDE	8,400	1,900		0/8		3E-SS06
4,4'-DDT	8,400	1,900		0/8		3E-SS06
Aroclor-1260	1,400	320		1/8	330	3E-SS06

TABLE B-1

Revised: December 20, 2007

**SUMMARY OF ORGANIC DETECTIONS IN SURFACE SOIL
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID	EPA Region III Industrial RBCs (ug/kg)	EPA Region III Residential RBCs (ug/kg)	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
Sample ID						
Sample Date						
Sample Depth (ft bgs)						
OP-Pesticides (ug/kg)						
Not Detected						
Chlorinated Herbicides (ug/kg)						
2,4,5-TP	NE	NE		NE		3E-SS01

Notes:

J - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.

U - The compound was analyzed for, but was not detected at or above the MDL/PQL.

P - The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two GC columns or HPLC detectors.

NE - Not Established.

ft bgs - feet below ground surface.

Bold indicates ex

ug/kg - micrograms per kilogram.

TABLE B-2

Revised: December 20, 2007

**SUMMARY OF INORGANIC DETECTIONS IN SURFACE SOIL
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID	EPA Region III	EPA Region III	2x Average	3E-01	3E-01	3E-02	3E-03	3E-04	3E-05	3E-05	3E-06
Sample ID	Industrial	Residential	Detected	3E-SS01	3E-SS01D	3E-SS02	3E-SS03	3E-SS04	3E-SS05	3E-SS05D	3E-SS06
Sample Date	RBCs	RBCs	Background	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04
Sample Depth (ft bgs)	(mg/kg)	(mg/kg)	(mg/kg)	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00	0.00 - 1.00
Appendix IX Inorganics (mg/kg)											
Antimony	41	3.1	2.3	2.6 UN	2.8 UN	2.3 UN	2.4 UN	1 BN	2.5 UN	3.2 UN	3.2 UN
Arsenic	1.9	0.43	2.4	1.1 B	1.2 B	<u>3.7</u>	1.2 U	1.5	1.2 B	<u>3.5</u>	<u>3.6</u>
Barium	7,200	550	181	110	70	81	55	83	36	62	74
Beryllium	200	16	0.45	0.35 B	0.34 B	0.2 B	0.17 B	0.22 B	0.088 B	0.13 B	0.26 B
Cadmium	100	7.8	0.27	<u>0.8</u>	<u>0.79</u>	<u>1.4</u>	<u>1.4</u>	<u>1.2</u>	<u>0.38 B</u>	<u>0.63 B</u>	<u>2.9</u>
Chromium	310	23	59.3	30	31	21	36	34	8.1	17	31
Cobalt	2,000	160	44.0	38	26	14	25	24	5.6	10	18
Copper	4,100	310	234	77 N	84 N	160 N	86 N	97 N	23 N	40 N	100 N
Cyanide	2,000	160	0.52	0.67 U	0.73 U	0.59 U	0.66 U	0.46 B	0.71 U	0.8 U	<u>0.53 B</u>
Lead	400 ⁽¹⁾	400 ⁽¹⁾	125	20	21	32	2.8	48	16	32	120
Mercury	31 ⁽²⁾	2.3 ⁽²⁾	0.11	0.049 N	0.05 N	0.009 BN	0.01 BSN	<u>0.16 SN</u>	<u>0.15 N</u>	0.049 N	0.054 N
Nickel	2,000	160	16.6	16	<u>19</u>	13	<u>28</u>	<u>20</u>	5.2	9.6	14
Tin	61,000	4,700	2.43	2.2 B	<u>2.7 B</u>	<u>3.9 B</u>	3.4 B	<u>3.7 B</u>	<u>3 B</u>	<u>3.3 B</u>	<u>4.1 B</u>
Vanadium	100	7.8	355	180	160	86	140	150	35	67	110
Zinc	31,000	2,300	125	87	90	<u>130</u>	70	120	34	63	<u>210</u>

Notes:

B - The reported result is an estimated concentration that is less than the PQL, 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.

S - The result was determined by Method of Standard Addition.

⁽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.

Shading indicates exceedance of EPA Region III Industrial BCs

Bold indicates exceedance of EPA Region III Residential RBCs

Underline indicates exceedance of 2 x Average Detected Background

TABLE B-2

Revised: December 20, 2007

**SUMMARY OF INORGANIC DETECTIONS IN SURFACE SOIL
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID Sample ID Sample Date Sample Depth (ft bgs)	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)	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)										
Antimony	41	3.1	2.3	0/8		0/8		0/8		3E-SS04
Arsenic	1.9	0.43	2.4	3/8	3.5 - 3.7	7/8	1.1B - 3.7	3/8	3.5 - 3.7	3E-SS02
Barium	7,200	550	181	0/8		0/8		0/8		3E-SS01
Beryllium	200	16	0.45	0/8		0/8		0/8		3E-SS01
Cadmium	100	7.8	0.27	0/8		0/8		8/8	0.38B - 2.9	3E-SS06
Chromium	310	23	59.3	0/8		5/8	30 - 36	0/8		3E-SS03
Cobalt	2,000	160	44.0	0/8		0/8		0/8		3E-SS01
Copper	4,100	310	234	0/8		0/8		0/8		3E-SS02
Cyanide	2,000	160	0.52	0/8		0/8		1/8	0.53B	3E-SS06
Lead	400 ⁽¹⁾	400 ⁽¹⁾	125	0/8		0/8		0/8		3E-SS06
Mercury	31 ⁽²⁾	2.3 ⁽²⁾	0.11	0/8		0/8		2/8	0.15N - 0.16N	3E-SS04
Nickel	2,000	160	16.6	0/8		0/8		3/8	19 - 28	3E-SS03
Tin	61,000	4,700	2.43	0/8		0/8		7/8	2.7B - 4.1B	3E-SS06
Vanadium	100	7.8	355	5/8	110 - 180	8/8	35 - 180	0/8		3E-SS01
Zinc	31,000	2,300	125	0/8		0/8		2/8	130 - 210	3E-SS06

Notes:

B - The reported result is an estimated concentration that is less than the PQL, 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.

S - The result was determined by Method of Standard Addition.

⁽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 B-3

**SUMMARY OF ORGANIC DETECTIONS IN SUBSURFACE SOIL
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID	EPA Region III	EPA Region III	3E-01	3E-02	3E-03	3E-04	3E-05	3E-06
Sample ID	Industrial	Residential	3E-SB01-01	3E-SB02-01	3E-SB03-01	3E-SB04-01	3E-SB05-01	3E-SB06-01
Sample Date	RBCs	RBCs	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04	05/05/04
Sample Depth (ft bgs)	(ug/kg)	(ug/kg)	1.00 - 3.00	1.00 - 3.00	1.00 - 3.00	1.00 - 3.00	1.00 - 3.00	1.00 - 3.00
Volatile Organic Compounds (ug/kg)								
Carbon tetrachloride	22,000	4,900	6.1 U	2.8 J	5.3 U	210 U	5.5 U	9.1 U
Semivolatile Organic Compounds (ug/kg)								
Pyrene	3,100,000	230,000	440 U	460 U	390 U	380 U	370 U	28 J
Pesticides/PCBs (ug/kg)								
Not Detected								
OP-Pesticides (ug/kg)								
Not Detected								
Chlorinated Herbicides (ug/kg)								
2,4,5-TP	NE	NE	11 U	12 U	9.8 U	4.1 J	9.3 U	15 U

Notes:

- J - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.
- U - The compound was analyzed for, but was not detected at or above the MDL/PQL.
- NE - Not Established.
- ft bgs - feet below ground surface.
- ug/kg - micrograms per kilogram.

TABLE B-3

**SUMMARY OF ORGANIC DETECTIONS IN SUBSURFACE SOIL
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID Sample ID Sample Date Sample Depth (ft bgs)	EPA Region III Industrial RBCs (ug/kg)	EPA Region III Residential RBCs (ug/kg)	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)							
Carbon tetrachloride	22,000	4,900	0/6		0/6		3E-SB02-01
Semivolatile Organic Compounds (ug/kg)							
Pyrene	3,100,000	230,000	0/6		0/6		3E-SB06-01
Pesticides/PCBs (ug/kg)							
Not Detected							
OP-Pesticides (ug/kg)							
Not Detected							
Chlorinated Herbicides (ug/kg)							
2,4,5-TP	NE	NE	NE		NE		3E-SB04-01

Notes:

- J - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.
- U - The compound was analyzed for, but was not detected at or above the MDL/PQL.
- NE - Not Established.
- ft bgs - feet below ground surface.
- ug/kg - micrograms per kilogram.

TABLE B-4

Revised: December 20, 2007

**SUMMARY OF INORGANIC DETECTIONS IN SUBSURFACE SOIL
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID	EPA Region III Industrial RBCs (mg/kg)	EPA Region III Residential RBCs (mg/kg)	2x Average Detected Background (mg/kg)	3E-01 3E-SB01-01 05/05/04 1.00 - 3.00	3E-02 3E-SB02-01 05/05/04 1.00 - 3.00	3E-03 3E-SB03-01 05/05/04 1.00 - 3.00	3E-04 3E-SB04-01 05/05/04 1.00 - 3.00	3E-05 3E-SB05-01 05/05/04 1.00 - 3.00	3E-06 3E-SB06-01 05/05/04 1.00 - 3.00
Appendix IX Inorganics (mg/kg)									
Arsenic	1.9	0.43	2.05	2	1.1 B	1 U	0.98 U	1 U	1.8 U
Barium	7,200	550	222	120	93	29	25	42	150
Beryllium	200	16	0.74	0.43 B	0.48 B	0.21 B	0.29 B	0.23 B	0.41 B
Cadmium	100	7.8	0.74	0.48 B	0.4 B	0.69	<u>1.9</u>	<u>0.96</u>	0.91 U
Chromium	310	23	133	24	29	110	28	14	21
Cobalt	2,000	160	30.0	12	28	<u>32</u>	29	22	<u>33</u>
Copper	4,100	310	193	94 N	84 N	120 N	120 N	95 N	60 N
Lead	400 ⁽¹⁾	400 ⁽¹⁾	8.68	<u>71</u>	<u>18</u>	1.5	<u>20</u>	7.3	<u>19</u>
Mercury	31 ⁽²⁾	2.3 ⁽²⁾	0.093	0.052 SN	0.029 BSN	0.034 SN	0.02 UN	0.021 UN	0.033 UN
Nickel	2,000	160	31.9	6.9	12	<u>37</u>	25	18	11
Silver	510	39	0.46	1.3 U	1.3 U	1 U	0.12 B	1 U	1.8 U
Tin	61,000	4,700	2.96	2.2 B	2.8 B	2.7 B	2.1 B	2.9 B	2 B
Vanadium	100	7.8	462	190	220	140	180	140	140
Zinc	31,000	2,300	88.6	78	62	60	<u>150</u>	75	57

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.

S - The result was determined by Method of Standard Addition.

⁽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.

Shading indicates exceedance of EPA Region III Industrial BCs

Bold indicates exceedance of EPA Region III Residential RBCs

Underline indicates exceedance of 2 x Average Detected Background

TABLE B-4

Revised: December 20, 2007

**SUMMARY OF INORGANIC DETECTIONS IN SUBSURFACE SOIL
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID	EPA Region III Industrial RBCs (mg/kg)	EPA Region III Residential RBCs (mg/kg)	2x Average Detected Background (mg/kg)	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	Number Exceeding Background	Range Exceeding Background	Location of Maximum Detection
Appendix IX Inorganics (mg/kg)										
Arsenic	1.9	0.43	2.05	1/6	2	2/6	1.1B - 2	0/6		3E-SB01-01
Barium	7,200	550	222	0/6		0/6		0/6		3E-SB06-01
Beryllium	200	16	0.74	0/6		0/6		0/6		3E-SB02-01
Cadmium	100	7.8	0.74	0/6		0/6		2/6	0.96 - 1.9	3E-SB04-01
Chromium	310	23	133	0/6		4/6	24 - 110	0/6		3E-SB03-01
Cobalt	2,000	160	30.0	0/6		0/6		2/6	32 - 33	3E-SB06-01
Copper	4,100	310	193	0/6		0/6		0/6		3E-SB03-01, 3E-SB04-01
Lead	400 ⁽¹⁾	400 ⁽¹⁾	8.68	0/6		0/6		4/6	18 - 71	3E-SB01-01
Mercury	31 ⁽²⁾	2.3 ⁽²⁾	0.093	0/6		0/6		0/6		3E-SB01-01
Nickel	2,000	160	31.9	0/6		0/6		1/6	37	3E-SB03-01
Silver	510	39	0.46	0/6		0/6		0/6		3E-SB04-01
Tin	61,000	4,700	2.96	0/6		0/6		0/6		3E-SB05-01
Vanadium	100	7.8	462	6/6	140 - 220	6/6	140 - 220	0/6		3E-SB02-01
Zinc	31,000	2,300	88.6	0/6		0/6		1/6	150	3E-SB04-01

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.

S - The result was determined by Method of Standard Addition.

⁽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 B-5

**SUMMARY OF ORGANIC DETECTIONS IN GROUNDWATER
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID	Federal MCLs (ug/L)	EPA Region III Tap Water RBCs (ug/L)	PR Water Quality Standards (ug/L)	3E-04 3E-GW01 05/10/04	3E-02 3E-GW02 05/10/04	Number Exceeding Federal MCLs	Range Exceeding Federal MCLs	Number Exceeding EPA Region III Tap Water RBCs	Range Exceeding EPA Region III Tap Water RBCs	Number Exceeding PR Water Quality Standards	Range Exceeding PR Water Quality Standards	Location Maximum Detection
Volatile Organic Compounds (ug/L)												
2-Butanone	NE	700	NE	2.6 J	1.5 J	NE		0/2		NE		3E-GW01
Iodomethane	NE	NE	NE	0.69 J	0.29 J	NE		NE		NE		3E-GW01
Acetone	NE	550	NE	11 J	12 J	NE		0/2		NE		3E-GW02
Chloromethane	NE	19	NE	0.41 J	1 U	NE		0/2		NE		3E-GW01
Semivolatile Organic Compounds (ug/L)												
Not Detected												
Pesticides/PCBs (ug/L)												
Not Detected												
OP-Pesticides (ug/L)												
Not Detected												
Chlorinated Herbicides (ug/L)												
Not Detected												

Notes:

J - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.

U - The compound was analyzed for, but was not detected at or above the MDL/PQL.

ug/L - micrograms per liter.

NE - Not Established.

TABLE B-6

Revised: December 20, 2007

**SUMMARY OF INORGANIC DETECTIONS IN GROUNDWATER
SWMU 57 - FACILITY No. 278 POL DRUM STORAGE AREA
PHASE I RFI WORK PLAN
NAVAL ACTIVITY PUERTO RICO**

Site ID	Federal MCLs	EPA Region III Tap Water RBCs	PR Water Quality Standards	3E-04	3E-02	Number Exceeding Federal MCLs	Range Exceeding Federal MCLs	Number Exceeding EPA Region III Tap Water RBCs	Range Exceeding EPA Region III Tap Water RBCs	Number Exceeding PR Water Quality Standards	Range Exceeding PR Water Quality Standards	Location Maximum Detection
Sample ID				3E-GW01	3E-GW02							
Sample Date	(mg/L)	(mg/L)	(mg/L)	05/10/04	05/10/04							
Appendix IX (Dissolved) Inorganics (mg/L)												
Barium	2	0.26	NE	0.018	0.0088 B	0/2		0/2		NE		3E-GW01
Copper	1.3 ⁽¹⁾	0.15	1.3	0.0032 B	0.02 U	0/2		0/2		0/2		3E-GW01
Mercury	0.002	0.0011 ⁽²⁾	0.002	0.00044 B	0.00041 B	0/2		0/2		0/2		3E-GW01
Vanadium	NE	0.0037	NE	0.015	0.022	NE		2/2	0.015 - 0.022	NE		3E-GW02
Zinc	NE	1.1	NE	0.0023 B	0.0039 B	NE		0/2		NE		3E-GW02
Total Cyanide and Sulfide (mg/L)												
Not Detected												

Notes:

B - The reported result is an estimated concentration that is less than the PQL, but greater than or equal to the MDL.

U - The compound was analyzed for, but was not detected at or above the MDL/PQL.

⁽¹⁾ - EPA action level.

⁽²⁾ - Value based on the Tap Water RBC for Mercuric Chloride.

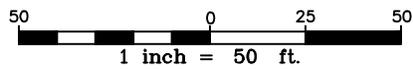
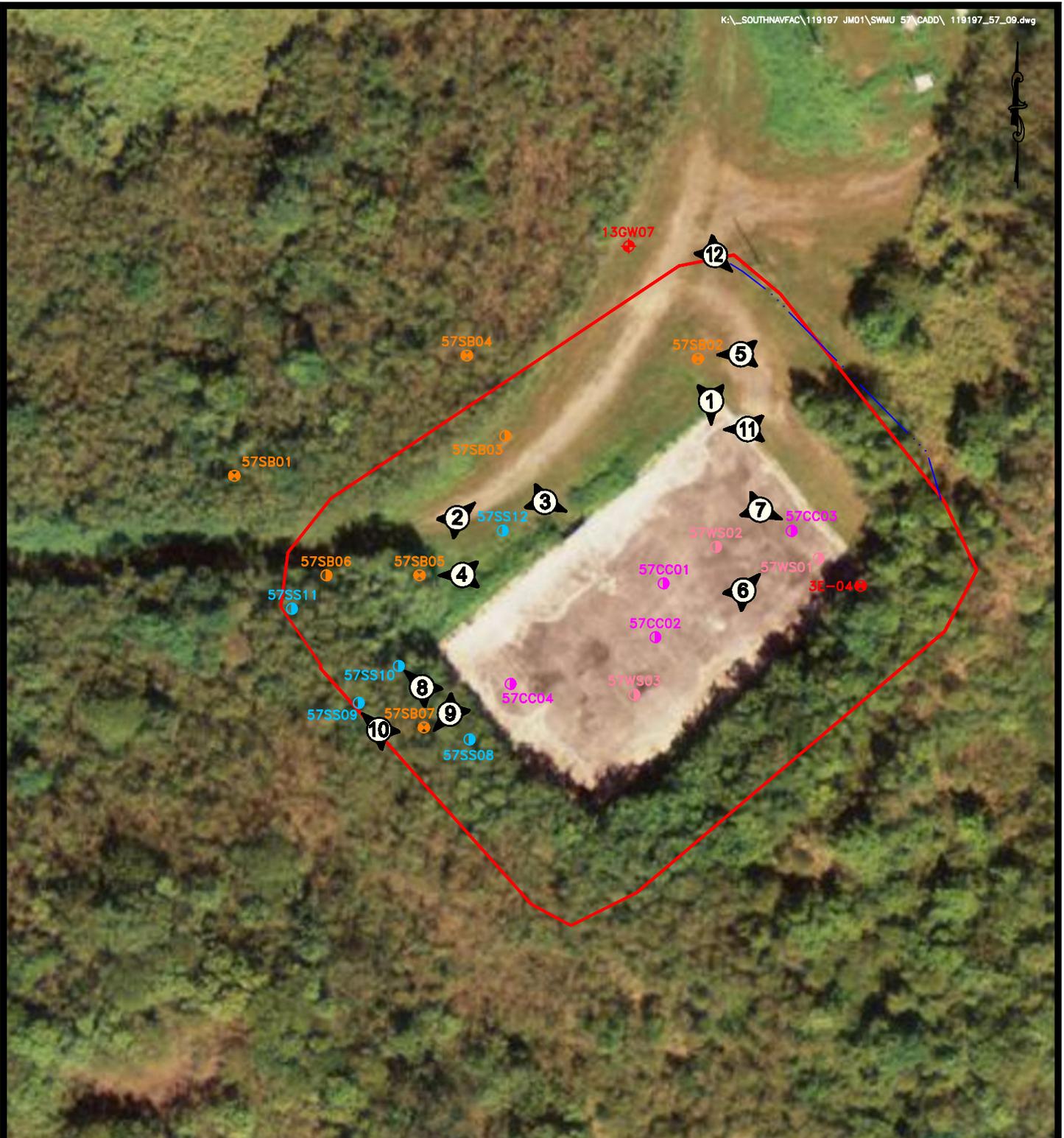
NE - Not Established.

mg/L - milligrams per liter.

Bold indicates exceedance of EPA Region III Tap Water RBCs

APPENDIX B
2010 FIELD ACTIVITIES

SITE PHOTOGRAPHS AND PHOTOGRAPH LOCATION MAP



SOURCE: USGS, NOV. 2006.

LEGEND

- EXISTING MONITORING WELL FROM SWMU 9
- PHASE I RFI SURFACE AND SUBSURFACE SAMPLING LOCATIONS
- PHASE I RFI CONCRETE CHIP SAMPLING LOCATIONS
- PHASE I RFI CONCRETE WIPE SAMPLING LOCATIONS
- PHASE I RFI SURFACE SOIL SAMPLING LOCATIONS
- EARTHEN DRAINAGE FEATURE
- SWMU BOUNDARY
- PHOTO LOCATION AND DIRECTION

PHOTO LOCATION MAP
 SWMU 57-FACILITY NO. 278
 POL DRUM STORAGE AREA
 PHASE I RFI REPORT

NAVAL ACTIVITY PUERTO RICO



Photo 1
SWMU 57 concrete pad. View looking south.
Photo taken 1/27/10



Photo 2
SWMU 57 - site overview. Concrete pad on right. View looking northeast.
Photo taken 1/28/10



Photo 5
Groundwater well installation at 57SB02. View looking west.
Photo taken 1/26/10



Photo 6
Drilling equipment storage and decontamination area. View looking northeast.
Photo taken 1/26/10



Photo 7
Concrete chip (post collection) sample 57CC03. Wipe sample 57SW01 in background.
View looking south southeast.
Photo taken 1/30/10



Photo 8
Surface debris and surface soil sample 57SS10. View looking northwest.
Photo taken 2/2/10



Photo 9
Surface debris and monitoring well 57SB07. View looking southwest.
Photo taken 2/2/10



Photo 10
Surface debris and surface soil sample location 57SS09. View looking northwest.
Photo taken 2/2/10



Photo 11
Containerized soil cuttings, groundwater, and decon liquids. View looking west.
Photo taken 2/2/10



Photo 12
Baker personnel surveying earthen drainage feature. View looking southeast.
Photo taken 1/27/10

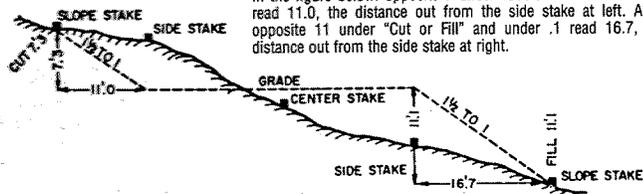
FIELD LOG BOOK NOTES

Environmental Scientist – Adam Gailey

DISTANCES FROM SIDE STAKES FOR CROSS-SECTIONING

Roadway of any Width. Side Slopes 1½ to 1.

In the figure below: opposite 7 under "Cut or Fill" and under .3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under .1 read 16.7, the distance out from the side stake at right.



Cut or Fill	Distance out from Side or Shoulder Stake										Cut or Fill
	0	.1	.2	.3	.4	.5	.6	.7	.8	.9	
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
18	27.0	27.2	27.3	27.5	27.6	27.8	27.9	28.1	28.2	28.4	18
19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
28	42.0	42.2	42.3	42.5	42.6	42.8	42.9	43.1	43.2	43.4	28
29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
30	45.0	45.2	45.3	45.5	45.6	45.8	45.9	46.1	46.2	46.4	30
31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
34	51.0	51.2	51.3	51.5	51.6	51.8	51.9	52.1	52.2	52.4	34
35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38
39	58.5	58.7	58.8	59.0	59.1	59.3	59.4	59.6	59.7	59.9	39
40	60.0	60.2	60.3	60.5	60.6	60.8	60.9	61.1	61.2	61.4	40

SMMU S7 Phase I
RFI Investigation

Field Team - Robert Roselius (RGR)
Adam Grayney (ADG)

The paper in this book is made of 50% high grade rag stock with a WATER RESISTING surface sizing.

January 26, 2010

0700 - Arrive at NWR. Meet with drivers (JFA) to discuss the day's events / Approach. Also, prep for sampling - Sample Containers, Coolers, equipment.

Arrive at Sumner S7 - determine sample locations. Drivers set up and prep for sample driving.

Assist with soil sampling. Surface / Subsurface soil samples collected for S7S02 and S7S03.

1230 back to Security bldg. to prep and ship samples. Via FEDEX.

WEATHER CONDITIONS:

Warm and Breezy, High of 84° F.

(2)

AGA

January 26, 2010

1500 - Samples Picked up by FEDEX Driver.

1500 - Collect S7ERO1 by running Deionized H₂O through an un-used Core-Liner.

1600 - Collect S7FBO1 using Deionized H₂O

ICE Samples

1645 - Depart NWR.

AGA

(3)

0105, 35

January 27, 2010

0545 - Arrive at NAPR.
Receive Remaining equipment
and Supplies.

Prepare for day's events.

Assist with Drilling / sampling
at Summit 57.

Locate and Navigate to
Proposed Sample Locations
using Mapping - grade GPS.
Unable to locate existing well 13GW11.

1100 - Assist with soil
sampling at 57SB07.

57SB07-00 } 1115
571B07-00D }

57SB07-01 } 1125
57SB07-01 MS }

57SB07-01 MSD }
57SB07-05 } 1200

1230 - Depart Summit 57 -
break for lunch and prep
Samples for FedEx shipment
at NAPR Security Bldg.
1205. / ADG.

(4)

0105, 35

January 27, 2010

Weather Conditions:

Mostly Sunny and Mild -
Mid 80's.

Collect GPS data for Summit
57. Data includes Reference
Points - Corners of Concrete
Pad and Center Line of Access
Road. Also, areas of
debris were surveyed in.

ADA
H

1640 - Collect 57ER02
by Running Deionized
H₂O through an unused
Core Liner.

1700 - Depart NAPR

ADG

(2)

1102 50 1/28/10

January 28, 2010

0645 - Arrive at NMPR

0710 - Collect 57ER03

Running D.I. water through Core-LINER.

0735 - Arrive at Summit

Assist with soil sampling. Drivers begin by clearing a way to proposed boring location 578B04.

Weather Conditions: Partly cloudy, High, mid 80's.

1300 - Depart Summit 07 - Lunch break and prep / pack / ship soil and private samples for FedEx pickup.

1500 - FedEx Pickup

⑥

ADG

0105 50 1/28/10

1/28/10

Summit 07 Recon for additional surface soil sample locations. ~~11/10~~ 5 additional surface soil samples were flagged.

1630 - Depart NMPR.

After leaving NMPR stop to purchase Distilled Water.

ADG

⑦

January 29, 2010

0645 Arrive at NAPP.

Prep for Surface Soil Sampling in A.M.

0735 - Depart for SWMU 57.

0740 Arrive SWMU 57.

Decon Bucket Augers
of Air Surface Soil Sampling.

0800 - 57SS12

0-0.2' Topsoil and organics.
0.2-0.6 - Brown, clay to coarse
sand with some fine gravel.
Damp.

0.6-0.9' - fine grain light grey
clay to med. sand
with shells. Beach type
of sand. 1 Mollusk.

PID - Background Reading
at 0.0

sea

1/29/10

0900 - 57SS08

0-0.3' Topsoil/organics,
dark brown

0.3-1.0' - Clay with little
silt. olive-grey/brown.
Moist and highly plastic.

PID = Background.

0930 - 57SS09 + [57SS09 Dup]

0-0.3' Topsoil/organics, dark
brown

0.3-1.0' - Clay with little silt.
olive to grey/brown.
Moist and highly plastic.

PID = Background.

1000 - 57SS10

0-0.2' Topsoil.
0.2-1.0' Silt - med. sand with
some clay and fine
gravel. Damp. No
plasticity.

Rusted 55-gal drum 5 ft. North/
Northwest of Sample Loc.

PID = Background

1/29/10

1015 - Back to MPR Security
bldg. for additional
Sweeping Supplies.

1035 - Collect 57 ER 04
lot running. Dia. 2" H₂O
through an unused stainless
Steel Bucket Auger.

1100 - Break for lunch and
purchase supplies at
local hardware store.

1235 - 57 SS 11

0 - 0.3' Topsoil.

0.3 - 1.0' Clay (red/brown) med
sand. Cobble at 1.0'.

PIV = Background to 0.7
(Slow response - Moisture?)

(20)

1/29/10

1250 - Depart Summit 57
back to MPR Security
to Prep/Pack + Ship
Surface Soil Samples
collected 1/22/10 and
ERO4 collected 1/29/10

WEATHER Conditions:

Partly cloudy with a slight
breeze. Pleasant - High in
the mid 80's.

1400 - Gas vehicle at Marina.

1420 - Arrive at Summit 57.
GPS Additional 5 Surface
Soil Sample locations:
57SS08, 57SS09, 57SS10,
57SS11, and 57SS12.
Soil boring 57SB06 was
also surveyed in using
Mapping. grade GPS.

Attempted to find existing
well 13GW11. Unable to
find the well.

(11)

1/29/10

1305 - Decon SS bucket
Augers used for surface
soil sampling.

Assist with GW development.

1615 Back at NAPR security
to unload vehicle and
prepare for next day's
events.

1640 Depart NAPR

APG

(12)

January 30, 2010

0645 - Arrive at NAPR.
Prepare for GW sampling
and CC chip/wipe sampling
at Sumner ST.

Decontaminate chisel
scheduled for concrete
chip sampling.

0935 - Collect 57CC01
0 - 0.5 depth obtained
Decon chisel

1010 - Collect 57CC02
0.0 - 0.5 inch depth obtained
Decon chisel

1045 - Collect 57CC03
0.0 - 0.5 inch depth obtained
Decon chisel.

1155 - Collect 57CC04
57CC04-D
57CC04-US/USD
0 - 0 - 0.5 inches obtained
Decon chisel

APG

(13)

1/30/10

1215 - Break for Lunch.

1330 - Meter Calibration

- YSI 556 - ^{initial} Adjusted

	Initial	Adjusted
pH buffer 4	4.02	4.00
7	7.09	7.00
10	9.84	9.97
ORP [240]	258	240
SP Conductance	1.409	1.389
DO (760 mmHg)	8.11	8.19
Temp	25.25	

Lanotte - 2020 Turbidity Meter

NTU Std (10) 9.87 10.00

1335 - Depart to SWMU 57.

1440 - Collect Wipe Sample
57 SW 01

1520 - Collect 57 SW 02

1540 - Collect 57 SW 03

1555 - Collect 57 SW 04 + Dup
MS/MSD

ARA

1/30/10

57

1645 - Collect EROS
by Running D.I. Water
over the chisel used
for Concrete Chip
Samples earlier Today.
Chisel was Decontaminated
after last use and
before the Rinse
was Collected.

1715 - Depart MAPR.

ADG

16

January 31, 2010

Arrive at NAPP 0645.

Load vehicle and prepare for GW Sampling at Summ 57.

Daily Decon Performed on Bladder Pump.

13GW01

SWL - 19.39

Total Depth - 32.90

Time	DTW	pH	Temp	ORP	DO
0838	19.76	6.79	26.80	47.30	5.50
0843	19.90	6.78	27.94	35.5	1.94
0848	19.94	6.72	28.01	39.0	1.26
0853	19.94	6.74	28.09	41.2	0.86
0858	19.98	6.74	28.20	42.4	0.71
0903	19.98	6.70	28.22	43.8	0.80
0908	19.93	6.70	28.17	45.0	0.67
0913	19.96	6.71	28.17	46.2	0.63
0918	19.95	6.70	28.21	48.1	0.85
0923	19.96	6.71	28.17	49.7	0.75
0929	19.93	6.71	28.13	52.5	0.77
0933	19.95	6.70	28.14	53.4	0.77

ADL

1/31/2010

Pump lowered to 28.5 from top of casing.

Teflon-lined PE Tubing used with bladder pump.

Start Pump at 0832.

Sample Time: 0955

- 3 VOCs Vials (VOC)
- 2 IL Amb (PCB)
- 2 IL Amb (SVOC)
- 2 IL Amb (DR)
- 1 (1,000 µg PCB) - DIS METALS
- 1 (1,000 µg POLY) - METALS
- 2 UOA Vials (GRO)

Turb	Vol	Rate	Comments	Conductivity
120	600 ^{ml}	75	Somewhat turbid	10.13
70	1200	170	"	10.60
55	700	140	Clearing	10.62
45	1000	200	(Clearing	10.64
35	900	180	Clearing	10.68
29	900	190	"	10.69
25	900	160	"	10.68
23	800	160	"	10.68
23	900	180	"	10.69
23	900	180	"	10.69
24	800	160	"	10.68
20	900	180	"	10.69

Continued

→ NEXT PAGE

57 GW 02

1/31/10

SWL - 22.35

TD - 27.35

Pump Set at 20.50

Time	DTW	pH	Temp	ORP	DO
1118	22.55	6.83	30.58	92.6	4.77
1123	22.98	6.84	30.55	93.1	3.61
1128	23.20	6.93	31.03	94.1	2.99
1133	23.48	6.74	31.16	95.9	3.59
1138	23.62	6.50	31.05	126.9	2.63
1143	23.82	6.67	30.51	116.7	3.81
1148	23.92	6.65	30.49	116.7	3.89
1153	24.0	6.65	30.32	117.9	3.79
1158	24.10	6.65	30.28	120.2	3.80
1203	24.20	6.65	30.05	121.0	3.79

Break for lunch at 1210.
Also, allow 57 GW 02 some time to recover before sample collection.

1210 - WEATHER CONDITIONS:
Cooler today. High near 80°F.
Cloudy - Sun at times.

(20)

ARL

START Pump - 1115
SAMPLE TIME - 1250

1/31/10

Time	Vol	Rate	Conduct	Comments
700	-	-	10.99	Final readings cloudy. No odor
380	650	130	10.70	" "
200	550	110	10.19	" "
65	550	110	9.384	Clearing. No odor
32	550	110	9.952	" "
15	500	100	9.850	" "
9.8	250	50	9.020	" "
7.8	200	40	9.169	" "
7.2	200	40	9.145	" "
7.1	200	40	9.181	" "

VOC & H2O samples collected and 1 L Amber. slow recovery

Decon Pump before next well.

ARL

(21)

57 GW04

1/31/10

SWL - 16.78

TD - 25.45

Pump set AT : 21.5 ^{ADD} 1/21/10

Time	DW	pH	Temp	ORP	DO
1402	17.05	7.01	27.42	145.5	3.23.50
1407	17.40	6.95	27.44	143.0	4.58
1412	17.40	6.93	27.44	139.8	4.09
1417	17.42	6.91	27.50	137.3	4.03
1422	17.42	6.91	27.50	135.6	3.84
1427	17.43	6.91	27.48	134.4	3.62
1432	17.44	6.91	27.45	133.6	3.40
1437	17.43	6.91	27.45	132.5	3.24
1442	17.44	6.91	27.45	131.8	3.13
1447	17.45	6.91	27.45	131.1	2.97
1452	17.44	6.91	27.45	130.2	2.89
1455	17.44	6.91	27.44	129.8	2.87
1458	17.44	6.91	27.45	129.4	2.84

ADW

(22)

Start Pump : 1400

Sample Time : 1505

Final SWL : 17.48

Turb	Vol	RMC	Conduct	Comments
25	/	/	4.443	Initial Readings
40	1600	320	4.399	cloudy - no odor
28	900	190	4.474	cloudy - clearing ^{no odor}
31	1200	240	4.662	" "
32	1000	200	4.734	" "
28	1200	240	4.808	clearing - no odor
23	1200	240	4.841	" "
18	1300	260	4.879	" "
15	1200	240	4.901	" "
11	1200	240	4.922	" "
9.0	1300	260	4.929	" "
8.7	800	266	4.941	clear
8.2	800	266	4.958	clear

Sampling Complete - Perform
between - well Decon.

ADL

(23)

57G-W07

1/31/10

Swl: 21.49

TD: 32.90

Pump set AT: 29.0

Time	DTU	pH	Temp	ORP	DO
1628	22.10	6.82	27.60	137.8	4.92
1633	22.11	6.80	27.75	137.0	4.11
1638	22.10	6.79	27.73	131.7	4.15
1643	22.60	6.78	27.78	131.0	4.06
1648	22.55	6.76	27.75	130.6	3.98
1653	22.57	6.75	27.75	130.0	3.44
1658	22.61	6.75	27.74	129.6	3.22
1703	22.70	6.75	27.68	129.3	3.06
1708	22.22	6.75	27.68	128.8	2.86
1713	22.22	6.75	27.67	128.3	2.72
1718	22.17	6.75	27.67	127.8	2.56
1723	22.22	6.76	27.67	127.1	2.42
1728	22.21	6.76	27.66	126.7	2.31
1733	22.19	6.76	27.66	126.3	2.23
1738	22.20	6.76	27.65	126.1	2.17
1743	22.21	6.76	27.67	126.0	2.11

1845 Collect 57ER06
 Depart
 MAPK 1915

(24)

A2

1/31/10

Start Pump: 1622

Sample Time: 1750

Final Swl: 23.25

Turb	Cond	Vol	Rate	Comments
2.542				Initial Readings
7.588	1400	280		Turbid. No odor
7.589	1300	260		" "
7.585	2100	420		" "
7.586	1800	360		" "
7.213	1400	360		" "
7.593	2100	420		Cleaning. No odor
7.585	1450	290		" "
7.583	1400	280		" "
7.543	1300	260		" "
7.581	1200	250		" "
7.581	1300	260		" "
7.582	1300	260		" "
7.582	1000	200		Clear. No odor.
7.582	1000	200		Clear.
7.582	1100	210		Clear

57G-W07
 57G-W07-D

Perform Daily Decon on
 Bladder Pump.

(25)

February 1, 2010

0615 - Arrive at NAPP.

0630 - YSI Meter Calibration

	Initial	Adjusted
pH buffer 4	3.52	4.00
" 7	7.03	7.00
" 10	9.43	9.99
ORP (240)	258	240
SP. Cond. 1.409	1.228	1.342
DO (760 mm/Hg)	9.75	9.65
TEMP	25.25	

LaMotte - 220 Turbidity Meter

NU SD (10) 10.00 10.00

0700 - Collect STEROT - by
pumping D.I. H₂O through
Teflon lined tubing.
STEROT was collected in
the same manner.

APG

26

2/1/10

LOW-TE

APG

27

57G-Wol

2/1/10

SWL: 15.95

TD: 25.25

Pump set At: 20.0

MAG 2/1/10

Time	DTW	pH	Temp	ORP	DO
0808	15.30	7.54	26.80	133.7	4.28
0813	15.55	7.62	27.16	117.8	2.39
0818	16.45	7.61	27.17	113.8	1.35
0823	16.40 ₄₃	7.59	27.14	111.8	0.60
0828	16.42	7.59	27.14	110.9	0.45
0833	16.38	7.59	27.14	110.2	0.39
0838	16.37	7.59	27.15	109.8	0.39
0843	16.39	7.59	27.16	109.4	0.38
0848	16.37	7.59	27.17	108.9	0.39
0853	16.38	7.58	27.17	108.6	0.37
0858	16.37	7.58	27.20	108.2	0.37
09	16.37	7.58	27.20	107.9	0.37

- 57G-Wol - (including Ms and MsD)

3 uoA vials (voc)

2 uoA vials (Geo)

2 uoA vials (PCB)

2 uoA vials (15 uoc)

2 uoA vials (DRO)

1 1000 ml Polt - TOTAL (Metals)

1 1000 ml Polt - Dissolved (Metals-Diss)

(29)

) A2 =

Start Pump: 0906

Sample time: 0920

Final SWL: 1622

Turb	Conduct	Vol	Rate	Comments
600	9.825	✓	✓	Initial Readings
500	9.128	1700	340	Turbid, No odor.
200	9.228	2000	400	" "
60	9.321	1500	360	Clearing. No odor.
36	9.325	1200	250	" "
26	9.318	1300	260	" "
20	9.310	1400	270	Clear. No odor.
15	9.314	1800	350	" "
11	9.315	1550	300	" "
9.8	9.316	1250	250	" "
8.6	9.323	1700	340	" "
8.2	9.32	1500	250	" "

WEATHER Conditions:

Mostly Sunny. High Near
85°F. Slight Breeze.

0945 - Collect FBO2

Store Bought Distilled H₂O.Perform between Well Decol
at 1040.

/ MAG (29)

2/1/10

1100 - back to sec. bldg.
to start prep/packing
coscers for FedEx
shipment.

1230 - Return to SWMU 57 -
Pick up RGR

Perform between well
Decon after obtaining
remaining samples from
57GW02.

Break for lunch and
return to MAPR. sec bldg.
to continue prep/pack
samples.

Weather Conditions:

Mostly sunny and warm,
high in mid 80's. Slight
Breeze.

30

ADG

2/1/10

ADG.

31

57GW05

2/1/10

SWL: 18.45

TD: 23.65

Pump Set At: 22.0

Time	DTW	pH	Temp	ORP	PO
1524	18.69	8.12	28.00	-153.8	3.88
1529	18.73	8.05	27.98	-170.2	1.48
1534	18.93	8.01	27.73	-128.8	4.63
1540	18.97	7.96	27.94	-147.7	0.99
1545	18.89	7.91	27.89	-141.0	0.85
1550	18.89	7.88	27.90	-130.9	0.78
1557	18.87	7.85	27.86	-118.4	0.72
1602	18.94	7.84	27.92	-114.1	0.70
1607	18.86	7.84	27.91	-111.6	0.62
1612	18.93	7.83	27.71	-107.9	0.62
1617	18.93	7.82	27.79	-101.9	0.67
1622	18.86	7.82	27.83	-98.4	0.65
1627	18.99	7.83	27.91	-97.9	0.68
1632	18.90	7.82	27.80	-96.5	0.67
1637	18.92	7.82	27.80	-95.3	0.67

APG

22

0102, 2/1/10

2/1/10

Start Pump: 1520

Sample Time: 1650

Final SWL: 18.97

Turb	Conduct	Vol	Rate	Comments
out of range	2.961	-	-	Initial Readings
" "	2.956	400	80	Turbid, No odor
650	2.614	400	80	" "
340	2.903	1000	166	" "
180	2.936	900	180	Turbid but clearing
110	2.950	800	160	Clearing, No odor
45	2.960	1150	230	" "
38	2.968	900	180	" "
25	2.971	700	140	" "
17	2.965	350	70	" "
11	2.970	700	140	Clear, No odor
8.7	2.972	600	120	" "
9.4	2.975	600	120	" "
8.3	2.977	800	160	" "
8.3	2.979	700	140	" "

1415 - DEPART N/PR

APG

23

February 2, 2010

0630 - Arrive at UAPR.

0645 - Collect STEROY _{UOC ONLY}

We will recollect Surface Soil Samples 57SS08 - 57SS12 due to FEDEX shipping delays in Memphis, TN. Only UOCs will be recollected.

0750 - Depart to Summit ST

0755 - Collect 57 IDW ⁰¹ ~~02~~ _{non-alike}
Acousis Samples.

0815 - Collect 57SS08

0820 - Collect 57SS09 + [57SS09 D]

0825 - Collect 57SS10

34

2/2/10

0930 - Collect 57SS11

0940 - Collect 57SS12

All bucket Augers used for this recollection were decontaminated after initial Surface Soil Sampling.

WEATHER CONDITIONS: Low 90's, Sunny, and breezy.

ADG

35

01/2/2/10

Sketch NOTES:

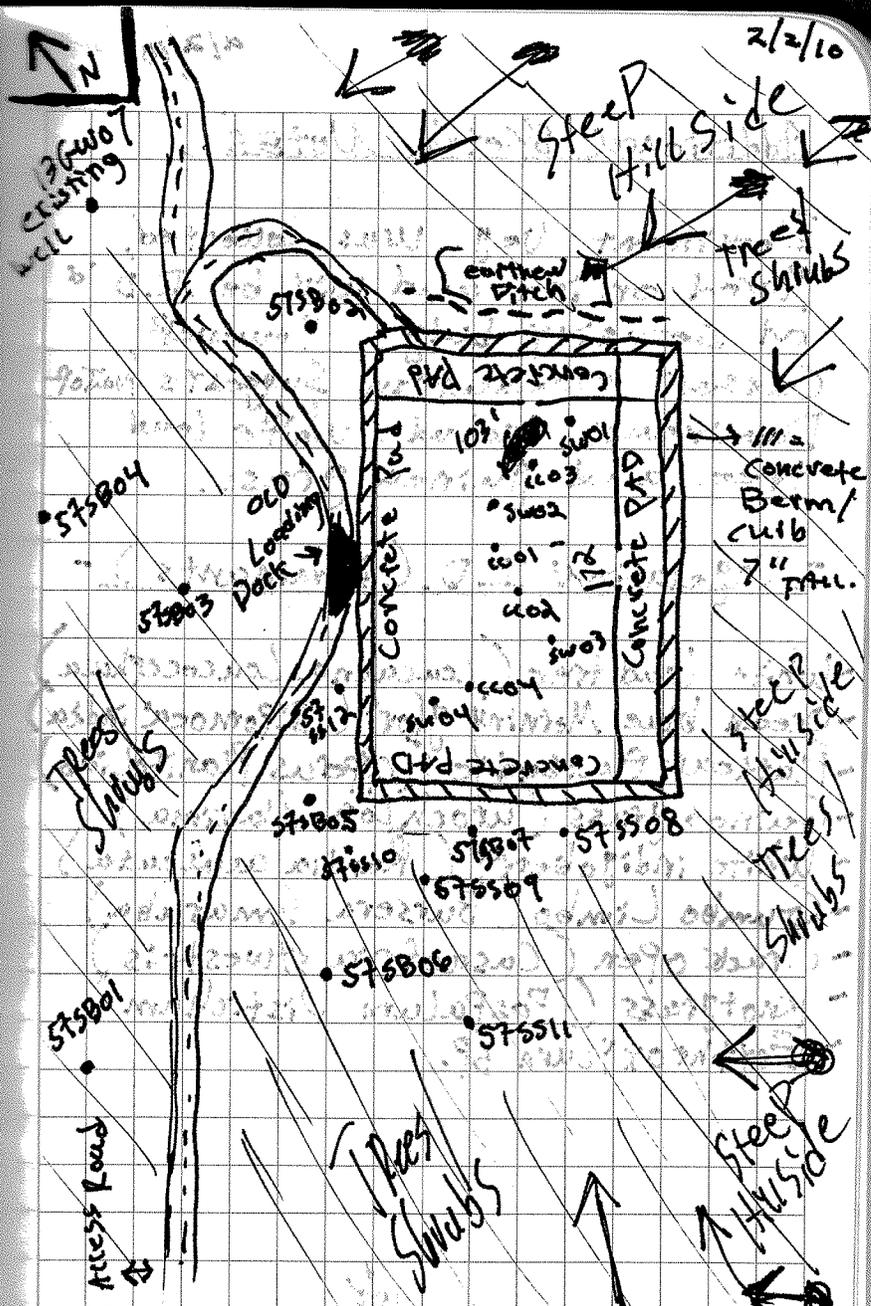
The concrete Pad associated with SWMU 57 is approx. 172' x 103'. The majority of the concrete pad is in good condition. Aside from a few cracks/pits.

A steep, vegetated hillside surrounds the pad to the NE, E, and South. The opposite side or area of the Access Road is generally flat.

A 7" tall concrete curb surrounds the entire pad. Curb is also in good condition.

An earthen Drainage feature was observed NE of the pad. Function is to divert runoff around the pad. Drainage feature does not contain hydrophytes and very little substrate. All upland veg. species in and around feature. Feature terminates before the access road.

(36)



Concrete Pad = 172' x 103'

(37)

2/2/10

Additional Sketch NOTES:

Dominant Veg. was collected, placed on ice and will be I.D.'d at security bldg. However, cursory evaluation suggests major dominants include white lead tree and guinea grass.

- Vegetation I.D. (Dominants) -

- White lead tree (*Leucaena Leucocephala*)
- Ocean blue Morning glory (*Ipomoea indica*)
- Flatleaf flatsedge (*Cyperus Planifolius*)
- Guinea grass (*Urochloa Maxima*)
- White indigoberry (*Randia aculeata*)
- Gumbo Limbo (*Bursera Simaruba*)
- Crack open (*Casaezia stuebelii*)
- Knotgrass (*Paspalum Distichum*)
- *Erythroxylum* sp.

ADG

38

2/2/10

1030 - Depart Summa ST to NAPR Security bldg. To pack supplies and Package Equipment.

1230 - Lunch break and Recon for an upcoming investigation planned at NAPR.

1430 - Continue/finish with packing for FEDEX.

1515 - FEDEX Arrives AT NAPR to take Supplies and Equipment.

NAPR Supply Room Inventory and Clean/organize.

1700 - Depart NAPR

ADG

39

Thursday May 20, 2010

0645 - Arrive at WAFR
Decon stainless steel
Bucket Augers for
Re-collection of Surf.
(GRO) Soil samples 575508-575512
at Summu SF. Re-collection
Necessary due to
inadvertant laboratory
mistake.

0735 - Arrive at Summu SF.

0745 - Collect 57ER08 by using
DI water through an un-used,
decontaminated SS bucket Auger.

0755 - Collect 575508 (TPH-GRO)

0800 - Collect 574509 (575509 D) - (TPH-GRO)

0805 - Collect 575510 (TPH-GRO)

0810 - Collect 575511 (TPH-GRO)

0815 - Collect 575512 (TPH-GRO)

(11)

5-20-10

For Additional Surface Soil
details from original Surface
Soil Collection - See pages
8-10. For this Re-collection
of GRO - The 1ft. depth
interval was obtained for
all samples.

Weather Conditions: Mostly
cloudy. Warm and humid, mid
60's. Slight Breeze.

0925 - Depart Summu SF.

APL

(12)

Environmental Geologist – Robert Roselius

CONTENTS		
PAGE NO.	REFERENCE	DATE
1-23	SWMU 57 ROSELINS (GAILEY)	1/25 to 2/3/2010
24-71	SWMU 61 ROSELINS (GAILEY)	2/14 to 2/27/10
72	BLANK	
73-	SWMU 67 ROSELINS (GAILEY) (NUPE @ LANDFILL)	

1/25/10 (MON.) SWMU 57

ROSELINS & GAILEY

V DRIVE SAND SWAN AIRPORT @ 1420 HRS.

GET RENTAL, HEAD TO NAPP -
CHECK EQUIP, SAMPLE BOTTLES,
LUMPACK, P&P. DEPART 1830 HRS.

2/26/10 (TUES)

DRIVE 0700 MEET W/ JFA MINBO
& EDWIN, DISCUSS ACTIVITIES / NO PLANS.
(GENERALS 6610DT / 3/4 ID ANCHORS)
GLASSMORSE - 3 VIAL VOCs

- 8 OZ GL SVOCS + URBNS

- 8 OZ GL PCBs / TPH DRO.

- 4 OZ ^{GENERAL} GL TPH GRD

PER PLANS ⇒ - 2 OZ ? METALS -

Found 4 OZ LABELED METALS

well ^{well} 13 GUS OF 19.30 (APPROX. WATER LEVEL)
MALFUNCTION.

EVALUATE SITE - CHECK BEAM OF PAD AND
DRILLING LOCATIONS.

0915 CALIBRATE PID = CAL TO 103

CHARGED LAST NIGHT.

0920 Sunny, TO BB MID-80S

② (PID BKG-0.1)

0935 **57SB02**

DEPTH Recovery PID

0-4 02 3.6 BKG

• 57SB00 @ 0950

• 57SB01 @ 0955

02

0-0.3 TOPSOIL - Clay w/ some

0.3-1.1 Silt, clay, moist

1.1-4.0 Clay, fine sand, plastic

~~2-2.2~~ - Silt to coarse

sand. w/ gravel fine

dry to damp, no plasticity

orange/brown. (some

~~black~~ red.

black mottling in

fine grained matrix.)

[still fill?]

4-8 4.0 BKG

weathered bedrock -

clay to fine sand

tan brown w/ white

mottling, dry, no

plasticity.

8-12 4.0 BKG

SAA

↓ DAMP
DPT DRIVING
MOISTURE OUT

• 57SB02-05 @ 1025 (9-11')

12-15. 3.0 BKG - 0.4 (humidity?) SAA.

REFUSAL @ 15' bgs. WILL ATTEMPT

RIGER TO DEPTH FOR WELL INSULATION

DRIVERS DEPART 1030 - NEED SOCKET

BOARDED RIGER AND SET NAT IS

LOCATED THAN THE SOCKETS THEY HAVE.

③

JHA RETURNS 1130⁺ CONTINUE

ANGERING SBOZ.

(FINE GRAVEL SIZED)

- JONAS DRILLING @ 13' THEN EASY.

✓ Lt. GRAY PIECES, HARD (LIMESTONE?)

1220 13GW07 19.2' 2.8 STICKUP

• 16.4 @ 13GW07

16.4 + 3' ELEVATION RISE @ SBOZ

• GW @ 19.5'

NO MUDDY/WET CUTTINGS (MINGO
SOYS TYPICAL).

WILL ANGER TO 26' AND BUILD WELL.
(FOR POTENTIAL CAVE)

1230 MOVE TO SBO3 (BOVINE ONLY)

TO COLLECT SAMPLES TO MAKE
FED-EX PICKUP.

RETURN TO SBOZ, PULL ANGERS.

- CAVE TO 25' BUILD WELL

★ TD - 25'
SCREEN - 15-25' ★ 57MW02 ★

SAND TO 13'

BENTONITE TO 11'

GRUNT TO SURFACE W/ 4" x 4" SQUARE

(SQUARE PAD & BOLDED LATER). PRO-TOP

④

57SB03 (SOIL BORING to 12' ONLY)

DEPTH	Recovery	PID	(PID BKG = 0.1)
0-4	2.8	Bkg	0-0.3 TOPSOIL / ORGANICS

• 57SB03-00 @ 1300

• 57SB03-01 @ 1305

0.3-1.0 SAND TO SILT
w/ GRAVEL, EDGE OF
ROAD (I.E. ROAD BOSS
GRAVEL

1.0-4.0 - CLAY, LITTLE
SILT, ORANGE BROWN w/
TAN/GREY, DAMP, MED.
PLASTICITY, MED STIFF
(RESIDUUM)

4-8

4.0'

Bkg

4-6.4 SAA

w/ F. SAND 6.4-8.0 SIMILAR TO ABOVE
OLIVE, BUT FRAGRILE AND w/ SOME
COAL & BLACK INCLUSIONS, NO
SLIGHT TO LOW PLASTICITY, DAMP, SOFT
(WESTERN BR)

8.0-12.0

4.0

Bkg

8.0-12.0

SAA - MOTTLED

• 57SB03-05 @ 1315

RETURN TO SB02 TO BUILD
WELL. SEE BOTTOM OF PAGE 3
EQUIP RINSATS / FIELD LOG - SEE GRILEY
1645 DEPART. (WORK @ COMDD.) LOG.

1/27/10 (WED.)

⑤

0545 ONSITE, MEET PEDRO RUIZ.
& GET EQUIP OUT OF OFFICE @ 0600.
GPS ON CHARGE; RE-TOB RINSATS/
DRINKS, RECEIVING ADDITIONAL GLOSSWARE
ORGANIZE, PREP FOR DAY.
0640 CALIBRATES PID. → @ 103 ppm.

0700 57MW02

SWL 23.39

TD 27.35

0740 SET UP @ 57SB05

PID
BKG - 0.6
MOISTURE &
HUMIDITY

DEPTH	Recovery	PID
0-4	3.0	BKG

• 57SB05-00 @ 0750

• 57SB05-01 @ 0800

+ - 01 @ 0800

0-0.3 TOPSOIL / ORGANICS.

0.3-3.0 - CLAY TO
F. SAND, w/ SOME FINE
GRAVEL, ORANGE BR AND
DK BROWN, DAMP, MED
PLASTICITY, BEDROCK, MED
(DIOXIDE?) GRAVEL SIZED
PIECE @ 3.8-3.9. (RESID)

3.0-4.0, CLAY, LITTLE
SILT, ORANGE BR w/ LITTLE
TAN/GREY, DAMP, MED TO
HIGH PLASTICITY, MED STIFF

SWIMMING PLANNING
← SCHEDULE @
NIGHT.

⑥ SB05 (CONT)

DEPTH Recovery P/A

4-8 4.0 BKG 5.8-
4:0-5.8 SAA. Tan/gray blk
mottled. w/mud

SILT to
F SAND w/
LITTLE clay -
Damp -
Very low
plasticity

5.8-8.0 SAA BUT FINE BLK,
SLIGHT INCREASE IN
CHAIN SIZE

8-12 4.0 BKG. 8.0-10.3 SAA (DIORITE?)

● 57SB05-05 @ 0815

10.3-12. $\frac{1}{2}$ HIGHLY

WEATHERED BEDROCK

SILT to F SAND w/ LITTLE
CLAY, DL, GRAY & BR.

MOTTLED, DAMP, NO

SLIGHT PLASTICITY, MED STIFF
SOFT?

12-16 4.0 1.0-1.5 — 12-14 SAA.

BKG. — 14.0-14.5 Lt GRAY
BEDROCK, HARD.

20+ — 14.5-16.0 SAA. SAME
AS 10.3-12. (WEATHERED
BEDROCK)

16-20 4.0 60-150 — 16.0-17.0 - SAA

Peak - 400+ @
18' bgs. — 17.0-20.0 - SILT & FINE

30-50 SAND w/ LITTLE CLAY

w/ SLIGHT 18-19 ORANGE, TAN/GRAY AND.

PEAK ORDR 20 19-20 SOME BLK, GRAY & DK BR.

DRILLER STATES WBT @ 18+!

19.27 SWL 13 GW07 @ 0835 ⑦
32.90 TD SOFT

SB05 (CONT)

DEPTH Recovery P/A BKG SAA.
20-21 1.0 WBT 20-21 WET, REFUSAL
W/A @ 21'

WILL BUILD WELL @ 23' (AFTER TO 24')

0925 UNDER REFUSAL @ 21' (SB05)
BUILD WELL w/ 21' TD

★ 57MW05 ★

TD 21'

SCREEN 11-21'

SAND TO 9'

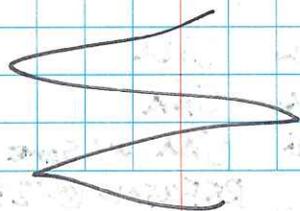
BENTONITE 7'

1040 SLOW MIND LOCATION 57SB07

1100 COMPLETE CLEARING (ADAM & ROBERT)
ABST.

57SB07

SEE NEXT PAGES



⑧
57SB07 (PID BKG - 0.2)

DEPTH	RECOVERY	PID	
0-4	3.5	BKG	0.0.2 TOPSOIL/ORGANICS
• 57SB0700 @ 1115			0.2-4.0 (CLAY, LITTLE)
• 57SB0700 D @ 1115			SILT, ORANGE GR W/
• 57SB0701			TAN/GREY AND BLK BOTTLING
• 57SB0701 MS @ V			DAMP, MED to HIGH PLASTICITY,
• 57SB07-01 MSD/1125			MSD REF
4-8	4.0	BKG	4.0-4.3 SAA
			4.3-8.0 SAA BUT
			FRIABLE, SLIGHT INCREASE
			IN GRAIN SIZE. (SILT to
			F SAND w/ LITTLE CLAY,
			DAMP, VERY LOW PLASTICITY
			(SLIGHT)
8-12	4.0	BKG	8.0-9.5 SAA
			9.5-9.6 Lt Grey
			BEOROCK, HARD (SEE
• 57SB07-05 @ 1200			SB05, PAGE 6 - ^{pic} L.A.??)
			9.6-12 SAA 8.0-9.5
12-16	4.0	BKG	SAA
16-20	4.0	BKG	SAA
20-23	3.0	BKG	SAA w/ SOME MSD SAND.
			REFUSAL @ 23

⑨
 - WILL ATTEMPT TO AUGER PAST 23 legs
 BASED ON SB05 ELEVATION GW AS 26'
 ATTEMPT TO AUGER TO 29 OR 30' FOR TD
 BASED UPON OBSERVED GW.

MOIST/WET AS 25' AUGER TO 30 TO
 BUILD WELL ★ 57MW07 ★

TD 29'
 SCREEN 19-29'
 SAND to 17'
 BENTONITE to 15'

INSTALL PRO-TOPS & GROUT (MW05 & 07)
 1500 - GPS DEBRIS AREA WEST OF
 PAD & ID TO RELOCATIONS OF
 57SB01 & SB06, ALSO GPS
 CONTROL / PAD CORNERS ETC.

— SB01 MOVED TO DOWN GRADIENT
 SOUTHWEST SIDE OF POTENTIAL
 IMPACTED GW (PLUMES)

— SB06 ON DOWN GRADIENT
 SIDE OF SURFACE DEBRIS.

(COORD W/ DRILLERS / PREP FOR TIMBERON)

1700 - DEPART WARR

10 1/28/16 (THURS)

0645 ONSITE / PREP.

0710 CALIBRATE PID - CAL TO 105

CHARLES MOUNTY

0740 CLEARING FOR S7SB04.

DECON BARRIER.

0815 MW S7MWO2 - PID @ WELL HEAD

0.2 (DEFLECTION - MOISTURE?)

SWL 22.49 - 22.49' TOC

TD 27.35' TOC

✓ SLIGHTLY TURBID

BOIL & SURGE DRY. ≈ 2 GAL. (@ 0830)

ALLOW TO RECHARGE & MONITOR

SWL 26.3 @ 0840

0845 BEGIN DRILLING @ SB04
(SEE NEXT PAGE)

0945 MW S7SB05 SWL 18.39 / TD 23.65

1010 S7MWO2 SWL 25.2

1030 SURGE & BOIL S7MWO5, REMOVE ≈ 3 GAL

1040 SWL 22.1 AND RISES SLOWLY.
ALLOW TO RECHARGE & MONITOR.

1515 MW05 SWL 18.37 (RECHARGED)

11 S7SB04 (PID CAL TO 100)

DEPTH RECOVERY PID

0-4 2.7 BKG

0-0.2 TOPSOIL/ORGANICS
LITTLE SILT &
0.2-1.0 CLAY w/ VF. TO

• S7SB04-00 @ 0855

MED SAND, TRACE GRAVEL

• S7SB04-01 @ 0900

(1 PICO), DAMP, ^{ALL} TO LOW TO
MED PLASTICITY, SOFT TO (RESID?)

1.0-1.9 CLAY AND F. SAND,
SOME LITTLE M. SAND, OLIVE,

(RESIDUUM?) DAMP, VERY LOW PLASTICITY, OR
1.9-4.0 CLAY, LITTLE SOFT.

SILT, ORANGE BR. w/ TAN/CLAY
& SOME BLK MOTTLES, DAMP

MED TO HIGH PLASTICITY, MED

4-8 3.8
4.8 4.0 BKG

SAA. (WHITISH) MED STIFF

8-12 3.9 BKG

SAA (MORE TAN/CLAY LESS
BLK.)

• S7SB04-05 @ 0910

12-16 3.8 BKG

SAA

16-20 3.7 BKG

SAA

20-22.5/3.5 BKG

SAA - REFUSOL, LINEAR
JAMMED @ 0915, AS BBFOLF
NO VISIBLE WATER, BASED

- EVALUATE EXISTING SWLS (MW02 & 05) WILL
INSTALL S7MWO4 @ 20' DEPTH. - ANGERINK

- 23.5 REFUSOL, LINEAR JAMMED @ 0915 RGR

(12)

1130 RCL
1135

1025 MINGO REPORTS THAT HB THINKS
WATER IS AROUND 18-19 $\frac{1}{2}$ FT. WILL
INSTALL WELL TO 22' ~~logs~~
QUANTRE EN.

1100 CLEARING/SET UP @ NEW 57SB06
LOCATION
CLEAR NEW 57SB01 LOCATION
WHILE EDWIN DECONS.
BEGIN SBOB @ 1125 \rightarrow

1155 DRILLING @ SBO1 (SEE PAGE 14)
FOR LOG

★ 57MW04 ★
TD 22' logs
SCREEN 12-22
SAND TO '10
BENTONITE TO '8 HYDRATE
WELL GROWN INSTALL STICKUP AFTER
57MW01 IS INSTALLED.

RCL
 \leftarrow

(13)

PID BKG (0.1)

57SB06 (BORING ONLY) to 12'

DEPTH	RECOVERY	PID	DESCRIPTION
0-4	3.0	BKG	0-0.3 TOPSOIL/ORGANICS 0.3-3.2 CLAY, W/ SILT AND F SAND. BR. (LIKELY) FILL OR REMOVED NORMAL SURFACE DEBRIS SAND. AREA) DAMP, DBS LOW TO SLIGHT, TNO PLASTICITY, SOFT?
			3.2-4.0 CLAY AND SILT W/ F. SAND. ORANGE/BR W/ TAN/GRAY. (VERY LITTLE BR). MED PLASTICITY, M. STIFF (RESIDUARY?)
4-8	3.2	BKG	4-6.2 SAA 6.2-8.0 SAA BUT FRIABLE SILT AND F SAND. FRIABLE. (LITTLE CLAY ORANGE/BR W/ TAN/GRAY DAMP, NO PLASTICITY, SLIGHT. \uparrow SOFT
8-12	3.0	BKG	8-12 SAA. SLIGHT. \uparrow SOFT

★ 57SB0605 @ 1145
END OF BORING @ 12' logs

14

57SB01 (PID BKG-0.1)

DEPTH RECOVERY PID

0-4 BKG. 0-0.3 TOPSOIL/ORGANICS

• 57SB01-00 @ 1215 0.3-4.0 Clay w/ SILT & F. SAND, LITTLE PLASTICITY

• 57SB01-00 @ 1220 Damp, orange/br, soft (RESIDUUM)

4-8 3.4 BKG. 4-8 SAA LITTLE

8-12 3.7 BKG. 8-9.8 Clay w/ SILT & SOME F. SAND, ORANGE/BR w/ TAN/GREY & BLK MOTTLING, DAMP, MED PLASTICITY, (LOW MED STIFF) (LOW TONES)

• 57SB01-05 @ 1235 9.8-11 SAA w/ INCREASE IN SILT - FRIABLE

11-12 SAA 8-9.8

12-16 3.8 BKG. 12-15.6 SILT, ORANGE/BR. MOIST (MAYBE WBT.) NO PLASTICITY, SOFT

1.8 (LOW RECOVERY) 15.6-16. Clay w/ SILT. LOOSE Lt GREY AND BLK LAMINATED BEDDING MED PLASTICITY, MOIST, MED STIFF.

REG

15

57SB01 (CONT)

DEPTH RECOVERY PID

16-20 2.5 BKG. 16-18.5 SAA "12-15.6" SILT/MOIST.

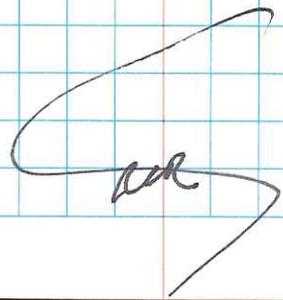
18.5-20 SAA 15.6-16. (LAMINATED)

20-24 2.7 BKG. 20-24 Clay w/ SILT & F. SAND, ORANGE/BR w/ TAN/GREY & BLK MOTTLING, FRIABLE, DAMP. LOW PLASTICITY, SOFT

- WILL BUILD WILL TO 22' BASED ON OTHER SWLS AND MOIST/WBT SILT ZONES (ORANGE INSTALS TO 22)

★ 57MW01 ★

TD 22' bgs
 SCREEN 12-22' bgs
 SAND TO 10'
 BENTONITE TO 8' HYDRATE



(16)

1520 ~~57~~ 57MW07 21.45' TOC SWL

" 32.45 TOC TD

Bailed/Swabs 11+ Gal. Recovers Good.

Prep for SS Sampling Tomorrow

1645 Depart NAPA, pickup distilled
for SS/GW sampling DECON.

- Sample Matrix/Planning

[Rec. address MSGS 69th Comments]

24

(17)

1/29/10 (Fri)

0645 ON SITE PREP FOR SS SAMPLING

0710 CONSULTS PID to BLOW = 0.0

- COLLECT SS SAMPLES (SEE GALEY LOG)
- DRILLING, COMPLETION WELLS AT SURFACE.
(PADS, BOLLARDS @ 2+5, GRANT.
BORINGS, MOVE DRUMS, CLEAN
SITE, LOAD EQUIP.)

- REVIEWED/SLAM JHA Drill Slams
MUNGO & EDWIN DEPART 1345,

2" 3 VOL = 6.7 GAL.

1425 13GW07 19.29 SWL TOC
32.90 TD TOC (SOFT)

1435 57MW04 16.73 SWL TOC
25.45 TD TOC (HARD)

2" 3 VOL = 4.3 GAL

13G-07 BAIL/SWABS. 10+ GAL (NEAR DRY
(CASY TURBID))

TD 29. 32.93 (HARD)

SWL 24 31.80 ± (CANT MONITOR RISE
WATER LEVEL STUCK TO
JUN.)

1330 BEGIN BAIL/SWABS 57MW04, REMOVE
7.5 ± GAL END @ 1550.
NEAR DRY SWL. 24.8 ± TD 25.45.
TURBID.

(18)

CLEANUP SITE, Dump NOTBA BTL.
RETURN TO OFFICE, Clean, KB
ORANGE GLOSSWORKS; PRBP
1640 DEPART MAPR

WORK ON DEVELOPMENT Summary
@ CONDO

RRR

1/30/10 (Sat.)

(19)

ONSITE.

COLLECT CHIP/NIPE SAMPLES, CALIBRATE
YSI/TURBIDITY. (SEE GOILEY LOG).

1420 S7MW01 SWL 15.63^{on}
(4.7 gal 3 VOL). TD. 25, 25 (Hard)

1430[±] BEGIN SOIL/SURF.

1505 BATH/SURF. 15+ GAL
SWL 22.3 (RISING)
TD. 25, 25 (Hard)

1715 DEPART

RRR

(20) 1/31/10 (SUN.)

0645 ONSITE

GW SAMPLING (SEE GAILEY LOG)

1915 DEPART

RLR

(21)

2/1/10 (MON.)

0615 ONSITE - CONTINUOUS GW SAMPLING
(SEE GAILEY LOG)

- ADAM HEADS TO OFFICE TO PACK SAMPLES.

1055 STMWOZ SWL 22.75

ATTEMPT TO COMPLETE SAMPLING MWOZ

COMPLETE COLLECTION STMWOZ:

- COMPLETE FILLING 1 L DRO

- FILL 1 L - 1 DRO, 2 PCBs, 1 SPOCS

- METALS 1 L TOTAL + 1 L DISSOLVED

1130 STMWOZ SWL 26.02 TOC.

DELOW PUMP, LOOSEN 10W DEUM LIDS.

★ PAD BERM IS 7" IN HEIGHT ★

ADAM RETURNS, CONTINUOUS GW
SAMPLING (SEE GAILEY LOG)

1815 DEPART.

RLR

pm
~~26.02 @ 1130~~

(22) 2/2/10 (TUES)

2155
RER

ONSITE. RE-
PROP. AREA & COLLECT SURFACES
SOIL SAMPLES. (SEE GAILLEY LOG)

	<u>PREVIOUS MEASURED SWL</u>	<u>SWL TODAY</u>	
MW01	15.63	15.95	@ 0913
02	23.39	22.87	@ 0921
04	16.73	16.88	@ 0919.
05	18.39	18.46	@ 0916
07	19.29	21.58	@ 0905
13GW07	19.27	19.40	@ 0925
74 WELL @ VP6Cb		18.56	@ 0929.
N OF 57 →			

0945 COLLECT SOIL/SOLIDS IDW SAMPLE
COMPOSITE FROM 5 DRUMS. (6th
DRUM FROM MW02 (1/2 FULL))
57-IDW01

SEE GAILLEY LOG FOR OTHER ACTIVITIES
FOR THIS DATE. DEPART

2/3/10 (WED.) DEMOB - DEPART ANKAS
0600 HRS "AT", DELAY IN POLLY, ARRIVE PITT 1600 ET^o

RESERVED FOR FUTURE SWMU 57 SWLS (23)

2/26/10 (FRI) COLLECT SWMU 57
SWL DATA @ END OF SWMU 61
INVEST. SWL

0740 WESTERN EXISTING WELL 14.76 TOC
(13GW11) ? [NOT SHOWN ON MAPPING
CORRECTLY]

0745 57 MW01 - 16.47' TOC
0746 57 MW05 - 19.00' TOC
0747 57 MW04 - 17.38' TOC
0748 57 MW02 - 22.90' TOC
0750 13 GW07 - 19.88' TOC
0751 74 VP6Cb - 19.08' TOC
0753 57 MW07 - 22.13' TOC

SEE PG 11 OF SWMU 59 LOG FOR
SWLS COLLECTED 4/20/2010

RER

5/20/10

0826 02 - 2339

0825 04 - 1793

1330 RETURN TO S9, COMPLETE SAMPLE
 MGMT/PACKAGE/SNIPPING
 DRILLER COMPLETE DECON, RINGS/CUT
 THROUGH ASPHALT @ 59SB05
 1345 BEGIN SAMPLE

— 59SB05 (PID BKG-0) —
 O.K. = 0.5' ASPHALT.
 0-5 ft. ~~0-0.5~~
 2.4/4.5 0-5 FILL - CLAY TO COARSE SAND,
 BKG SOME GRAVEL, COBBLE TO BR, NON
 PLASTIC LEAD, AXY.

59SB05-01
 @ 1355

↳ SWL @ 59GW03 STILL 17.54' TOC

5-10 5-10 Clay, some silt, tan, olive,
 4.6 Br. & Bk, slight plasticity, stiff
 Bkg Damp.

59SB05-05

10-15 10-12.5 SAA. (Voxy)
 3.9 12.5-15 SAA BUT PRIMARYLY WHITE
 Bkg W/ LITTLE ORANGE, OLIVE & TAN (MUCK)
 — 0.1' THICK HARD GRAY BEDROCK @ 14'
 Damp to moist

59SB05 (cont)

15-20 SAA. BUT MOIST. AND LOTS WHITE.

4.1
 Bkg

20-24 REFINED @ 74 logs.

3.6/4.0 20-24 SAA

Bkg

— WILL BUILD WELL TO 22' logs. CONSIDERING
 VICINITY, ELEVATION AND 59GW03 SWL 15 logs

1430 COLLECT 59ER02 FROM NEW LINE

15 SWM 57 SWL

1341 57GW05 19.43

1344 57GW07 22.55

1335 57GW02 23.30

1340 57GW04 17.82

1343 57GW01 16.90

1337 13GW07 20.30

1347 13GW11 15.20

1338 74VP6CB 19.43

● 59GW05 ●

TD 22' logs

SCREEN 12-22' logs

SAND TO 10' logs

RENTON TO 8' logs

1600 RETURN S9, 59GW05 COMPLETED
 DRILLER'S DEPART. MANAGER SAMPLE REPAIR
 CANOPY. 1700 DEPART NIPR.

SOIL BORING AND MONITORING WELL LOGS



TEST BORING AND WELL CONSTRUCTION RECORD

Michael Baker Jr., Inc.

PROJECT: Naval Activity Puerto Rico SWMU 57
 PROJ. NO.: 119197, 6.2 BORING NO.: 57SB01
 COORDINATES: EAST: 939227.2415 NORTH: 804379.7914
 ELEVATION: SURFACE: 115.4 TOP OF PVC CASING: 118.42

Rig:	Geoprobe 6610DT				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	MC Sampler	Casing	Augers	Core Barrel				
Size (ID)	1.48"	--	3.25"	--	1/28/2010	0.0 - 24.0	Sunny, mid 80s	
Length	4'	--	5'	--				
Type	--	--	HSA	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: PID background (BKG) is 0.1.

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		2"	~+2.5	12.0
						Schedule 40 PVC Screen		2"	12.0	22.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft., %)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail		Elevation (Ft. Datum)	
1				57SB01-00		TOPSOIL (organics) ----- 0.3 CLAY w/ silt and f. sand, orange br, damp; slight plasticity, soft (residuum)	cement grout to surface 2" PVC Riser		115.1	
2	D-1	2.7 68%		57SB01-01	BKG					
3										
4	4.0									
5										
6	D-2	3.4 85%			BKG					
7										
8	8.0								107.4	
9						CLAY w/ silt and little f. sand, orange br w/ tan/gray and blk mottling, damp, med plasticity, med stiff ----- 9.8	Bentonite 8 to 10'			
10	D-3	3.7 93%		57SB01-05	BKG	SAA (same as above) w/ increase in silt, friable			105.6	

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB01 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

Michael Baker Jr., Inc.

PROJECT: Naval Activity Puerto Rico SWMU 57

PROJ. NO.: 119197, 6.2

BORING NO.: 57SB01

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. Datum)
11						Continued from Sheet 1		104.4
12	D-3	3.7 93%				Same as 8.0' to 9.8'		103.4
13						SILT, orange br, moist to wet, no plasticity, loose		
14	D-4	1.8 45%						
15						15.6'-16.0': CLAY w/ silt, lt gray and blk laminated, moist, med plasticity, med stiff		
16						same as 12.0' to 15.6' (moist silt)		99.4
17								
18	D-5	2.5 63%						96.9
19						same as 15.6 to 16.0' (laminated clay)		
20								95.4
21						CLAY w/ silt and f. sand, orange br w/ tan/gray and blk mottling, friable, damp, slight plasticity, soft		
22	D-6	2.7 68%						93.4
23								
24								91.4
25						End of Boring at 24'		
26								
27								
28								
29								
30								

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB01 SHEET 2 OF 2



TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: Naval Activity Puerto Rico SWMU 57
 PROJ. NO.: 119197, 6.2 BORING NO.: 57SB02
 COORDINATES: EAST: 939428.8164 NORTH: 804431.4509
 ELEVATION: SURFACE: 121.9 TOP OF PVC CASING: 124.62

Rig: Geoprobe 6610DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1.48"	--	3.25"	--	1/26/2010	0.0 - 26.0	Sunny 84	
Length	4'	--	5'	--	1/27/2010	NA		23.39 TOC
Type	--	--	HSA	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: PID background (BKG) is 0.1.

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		2"	~+2.5	15.0
						Schedule 40 PVC Screen		2"	15.0	25.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail		Elevation (Ft. Datum)	
1				57SB02-00		TOPSOIL (organics) 0.3	cement grout to surface ← 2" PVC Riser		121.6	
2	D-1	3.6 90%		57SB02-01	BKG	CLAY, some silt; brown; moist; med stiff; med plasticity (fill) 1.1			120.8	
3						CLAY to COARSE SAND w/ some fine gravel; orange br. (some black mottling in fine grained matrix); dry to damp; no plasticity (fill)				
4	4.0					4.0			117.9	
5						CLAY to FINE SAND (weathered bedrock); tan br. w/ white mottling; damp; no plasticity				
6	D-2	4.0 100%			BKG					
7										
8	8.0									
9	D-3	4.0 100%			BKG	same as above (SAA) to 15'				
10				57SB02-05						

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB02 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

Michael Baker Jr., Inc.

PROJECT: Naval Activity Puerto Rico SWMU 57

PROJ. NO.: 119197, 6.2

BORING NO.: 57SB02

<u>SAMPLE TYPE</u>						<u>DEFINITIONS</u>		
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push 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. Datum)
11						Continued from Sheet 1		
12	D-3	4.0 100%			BKG		Bentonite 11 to 13'	
13						SAA to 15'	2" PVC Riser	
14	D-4	3.0 100%			BKG			
15						DPT refusal at 15', auger to depth for well installation	15.0	106.9
16						SAA to 26' (as observed from auger cuttings)	Sand 13 to 25'	
17								
18						tough augering at 18' (lt grey, hard, gravel sized pieces); easier augering thereafter		
19								
20	A-N						2" PVC Screen 15 to 25'	
21								
22								
23								
24								
25								
26							Soil	95.9
27						End of Boring at 26.0'		
28								
29								
30								

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB02 SHEET 2 OF 2



TEST BORING RECORD

Michael Baker Jr., Inc.

PROJECT: Naval Activity Puerto Rico SWMU 57
 PROJ. NO.: 119197, 6.2 BORING NO.: 57SB03
 COORDINATES: EAST: 939342.5 NORTH: 804396.0
 ELEVATION: SURFACE: 118.4

Rig: Geoprobe Track Rig 6610 DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
Macro Sampler	Casing	Augers	Core Barrel					
Size (ID)	1.48"				1/26/2010	0.0 - 12.0	sunny, mid-80s	
Length	4'							
Type								
Hammer Wt.								
Fall								

Remarks: PID background (BKG) is 0.1.

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 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. Datum)
1				57SB03-00		TOPSOIL (organics) 0.3	118.1
						SILT to SAND w/ gravel (former road base) 1.0	117.4
2	D-1	2.8 70%		57SB03-01	BKG	CLAY, little silt; orange br. w/ tan/gray, damp, med plasticity, med stiff (residuum)	
3							
4	4.0						
5							
6	D-2	4.0 100%			BKG		
7							
8	8.0					similar to above w/ some fine sand, friable, some olive color w/ black mottling, damp, slight to low plasticity, med stiff, soft (weathered bedrock) 6.4	112.0
9							
10	D-3	4.0 100%		57SB03-05	BKG		

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB03 SHEET 1 OF 2



TEST BORING RECORD

Michael Baker Jr., Inc.

PROJECT: Naval Activity Puerto Rico SWMU 57

SO NO.: 119197, 6.2

BORING NO.: 57SB03

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	Elevation (Ft. Datum)
11						Continued from Sheet 1	
12	D-3	4.0 100%			BKG		12.0 106.4
13						End of Boring at 12.0'	
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB03 SHEET 2 OF 2



TEST BORING AND WELL CONSTRUCTION RECORD

Michael Baker Jr., Inc.

PROJECT:	Naval Activity Puerto Rico SWMU 57		
PROJ. NO.:	119197, 6.2	BORING NO.:	57SB04
COORDINATES: EAST:	939313.4627	NORTH:	804431.8766
ELEVATION: SURFACE:	116.4	TOP OF PVC CASING:	119.26

Rig:	Geoprobe 6610DT				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	MC Sampler	Casing	Augers	Core Barrel				
Size (ID)	1.48"	--	3.25"	--	1/28/2010	0.0 - 23.5	Sunny, mid 80s	
Length	4'	--	5'	--				
Type	--	--	HSA	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: PID background (BKG) is 0.0.

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	2"	~+2.5	12.0
					Schedule 40 PVC Screen	2"	12.0	22.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail	Elevation (Ft. Datum)
1				57SB04-00		TOPSOIL (organics) 0.2		116.2
2	D-1	2.7 68%		57SB04-01	BKG	CLAY, little silt and fine to med sand; damp; med plasticity; soft (residuum) 1.0		114.5
3						CLAY, silt to fine sand, little med sand; olive; damp; very low plasticity; soft (residuum) 1.9		
4						CLAY, little silt; orange br. w/ tan/gray and some blk mottling, damp, med to high plasticity, med stiff		
5								
6	D-2	3.8 95%			BKG			
7								
8								
8		8.0						
9	D-3	3.9 98%			BKG	SAA w/ more tan (whitish)/gray and less blk		
10				57SB04-05				

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB04 SHEET 1 OF 2



TEST BORING AND WELL CONSTRUCTION RECORD

Michael Baker Jr., Inc.

PROJECT: Naval Activity Puerto Rico SWMU 57

PROJ. NO.: 119197, 6.2

BORING NO.: 57SB04

57SB04

<u>SAMPLE TYPE</u>						<u>DEFINITIONS</u>		
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Direct Push 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. Datum)
11						Continued from Sheet 1		
12	D-3	3.9 98%			BKG			
13								
14	D-4	3.8 95%			BKG			
15								
16								
17								
18	D-5	3.7 93%			BKG			
19								
20								
21								
22	D-6	3.5 100%			BKG		94.4	
23						DPT refusal at 23.5'; build well w/ 22'		
23.5						TD based on possible GW ~18'		92.9
24						End of Boring at 23.5'		
25								
26								
27								
28								
29								
30								

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB04 SHEET 2 OF 2



TEST BORING AND WELL CONSTRUCTION RECORD

Michael Baker Jr., Inc.

PROJECT: Naval Activity Puerto Rico SWMU 57
 PROJ. NO.: 119197, 6.2 BORING NO.: 57SB05
 COORDINATES: EAST: 939306.6980 NORTH: 804337.846
 ELEVATION: SURFACE: 118.1 TOP OF PVC CASING: 121.02

Rig: Geoprobe 6610DT					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
MC Sampler	Casing	Augers	Core Barrel					
Size (ID)	1.48" ID	--	3.25" ID	--	1/27/2010	0.0 - 21.0	Sunny, 84	
Length	4'	--	5'	--				
Type	--	--	HSA	--				
Hammer Wt.	--	--	--	--				
Fall	--	--	--	--				

Remarks: PID background (BKG) is 0.6.

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	2"	~+2.5	11.0
						Schedule 40 PVC Screen	2"	11.0	21.0
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm)	Visual Description	Well Installation Detail	Elevation (Ft. Datum)	
1				57SB05-00		TOPSOIL (organics) 0.3		117.8	
2	D-1	3.0 75%		57SB05-01 & duplicate	BKG	CLAY to F. SAND w/ some f. gravel, orange br. and dk br., damp, slight plasticity, med stiff (residuum)		115.1	
3						3.0			
4	4.0					CLAY, little silt; orange br. w/ tan/gray, damp, med to high plasticity, med stiff			
5						SAA w/ some black mottling			
6	D-2	4.0 100%			BKG	5.8			
7						SAA w/ slight increase in grain size and friable			
8	8.0								
9	D-3	4.0 100%			BKG	SAA to 10.3'			
10				57SB05-05		10.3			

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB05 SHEET 1 OF 2

TEST BORING AND WELL CONSTRUCTION RECORD

Michael Baker Jr., Inc.

PROJECT: Naval Activity Puerto Rico SWMU 57

PROJ. NO.: 119197, 6.2

BORING NO.: 57SB05

57SB05

<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	Well Installation Detail	Elevation (Ft. Datum)	
11	D-3	4.0 100%			BKG	Continued from Sheet 1			
12						12.0			SILT to F. SAND w/ little clay; blk, gray & br mottled; damp; slight plasticity; soft (weathered bedrock)
13	D-4	4.0 100%			1.5				
14					14				
15					BKG	lt gray hard bedrock			14.5
16					16.0	20+			SILT to F. SAND w/ little clay; blk, gray & br mottled; damp; slight plasticity; soft (weathered bedrock)
17	D-5	4.0 100%			60-150				
18					17				
19					18	SILT and F. SAND w/ little clay; orange br, tan/gray and some blk, gray and dk br; wet at 18.0'; slight petro odor			
20					20.0	below 18-20'			
21		1.0 100%			BKG	SAA, wet, DPT refusal at 21'; attempt to auger; auger refusal at 21'		97.1	
22						End of Boring at 21.0'			
23									
24									
25									
26									
27									
28									
29									
30									

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB05 SHEET 2 OF 2



TEST BORING RECORD

Michael Baker Jr., Inc.

PROJECT: Naval Activity Puerto Rico SWMU 57
 PROJ. NO.: 119197, 6.2 BORING NO.: 57SB06
 COORDINATES: EAST: 939264.2 NORTH: 804326.9
 ELEVATION: SURFACE: 117.2

Rig:	Geoprobe Track Rig 6610 DT				Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Macro Sampler	Casing	Augers	Core Barrel				
Size (ID)	1.48"				1/28/2010	0.0 - 12.0	sunny, mid-80s	
Length	4'							
Type								
Hammer Wt.								
Fall								

Remarks: PID background (BKG) is 0.1.

<u>SAMPLE TYPE</u> S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample	<u>DEFINITIONS</u> 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. Datum)
1				57SB06-00		TOPSOIL (organics) ----- 0.3	116.9
2	D-1	3.0 75%		57SB06-01	BKG	CLAY w/ silt and fine to coarse sand, br, damp, slight to low plasticity, soft (fill/reworked)	
3						----- 3.2	114.0
4	4.0					CLAY and SILT w/ f. sand, orange br w/ tan/gray (very little blk), damp, med plasticity, med stiff (residuum)	
5							
6	D-2	3.2 80%			BKG		
7						----- 6.2	111.0
8	8.0					SILT and F. SAND w/ some clay, friable, orange/br w/ tan/gray, damp, slight plasticity, soft	
9							
10	D-3	3.0 75%		57SB06-05	BKG		

DRILLING CO.: JFA Geo & Enviro Scientists
 DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius
 BORING NO.: 57SB06 SHEET 1 OF 2

TEST BORING RECORD

Michael Baker Jr., Inc.

PROJECT: Naval Activity Puerto Rico SWMU 57

SO NO.: 119197, 6.2

BORING NO.: 57SB06

57SB06

<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. Datum)
11						Continued from Sheet 1	
12	D-3	3.0 75%			BKG		105.2
13						End of Boring at 12.0'	
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

DRILLING CO.: JFA Geo & Enviro Scientists

DRILLER: Domingo Gonzalez

BAKER REP.: Robert Roselius

BORING NO.: 57SB06 SHEET 2 OF 2

CHAIN-OF-CUSTODY FORMS



CompuChem
a division of Liberty Analytical Corp.

CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513

Phone: 919-379-4100 Fax 919-379-4040

Courier FED EX
Airbill No. 9685 9529 4765
Sampling Complete? Y or N

Client/Reporting Information				Project Information				Requested Analysis (include method and bottle type)								Matrices	
Company Name <u>Michael Baker Jr, INC.</u>				Project Name <u>SWMU 57</u>				<u>APP IX. VOC (3-40ml) #118</u> <u>APP. IX. LL-SVOC (2-AL)</u> <u>PcB (9082) (2-AL)</u> <u>TPH DRO (9015 B)</u> <u>APP IX. Metals (1-PL)</u> <u>TPH GRO (9015 B) (2-40ml)</u>								GW - Ground water WW - Waste water SW - Surface water SO - Soil/Sediment TB - Trip Blank RI - Rinsate WP - Wipe O - Other	
Address <u>100 Arside Drive</u>				Sampling Location <u>NAPR - Puerto Rico</u>													
City State Zip <u>Moorestown PA 15708</u>				Turnaround time <u>STANDARD</u>													
Project Contact <u>Mark Kimes</u>				Batch QC or Project Specific? If Specific, which Sample ID?													
Phone # <u>412-269-2009</u>				Are aqueous samples field filtered for metals? Y or N													
Sampler's Name <u>A. Gailey</u>				Are high concentrations expected? Y or <input checked="" type="radio"/> N? If yes, which ID(s)?												pH / Sample Info (Lab Use)	
CompuChem No (Lab Use)	Residual Chlorine Present?		Collection		Matrix	# of bottles	Number of Preserved Bottles						Metals				
	Yes	No	Date	Time			HCl	NaOH	HNO3	H2SO4	MEOH	Other					
<u>1001160-05</u>		<input checked="" type="checkbox"/>	<u>1/27/10</u>	<u>1640</u>	<u>RI</u>	<u>12</u>	<u>5</u>		<u>1</u>				<u>W</u>	<u>2</u>	<u>2</u>		
<u>-06</u>		<input checked="" type="checkbox"/>	<u>1/28/10</u>	<u>0710</u>	<u>RI</u>	<u>12</u>	<u>5</u>		<u>1</u>				<u>W</u>	<u>2</u>	<u>2</u>		
<u>-07</u>		<input checked="" type="checkbox"/>	<u>1/27/10</u>		<u>TB</u>	<u>5</u>	<u>5</u>						<u>W</u>	<u>2</u>	<u>2</u>		

Lab Use Only	Comments
Sample Unpacked By: <u>K. Manning</u>	* Laboratory accident: 40ml HCl VOC for 57ER03 was broken after receipt. (still have 2 vials left for VOC) * 2-40ml #1-40ml (GRO) for 57TB03 has < pea size bbl. * 1-40ml for (GRO) 57TB03 has > pea size bbl.
Sample Order Entry By: <u>[Signature]</u>	
Samples Received in Good Condition? <input checked="" type="checkbox"/> Y or <input checked="" type="checkbox"/> N If no, explain:	

Sample Custody			
Relinquished by: <u>[Signature]</u>	Date/Time: <u>1/28/10 1500</u>	Received by: <u>K. Manning</u>	Date/Time: <u>01-29-10 0930</u>
Relinquished by:	Date/Time:	Received by:	Date/Time:
Subcontract? <input checked="" type="checkbox"/> Y or N If yes, where?	Custody Seal(s) intact? <input checked="" type="checkbox"/> Y or N	On Ice? <input checked="" type="checkbox"/> Y or N	Cooler Temp: <u>0.3, 1.5°C</u> °C

Residual Chlorine Present?

Yes _____ No

CHAIN OF CUSTODY

Page 1 of 1
21563CompuChem
a division of Liberty Analytical Corp.

501 Madison Ave.

Cary, NC 27513

Phone: 919-379-4100 Fax 919-379-4040

Courier FEDEX
Airbill No. 8617 8652 7384
Sampling Complete? Y or

Client/Reporting Information				Project Information				Requested Analysis (include method and bottle type)						Matrices	
Company Name Michael Baker Jr., Inc.				Project Name SWMU 57				AP. IX. UOC AP. IX. LL SUOC PCB (8082) TPH DRO (8015 B) AP. IX. Metals TPH G-RO (8015 B)						GW - Ground water WW - Waste water SW - Surface water SO - Soil/Sediment TB - Trip Blank RI - Rinsate WP - Wipe O - Other	
Address 100 Airside Drive				Sampling Location NAPR - Puerto Rico											
City State Zip Moon TWP PA 15108				Turnaround time Standard											
Project Contact Mark Kimes				Batch QC or Project Specific? If Specific, which Sample ID?											
Phone # 412-269-2009				Are aqueous samples field filtered for metals? Y or N											
Sampler's Name A. Caye / R. Roselius				Are high concentrations expected? Y or <input checked="" type="checkbox"/> If yes, which ID(s)?										pH / Sample Info (Lab Use)	
CompuChem No (Lab. Use)	Field ID	Collection		Matrix	# of bottles	Number of Preserved Bottles						Metals			
		Date	Time			HCl	NaOH	HNO3	H2SO4	MEOH	Other				
1001181-04	57SS08	1/29/10	0900	SO	7										
-05	57SS09**		0930	SO	7										
-06	57SS09-D		0930	SO	7										
-07	57SS10		1000	SO	7										
-08	57SS11		1235	SO	7										
-09	57SS12	1/29/10	0800	SO	7										
1001160-08	57ER04*	1/29/10	1035	RI	12	5		1						12	
-09	57TB04	1/29/10		TB		5									
Lab Use Only						Comments									
Sample Unpacked By: <i>Doane Dwyer</i>						Cyanide samples checked for sulfide & chlorine? Y or <input checked="" type="checkbox"/> NA						*ID 57ER04 - Rec'd 1 AL DRO and 1 AL PCB 1/11/10			
Sample Order Entry By: <i>Doane Dwyer</i>						625 & Phenol samples checked for chlorine? Y or <input checked="" type="checkbox"/> NA						Broken. ** Rec'd 1-8 oz jar for PCB/DRO with 2/11/10			
Samples Received in Good Condition? Y or <input checked="" type="checkbox"/> N						608 samples checked for pH between 5.0-9.0? Y or <input checked="" type="checkbox"/> NA						broken bottom (ID 57SS09), analyzed approx 1/20/10			
If no, explain: <i>see breakage notes</i>												will use SVOC/LL RAH 8oz jar for All 3 parameters 2/11/10			
Relinquished by: <i>Doane Dwyer</i>						Date/Time: 1/29/10 1500						Received by: <i>Doane Dwyer</i>		Date/Time: 2/1/10 1155	
Relinquished by:						Date/Time:						Received by:		Date/Time:	
Subcontact? Y or <input checked="" type="checkbox"/> N If yes, where?						Custody Seal(s) intact? Y or <input checked="" type="checkbox"/> N						On Ice? Y or N		Cooler Temp: 2.8° 1.7 °C	

Samples stored 60 days after date report mailed at no extra charge.

White & Yellow copy to lab • Pink copy for customer SW0015



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CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513

Phone: 919-379-4100 Fax 919-379-4040

Courier **FEDEX**
Airbill No. **8617 8652 7410**
Sampling Complete? Y or N

Client/Reporting Information				Project Information				Requested Analysis (include method and bottle type)										Matrices	
Company Name Michael Baker Jr., INC.				Project Name SWMU 57				APP IX. VOC 3-40ml APP. IX LL SUOC 2AL/40 PCB (8082) 40Z/2-AL TPH DRO (8015 B) 40Z/2-AL APP IX Metals 40Z APP. IX. Metals (Dissolved) 2-40ml TPH G-RO (8015 B) 2-40ml										GW - Ground water	
Address 100 Airside Drive				Sampling Location NAPR - P.R.														WW - Waste water	
City State Zip MOON TWP. PA 15108				Turnaround time Standard														SW - Surface water	
Project Contact Mark Kimes				Batch QC or Project Specific? If Specific, which Sample ID?														SO - Soil/Sediment	
Phone # 412-269-2009				Are aqueous samples field filtered for metals? Y or N														TB - Trip Blank	
Sampler's Name A. Gairol / R. Pocius				Are high concentrations expected? Y or <input checked="" type="radio"/> N? If yes, which ID(s)?				RI - Rinsate		WP - Wipe		O - Other							
CompuChem No (Lab Use)	Field ID	Collection		# of bottles	Number of Preserved Bottles							Metals	Diss. Metals	pH (Sample Info Lab Use)					
		Date	Time		Matrix	HCl	NaOH	HNO3	H2SO4	MEOH	Other								
1002019-01	13GW07	1/31/10	0955	GW	13	5	2												
1002019-01	57GW01	2/1/10	0920	GW	13	5	2												
1002019-01	57GW01-MS	2/1/10	0920	GW	13	5	2												
1002019-01	57GW01-MSD	2/1/10	0920	GW	13	5	2												
1002019-01	57GW02	1/31/10	1250	GW	13	5	2												
1002019-01	57GW04	1/31/10	1505	GW	13	5	2												
1002019-01	57GW07	1/31/10	1750	GW	13	5	2												
1002019-01	57GW07-D	1/31/10	1750	GW	13	5	2												
1002020-01	57WS01	1/30/10	1440	O	4														
1002020-01	57WS02	1/30/10	1500	O	4														

Sample Unpacked By: <i>Jennifer Dole</i>		Cyanide samples checked for sulfide & chlorine? Y or <input checked="" type="radio"/> NA	Residual Chlorine Present? Yes _____ No <input checked="" type="checkbox"/>
Sample Order Entry By: <i>Jennifer Dole</i>		625 & Phenol samples checked for chlorine? Y or <input checked="" type="radio"/> NA	
Samples Received in Good Condition? Y or N		608 samples checked for pH between 5.0-9.0? Y or <input checked="" type="radio"/> NA	

Sample Custody			
Relinquished by: <i>[Signature]</i>	Date/Time: 2/1/10 1500	Received by: <i>Jennifer Dole</i>	Date/Time: 2-2-10 11:25
Relinquished by:	Date/Time:	Received by:	Date/Time:
Subcontact? Y or <input checked="" type="radio"/> N If yes, where?	Custody Seal(s) intact? <input checked="" type="radio"/> Y or N	On Ice? <input checked="" type="radio"/> Y or N	Cooler Temp: 0.6, 1.5, 2.6

Samples stored 60 days after date report mailed at no extra charge. White & Yellow copy to lab. Pink copy for customer. **5N0010**



CompuChem
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CHAIN OF CUSTODY

501 Madison Ave.
Cary, NC 27513

Phone: 919-379-4100 Fax 919-379-4040

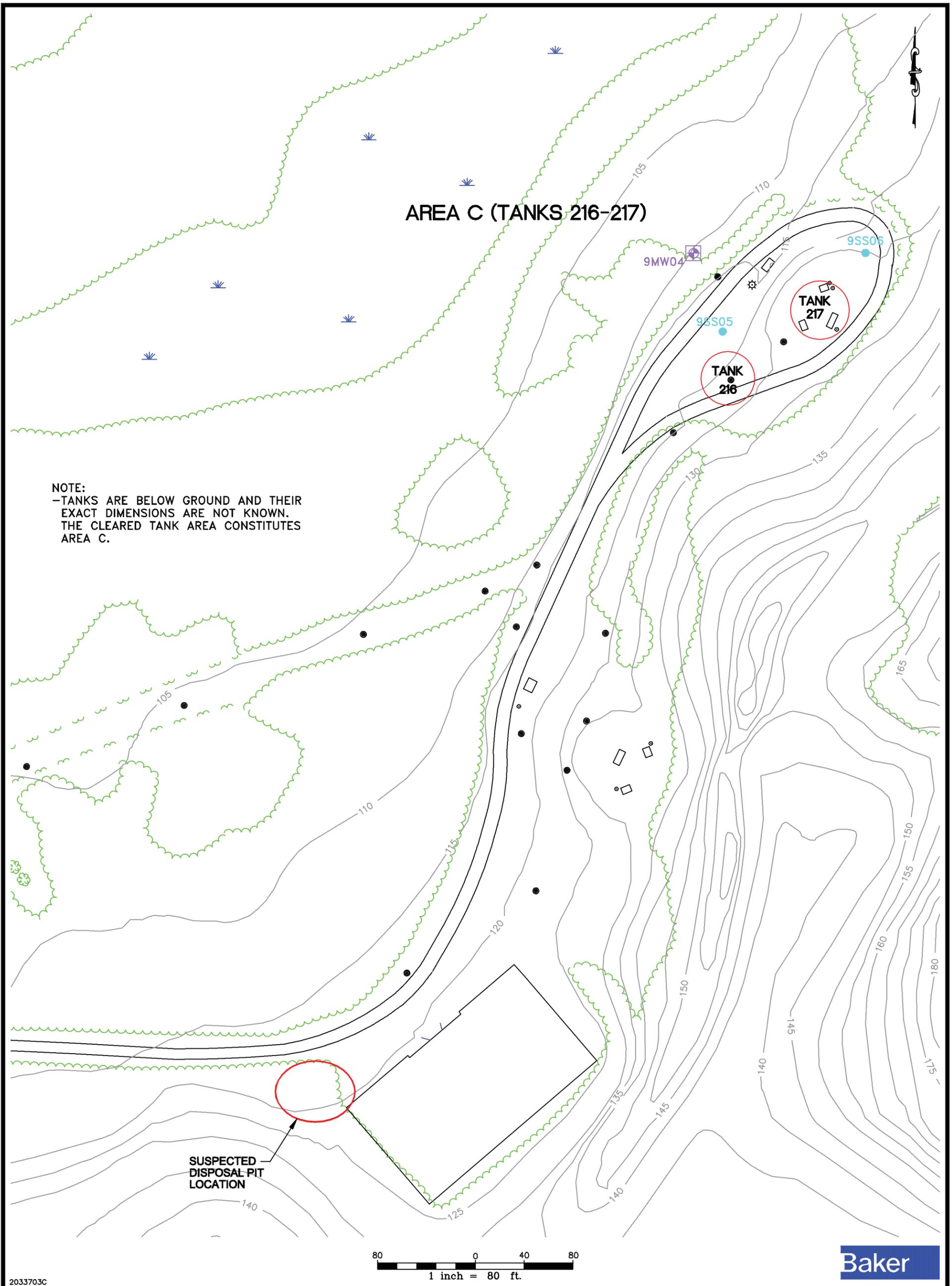
Courier **FEDEX**
Airbill No. **8617 8652 7400**
Sampling Complete? or N

Client/Reporting Information				Project Information				Requested Analysis (include method and bottle type)								Matrices			
Company Name Michael Baker Jr., Inc.				Project Name SWMU 57				<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> APP. IX. PCB (2-AL) (1-8oz) </div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> TCLP Volatiles (1-AL) (1-8oz) </div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> TCLP RCRA Metals (1-AL) (1-8oz) </div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);"> RCI (1-AL) (1-8oz / Share 8oz w/ PCB) </div> </div>								Matrices			
Address 100 Airside Drive				Sampling Location NAPP - PR												GW - Ground water			
City State Zip Mon TWP PA 15108				Turnaround time Standard												WW - Waste water			
Project Contact Mark Kimes				Batch QC or Project Specific? If Specific, which Sample ID?												SW - Surface water			
Phone # 412-269-52009				Are aqueous samples field filtered for metals? Y or N				SO - Soil/Sediment											
Sampler's Name A. Gurey / R. Roselius				Are high concentrations expected? Y or <input checked="" type="checkbox"/> N? If yes, which ID(s)?				TB - Trip Blank											
Residual Chlorine Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				Collection				Number of Preserved Bottles								pH / Sample Info (Lab Use)			
				Field ID	Date	Time	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	MEOH	Other					
CompuChem No (Lab Use)				1002031-01				57 IDW 01		2/2/10		0755		0		6			
1002032-01				57 IDW 02				2/2/10		0945		50		3					

Lab Use Only		Comments	
Sample Unpacked By: K. Manning	Cyanide samples checked for sulfide & chlorine? Y or <input checked="" type="checkbox"/> N	Done of 57IDW01 RCRA Metals AL's was broken upon receipt.	
Sample Order Entry By: [Signature]	625 & Phenol samples checked for chlorine? Y or <input checked="" type="checkbox"/> N		
Samples Received in Good Condition? Y or N	608 samples checked for pH between 5.0-9.0? Y or <input checked="" type="checkbox"/> N		
If no, explain: * see comments			

Sample Custody			
Relinquished by: [Signature]	Date/Time: 2/2/10 1500	Received by: K. Manning	Date/Time: 020310 0850
Relinquished by: [Signature]	Date/Time:	Received by:	Date/Time:
Subcontract? Y or N	Custody Seal(s) intact? <input checked="" type="checkbox"/> or N	On Ice? <input checked="" type="checkbox"/> or N	Cooler Temp: 4.2; 1.1 °C

APPENDIX C
SWMU 9 CMS INVESTIGATION REPORT FIGURE 2-5



LEGEND

- - SURFACE SOIL SAMPLE LOCATION (PHASE I)
- ⊕ - MONITORING WELL LOCATION (PHASE I)
- 110— - SURFACE ELEVATION CONTOUR
- SUSPECTED LOCATION OF DISPOSAL PIT
- ⊙ - TELEPHONE POLE

FIGURE 2-5
SURFACE SOIL SAMPLING LOCATIONS
SWMU 9 – AREA C
TANKS 216 – 217

NAVAL STATION ROOSEVELT ROADS
 PUERTO RICO

APPENDIX D
LABORATORY ANALYTICAL RESULTS

SURFACE SOIL

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB01	57SB02	57SB03	57SB04	57SB05
Sample ID	57SB01-00	57SB02-00	57SB03-00	57SB04-00	57SB05-00
Sample Date	1/28/2010	1/26/2010	1/26/2010	1/28/2010	1/27/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Volatiles (ug/kg)					
1,1,1,2-Tetrachloroethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,1,1-Trichloroethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,1,2,2-Tetrachloroethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,1,2-Trichloroethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,1-Dichloroethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,1-Dichloroethene	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,2,3-Trichloropropane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,2-Dibromo-3-chloropropane (DBCP)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,2-Dibromoethane (EDB)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,2-Dichloroethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,2-Dichloroethene (trans)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,2-Dichloropropane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,3-Dichloropropene (cis)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,3-Dichloropropene (trans)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
1,4-Dichloro-2-butene (trans)	20 U	20 R	19 U	15 U	21 U
1,4-Dioxane (p-)	250 R	260 R	240 R	190 R	260 R
2-Butanone (MEK)	13 U	13 R	12 U	9.3 U	13 U
2-Chloro-1,3-butadiene (Chloroprene)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
2-Hexanone (MBK)	13 U	13 R	12 U	9.3 U	13 U
3-Chloropropene (Allyl Chloride)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
4-Methyl-2-pentanone (MIBK)	13 U	13 R	12 U	9.3 U	13 U
Acetone	21 U	22 R	20 U	16 U	22 U
Acetonitrile	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Acrolein	50 R	51 R	47 R	37 R	53 R
Acrylonitrile	50 U	51 R	47 U	37 U	53 U
Benzene	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Bromodichloromethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Bromoform	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Bromomethane	7.4 U	7.5 R	6.9 U	5.4 U	7.7 U
Carbon Disulfide	2.4 J	5.1 R	4.7 U	3.7 U	5.3 U
Carbon Tetrachloride	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Chlorobenzene	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Chloroethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Chloroform	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Chloromethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Dibromochloromethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Dibromomethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Dichlorodifluoromethane (Freon-12)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Ethyl Methacrylate	50 U	51 R	47 U	37 U	53 U
Ethylbenzene	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Isobutyl Alcohol	250 R	260 R	240 R	190 R	260 R
Methyl Acrylonitrile	50 U	51 R	47 U	37 U	53 U
Methyl Iodide	5 U	5.1 R	4.7 U	3.7 U	5.3 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB01	57SB02	57SB03	57SB04	57SB05
Sample ID	57SB01-00	57SB02-00	57SB03-00	57SB04-00	57SB05-00
Sample Date	1/28/2010	1/26/2010	1/26/2010	1/28/2010	1/27/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Volatiles (ug/kg) (Cont)					
Methyl Methacrylate	50 U	51 R	47 U	37 U	53 U
Methylene Chloride	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Pentachloroethane	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Propionitrile (Ethyl Cyanide)	250 R	260 R	240 R	190 R	260 R
Styrene (Ethenylbenzene)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Tetrachloroethene (PCE)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Toluene	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Trichloroethene (TCE)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Trichlorofluoromethane (Freon 11)	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Vinyl Acetate	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Vinyl Chloride	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Xylene, m/p-	10 U	10 R	9.5 U	7.4 U	11 U
Xylene, o-	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Xylenes, total	5 U	5.1 R	4.7 U	3.7 U	5.3 U
Semivolatiles (ug/kg)					
1,2,4,5-Tetrachlorobenzene	220 U	220 U	200 U	200 U	250 U
1,2,4-Trichlorobenzene	220 U	220 U	200 U	200 U	250 U
1,2-Dichlorobenzene (o-)	220 U	220 U	200 U	200 U	250 U
1,3,5-Trinitrobenzene (TNB)	220 UJ	220 U	200 U	200 U	250 U
1,3-Dichlorobenzene (m-)	220 U	220 U	200 U	200 U	250 U
1,3-Dinitrobenzene (m-)	220 U	220 U	200 U	200 U	250 UJ
1,4-Dichlorobenzene (p-)	220 U	220 U	200 U	200 U	250 U
1,4-Naphthoquinone	220 UJ	220 U	200 U	200 U	250 U
1,4-Phenylenediamine	2200 R	2200 R	2000 R	2000 R	2500 R
1-Naphthylamine	220 UJ	220 U	200 U	200 UJ	250 U
2,2'-Oxybis[1-chloropropane]	220 U	220 U	200 U	200 U	250 UJ
2,3,4,6-Tetrachlorophenol	420 U	430 U	400 U	390 U	480 U
2,4,5-Trichlorophenol	420 U	430 U	400 U	390 U	480 U
2,4,6-Trichlorophenol	420 U	430 U	400 U	390 U	480 U
2,4-Dichlorophenol	420 U	430 U	400 U	390 U	480 U
2,4-Dimethylphenol	420 U	430 U	400 U	390 U	480 U
2,4-Dinitrophenol	420 U	430 U	400 U	390 U	480 U
2,4-Dinitrotoluene (DNT)	220 U	220 U	200 U	200 U	250 U
2,6-Dichlorophenol	420 U	430 U	400 U	390 U	480 U
2,6-Dinitrotoluene (DNT)	220 U	220 U	200 U	200 U	250 UJ
2-Acetylaminofluorene	220 U	220 U	200 U	200 UJ	250 U
2-Chloronaphthalene	220 U	220 U	200 U	200 U	250 U
2-Chlorophenol	420 U	430 U	400 U	390 U	480 U
2-Methyl-5-nitroaniline	220 U	220 U	200 U	200 UJ	250 U
2-Methylphenol (o-Cresol)	420 U	430 U	400 U	390 U	480 U
2-Naphthylamine	220 UJ	220 U	200 U	200 UJ	250 U
2-Nitroaniline	220 UJ	220 U	200 U	200 U	250 UJ
2-Nitrophenol	420 U	430 U	400 U	390 U	480 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB01	57SB02	57SB03	57SB04	57SB05
Sample ID	57SB01-00	57SB02-00	57SB03-00	57SB04-00	57SB05-00
Sample Date	1/28/2010	1/26/2010	1/26/2010	1/28/2010	1/27/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0

Semivolatiles (ug/kg) (Cont)

2-Picoline	220 U	220 U	200 U	200 UJ	250 U
3,3'-Dichlorobenzidine	220 U	220 U	200 U	200 U	250 U
3,3'-Dimethylbenzidine	220 U	220 U	200 U	200 UJ	250 U
3-Methylcholanthrene	220 U	220 U	200 U	200 U	250 U
3-Methylphenol (m-Cresol)	320 U	320 U	300 U	300 U	360 U
3-Nitroaniline	220 U	220 U	200 U	200 U	250 U
4,6-Dinitro-2-methylphenol	420 U	430 U	400 U	390 U	480 U
4-Aminobiphenyl	220 U	220 U	200 U	200 UJ	250 U
4-Bromophenyl-phenylether	220 U	220 U	200 U	200 U	250 U
4-Chloro-3-methylphenol	420 UJ	430 U	400 U	390 U	480 U
4-Chloroaniline	220 U	220 U	200 U	200 U	250 U
4-Chlorophenyl-phenylether	220 U	220 U	200 U	200 U	250 U
4-Dimethylaminoazobenzene (p-)	220 U	220 U	200 U	200 UJ	250 U
4-Methylphenol (p-Cresol)	320 U	320 U	300 U	300 U	360 U
4-Nitroaniline	220 U	220 U	200 U	200 U	250 U
4-Nitrophenol	420 U	430 U	400 U	390 U	480 U
4-Nitroquinoline-1-oxide	220 UJ	220 U	200 U	200 UJ	250 U
7,12-Dimethylbenz(a)anthracene	220 U	220 U	200 U	200 U	250 U
Acetophenone	220 U	220 U	200 U	200 U	250 U
Aniline	220 U	220 U	200 U	200 U	250 UJ
Aramite	220 U	220 U	200 U	200 R	250 UJ
Benzyl Alcohol	220 UJ	220 U	200 U	200 U	250 U
Bis(2-chloroethoxy)methane	220 U	220 U	200 U	200 U	250 UJ
Bis(2-chloroethyl)ether	220 U	220 U	200 U	200 U	250 UJ
Bis(2-ethylhexyl) Phthalate (BEHP)	160 J	110 J	97 J	200 U	250 U
Butyl Benzyl Phthalate	220 U	220 U	200 U	200 U	250 U
Diallate	220 UJ	220 U	200 U	200 UJ	250 UJ
Diallate (cis)	220 UJ	220 U	200 U	200 U	250 UJ
Diallate (trans)	220 UJ	220 U	200 U	200 UJ	250 UJ
Dibenzofuran	220 U	220 U	200 U	200 U	250 U
Diethyl Phthalate (DEP)	220 U	220 U	200 U	200 U	250 U
Dimethyl Phthalate	220 U	220 U	200 U	200 U	250 UJ
Di-n-butyl Phthalate (DBP)	220 UJ	220 U	200 U	200 U	250 U
Di-n-octyl Phthalate	220 U	220 U	200 U	200 U	250 U
Dinoseb	220 U	220 U	200 U	200 U	250 U
Ethyl Methane Sulfonate (EMS)	220 UJ	220 U	200 U	200 U	250 U
Hexachloro-1,3-butadiene	220 U	220 U	200 U	200 U	250 U
Hexachlorobenzene	220 U	220 U	200 U	200 U	250 U
Hexachlorocyclopentadiene	220 R	220 U	200 U	200 R	250 U
Hexachloroethane	220 U	220 U	200 U	200 U	250 U
Hexachloropropene	220 R	220 U	200 U	200 R	250 U
Isophorone	220 U	220 U	200 U	200 U	250 U
Isosafrole	220 U	220 U	200 U	200 U	250 UJ

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**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB01	57SB02	57SB03	57SB04	57SB05
Sample ID	57SB01-00	57SB02-00	57SB03-00	57SB04-00	57SB05-00
Sample Date	1/28/2010	1/26/2010	1/26/2010	1/28/2010	1/27/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Semivolatiles (ug/kg) (Cont)					
Methapyrilene	220 U	220 UJ	200 UJ	200 UJ	250 UJ
Methyl Methane Sulfonate	220 U	220 U	200 U	200 U	250 U
Nitrobenzene	220 U	220 U	200 U	200 U	250 U
n-Nitrosodiethylamine	220 U	220 U	200 U	200 UJ	250 U
n-Nitrosodimethylamine (NDMA)	220 U	220 U	200 U	200 U	250 U
n-Nitroso-di-n-butylamine	220 U	220 UJ	200 UJ	200 U	250 UJ
n-Nitrosodi-n-propylamine	220 UJ	220 U	200 U	200 U	250 UJ
n-Nitrosodiphenylamine	220 U	220 U	200 U	200 UJ	250 U
n-Nitrosomethylethylamine	220 U	220 U	200 U	200 UJ	250 U
n-Nitrosomorpholine	220 UJ	220 U	200 U	200 UJ	250 UJ
n-Nitrosopiperidine	220 U	220 U	200 U	200 UJ	250 U
n-Nitrosopyrrolidine	220 UJ	220 U	200 U	200 UJ	250 UJ
o-Toluidine	220 U	220 U	200 U	200 UJ	250 U
Pentachlorobenzene	220 U	220 U	200 U	200 U	250 U
Pentachloronitrobenzene	220 U	220 U	200 U	200 U	250 U
Pentachlorophenol	420 UJ	430 U	400 U	390 U	480 U
Phenacetin	220 U	220 U	200 U	200 U	250 U
Phenol	420 U	430 U	400 U	390 U	480 U
Pronamide	420 U	430 U	400 U	390 U	480 U
Pyridine	220 U	220 U	200 U	200 U	250 U
Safrole	220 U	220 U	200 U	200 U	250 U
Low Molecular Weight PAHs (ug/kg)					
2-Methylnaphthalene	3.1 J	11 U	10 U	3.6 J	12 U
Acenaphthene	0.93 J	11 U	10 U	1.3 J	12 U
Acenaphthylene	3.3 J	11 U	10 U	3.6 J	12 U
Anthracene	2.5 J	11 U	10 U	7.1 J	12 U
Fluoranthene	11 U	11 U	10 U	12	12 U
Fluorene	0.97 J	11 U	10 U	1.5 J	12 U
Naphthalene	11 UJ	1.1 J	1.2 J	9.9 UJ	12 U
Phenanthrene	7.3 J	11 U	10 U	15	12 U
High Molecular Weight PAHs (ug/kg)					
Benzo(a)anthracene	8.2 J	11 U	10 U	8.9 J	12 U
Benzo(a)pyrene (BaP)	6.6 J	11 U	10 U	6.2 J	0.63 J
Benzo(b)fluoranthene	4.5 J	11 U	10 U	3.6 J	1.5 J
Benzo(g,h,i)perylene	2.6 J	11 U	10 U	1.7 J	0.65 J
Benzo(k)fluoranthene	5.3 J	11 U	10 U	4.9 J	0.9 J
Chrysene	8.1 J	11 U	10 U	8.6 J	1.1 J
Dibenz(a,h)anthracene	0.75 J	11 U	10 U	0.71 J	12 U
Indeno(1,2,3-cd)pyrene	3.5 J	11 U	10 U	2.5 J	0.8 J
Pyrene	13	11 U	10 U	17	0.9 J
PAH totals (ug/kg)					
Low molecular weight PAHs	40.1	78.1	71.2	54	96
High molecular weight PAHs	52.55	99	90	54.11	30.48

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB01	57SB02	57SB03	57SB04	57SB05
Sample ID	57SB01-00	57SB02-00	57SB03-00	57SB04-00	57SB05-00
Sample Date	1/28/2010	1/26/2010	1/26/2010	1/28/2010	1/27/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
PCBs (ug/kg)					
Aroclor-1016	95 U	97 U	90 U	89 U	110 U
Aroclor-1221	76 U	78 U	72 U	71 U	87 U
Aroclor-1232	32 U	32 U	30 U	30 U	36 U
Aroclor-1242	44 U	45 U	42 U	42 U	51 U
Aroclor-1248	32 U	32 U	30 U	30 U	36 U
Aroclor-1254	25 U	26 U	24 U	24 U	29 U
Aroclor-1260	38 U	39 U	36 U	36 U	43 U
TPH (mg/kg)					
Diesel Range Organics (DRO)	10 U	6.9 J	5.5 J	4.1 J	9.2 J
Gasoline Range Organics (GRO)	0.63 U	0.65 U	0.6 U	0.6 U	0.72 U
Total TPH	10.63 U	7.55 J	6.1 J	4.7 J	9.92 J
Inorganics (mg/kg)					
Antimony	0.75 U	1.3 J	0.95 J	1.2 J	1.5 J
Arsenic	0.74 U	1.4	1.4	0.34 U	2
Barium	82.8 J	90.8	55.6	67.1	72
Beryllium	0.26 J	0.45 U	0.1 U	0.03 U	0.16 U
Cadmium	0.75	0.25 U	0.26 U	0.17 U	0.58 U
Chromium	28.5	24.2	16.9	108	29.1
Cobalt	27.2	52.7	14.5	38.7	16.4
Copper	92.1	63.7 J	49.4 J	127 J	86.3 J
Lead	52.5	19.1 J	9.2 J	10.3 J	20.6 J
Mercury	0.04 J	0.13	0.026 J	0.019 U	0.04 J
Nickel	19.4	14.7	10	39.2	10.7
Selenium	0.23 U	0.45 R	0.4 R	0.43 R	0.51 R
Silver	0.12 U	0.26 J	0.15 J	0.23 J	0.22 J
Thallium	8.3	3.6	1.1 J	4	1.4 J
Tin	1.9 J	1.7 J	1.6 J	2.3 J	2.3 J
Vanadium	155	184	74.9	154	149
Zinc	99.5	45.7	67.2	74.6	155

Notes:

- NA - Not Analyzed
- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB06	57SB07	57SB07	57SS08	57SS09
Sample ID	57SB06-00	57SB07-00	57SB07-00D	57SS08	57SS09
Sample Date	1/28/2010	1/27/2010	1/27/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Volatiles (ug/kg)					
1,1,1,2-Tetrachloroethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,1,1-Trichloroethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,1,2,2-Tetrachloroethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,1,2-Trichloroethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,1-Dichloroethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,1-Dichloroethene	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,2,3-Trichloropropane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,2-Dibromo-3-chloropropane (DBCP)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,2-Dibromoethane (EDB)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,2-Dichloroethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,2-Dichloroethene (trans)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,2-Dichloropropane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,3-Dichloropropene (cis)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,3-Dichloropropene (trans)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
1,4-Dichloro-2-butene (trans)	17 U	21 U	22 U	29 U	20 U
1,4-Dioxane (p-)	210 R	260 R	270 R	360 R	250 R
2-Butanone (MEK)	10 U	13 U	14 U	18 U	13 U
2-Chloro-1,3-butadiene (Chloroprene)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
2-Hexanone (MBK)	10 U	13 U	14 U	18 U	13 U
3-Chloropropene (Allyl Chloride)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
4-Methyl-2-pentanone (MIBK)	10 U	13 U	14 U	18 U	13 U
Acetone	18 U	22 U	23 U	48 U	22 U
Acetonitrile	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Acrolein	42 R	52 R	54 R	72 R	51 R
Acrylonitrile	42 U	52 U	54 U	72 R	51 R
Benzene	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Bromodichloromethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Bromoform	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Bromomethane	6.1 U	7.6 U	8 U	11 U	7.4 U
Carbon Disulfide	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Carbon Tetrachloride	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Chlorobenzene	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Chloroethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Chloroform	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Chloromethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Dibromochloromethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Dibromomethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Dichlorodifluoromethane (Freon-12)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Ethyl Methacrylate	42 U	52 U	54 U	72 U	51 U
Ethylbenzene	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Isobutyl Alcohol	210 R	260 R	270 R	360 R	250 R
Methyl Acrylonitrile	42 U	52 U	54 U	72 U	51 U
Methyl Iodide	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U

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**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB06	57SB07	57SB07	57SS08	57SS09
Sample ID	57SB06-00	57SB07-00	57SB07-00D	57SS08	57SS09
Sample Date	1/28/2010	1/27/2010	1/27/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Volatiles (ug/kg) (Cont)					
Methyl Methacrylate	42 U	52 U	54 U	72 U	51 U
Methylene Chloride	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Pentachloroethane	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Propionitrile (Ethyl Cyanide)	210 R	260 R	270 R	360 R	250 R
Styrene (Ethenylbenzene)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Tetrachloroethene (PCE)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Toluene	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Trichloroethene (TCE)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Trichlorofluoromethane (Freon 11)	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Vinyl Acetate	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Vinyl Chloride	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Xylene, m/p-	8.4 U	10 U	11 U	14 U	10 U
Xylene, o-	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Xylenes, total	4.2 U	5.2 U	5.4 U	7.2 U	5.1 U
Semivolatiles (ug/kg)					
1,2,4,5-Tetrachlorobenzene	200 U	250 U	250 U	240 U	230 U
1,2,4-Trichlorobenzene	200 U	250 U	250 U	240 U	230 U
1,2-Dichlorobenzene (o-)	200 U	250 U	250 U	240 U	230 U
1,3,5-Trinitrobenzene (TNB)	200 UJ	250 U	250 U	240 UJ	230 UJ
1,3-Dichlorobenzene (m-)	200 U	250 U	250 U	240 U	230 U
1,3-Dinitrobenzene (m-)	200 U	250 UJ	250 UJ	240 U	230 U
1,4-Dichlorobenzene (p-)	200 U	250 U	250 U	240 U	230 U
1,4-Naphthoquinone	200 U	250 U	250 U	240 UJ	230 UJ
1,4-Phenylenediamine	2000 R	2500 R	2500 R	2400 R	2300 R
1-Naphthylamine	200 UJ	250 U	250 U	240 UJ	230 UJ
2,2'-Oxybis[1-chloropropane]	200 UJ	250 UJ	250 UJ	240 U	230 U
2,3,4,6-Tetrachlorophenol	390 U	480 U	480 U	460 U	450 U
2,4,5-Trichlorophenol	390 U	480 U	480 U	460 U	450 U
2,4,6-Trichlorophenol	390 U	480 U	480 U	460 U	450 U
2,4-Dichlorophenol	390 U	480 U	480 U	460 U	450 U
2,4-Dimethylphenol	390 U	480 U	480 U	460 U	450 U
2,4-Dinitrophenol	390 U	480 U	480 U	460 U	450 U
2,4-Dinitrotoluene (DNT)	200 U	250 U	250 U	240 U	230 U
2,6-Dichlorophenol	390 U	480 U	480 U	460 U	450 U
2,6-Dinitrotoluene (DNT)	200 U	250 UJ	250 UJ	240 U	230 U
2-Acetylaminofluorene	200 U	250 U	250 U	240 U	230 U
2-Chloronaphthalene	200 U	250 U	250 U	240 U	230 U
2-Chlorophenol	390 U	480 U	480 U	460 U	450 U
2-Methyl-5-nitroaniline	200 U	250 U	250 U	240 U	230 U
2-Methylphenol (o-Cresol)	390 U	480 U	480 U	460 U	450 U
2-Naphthylamine	200 UJ	250 U	250 U	240 UJ	230 UJ
2-Nitroaniline	200 UJ	250 UJ	250 UJ	240 UJ	230 UJ
2-Nitrophenol	390 U	480 U	480 U	460 U	450 U

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**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB06	57SB07	57SB07	57SS08	57SS09
Sample ID	57SB06-00	57SB07-00	57SB07-00D	57SS08	57SS09
Sample Date	1/28/2010	1/27/2010	1/27/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0

Semivolatiles (ug/kg) (Cont)

2-Picoline	200 U	250 U	250 U	240 U	230 U
3,3'-Dichlorobenzidine	200 U	250 U	250 U	240 U	230 U
3,3'-Dimethylbenzidine	200 UJ	250 U	250 U	240 U	230 U
3-Methylcholanthrene	200 U	250 U	250 U	240 U	230 U
3-Methylphenol (m-Cresol)	300 U	370 U	370 U	350 U	340 U
3-Nitroaniline	200 U	250 U	250 U	240 U	230 U
4,6-Dinitro-2-methylphenol	390 U	480 U	480 U	460 U	450 U
4-Aminobiphenyl	200 U	250 U	250 U	240 U	230 U
4-Bromophenyl-phenylether	200 U	250 U	250 U	240 U	230 U
4-Chloro-3-methylphenol	390 UJ	480 U	480 U	460 UJ	450 UJ
4-Chloroaniline	200 U	250 U	250 U	240 U	230 U
4-Chlorophenyl-phenylether	200 U	250 U	250 U	240 U	230 U
4-Dimethylaminoazobenzene (p-)	200 U	250 U	250 U	240 U	230 U
4-Methylphenol (p-Cresol)	300 U	370 U	370 U	350 U	340 U
4-Nitroaniline	200 U	250 U	250 U	240 U	230 U
4-Nitrophenol	390 U	480 U	480 U	460 U	450 U
4-Nitroquinoline-1-oxide	200 UJ	250 U	250 U	240 UJ	230 UJ
7,12-Dimethylbenz(a)anthracene	200 U	250 U	250 U	240 U	230 U
Acetophenone	200 U	39 J	250 U	240 U	230 U
Aniline	200 U	250 UJ	250 UJ	240 U	230 U
Aramite	200 U	250 UJ	250 UJ	240 U	230 U
Benzyl Alcohol	200 UJ	250 U	250 U	240 UJ	230 UJ
Bis(2-chloroethoxy)methane	200 U	250 UJ	250 UJ	240 U	230 U
Bis(2-chloroethyl)ether	200 U	250 UJ	250 UJ	240 U	230 U
Bis(2-ethylhexyl) Phthalate (BEHP)	110 J	71 J	54 J	240 U	230 U
Butyl Benzyl Phthalate	200 U	250 U	250 U	240 U	230 U
Diallate	200 UJ	250 UJ	250 UJ	240 UJ	230 UJ
Diallate (cis)	200 UJ	250 UJ	250 UJ	240 UJ	230 UJ
Diallate (trans)	200 UJ	250 UJ	250 UJ	240 UJ	230 UJ
Dibenzofuran	200 U	250 U	250 U	240 U	230 U
Diethyl Phthalate (DEP)	200 U	250 U	250 U	240 U	230 U
Dimethyl Phthalate	200 U	250 UJ	250 UJ	240 U	230 U
Di-n-butyl Phthalate (DBP)	200 UJ	250 U	250 U	240 UJ	230 UJ
Di-n-octyl Phthalate	200 U	250 U	250 U	240 U	230 U
Dinoseb	200 U	250 U	250 U	240 U	230 U
Ethyl Methane Sulfonate (EMS)	200 UJ	250 U	250 U	240 UJ	230 UJ
Hexachloro-1,3-butadiene	200 U	250 U	250 U	240 U	230 U
Hexachlorobenzene	200 U	250 U	250 U	240 U	230 U
Hexachlorocyclopentadiene	200 R	250 U	250 U	240 R	230 R
Hexachloroethane	200 U	250 U	250 U	240 U	230 U
Hexachloropropene	200 R	250 U	250 U	240 R	230 R
Isophorone	200 UJ	250 U	250 U	240 U	230 U
Isosafrole	200 U	250 UJ	250 UJ	240 U	230 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB06	57SB07	57SB07	57SS08	57SS09
Sample ID	57SB06-00	57SB07-00	57SB07-00D	57SS08	57SS09
Sample Date	1/28/2010	1/27/2010	1/27/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Semivolatiles (ug/kg) (Cont)					
Methapyrilene	200 UJ	250 UJ	250 UJ	240 U	230 U
Methyl Methane Sulfonate	200 U	250 U	250 U	240 U	230 U
Nitrobenzene	200 U	250 U	250 U	240 U	230 U
n-Nitrosodiethylamine	200 U	250 U	250 U	240 U	230 U
n-Nitrosodimethylamine (NDMA)	200 U	250 U	250 U	240 U	230 U
n-Nitroso-di-n-butylamine	200 U	250 UJ	250 UJ	240 U	230 U
n-Nitrosodi-n-propylamine	200 UJ	250 U	250 UJ	240 UJ	230 UJ
n-Nitrosodiphenylamine	200 U	250 U	250 U	240 U	230 U
n-Nitrosomethylethylamine	200 U	250 U	250 U	240 U	230 U
n-Nitrosomorpholine	200 UJ	250 UJ	250 UJ	240 UJ	230 UJ
n-Nitrosopiperidine	200 U	250 U	250 U	240 U	230 U
n-Nitrosopyrrolidine	200 UJ	250 UJ	250 UJ	240 UJ	230 UJ
o-Toluidine	200 U	250 U	250 U	240 U	230 U
Pentachlorobenzene	200 U	250 U	250 U	240 U	230 U
Pentachloronitrobenzene	200 U	250 U	250 U	240 U	230 U
Pentachlorophenol	390 UJ	480 U	480 U	460 UJ	450 UJ
Phenacetin	200 U	250 U	250 U	240 U	230 U
Phenol	390 U	480 U	480 U	460 U	450 U
Pronamide	390 U	480 U	480 U	460 U	450 U
Pyridine	200 U	250 U	250 U	240 U	230 U
Safrole	200 U	250 U	250 U	240 U	230 U
Low Molecular Weight PAHs (ug/kg)					
2-Methylnaphthalene	1.7 J	12 U	12 U	6 J	2.3 J
Acenaphthene	9.9 U	12 U	12 U	1.9 J	0.91 J
Acenaphthylene	1.3 J	12 U	12 U	1.8 J	1.4 J
Anthracene	2.1 J	1.3 J	12 U	3.7 J	2.1 J
Fluoranthene	9.9 U	2.5 J	12 U	16	11 UJ
Fluorene	0.71 J	12 U	12 U	1.7 J	0.64 J
Naphthalene	9.9 UJ	1.6 J	12 U	12 U	11 U
Phenanthrene	5 J	2.4 J	12 U	7.7 J	4.9 J
High Molecular Weight PAHs (ug/kg)					
Benzo(a)anthracene	3.3 J	0.98 J	12 U	5.9 J	2.9 J
Benzo(a)pyrene (BaP)	2.3 J	12 U	12 U	12 UJ	11 U
Benzo(b)fluoranthene	1.9 J	12 UJ	12 U	12 UJ	11 UJ
Benzo(g,h,i)perylene	9.9 UJ	12 U	12 U	12 UJ	11 UJ
Benzo(k)fluoranthene	1.8 J	12 U	12 U	12 UJ	11 U
Chrysene	3.3 J	1 J	12 U	6.7 J	3.1 J
Dibenz(a,h)anthracene	9.9 U	12 U	12 U	12 UJ	11 U
Indeno(1,2,3-cd)pyrene	9.9 U	12 U	12 U	12 UJ	11 U
Pyrene	9.9 U	2 J	12 U	16	11 UJ
PAH totals (ug/kg)					
Low molecular weight PAHs	40.51	55.8	96	50.8	34.25
High molecular weight PAHs	52.2	75.98	108	100.6	83

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB06	57SB07	57SB07	57SS08	57SS09
Sample ID	57SB06-00	57SB07-00	57SB07-00D	57SS08	57SS09
Sample Date	1/28/2010	1/27/2010	1/27/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
PCBs (ug/kg)					
Aroclor-1016	89 U	110 U	110 U	520 U	510 U
Aroclor-1221	71 U	88 U	88 U	420 U	410 U
Aroclor-1232	30 U	37 U	37 U	170 U	170 U
Aroclor-1242	42 U	51 U	51 U	240 U	240 U
Aroclor-1248	30 U	37 U	37 U	170 U	170 U
Aroclor-1254	24 U	29 U	29 U	140 U	140 U
Aroclor-1260	36 U	310 J	130 J	550	760
TPH (mg/kg)					
Diesel Range Organics (DRO)	7 J	13 J	16	70	72 J
Gasoline Range Organics (GRO)	0.6 U	0.74 U	0.74 U	0.6 UJ	0.6 UJ
Total TPH	7.6 J	13.74 J	16.74	70.6	72.6 J
Inorganics (mg/kg)					
Antimony	1.2 J	1.1 J	1.7 J	1 J	0.85 U
Arsenic	1.2	0.83 J	1.3 J	5.2	1.6
Barium	45.8	95 J	161 J	163 J	190 J
Beryllium	0.14 U	0.53 U	0.64 U	0.3 J	0.34 J
Cadmium	0.49 U	0.28 U	0.31 U	5.3	1.1
Chromium	20.7	29.3	39.7	38.5	26.5
Cobalt	22.3	31.7	49.3	30.3	34
Copper	65.8 J	75.5 J	85.6 J	71.2	92.3
Lead	10.2 J	17.6 J	21.1 J	116	29.6 J
Mercury	0.041	0.023 U	0.023 U	0.051	0.15 J
Nickel	13.7	13.9	16.1	18.8	27.8 J
Selenium	0.42 R	0.51 R	0.49 R	0.25 U	0.26 UJ
Silver	0.23 J	0.18 J	0.24 J	0.14 J	0.13 U
Thallium	2.1	1.5 J	3.2 J	8.5	8.8
Tin	0.97 J	1.9 J	1.5 J	2.4 J	2.1 J
Vanadium	120	170	240	141	180
Zinc	94.9	73.5	77.4	183	136

Notes:

- NA - Not Analyzed
- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SS09	57SS10	57SS11	57SS12
Sample ID	57SS09D	57SS10	57SS11	57SS12
Sample Date	1/29/2010	1/29/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0

Volatiles (ug/kg)

1,1,1,2-Tetrachloroethane	5 R	5.5 U	4.9 U	4.3 U
1,1,1-Trichloroethane	5 R	5.5 U	4.9 U	4.3 U
1,1,2,2-Tetrachloroethane	5 R	5.5 U	4.9 U	4.3 U
1,1,2-Trichloroethane	5 R	5.5 U	4.9 U	4.3 U
1,1-Dichloroethane	5 R	5.5 U	4.9 U	4.3 U
1,1-Dichloroethene	5 R	5.5 U	4.9 U	4.3 U
1,2,3-Trichloropropane	5 R	5.5 U	4.9 U	4.3 U
1,2-Dibromo-3-chloropropane (DBCP)	5 R	5.5 U	4.9 U	4.3 U
1,2-Dibromoethane (EDB)	5 R	5.5 U	4.9 U	4.3 U
1,2-Dichloroethane	5 R	5.5 U	4.9 U	4.3 U
1,2-Dichloroethene (trans)	5 R	5.5 U	4.9 U	4.3 U
1,2-Dichloropropane	5 R	5.5 U	4.9 U	4.3 U
1,3-Dichloropropene (cis)	5 R	5.5 U	4.9 U	4.3 U
1,3-Dichloropropene (trans)	5 R	5.5 U	4.9 U	4.3 UJ
1,4-Dichloro-2-butene (trans)	20 R	22 U	20 U	17 UJ
1,4-Dioxane (p-)	250 R	270 R	250 R	210 R
2-Butanone (MEK)	13 R	14 U	12 U	11 U
2-Chloro-1,3-butadiene (Chloroprene)	5 R	5.5 U	4.9 U	4.3 U
2-Hexanone (MBK)	13 R	14 U	12 U	11 U
3-Chloropropene (Allyl Chloride)	5 R	5.5 U	4.9 U	4.3 U
4-Methyl-2-pentanone (MIBK)	13 R	14 U	12 U	11 U
Acetone	21 R	23 U	21 U	18 U
Acetonitrile	5 R	5.5 U	4.9 U	4.3 U
Acrolein	50 R	55 R	49 R	43 R
Acrylonitrile	50 R	55 R	49 R	43 R
Benzene	5 R	5.5 U	4.9 U	4.3 U
Bromodichloromethane	5 R	5.5 U	4.9 U	4.3 U
Bromoform	5 R	5.5 U	4.9 U	4.3 U
Bromomethane	7.3 R	8 U	7.2 U	6.2 U
Carbon Disulfide	5 R	5.5 U	4.9 U	4.3 U
Carbon Tetrachloride	5 R	5.5 U	4.9 U	4.3 U
Chlorobenzene	5 R	5.5 U	4.9 U	4.3 U
Chloroethane	5 R	5.5 U	4.9 U	4.3 U
Chloroform	5 R	5.5 U	4.9 U	4.3 U
Chloromethane	5 R	5.5 U	4.9 U	4.3 U
Dibromochloromethane	5 R	5.5 U	4.9 U	4.3 U
Dibromomethane	5 R	5.5 U	4.9 U	4.3 U
Dichlorodifluoromethane (Freon-12)	5 R	5.5 U	4.9 U	4.3 U
Ethyl Methacrylate	50 R	55 U	49 U	43 U
Ethylbenzene	5 R	5.5 U	4.9 U	4.3 U
Isobutyl Alcohol	250 R	270 R	250 R	210 R
Methyl Acrylonitrile	50 R	55 U	49 U	43 U
Methyl Iodide	5 R	5.5 U	4.9 U	4.3 U

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**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SS09	57SS10	57SS11	57SS12
Sample ID	57SS09D	57SS10	57SS11	57SS12
Sample Date	1/29/2010	1/29/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0

Volatiles (ug/kg) (Cont)

Methyl Methacrylate	50 R	55 U	49 U	43 U
Methylene Chloride	5 R	5.5 U	4.9 U	4.3 U
Pentachloroethane	5 R	5.5 U	4.9 U	4.3 U
Propionitrile (Ethyl Cyanide)	250 R	270 R	250 R	210 R
Styrene (Ethenylbenzene)	5 R	5.5 U	4.9 U	4.3 U
Tetrachloroethene (PCE)	5 R	5.5 U	4.9 U	4.3 U
Toluene	5 R	5.5 U	4.9 U	4.3 U
Trichloroethene (TCE)	5 R	5.5 U	4.9 U	4.3 U
Trichlorofluoromethane (Freon 11)	5 R	5.5 U	4.9 U	4.3 U
Vinyl Acetate	5 R	5.5 U	4.9 U	4.3 U
Vinyl Chloride	5 R	5.5 U	4.9 U	4.3 U
Xylene, m/p-	10 R	11 U	9.8 U	8.5 U
Xylene, o-	5 R	5.5 U	4.9 U	4.3 U
Xylenes, total	5 R	5.5 U	4.9 U	4.3 U

Semivolatiles (ug/kg)

1,2,4,5-Tetrachlorobenzene	240 U	200 U	210 U	200 U
1,2,4-Trichlorobenzene	240 U	200 U	210 U	200 U
1,2-Dichlorobenzene (o-)	240 U	200 U	210 U	200 U
1,3,5-Trinitrobenzene (TNB)	240 UJ	200 UJ	210 UJ	200 UJ
1,3-Dichlorobenzene (m-)	240 U	200 U	210 U	200 U
1,3-Dinitrobenzene (m-)	240 U	200 U	210 U	200 U
1,4-Dichlorobenzene (p-)	240 U	200 U	210 U	200 U
1,4-Naphthoquinone	240 UJ	200 UJ	210 UJ	200 UJ
1,4-Phenylenediamine	2400 R	2000 R	2100 R	2000 R
1-Naphthylamine	240 UJ	200 UJ	210 UJ	200 UJ
2,2'-Oxybis[1-chloropropane]	240 U	200 U	210 U	200 U
2,3,4,6-Tetrachlorophenol	470 U	400 U	410 U	380 U
2,4,5-Trichlorophenol	470 U	400 U	410 U	380 U
2,4,6-Trichlorophenol	470 U	400 U	410 U	380 U
2,4-Dichlorophenol	470 U	400 U	410 U	380 U
2,4-Dimethylphenol	470 U	400 U	410 U	380 U
2,4-Dinitrophenol	470 U	400 U	410 U	380 U
2,4-Dinitrotoluene (DNT)	240 U	200 U	210 U	200 U
2,6-Dichlorophenol	470 U	400 U	410 U	380 U
2,6-Dinitrotoluene (DNT)	240 U	200 U	210 U	200 U
2-Acetylaminofluorene	240 U	200 U	210 U	200 U
2-Chloronaphthalene	240 U	200 U	210 U	200 U
2-Chlorophenol	470 U	400 U	410 U	380 U
2-Methyl-5-nitroaniline	240 U	200 U	210 U	200 U
2-Methylphenol (o-Cresol)	470 U	400 U	410 U	380 U
2-Naphthylamine	240 UJ	200 UJ	210 UJ	200 UJ
2-Nitroaniline	240 UJ	200 UJ	210 UJ	200 UJ
2-Nitrophenol	470 U	400 U	410 U	380 U

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**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SS09	57SS10	57SS11	57SS12
Sample ID	57SS09D	57SS10	57SS11	57SS12
Sample Date	1/29/2010	1/29/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0

Semivolatiles (ug/kg) (Cont)

2-Picoline	240 U	200 U	210 U	200 U
3,3'-Dichlorobenzidine	240 U	200 U	210 U	200 U
3,3'-Dimethylbenzidine	240 U	200 U	210 U	200 U
3-Methylcholanthrene	240 U	200 U	210 U	200 U
3-Methylphenol (m-Cresol)	360 U	300 U	310 U	290 U
3-Nitroaniline	240 U	200 U	210 U	200 U
4,6-Dinitro-2-methylphenol	470 U	400 U	410 U	380 U
4-Aminobiphenyl	240 U	200 U	210 U	200 U
4-Bromophenyl-phenylether	240 U	200 U	210 U	200 U
4-Chloro-3-methylphenol	470 UJ	400 UJ	410 UJ	380 UJ
4-Chloroaniline	240 U	200 U	210 U	200 U
4-Chlorophenyl-phenylether	240 U	200 U	210 U	200 U
4-Dimethylaminoazobenzene (p-)	240 U	200 U	210 U	200 U
4-Methylphenol (p-Cresol)	360 U	300 U	310 U	290 U
4-Nitroaniline	240 U	200 U	210 U	200 U
4-Nitrophenol	470 U	400 U	410 U	380 U
4-Nitroquinoline-1-oxide	240 UJ	200 UJ	210 UJ	200 UJ
7,12-Dimethylbenz(a)anthracene	240 U	200 U	210 U	200 U
Acetophenone	240 U	200 U	210 U	200 U
Aniline	240 U	200 U	210 U	200 U
Aramite	240 U	200 U	210 U	200 U
Benzyl Alcohol	240 UJ	200 UJ	210 UJ	200 UJ
Bis(2-chloroethoxy)methane	240 U	200 U	210 U	200 U
Bis(2-chloroethyl)ether	240 U	200 U	210 U	200 U
Bis(2-ethylhexyl) Phthalate (BEHP)	240 U	70 J	50 J	1800
Butyl Benzyl Phthalate	240 U	200 U	210 U	200 U
Diallate	240 UJ	200 UJ	210 UJ	200 UJ
Diallate (cis)	240 UJ	200 UJ	210 UJ	200 UJ
Diallate (trans)	240 UJ	200 UJ	210 UJ	200 UJ
Dibenzofuran	240 U	200 U	210 U	200 U
Diethyl Phthalate (DEP)	240 U	200 U	210 U	200 U
Dimethyl Phthalate	240 U	200 U	210 U	200 U
Di-n-butyl Phthalate (DBP)	240 UJ	200 UJ	210 UJ	200 UJ
Di-n-octyl Phthalate	240 U	200 U	210 U	200 U
Dinoseb	240 U	200 U	210 U	200 U
Ethyl Methane Sulfonate (EMS)	240 UJ	200 UJ	210 UJ	200 UJ
Hexachloro-1,3-butadiene	240 U	200 U	210 U	200 U
Hexachlorobenzene	240 U	200 U	210 U	200 U
Hexachlorocyclopentadiene	240 R	200 R	210 R	200 R
Hexachloroethane	240 U	200 U	210 U	200 U
Hexachloropropene	240 R	200 R	210 R	200 R
Isophorone	240 U	200 U	210 U	200 U
Isosafrole	240 U	200 U	210 U	200 U

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**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SS09	57SS10	57SS11	57SS12
Sample ID	57SS09D	57SS10	57SS11	57SS12
Sample Date	1/29/2010	1/29/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
Semivolatiles (ug/kg) (Cont)				
Methapyrilene	240 U	200 U	210 U	200 U
Methyl Methane Sulfonate	240 U	200 U	210 U	200 U
Nitrobenzene	240 U	200 U	210 U	200 U
n-Nitrosodiethylamine	240 U	200 U	210 U	200 U
n-Nitrosodimethylamine (NDMA)	240 U	200 U	210 U	200 U
n-Nitroso-di-n-butylamine	240 U	200 U	210 U	200 U
n-Nitrosodi-n-propylamine	240 UJ	200 UJ	210 UJ	200 UJ
n-Nitrosodiphenylamine	240 U	200 U	210 U	200 U
n-Nitrosomethylethylamine	240 U	200 U	210 U	200 U
n-Nitrosomorpholine	240 UJ	200 UJ	210 UJ	200 UJ
n-Nitrosopiperidine	240 U	200 U	210 U	200 U
n-Nitrosopyrrolidine	240 UJ	200 UJ	210 UJ	200 UJ
o-Toluidine	240 U	200 U	210 U	200 U
Pentachlorobenzene	240 U	200 U	210 U	200 U
Pentachloronitrobenzene	240 U	200 U	210 U	200 U
Pentachlorophenol	470 UJ	400 UJ	410 UJ	380 UJ
Phenacetin	240 U	200 U	210 U	200 U
Phenol	470 U	400 U	410 U	380 U
Pronamide	470 U	400 U	410 U	380 U
Pyridine	240 U	200 U	210 U	200 U
Safrole	240 U	200 U	210 U	200 U
Low Molecular Weight PAHs (ug/kg)				
2-Methylnaphthalene	2.3 J	1.9 J	1 J	2 J
Acenaphthene	2.4 J	1.8 J	10 U	0.82 J
Acenaphthylene	14 J	1.7 J	10 UJ	0.86 J
Anthracene	7.9 J	2.7 J	0.67 J	3.8 J
Fluoranthene	41 J	47	10 U	9.5 U
Fluorene	1.8 J	1.3 J	10 UJ	0.8 J
Naphthalene	12 U	10 UJ	10 UJ	9.5 U
Phenanthrene	9.4 J	34	3 J	2.5 J
High Molecular Weight PAHs (ug/kg)				
Benzo(a)anthracene	30 J	17	2.9 J	1.3 J
Benzo(a)pyrene (BaP)	12 UJ	10 UJ	10 U	9.5 UJ
Benzo(b)fluoranthene	12 UJ	10 UJ	10 U	9.5 UJ
Benzo(g,h,i)perylene	12 UJ	10 UJ	10 UJ	9.5 UJ
Benzo(k)fluoranthene	12 UJ	10 UJ	10 U	9.5 UJ
Chrysene	27 J	26	3.4 J	1.4 J
Dibenz(a,h)anthracene	12 UJ	10 UJ	10 U	9.5 UJ
Indeno(1,2,3-cd)pyrene	12 UJ	10 UJ	10 U	9.5 UJ
Pyrene	63 J	69	10 U	9.5 U
PAH totals (ug/kg)				
Low molecular weight PAHs	90.8	100.4	54.67	29.78
High molecular weight PAHs	192	172	76.3	69.2

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SS09	57SS10	57SS11	57SS12
Sample ID	57SS09D	57SS10	57SS11	57SS12
Sample Date	1/29/2010	1/29/2010	1/29/2010	1/29/2010
Sample Depth (ft bgs)	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0	0.0 - 1.0
PCBs (ug/kg)				
Aroclor-1016	540 U	90 U	94 U	86 U
Aroclor-1221	430 U	72 U	75 U	69 U
Aroclor-1232	180 U	30 U	31 U	29 U
Aroclor-1242	250 U	42 U	44 U	40 U
Aroclor-1248	180 U	30 U	31 U	29 U
Aroclor-1254	140 U	24 U	25 U	23 U
Aroclor-1260	610	39 J	38 U	46
TPH (mg/kg)				
Diesel Range Organics (DRO)	37 J	28	25	13
Gasoline Range Organics (GRO)	0.68 UJ	0.57 UJ	0.62 UJ	0.56 UJ
Total TPH	37.68 J	28.57	25.62	13.56
Inorganics (mg/kg)				
Antimony	0.85 U	0.7 U	0.73 U	0.67 U
Arsenic	1.8	1.2	1.4	2.4
Barium	88.9 J	98.1 J	200 J	42.2 J
Beryllium	0.27 J	0.27 J	0.32 J	0.07 J
Cadmium	1.4	1.3	1.1	0.76
Chromium	27.7	19.2	24.9	11
Cobalt	29.4	24.9	64.8	8.2
Copper	86.7	85.1	80.9	35.8
Lead	46.4 J	60.6	33.7	30.5
Mercury	0.45 J	0.037 J	0.058	0.018 U
Nickel	14.8 J	15	15.4	4.9
Selenium	0.93 J	0.21 U	0.22 U	0.21 U
Silver	0.13 U	0.11 U	0.15 J	0.11 U
Thallium	7.1	7.6	7.7	3.1
Tin	2.2 J	1.5 J	1.5 J	1.8 J
Vanadium	150	118	141	44.4
Zinc	143	96.9	79.7	49.4

Notes:

- NA - Not Analyzed
- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable

SUBSURFACE SOIL

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB01	57SB01	57SB02	57SB02	57SB03
Sample ID	57SB01-01	57SB01-05	57SB02-01	57SB02-05	57SB03-01
Sample Date	1/28/2010	1/28/2010	1/26/2010	1/26/2010	1/26/2010
Sample Depth (ft bgs)	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0
Volatiles (ug/kg)					
1,1,1,2-Tetrachloroethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,1,1-Trichloroethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,1,2,2-Tetrachloroethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,1,2-Trichloroethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,1-Dichloroethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,1-Dichloroethene	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,2,3-Trichloropropane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,2-Dibromo-3-chloropropane (DBCP)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,2-Dibromoethane (EDB)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,2-Dichloroethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,2-Dichloroethene (trans)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,2-Dichloropropane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,3-Dichloropropene (cis)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,3-Dichloropropene (trans)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
1,4-Dichloro-2-butene (trans)	18 U	19 U	21 U	18 U	20 U
1,4-Dioxane (p-)	220 R	240 R	260 R	220 R	250 R
2-Butanone (MEK)	11 U	12 U	13 U	11 U	13 U
2-Chloro-1,3-butadiene (Chloroprene)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
2-Hexanone (MBK)	11 U	12 U	13 U	11 U	13 U
3-Chloropropene (Allyl Chloride)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
4-Methyl-2-pentanone (MIBK)	11 U	12 U	13 U	11 U	13 U
Acetone	19 U	20 U	22 U	19 U	21 U
Acetonitrile	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Acrolein	44 R	47 R	53 R	45 R	51 R
Acrylonitrile	44 U	47 U	53 U	45 U	51 U
Benzene	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Bromodichloromethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Bromoform	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Bromomethane	6.5 U	6.9 U	7.7 U	6.6 U	7.4 U
Carbon Disulfide	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Carbon Tetrachloride	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Chlorobenzene	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Chloroethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Chloroform	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Chloromethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Dibromochloromethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Dibromomethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Dichlorodifluoromethane (Freon-12)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Ethyl Methacrylate	44 U	47 U	53 U	45 U	51 U
Ethylbenzene	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Isobutyl Alcohol	220 R	240 R	260 R	220 R	250 R
Methyl Acrylonitrile	44 U	47 U	53 U	45 U	51 U
Methyl Iodide	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB01	57SB01	57SB02	57SB02	57SB03
Sample ID	57SB01-01	57SB01-05	57SB02-01	57SB02-05	57SB03-01
Sample Date	1/28/2010	1/28/2010	1/26/2010	1/26/2010	1/26/2010
Sample Depth (ft bgs)	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0
Volatiles (ug/kg) (Cont)					
Methyl Methacrylate	44 U	47 U	53 U	45 U	51 U
Methylene Chloride	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Pentachloroethane	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Propionitrile (Ethyl Cyanide)	220 R	240 R	260 R	220 R	250 R
Styrene (Ethenylbenzene)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Tetrachloroethene (PCE)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Toluene	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Trichloroethene (TCE)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Trichlorofluoromethane (Freon 11)	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Vinyl Acetate	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Vinyl Chloride	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Xylene, m/p-	8.8 U	9.4 U	11 U	9 U	10 U
Xylene, o-	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Xylenes, total	4.4 U	4.7 U	5.3 U	4.5 U	5.1 U
Semivolatiles (ug/kg)					
1,2,4,5-Tetrachlorobenzene	220 U	220 U	210 U	190 U	220 U
1,2,4-Trichlorobenzene	220 U	220 U	210 U	190 U	220 U
1,2-Dichlorobenzene (o-)	220 U	220 U	210 U	190 U	220 U
1,3,5-Trinitrobenzene (TNB)	220 UJ	220 UJ	210 U	190 U	220 U
1,3-Dichlorobenzene (m-)	220 U	220 U	210 U	190 U	220 U
1,3-Dinitrobenzene (m-)	220 U	220 U	210 U	190 U	220 U
1,4-Dichlorobenzene (p-)	220 U	220 U	210 U	190 U	220 U
1,4-Naphthoquinone	220 UJ	220 UJ	210 U	190 U	220 U
1,4-Phenylenediamine	2200 R	2200 R	2100 R	1900 R	2200 R
1-Naphthylamine	220 UJ	220 UJ	210 U	190 U	220 U
2,2'-Oxybis[1-chloropropane]	220 U	220 U	210 U	190 U	220 U
2,3,4,6-Tetrachlorophenol	420 U	420 U	410 U	370 U	430 U
2,4,5-Trichlorophenol	420 U	420 U	410 U	370 U	430 U
2,4,6-Trichlorophenol	420 U	420 U	410 U	370 U	430 U
2,4-Dichlorophenol	420 U	420 U	410 U	370 U	430 U
2,4-Dimethylphenol	420 U	420 U	410 U	370 U	430 U
2,4-Dinitrophenol	420 U	420 U	410 U	370 U	430 U
2,4-Dinitrotoluene (DNT)	220 U	220 U	210 U	190 U	220 U
2,6-Dichlorophenol	420 U	420 U	410 U	370 U	430 U
2,6-Dinitrotoluene (DNT)	220 U	220 U	210 U	190 U	220 U
2-Acetylaminofluorene	220 U	220 U	210 U	190 U	220 U
2-Chloronaphthalene	220 U	220 U	210 U	190 U	220 U
2-Chlorophenol	420 U	420 U	410 U	370 U	430 U
2-Methyl-5-nitroaniline	220 U	220 U	210 U	190 U	220 U
2-Methylphenol (o-Cresol)	420 U	420 U	410 U	370 U	430 U
2-Naphthylamine	220 UJ	220 UJ	210 U	190 U	220 U
2-Nitroaniline	220 UJ	220 UJ	210 U	190 U	220 U
2-Nitrophenol	420 U	420 U	410 U	370 U	430 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB01	57SB01	57SB02	57SB02	57SB03
Sample ID	57SB01-01	57SB01-05	57SB02-01	57SB02-05	57SB03-01
Sample Date	1/28/2010	1/28/2010	1/26/2010	1/26/2010	1/26/2010
Sample Depth (ft bgs)	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0
Semivolatiles (ug/kg) (Cont)					
2-Picoline	220 U	220 U	210 U	190 U	220 U
3,3'-Dichlorobenzidine	220 U	220 U	210 U	190 U	220 U
3,3'-Dimethylbenzidine	220 U	220 U	210 U	190 U	220 U
3-Methylcholanthrene	220 U	220 U	210 U	190 U	220 U
3-Methylphenol (m-Cresol)	320 U	320 U	310 U	280 U	330 U
3-Nitroaniline	220 U	220 U	210 U	190 U	220 U
4,6-Dinitro-2-methylphenol	420 U	420 U	410 U	370 U	430 U
4-Aminobiphenyl	220 U	220 U	210 U	190 U	220 U
4-Bromophenyl-phenylether	220 U	220 U	210 U	190 U	220 U
4-Chloro-3-methylphenol	420 UJ	420 UJ	410 U	370 U	430 U
4-Chloroaniline	220 U	220 U	210 U	190 U	220 U
4-Chlorophenyl-phenylether	220 U	220 U	210 U	190 U	220 U
4-Dimethylaminoazobenzene (p-)	220 U	220 U	210 U	190 U	220 U
4-Methylphenol (p-Cresol)	320 U	320 U	310 U	280 U	330 U
4-Nitroaniline	220 U	220 U	210 U	190 U	220 U
4-Nitrophenol	420 U	420 U	410 U	370 U	430 U
4-Nitroquinoline-1-oxide	220 UJ	220 UJ	210 U	190 U	220 U
7,12-Dimethylbenz(a)anthracene	220 U	220 U	210 U	190 U	220 U
Acetophenone	220 U	220 U	210 U	190 U	220 U
Aniline	220 U	220 U	210 U	190 U	220 U
Aramite	220 U	220 U	210 U	190 U	220 U
Benzyl Alcohol	220 UJ	220 UJ	210 U	190 U	220 U
Bis(2-chloroethoxy)methane	220 U	220 U	210 U	190 U	220 U
Bis(2-chloroethyl)ether	220 U	220 U	210 U	190 U	220 U
Bis(2-ethylhexyl) Phthalate (BEHP)	58 J	100 J	60 J	190 U	140 J
Butyl Benzyl Phthalate	220 U	220 U	210 U	190 U	220 U
Diallate	220 UJ	220 UJ	210 U	190 U	220 U
Diallate (cis)	220 UJ	220 UJ	210 U	190 U	220 U
Diallate (trans)	220 UJ	220 UJ	210 U	190 U	220 U
Dibenzofuran	220 U	220 U	210 U	190 U	220 U
Diethyl Phthalate (DEP)	220 U	220 U	210 U	190 U	220 U
Dimethyl Phthalate	220 U	220 U	210 U	190 U	220 U
Di-n-butyl Phthalate (DBP)	220 UJ	220 UJ	210 U	190 U	220 U
Di-n-octyl Phthalate	220 U	220 U	210 U	190 U	220 U
Dinoseb	220 U	220 U	210 U	190 U	220 U
Ethyl Methane Sulfonate (EMS)	220 UJ	220 UJ	210 U	190 U	220 U
Hexachloro-1,3-butadiene	220 U	220 U	210 U	190 U	220 U
Hexachlorobenzene	220 U	220 U	210 U	190 U	220 U
Hexachlorocyclopentadiene	220 R	220 R	210 U	190 U	220 U
Hexachloroethane	220 U	220 U	210 U	190 U	220 U
Hexachloropropene	220 R	220 R	210 U	190 U	220 U
Isophorone	220 U	220 U	210 U	190 U	220 U
Isosafrole	220 U	220 U	210 U	190 U	220 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB01	57SB01	57SB02	57SB02	57SB03
Sample ID	57SB01-01	57SB01-05	57SB02-01	57SB02-05	57SB03-01
Sample Date	1/28/2010	1/28/2010	1/26/2010	1/26/2010	1/26/2010
Sample Depth (ft bgs)	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0
Semivolatiles (ug/kg) (Cont)					
Methapyrilene	220 U	220 U	210 UJ	190 UJ	220 UJ
Methyl Methane Sulfonate	220 U	220 U	210 U	190 U	220 U
Nitrobenzene	220 U	220 U	210 U	190 U	220 U
n-Nitrosodiethylamine	220 U	220 U	210 U	190 U	220 U
n-Nitrosodimethylamine (NDMA)	220 U	220 U	210 U	190 U	220 U
n-Nitroso-di-n-butylamine	220 U	220 U	210 UJ	190 UJ	220 UJ
n-Nitrosodi-n-propylamine	220 UJ	220 UJ	210 U	190 U	220 U
n-Nitrosodiphenylamine	220 U	220 U	210 U	190 U	220 U
n-Nitrosomethylethylamine	220 U	220 U	210 U	190 U	220 U
n-Nitrosomorpholine	220 UJ	220 UJ	210 U	190 U	220 U
n-Nitrosopiperidine	220 U	220 U	210 U	190 U	220 U
n-Nitrosopyrrolidine	220 UJ	220 UJ	210 U	190 U	220 U
o-Toluidine	220 U	220 U	210 U	190 U	220 U
Pentachlorobenzene	220 U	220 U	210 U	190 U	220 U
Pentachloronitrobenzene	220 U	220 U	210 U	190 U	220 U
Pentachlorophenol	420 UJ	420 UJ	410 U	370 U	430 U
Phenacetin	220 U	220 U	210 U	190 U	220 U
Phenol	420 U	420 U	410 U	370 U	430 U
Pronamide	420 U	420 U	410 U	370 U	430 U
Pyridine	220 U	220 U	210 U	190 U	220 U
Safrole	220 U	220 U	210 U	190 U	220 U
Low Molecular Weight PAHs (ug/kg)					
2-Methylnaphthalene	1.2 J	2.8 J	10 U	9.3 U	11 U
Acenaphthene	11 U	0.79 J	10 U	9.3 U	11 U
Acenaphthylene	11 UJ	1.4 J	10 U	9.3 U	11 U
Anthracene	0.68 J	2.1 J	10 U	9.3 U	11 U
Fluoranthene	11 U	11 U	1.9 J	9.3 U	11 U
Fluorene	11 UJ	0.93 J	10 U	9.3 U	11 U
Naphthalene	11 UJ	11 UJ	1.1 J	0.92 J	11 U
Phenanthrene	2.2 J	5 J	2.9 J	9.3 U	11 U
High Molecular Weight PAHs (ug/kg)					
Benzo(a)anthracene	1.5 J	4.2 J	10 U	9.3 U	11 U
Benzo(a)pyrene (BaP)	0.74 J	3.1 J	10 U	9.3 U	11 U
Benzo(b)fluoranthene	0.89 J	1.9 J	0.74 J	9.3 U	11 U
Benzo(g,h,i)perylene	11 UJ	1 J	10 U	9.3 U	11 U
Benzo(k)fluoranthene	0.8 J	2.3 J	10 U	9.3 U	11 U
Chrysene	1.6 J	4.2 J	10 U	9.3 U	11 U
Dibenz(a,h)anthracene	11 U	11 U	10 U	9.3 U	11 U
Indeno(1,2,3-cd)pyrene	0.5 J	1.3 J	10 U	9.3 U	11 U
Pyrene	11 U	11 U	1.1 J	9.3 U	11 U
PAH totals (ug/kg)					
Low molecular weight PAHs	59.08	35.02	55.9	66.02	88
High molecular weight PAHs	39.03	40	71.84	83.7	99

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB01	57SB01	57SB02	57SB02	57SB03
Sample ID	57SB01-01	57SB01-05	57SB02-01	57SB02-05	57SB03-01
Sample Date	1/28/2010	1/28/2010	1/26/2010	1/26/2010	1/26/2010
Sample Depth (ft bgs)	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0
PCBs (ug/kg)					
Aroclor-1016	96 U	96 U	94 U	84 U	99 U
Aroclor-1221	77 U	77 U	75 U	67 U	79 U
Aroclor-1232	32 U	32 U	31 U	28 U	33 U
Aroclor-1242	45 U	45 U	44 U	39 U	46 U
Aroclor-1248	32 U	32 U	31 U	28 U	33 U
Aroclor-1254	26 U	26 U	25 U	22 U	26 U
Aroclor-1260	38 U	38 U	38 U	34 U	39 U
TPH (mg/kg)					
Diesel Range Organics (DRO)	10 U	10 U	3.5 J	11 U	6.7 J
Gasoline Range Organics (GRO)	0.64 U	0.64 U	0.63 U	0.56 U	0.66 U
Total TPH	10.64 U	10.64 U	4.13 J	11.56 U	7.36 J
Inorganics (mg/kg)					
Antimony	0.79 U	0.78 U	2.1 J	1.7 J	1.4 J
Arsenic	1.2 J	0.77 U	2.4	0.4 J	1.5
Barium	79.3 J	10.4 J	290	21.8	97.2
Beryllium	0.44 J	0.44 J	0.61	0.02 U	0.53 U
Cadmium	0.71	0.3 J	0.17 U	0.11 U	0.19 U
Chromium	33.4	10.1	30.3	50.4	30.6
Cobalt	37.5	18.2	97	28.8	33.6
Copper	81.3	83.4	95.3 J	81.6 J	76.6 J
Lead	27.7	15.2	44.1 J	3.3 J	21.2 J
Mercury	0.067	0.02 U	0.021 U	0.018 U	0.021 U
Nickel	14.3	8.2	25.9	30.5	13.6
Selenium	0.44 J	0.36 J	0.44 R	0.37 R	0.47 R
Silver	0.12 U	0.12 U	0.33 J	0.25 J	0.24 J
Thallium	10.2	6.1	8.6	4.6	2
Tin	2 J	1.4 J	0.62 U	1.3 J	1.9 J
Vanadium	217	129	237	193	225
Zinc	58	223	96.2	78.9	55.4

Notes:

- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB03	57SB04	57SB04	57SB05	57SB05
Sample ID	57SB03-05	57SB04-01	57SB04-05	57SB05-01	57SB05-01D
Sample Date	1/26/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	1.0 - 3.0
Volatiles (ug/kg)					
1,1,1,2-Tetrachloroethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,1,1-Trichloroethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,1,2,2-Tetrachloroethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,1,2-Trichloroethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,1-Dichloroethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,1-Dichloroethene	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,2,3-Trichloropropane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,2-Dibromo-3-chloropropane (DBCP)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,2-Dibromoethane (EDB)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,2-Dichloroethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,2-Dichloroethene (trans)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,2-Dichloropropane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,3-Dichloropropene (cis)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,3-Dichloropropene (trans)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
1,4-Dichloro-2-butene (trans)	18 U	16 U	19 U	17 U	21 U
1,4-Dioxane (p-)	230 R	200 R	230 R	210 R	260 R
2-Butanone (MEK)	11 U	9.9 U	12 U	11 U	13 U
2-Chloro-1,3-butadiene (Chloroprene)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
2-Hexanone (MBK)	11 U	9.9 U	12 U	11 U	13 U
3-Chloropropene (Allyl Chloride)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
4-Methyl-2-pentanone (MIBK)	11 U	9.9 U	12 U	11 U	13 U
Acetone	19 U	17 U	20 U	18 U	22 U
Acetonitrile	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Acrolein	46 R	40 R	46 R	43 R	52 R
Acrylonitrile	46 U	40 U	46 U	43 U	52 U
Benzene	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Bromodichloromethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Bromoform	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Bromomethane	6.7 U	5.8 U	6.8 U	6.2 U	7.5 U
Carbon Disulfide	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Carbon Tetrachloride	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Chlorobenzene	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Chloroethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Chloroform	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Chloromethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Dibromochloromethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Dibromomethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Dichlorodifluoromethane (Freon-12)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Ethyl Methacrylate	46 U	40 U	46 U	43 U	52 U
Ethylbenzene	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Isobutyl Alcohol	230 R	200 R	230 R	210 R	260 R
Methyl Acrylonitrile	46 U	40 U	46 U	43 U	52 U
Methyl Iodide	4.6 U	4 U	4.6 U	4.3 U	5.2 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB03	57SB04	57SB04	57SB05	57SB05
Sample ID	57SB03-05	57SB04-01	57SB04-05	57SB05-01	57SB05-01D
Sample Date	1/26/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	1.0 - 3.0
Volatiles (ug/kg) (Cont)					
Methyl Methacrylate	46 U	40 U	46 U	43 U	52 U
Methylene Chloride	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Pentachloroethane	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Propionitrile (Ethyl Cyanide)	230 R	200 R	230 R	210 R	260 R
Styrene (Ethenylbenzene)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Tetrachloroethene (PCE)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Toluene	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Trichloroethene (TCE)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Trichlorofluoromethane (Freon 11)	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Vinyl Acetate	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Vinyl Chloride	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Xylene, m/p-	9.1 U	7.9 U	9.3 U	8.5 U	10 U
Xylene, o-	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Xylenes, total	4.6 U	4 U	4.6 U	4.3 U	5.2 U
Semivolatiles (ug/kg)					
1,2,4,5-Tetrachlorobenzene	220 U	210 U	230 U	200 U	220 U
1,2,4-Trichlorobenzene	220 U	210 U	230 U	200 U	220 U
1,2-Dichlorobenzene (o-)	220 U	210 U	230 U	200 U	220 U
1,3,5-Trinitrobenzene (TNB)	220 U	210 UJ	230 UJ	200 U	220 U
1,3-Dichlorobenzene (m-)	220 U	210 U	230 U	200 U	220 U
1,3-Dinitrobenzene (m-)	220 U	210 U	230 U	200 UJ	220 UJ
1,4-Dichlorobenzene (p-)	220 U	210 U	230 U	200 U	220 U
1,4-Naphthoquinone	220 U	210 U	230 U	200 U	220 U
1,4-Phenylenediamine	2200 R	2100 R	2300 R	2000 R	2200 R
1-Naphthylamine	220 U	210 UJ	230 UJ	200 U	220 U
2,2'-Oxybis[1-chloropropane]	220 U	210 UJ	230 UJ	200 UJ	220 UJ
2,3,4,6-Tetrachlorophenol	420 U	400 U	440 U	390 U	430 U
2,4,5-Trichlorophenol	420 U	400 U	440 U	390 U	430 U
2,4,6-Trichlorophenol	420 U	400 U	440 U	390 U	430 U
2,4-Dichlorophenol	420 U	400 U	440 U	390 U	430 U
2,4-Dimethylphenol	420 U	400 U	440 U	390 U	430 U
2,4-Dinitrophenol	420 U	400 U	440 U	390 U	430 U
2,4-Dinitrotoluene (DNT)	220 U	210 U	230 U	200 U	220 U
2,6-Dichlorophenol	420 U	400 U	440 U	390 U	430 U
2,6-Dinitrotoluene (DNT)	220 U	210 U	230 U	200 UJ	220 UJ
2-Acetylaminofluorene	220 U	210 U	230 U	200 U	220 U
2-Chloronaphthalene	220 U	210 U	230 U	200 U	220 U
2-Chlorophenol	420 U	400 U	440 U	390 U	430 U
2-Methyl-5-nitroaniline	220 U	210 U	230 U	200 U	220 U
2-Methylphenol (o-Cresol)	420 U	400 U	440 U	390 U	430 U
2-Naphthylamine	220 U	210 UJ	230 UJ	200 U	220 U
2-Nitroaniline	220 U	210 UJ	230 UJ	200 UJ	220 UJ
2-Nitrophenol	420 U	400 U	440 U	390 U	430 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB03	57SB04	57SB04	57SB05	57SB05
Sample ID	57SB03-05	57SB04-01	57SB04-05	57SB05-01	57SB05-01D
Sample Date	1/26/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	1.0 - 3.0
Semivolatiles (ug/kg) (Cont)					
2-Picoline	220 U	210 U	230 U	200 U	220 U
3,3'-Dichlorobenzidine	220 U	210 U	230 U	200 U	220 U
3,3'-Dimethylbenzidine	220 U	210 UJ	230 UJ	200 U	220 U
3-Methylcholanthrene	220 U	210 U	230 U	200 U	220 U
3-Methylphenol (m-Cresol)	320 U	300 U	330 U	290 U	330 U
3-Nitroaniline	220 U	210 U	230 U	200 U	220 U
4,6-Dinitro-2-methylphenol	420 U	400 U	440 U	390 U	430 U
4-Aminobiphenyl	220 U	210 U	230 U	200 U	220 U
4-Bromophenyl-phenylether	220 U	210 U	230 U	200 U	220 U
4-Chloro-3-methylphenol	420 U	400 UJ	440 UJ	390 U	430 U
4-Chloroaniline	220 U	210 U	230 U	200 U	220 U
4-Chlorophenyl-phenylether	220 U	210 U	230 U	200 U	220 U
4-Dimethylaminoazobenzene (p-)	220 U	210 U	230 U	200 U	220 U
4-Methylphenol (p-Cresol)	320 U	300 U	330 U	290 U	330 U
4-Nitroaniline	220 U	210 U	230 U	200 U	220 U
4-Nitrophenol	420 U	400 U	440 U	390 U	430 U
4-Nitroquinoline-1-oxide	220 U	210 UJ	230 UJ	200 U	220 U
7,12-Dimethylbenz(a)anthracene	220 U	210 U	230 U	200 U	220 U
Acetophenone	220 U	210 U	230 U	200 U	220 U
Aniline	220 U	210 U	230 U	200 UJ	220 UJ
Aramite	220 U	210 U	230 U	200 UJ	220 UJ
Benzyl Alcohol	220 U	210 UJ	230 UJ	200 U	220 U
Bis(2-chloroethoxy)methane	220 U	210 U	230 U	200 UJ	220 UJ
Bis(2-chloroethyl)ether	220 U	210 U	230 U	200 UJ	220 UJ
Bis(2-ethylhexyl) Phthalate (BEHP)	60 J	56 J	230 U	200 U	220 U
Butyl Benzyl Phthalate	220 U	210 U	230 U	200 U	220 U
Diallate	220 U	210 UJ	230 UJ	200 UJ	220 UJ
Diallate (cis)	220 U	210 UJ	230 UJ	200 UJ	220 UJ
Diallate (trans)	220 U	210 UJ	230 UJ	200 UJ	220 UJ
Dibenzofuran	220 U	210 U	230 U	200 U	220 U
Diethyl Phthalate (DEP)	220 U	210 U	230 U	200 U	220 U
Dimethyl Phthalate	220 U	210 U	230 U	200 UJ	220 UJ
Di-n-butyl Phthalate (DBP)	220 U	210 UJ	230 UJ	200 U	220 U
Di-n-octyl Phthalate	220 U	210 U	230 U	200 U	220 U
Dinoseb	220 U	210 U	230 U	200 U	220 U
Ethyl Methane Sulfonate (EMS)	220 U	210 UJ	230 UJ	200 U	220 U
Hexachloro-1,3-butadiene	220 U	210 U	230 U	200 U	220 U
Hexachlorobenzene	220 U	210 U	230 U	200 U	220 U
Hexachlorocyclopentadiene	220 U	210 R	230 R	200 U	220 U
Hexachloroethane	220 U	210 U	230 U	200 U	220 U
Hexachloropropene	220 U	210 R	230 R	200 U	220 U
Isophorone	220 U	210 UJ	230 UJ	200 U	220 U
Isosafrole	220 U	210 U	230 U	200 UJ	220 UJ

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB03	57SB04	57SB04	57SB05	57SB05
Sample ID	57SB03-05	57SB04-01	57SB04-05	57SB05-01	57SB05-01D
Sample Date	1/26/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	1.0 - 3.0
Semivolatiles (ug/kg) (Cont)					
Methapyrilene	220 UJ	210 UJ	230 UJ	200 UJ	220 UJ
Methyl Methane Sulfonate	220 U	210 U	230 U	200 U	220 U
Nitrobenzene	220 U	210 U	230 U	200 U	220 U
n-Nitrosodiethylamine	220 U	210 U	230 U	200 U	220 U
n-Nitrosodimethylamine (NDMA)	220 U	210 U	230 U	200 U	220 U
n-Nitroso-di-n-butylamine	220 UJ	210 U	230 U	200 UJ	220 UJ
n-Nitrosodi-n-propylamine	220 U	210 UJ	230 UJ	200 UJ	220 UJ
n-Nitrosodiphenylamine	220 U	210 U	230 U	200 U	220 U
n-Nitrosomethylethylamine	220 U	210 U	230 U	200 U	220 U
n-Nitrosomorpholine	220 U	210 UJ	230 UJ	200 UJ	220 UJ
n-Nitrosopiperidine	220 U	210 U	230 U	200 U	220 U
n-Nitrosopyrrolidine	220 U	210 UJ	230 UJ	200 UJ	220 UJ
o-Toluidine	220 U	210 U	230 U	200 U	220 U
Pentachlorobenzene	220 U	210 U	230 U	200 U	220 U
Pentachloronitrobenzene	220 U	210 U	230 U	200 U	220 U
Pentachlorophenol	420 U	400 UJ	440 UJ	390 U	430 U
Phenacetin	220 U	210 U	230 U	200 U	220 U
Phenol	420 U	400 U	440 U	390 U	430 U
Pronamide	420 U	400 U	440 U	390 U	430 U
Pyridine	220 U	210 U	230 U	200 U	220 U
Safrole	220 U	210 U	230 U	200 U	220 U
Low Molecular Weight PAHs (ug/kg)					
2-Methylnaphthalene	11 U	3.4 J	11 U	9.8 U	11 U
Acenaphthene	11 U	1.3 J	11 U	9.8 U	11 U
Acenaphthylene	11 U	6.8 J	11 UJ	9.8 U	11 U
Anthracene	11 U	4.2 J	11 UJ	9.8 U	11 U
Fluoranthene	11 U	18	11 U	9.8 U	11 U
Fluorene	11 U	1.6 J	11 UJ	9.8 U	11 U
Naphthalene	11 U	10 UJ	11 UJ	0.9 J	11 U
Phenanthrene	11 U	9.2 J	11 U	9.8 U	11 U
High Molecular Weight PAHs (ug/kg)					
Benzo(a)anthracene	11 U	20	0.96 J	9.8 U	11 U
Benzo(a)pyrene (BaP)	11 U	17	0.59 J	9.8 U	11 U
Benzo(b)fluoranthene	11 U	9.6 J	11 U	9.8 U	11 U
Benzo(g,h,i)perylene	11 U	5.7 J	11 UJ	9.8 U	11 U
Benzo(k)fluoranthene	11 U	11	0.65 J	9.8 U	11 U
Chrysene	11 U	20	1.1 J	9.8 U	11 U
Dibenz(a,h)anthracene	11 U	1.8 J	11 U	9.8 U	11 U
Indeno(1,2,3-cd)pyrene	11 U	7 J	11 U	9.8 U	11 U
Pyrene	11 U	28	11 U	9.8 U	11 U
PAH totals (ug/kg)					
Low molecular weight PAHs	88	54.5	88	69.5	88
High molecular weight PAHs	99	120.1	58.3	88.2	99

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB03	57SB04	57SB04	57SB05	57SB05
Sample ID	57SB03-05	57SB04-01	57SB04-05	57SB05-01	57SB05-01D
Sample Date	1/26/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	1.0 - 3.0
PCBs (ug/kg)					
Aroclor-1016	96 U	91 U	100 U	88 U	99 U
Aroclor-1221	77 U	73 U	80 U	71 U	79 U
Aroclor-1232	32 U	30 U	33 U	29 U	33 U
Aroclor-1242	45 U	43 U	47 U	41 U	46 U
Aroclor-1248	32 U	30 U	33 U	29 U	33 U
Aroclor-1254	26 U	24 U	27 U	24 U	26 U
Aroclor-1260	38 U	37 U	40 U	35 U	39 U
TPH (mg/kg)					
Diesel Range Organics (DRO)	3.8 J	4.2 J	3.7 J	7.9 J	6.5 J
Gasoline Range Organics (GRO)	0.64 U	0.61 U	0.67 U	0.59 U	0.66 U
Total TPH	4.44 J	4.81 J	4.37 J	8.49 J	7.16 J
Inorganics (mg/kg)					
Antimony	1.2 J	1.2 J	1.3 J	1 J	1.7 J
Arsenic	0.52 J	1 J	1.4	0.97 J	1.7 J
Barium	72.8	36.7	1240	131 J	228 J
Beryllium	0.23 U	0.41 U	0.92	0.4 U	0.61 U
Cadmium	0.15 U	0.12 U	0.35 U	0.7	0.81
Chromium	15.4	23.1	44.9	24.9	30
Cobalt	23.7	12.9	149	43.2	73.9
Copper	87.3 J	56.2 J	104 J	52.9 J	68.7 J
Lead	5.7 J	16.5 J	5.3 J	39.6 J	56 J
Mercury	0.02 U	0.019 U	0.02 U	0.11 J	0.061 J
Nickel	15.5	10.8	41.4	17.9	14.2
Selenium	0.45 R	0.41 R	0.47 R	0.4 R	0.46 R
Silver	0.26 J	0.19 J	0.4 J	0.37 J	0.43 J
Thallium	2.8	2	7.3	3.5	5
Tin	1.3 J	1.7 J	1.7 J	0.91 J	1.6 J
Vanadium	198	155	263	172	220
Zinc	70.6	35.1	92	59.3	77

Notes:

- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB05	57SB06	57SB06	57SB07	57SB07
Sample ID	57SB05-05	57SB06-01	57SB06-05	57SB07-01	57SB07-05
Sample Date	1/27/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0
Volatiles (ug/kg)					
1,1,1,2-Tetrachloroethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,1,1-Trichloroethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,1,2,2-Tetrachloroethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,1,2-Trichloroethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,1-Dichloroethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,1-Dichloroethene	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,2,3-Trichloropropane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,2-Dibromo-3-chloropropane (DBCP)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,2-Dibromoethane (EDB)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,2-Dichloroethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,2-Dichloroethene (trans)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,2-Dichloropropane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,3-Dichloropropene (cis)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,3-Dichloropropene (trans)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
1,4-Dichloro-2-butene (trans)	19 U	18 U	16 U	18 U	17 U
1,4-Dioxane (p-)	240 R	220 R	200 R	230 R	220 R
2-Butanone (MEK)	12 U	11 U	9.9 U	12 U	11 U
2-Chloro-1,3-butadiene (Chloroprene)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
2-Hexanone (MBK)	12 U	11 U	9.9 U	12 U	11 U
3-Chloropropene (Allyl Chloride)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
4-Methyl-2-pentanone (MIBK)	12 U	11 U	9.9 U	12 U	11 U
Acetone	20 U	19 U	17 U	20 U	18 U
Acetonitrile	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Acrolein	47 R	45 R	40 R	46 R	43 R
Acrylonitrile	47 U	45 U	40 U	46 U	43 U
Benzene	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Bromodichloromethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Bromoform	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Bromomethane	6.9 U	6.6 U	5.8 U	6.7 U	6.3 U
Carbon Disulfide	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Carbon Tetrachloride	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Chlorobenzene	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Chloroethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Chloroform	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Chloromethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Dibromochloromethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Dibromomethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Dichlorodifluoromethane (Freon-12)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Ethyl Methacrylate	47 U	45 U	40 U	46 U	43 U
Ethylbenzene	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Isobutyl Alcohol	240 R	220 R	200 R	230 R	220 R
Methyl Acrylonitrile	47 U	45 U	40 U	46 U	43 U
Methyl Iodide	4.7 U	4.5 U	4 U	4.6 U	4.3 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB05	57SB06	57SB06	57SB07	57SB07
Sample ID	57SB05-05	57SB06-01	57SB06-05	57SB07-01	57SB07-05
Sample Date	1/27/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0
Volatiles (ug/kg) (Cont)					
Methyl Methacrylate	47 U	45 U	40 U	46 U	43 U
Methylene Chloride	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Pentachloroethane	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Propionitrile (Ethyl Cyanide)	240 R	220 R	200 R	230 R	220 R
Styrene (Ethenylbenzene)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Tetrachloroethene (PCE)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Toluene	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Trichloroethene (TCE)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Trichlorofluoromethane (Freon 11)	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Vinyl Acetate	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Vinyl Chloride	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Xylene, m/p-	9.4 U	9 U	7.9 U	9.2 U	8.6 U
Xylene, o-	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Xylenes, total	4.7 U	4.5 U	4 U	4.6 U	4.3 U
Semivolatiles (ug/kg)					
1,2,4,5-Tetrachlorobenzene	210 U	210 U	200 U	220 U	210 U
1,2,4-Trichlorobenzene	210 U	210 U	200 U	220 U	210 U
1,2-Dichlorobenzene (o-)	210 U	210 U	200 U	220 U	210 U
1,3,5-Trinitrobenzene (TNB)	210 U	210 UJ	200 UJ	220 U	210 U
1,3-Dichlorobenzene (m-)	210 U	210 U	200 U	220 U	210 U
1,3-Dinitrobenzene (m-)	210 UJ	210 U	200 U	220 U	210 U
1,4-Dichlorobenzene (p-)	210 U	210 U	200 U	220 U	210 U
1,4-Naphthoquinone	210 U	210 U	200 U	220 U	210 U
1,4-Phenylenediamine	2100 R	2100 R	2000 R	2200 R	2100 R
1-Naphthylamine	210 U	210 UJ	200 UJ	220 U	210 U
2,2'-Oxybis[1-chloropropane]	210 UJ	210 UJ	200 UJ	220 U	210 U
2,3,4,6-Tetrachlorophenol	410 U	410 U	380 U	430 U	400 U
2,4,5-Trichlorophenol	410 U	410 U	380 U	430 U	400 U
2,4,6-Trichlorophenol	410 U	410 U	380 U	430 U	400 U
2,4-Dichlorophenol	410 U	410 U	380 U	430 U	400 U
2,4-Dimethylphenol	410 U	410 U	380 U	430 U	400 U
2,4-Dinitrophenol	410 U	410 U	380 U	430 U	400 U
2,4-Dinitrotoluene (DNT)	210 U	210 U	200 U	220 U	210 U
2,6-Dichlorophenol	410 U	410 U	380 U	430 U	400 U
2,6-Dinitrotoluene (DNT)	210 UJ	210 U	200 U	220 U	210 U
2-Acetylaminofluorene	210 U	210 U	200 U	220 U	210 U
2-Chloronaphthalene	210 U	210 U	200 U	220 U	210 U
2-Chlorophenol	410 U	410 U	380 U	430 U	400 U
2-Methyl-5-nitroaniline	210 U	210 U	200 U	220 U	210 U
2-Methylphenol (o-Cresol)	410 U	410 U	380 U	430 U	400 U
2-Naphthylamine	210 U	210 UJ	200 UJ	220 U	210 U
2-Nitroaniline	210 UJ	210 UJ	200 UJ	220 U	210 U
2-Nitrophenol	410 U	410 U	380 U	430 U	400 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB05	57SB06	57SB06	57SB07	57SB07
Sample ID	57SB05-05	57SB06-01	57SB06-05	57SB07-01	57SB07-05
Sample Date	1/27/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0
Semivolatiles (ug/kg) (Cont)					
2-Picoline	210 U	210 U	200 U	220 U	210 U
3,3'-Dichlorobenzidine	210 U	210 U	200 U	220 U	210 U
3,3'-Dimethylbenzidine	210 U	210 UJ	200 UJ	220 U	210 U
3-Methylcholanthrene	210 U	210 U	200 U	220 U	210 U
3-Methylphenol (m-Cresol)	310 U	310 U	290 U	330 U	300 U
3-Nitroaniline	210 U	210 U	200 U	220 U	210 U
4,6-Dinitro-2-methylphenol	410 U	410 U	380 U	430 U	400 U
4-Aminobiphenyl	210 U	210 U	200 U	220 U	210 U
4-Bromophenyl-phenylether	210 U	210 U	200 U	220 U	210 U
4-Chloro-3-methylphenol	410 U	410 UJ	380 UJ	430 U	400 U
4-Chloroaniline	210 U	210 U	200 U	220 U	210 U
4-Chlorophenyl-phenylether	210 U	210 U	200 U	220 U	210 U
4-Dimethylaminoazobenzene (p-)	210 U	210 U	200 U	220 U	210 U
4-Methylphenol (p-Cresol)	310 U	310 U	290 U	330 U	300 U
4-Nitroaniline	210 U	210 U	200 U	220 U	210 U
4-Nitrophenol	410 U	410 U	380 U	430 U	400 U
4-Nitroquinoline-1-oxide	210 U	210 UJ	200 UJ	220 U	210 U
7,12-Dimethylbenz(a)anthracene	210 U	210 U	200 U	220 U	210 U
Acetophenone	210 U	210 U	200 U	220 U	210 U
Aniline	210 UJ	210 U	200 U	220 U	210 U
Aramite	210 UJ	210 U	200 U	220 U	210 U
Benzyl Alcohol	210 U	210 UJ	200 UJ	220 U	210 U
Bis(2-chloroethoxy)methane	210 UJ	210 U	200 U	220 U	210 U
Bis(2-chloroethyl)ether	210 UJ	210 U	200 U	220 U	210 U
Bis(2-ethylhexyl) Phthalate (BEHP)	210 U	58 J	270	220 U	210 U
Butyl Benzyl Phthalate	210 U	210 U	200 U	220 U	210 U
Diallate	210 UJ	210 UJ	200 UJ	220 U	210 U
Diallate (cis)	210 UJ	210 UJ	200 UJ	220 U	210 U
Diallate (trans)	210 UJ	210 UJ	200 UJ	220 U	210 U
Dibenzofuran	210 U	210 U	200 U	220 U	210 U
Diethyl Phthalate (DEP)	210 U	210 U	200 U	220 U	210 U
Dimethyl Phthalate	210 UJ	210 U	200 U	220 U	210 U
Di-n-butyl Phthalate (DBP)	210 U	210 UJ	200 UJ	220 U	210 U
Di-n-octyl Phthalate	210 U	210 U	200 U	220 U	210 U
Dinoseb	210 U	210 U	200 U	220 U	210 U
Ethyl Methane Sulfonate (EMS)	210 U	210 UJ	200 UJ	220 U	210 U
Hexachloro-1,3-butadiene	210 U	210 U	200 U	220 U	210 U
Hexachlorobenzene	210 U	210 U	200 U	220 U	210 U
Hexachlorocyclopentadiene	210 U	210 R	200 R	220 U	210 U
Hexachloroethane	210 U	210 U	200 U	220 U	210 U
Hexachloropropene	210 U	210 R	200 R	220 U	210 U
Isophorone	210 U	210 UJ	200 UJ	220 U	210 U
Isosafrole	210 UJ	210 U	200 U	220 U	210 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB05	57SB06	57SB06	57SB07	57SB07
Sample ID	57SB05-05	57SB06-01	57SB06-05	57SB07-01	57SB07-05
Sample Date	1/27/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0
Semivolatiles (ug/kg) (Cont)					
Methapyrilene	210 UJ	210 UJ	200 UJ	220 UJ	210 UJ
Methyl Methane Sulfonate	210 U	210 U	200 U	220 U	210 U
Nitrobenzene	210 U	210 U	200 U	220 U	210 U
n-Nitrosodiethylamine	210 U	210 U	200 U	220 U	210 U
n-Nitrosodimethylamine (NDMA)	210 U	210 U	200 U	220 U	210 U
n-Nitroso-di-n-butylamine	210 UJ	210 U	200 U	220 UJ	210 UJ
n-Nitrosodi-n-propylamine	210 UJ	210 UJ	200 UJ	220 U	210 U
n-Nitrosodiphenylamine	210 U	210 U	200 U	220 U	210 U
n-Nitrosomethylethylamine	210 U	210 U	200 U	220 U	210 U
n-Nitrosomorpholine	210 UJ	210 UJ	200 UJ	220 U	210 U
n-Nitrosopiperidine	210 U	210 U	200 U	220 U	210 U
n-Nitrosopyrrolidine	210 UJ	210 UJ	200 UJ	220 U	210 U
o-Toluidine	210 U	210 U	200 U	220 U	210 U
Pentachlorobenzene	210 U	210 U	200 U	220 U	210 U
Pentachloronitrobenzene	210 U	210 U	200 U	220 U	210 U
Pentachlorophenol	410 U	410 UJ	380 UJ	430 U	400 U
Phenacetin	210 U	210 U	200 U	220 U	210 U
Phenol	410 U	410 U	380 U	430 U	400 U
Pronamide	410 U	410 U	380 U	430 U	400 U
Pyridine	210 U	210 U	200 U	220 U	210 U
Safrole	210 U	210 U	200 U	220 U	210 U
Low Molecular Weight PAHs (ug/kg)					
2-Methylnaphthalene	10 U	1.1 J	0.94 J	11 U	10 U
Acenaphthene	10 U	10 U	9.7 U	11 U	10 U
Acenaphthylene	10 U	0.98 J	0.7 J	11 U	10 U
Anthracene	10 U	1.3 J	0.8 J	11 U	10 U
Fluoranthene	10 U	10 U	9.7 U	11 U	10 U
Fluorene	10 U	10 UJ	9.7 UJ	11 U	10 U
Naphthalene	0.96 J	10 UJ	9.7 UJ	11 U	10 U
Phenanthrene	10 U	3.1 J	2.3 J	11 U	10 U
High Molecular Weight PAHs (ug/kg)					
Benzo(a)anthracene	10 U	3 J	1.6 J	11 U	10 U
Benzo(a)pyrene (BaP)	10 U	10 U	0.93 J	11 U	10 U
Benzo(b)fluoranthene	10 U	10 U	1 J	11 U	10 U
Benzo(g,h,i)perylene	10 U	10 UJ	9.7 UJ	11 U	10 U
Benzo(k)fluoranthene	10 U	10 U	0.82 J	11 U	10 U
Chrysene	10 U	2.9 J	1.7 J	11 U	10 U
Dibenz(a,h)anthracene	10 U	10 U	9.7 U	11 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	9.7 U	11 U	10 U
Pyrene	10 U	10 U	9.7 U	11 U	10 U
PAH totals (ug/kg)					
Low molecular weight PAHs	70.96	46.48	43.54	88	80
High molecular weight PAHs	90	75.9	44.85	99	90

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, SUBSURFACE SOIL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57SB05	57SB06	57SB06	57SB07	57SB07
Sample ID	57SB05-05	57SB06-01	57SB06-05	57SB07-01	57SB07-05
Sample Date	1/27/2010	1/28/2010	1/28/2010	1/27/2010	1/27/2010
Sample Depth (ft bgs)	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0	1.0 - 3.0	9.0 - 11.0
PCBs (ug/kg)					
Aroclor-1016	94 U	93 U	87 U	99 U	91 U
Aroclor-1221	75 U	74 U	70 U	79 U	73 U
Aroclor-1232	31 U	31 U	29 U	33 U	30 U
Aroclor-1242	44 U	43 U	41 U	46 U	43 U
Aroclor-1248	31 U	31 U	29 U	33 U	30 U
Aroclor-1254	25 U	25 U	23 U	26 U	24 U
Aroclor-1260	38 U	37 U	35 U	34 J	37 U
TPH (mg/kg)					
Diesel Range Organics (DRO)	5.1 J	4.7 J	4.1 J	11 J	10 J
Gasoline Range Organics (GRO)	0.62 U	0.62 U	0.58 U	0.66 UJ	0.61 U
Total TPH	5.72 J	5.32 J	4.68 J	11.66 J	10.61 J
Inorganics (mg/kg)					
Antimony	1.2 J	0.97 J	1.5 J	1.4 J	1.4 J
Arsenic	0.42 J	0.77 J	1.1 J	1.1 J	0.55 J
Barium	81.3	47.2	302	115	10.7 J
Beryllium	0.24 U	0.39 U	1.2	0.57 U	0.21 U
Cadmium	0.2 U	0.44 U	0.63	0.22 U	0.27 U
Chromium	22.3	21.9	10.8	29.3	21.4
Cobalt	33	34.4	104	38	13.8
Copper	72.8 J	67.5 J	147 J	74.6 J	58.7 J
Lead	4.5 J	17.4 J	7.4 J	20.3 J	5.7 J
Mercury	0.02 U	0.043	0.018 U	0.05	0.02 U
Nickel	25.8	16.2	17	13.5	18.7
Selenium	0.45 R	0.43 R	0.41 R	0.47 R	0.42 R
Silver	0.14 J	0.42 J	0.22 J	0.18 J	0.12 J
Thallium	3.4	2	4.1	2.3	1.9
Tin	1.6 J	1.1 J	0.72 J	1.7 J	0.92 J
Vanadium	136	149	215	184	121
Zinc	98.9	69.3	246	70.1	103

Notes:

- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable

GROUNDWATER

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07
Sample ID	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07D
Sample Date	1/31/2010	2/1/2010	1/31/2010	1/31/2010	2/1/2010	1/31/2010	1/31/2010
Volatiles (ug/L)							
1,1,1,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,2,3-Trichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane (DBCP)	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 R	0.5 R
1,2-Dibromoethane (EDB)	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,2-Dichloroethene (trans)	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,2-Dichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,3-Dichloropropene (cis)	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,3-Dichloropropene (trans)	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
1,4-Dichloro-2-butene (trans)	2 U	2 U	2 U	2 U	5 R	2 U	2 U
1,4-Dioxane (p-)	25 R	25 R	25 R	25 R	63 R	25 R	25 R
2-Butanone (MEK)	2.5 R	2.5 R	2.5 R	2.5 R	6.3 R	2.5 R	2.5 R
2-Chloro-1,3-butadiene (Chloroprene)	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
2-Hexanone (MBK)	2.5 U	2.5 U	2.5 U	2.5 U	6.3 R	2.5 U	2.5 U
3-Chloropropene (Allyl Chloride)	0.96 U	0.96 U	0.96 U	0.96 U	2.4 R	0.96 U	0.96 U
4-Methyl-2-pentanone (MIBK)	2.5 U	2.5 U	2.5 U	2.5 U	6.3 R	2.5 U	2.5 U
Acetone	3.5 R	3.5 R	4.4 R	3.5 R	8.6 R	3.5 R	3.5 R
Acetonitrile	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Acrolein	8.1 R	8.1 R	8.1 R	8.1 R	20 R	8.1 R	8.1 R
Acrylonitrile	5 R	5 R	5 R	5 R	13 R	5 R	5 R
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Bromodichloromethane	0.5 U	0.5 U	0.94 U	0.5 U	1.3 R	0.5 U	0.5 U
Bromoform	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Bromomethane	1.4 U	1.4 U	1.4 U	1.4 U	3.5 R	1.4 U	1.4 U
Carbon Disulfide	0.5 U	0.5 U	1.8	0.25 J	1.3 R	0.16 J	0.19 J
Carbon Tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Chloroethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Chloroform	0.5 U	0.5 U	5	3.2 U	1.4 R	0.5 U	0.5 U
Chloromethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Dibromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Dibromomethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Dichlorodifluoromethane (Freon-12)	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Ethyl Methacrylate	5 U	5 U	5 U	5 U	13 R	5 U	5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Isobutyl Alcohol	25 R	25 R	25 R	25 R	63 R	25 R	25 R
Methyl Acrylonitrile	5 U	5 U	5 U	5 U	13 R	5 U	5 U
Methyl Iodide	0.5 U	0.5 U	0.2 J	0.5 U	1.3 R	0.5 UJ	0.5 UJ
Methyl Methacrylate	5 U	5 U	5 U	5 U	13 R	5 U	5 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07
Sample ID	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07D
Sample Date	1/31/2010	2/1/2010	1/31/2010	1/31/2010	2/1/2010	1/31/2010	1/31/2010
Volatiles (ug/L) (Cont)							
Methylene Chloride	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Pentachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Propionitrile (Ethyl Cyanide)	25 R	25 R	25 R	25 R	63 R	25 R	25 R
Styrene (Ethenylbenzene)	0.5 U	0.5 UJ	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Tetrachloroethene (PCE)	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Trichloroethene (TCE)	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Trichlorofluoromethane (Freon 11)	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ	1.3 R	0.5 U	0.5 U
Vinyl Acetate	1 U	1 U	1 U	1 U	2.5 R	1 U	1 U
Vinyl Chloride	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Xylene, m/p-	1 U	1 U	1 U	1 U	2.5 R	1 U	1 U
Xylene, o-	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Xylenes, total	0.5 U	0.5 U	0.5 U	0.5 U	1.3 R	0.5 U	0.5 U
Semivolatiles (ug/L)							
1,2,4,5-Tetrachlorobenzene	5.1 UJ	5.3 U	5 R	5 R	5 U	5 U	5.3 U
1,2,4-Trichlorobenzene	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
1,2-Dichlorobenzene (o-)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
1,3,5-Trinitrobenzene (TNB)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
1,3-Dichlorobenzene (m-)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
1,3-Dinitrobenzene (m-)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
1,4-Dichlorobenzene (p-)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
1,4-Naphthoquinone	5.1 UJ	5.3 U	5 R	5 R	5 U	5 U	5.3 U
1,4-Phenylenediamine	52 R	54 R	51 R	51 R	51 R	51 R	54 R
1-Naphthylamine	5.1 R	5.3 R	5 R	5 R	5 R	5 R	5.3 R
2,2'-Oxybis[1-chloropropane]	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
2,3,4,6-Tetrachlorophenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
2,4,5-Trichlorophenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
2,4,6-Trichlorophenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
2,4-Dichlorophenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
2,4-Dimethylphenol	10 R	10 R	10 R	10 R	10 U	10 UJ	10 UJ
2,4-Dinitrophenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
2,4-Dinitrotoluene (DNT)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
2,6-Dichlorophenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
2,6-Dinitrotoluene (DNT)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
2-Acetylaminofluorene	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
2-Chloronaphthalene	5.1 UJ	5.3 U	5 R	5 R	5 U	5 U	5.3 U
2-Chlorophenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
2-Methyl-5-nitroaniline	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
2-Methylnaphthalene	0.21 U	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U
2-Methylphenol (o-Cresol)	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
2-Naphthylamine	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
2-Nitroaniline	5.1 UJ	5.3 U	5 R	5 R	5 U	5 U	5.3 U
2-Nitrophenol	10 R	10 U	10 R	10 R	10 U	10 UJ	10 UJ
2-Picoline	5.1 UJ	5.3 R	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07
Sample ID	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07D
Sample Date	1/31/2010	2/1/2010	1/31/2010	1/31/2010	2/1/2010	1/31/2010	1/31/2010
Semivolatiles (ug/L) (Cont)							
3,3'-Dichlorobenzidine	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
3,3'-Dimethylbenzidine	5.1 UJ	5.3 R	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
3-Methylcholanthrene	5.1 U	5.3 R	5 U	5 UJ	5 U	5 U	5.3 U
3-Methylphenol (m-Cresol)	8.2 R	8.4 R	8 R	8 R	8 U	8 UJ	8.4 UJ
3-Nitroaniline	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
4,6-Dinitro-2-methylphenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
4-Aminobiphenyl	5.1 UJ	5.3 R	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
4-Bromophenyl-phenylether	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
4-Chloro-3-methylphenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
4-Chloroaniline	5.1 UJ	5.3 U	5 R	5 R	5 U	5 U	5.3 U
4-Chlorophenyl-phenylether	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
4-Dimethylaminoazobenzene (p-)	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
4-Methylphenol (p-Cresol)	8.2 R	8.4 R	8 R	8 R	8 U	8 UJ	8.4 U
4-Nitroaniline	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
4-Nitrophenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
4-Nitroquinoline-1-oxide	5.1 UJ	5.3 R	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
7,12-Dimethylbenz(a)anthracene	5.1 U	5.3 U	5 U	5 UJ	5 U	5 U	5.3 U
Acenaphthene	0.21 U	0.21 U	0.2 U	0.2 U	0.41	0.2 U	0.21 U
Acenaphthylene	0.21 U	0.21 U	0.03 J	0.2 U	0.011 J	0.2 U	0.21 U
Acetophenone	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Aniline	5.1 U	5.3 R	5 U	5 U	5 U	5 U	5.3 U
Anthracene	0.21 U	0.21 U	0.2 U	0.2 U	0.55	0.2 U	0.21 U
Aramite	5.1 R	5.3 R	5 R	5 R	5 U	5 U	5.3 R
Benzo(a)anthracene	0.21 U	0.21 U	0.2 U	0.2 U	0.18 J	0.2 U	0.21 U
Benzo(a)pyrene (BaP)	0.21 U	0.21 U	0.2 U	0.2 U	0.023 J	0.2 U	0.21 U
Benzo(b)fluoranthene	0.21 U	0.21 U	0.2 U	0.2 U	0.031 J	0.2 U	0.21 U
Benzo(g,h,i)perylene	0.011 J	0.21 U	0.2 U	0.2 U	0.012 J	0.2 U	0.21 U
Benzo(k)fluoranthene	0.21 UJ	0.21 UJ	0.2 UJ	0.2 UJ	0.025 J	0.2 UJ	0.21 UJ
Benzyl Alcohol	5.1 R	5.3 R	5 R	5 R	5 U	5 UJ	5.3 UJ
Bis(2-chloroethoxy)methane	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Bis(2-chloroethyl)ether	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Bis(2-ethylhexyl) Phthalate (BEHP)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Butyl Benzyl Phthalate	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Chrysene	0.018 J	0.21 U	0.2 U	0.2 U	0.19 J	0.2 U	0.017 J
Diallate	5.1 UJ	5.3 UJ	5 U	5 UJ	5 UJ	5 UJ	5.3 UJ
Diallate (cis)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Diallate (trans)	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
Dibenz(a,h)anthracene	0.21 U	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U
Dibenzofuran	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Diethyl Phthalate (DEP)	5.1 U	5.3 U	5 U	5 U	0.6 J	5 U	5.3 U
Dimethyl Phthalate	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Di-n-butyl Phthalate (DBP)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Di-n-octyl Phthalate	5.1 U	5.3 U	5 U	5 UJ	5 U	5 U	5.3 U
Dinoseb	5.1 U	5.3 U	5 U	5 UJ	5 U	5 U	5.3 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07
Sample ID	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07D
Sample Date	1/31/2010	2/1/2010	1/31/2010	1/31/2010	2/1/2010	1/31/2010	1/31/2010
Semivolatiles (ug/L) (Cont)							
Ethyl Methane Sulfonate (EMS)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Fluoranthene	0.21 U	0.21 U	0.2 U	0.2 U	2.4	0.2 U	0.21 U
Fluorene	0.21 U	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U
Hexachloro-1,3-butadiene	5.1 UJ	5.3 U	5 R	5 R	5 U	5 U	5.3 U
Hexachlorobenzene	5.1 U	5.3 UJ	5 U	5 U	5 U	5 U	5.3 U
Hexachlorocyclopentadiene	5.1 UJ	5.3 U	5 R	5 R	5 U	5 U	5.3 U
Hexachloroethane	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Hexachloropropene	5.1 UJ	5.3 U	5 R	5 R	5 U	5 U	5.3 U
Indeno(1,2,3-cd)pyrene	0.21 U	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U
Isophorone	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Isosafrole	5.1 UJ	5.3 R	5 R	5 R	5 U	5 U	5.3 U
Methapyrilene	5.1 UJ	5.3 R	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
Methyl Methane Sulfonate	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Naphthalene	0.21 U	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U
Nitrobenzene	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
n-Nitrosodiethylamine	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
n-Nitrosodimethylamine (NDMA)	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
n-Nitroso-di-n-butylamine	5.1 UJ	5.3 U	5 R	5 R	5 U	5 U	5.3 U
n-Nitrosodi-n-propylamine	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
n-Nitrosodiphenylamine	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
n-Nitrosomethylethylamine	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
n-Nitrosomorpholine	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
n-Nitrosopiperidine	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
n-Nitrosopyrrolidine	5.1 UJ	5.3 UJ	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
o-Toluidine	5.1 UJ	5.3 R	5 UJ	5 UJ	5 UJ	5 UJ	5.3 UJ
Pentachlorobenzene	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Pentachloronitrobenzene	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Pentachlorophenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
Phenacetin	5.1 U	5.3 U	5 U	5 U	5 U	5 U	5.3 U
Phenanthrene	0.06 J	0.21 U	0.2 U	0.2 U	0.049 J	0.2 U	0.078 J
Phenol	10 R	10 UJ	10 R	10 R	10 U	10 UJ	10 UJ
Pronamide	10 U	10 R	10 U	10 U	10 U	10 U	10 U
Pyrene	0.21 U	0.21 U	0.2 U	0.2 U	1.9	0.2 U	0.21 U
Pyridine	5.1 U	5.3 R	5 U	5 U	5 U	5 U	5.3 U
Safrole	5.1 UJ	5.3 U	5 R	5 R	5 U	5 U	5.3 U
PCB (ug/L)							
Aroclor-1016	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 U
Aroclor-1221	3.9 U	3.9 U	3.9 UJ	3.9 U	3.8 U	3.9 U	3.9 U
Aroclor-1232	1.8 U	1.8 U	1.8 UJ	1.8 U	1.8 U	1.8 U	1.8 U
Aroclor-1242	1.1 U	1.1 U	1.1 UJ	1.1 U	1 U	1.1 U	1.1 U
Aroclor-1248	1.3 U	1.3 U	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 U
Aroclor-1254	0.66 U	0.66 U	0.66 UJ	0.66 U	0.63 U	0.66 U	0.66 U
Aroclor-1260	0.98 U	0.98 U	0.98 UJ	0.98 U	0.93 U	0.98 U	0.98 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, GROUNDWATER
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07
Sample ID	13GW07	57GW01	57GW02	57GW04	57GW05	57GW07	57GW07D
Sample Date	1/31/2010	2/1/2010	1/31/2010	1/31/2010	2/1/2010	1/31/2010	1/31/2010
TPH (mg/L)							
Diesel Range Organics (DRO)	0.53 U	0.51 U	0.5 U	0.56 U	0.5 U	0.5 U	0.56 U
Gasoline Range Organics (GRO)	0.5 U	0.5 UJ	0.5 U	0.5 U	2.1	0.5 U	0.5 U
Total TPH	1.03 U	1.01 UJ	1 U	1.06 U	2.6	1 U	1.06 U
Dissolved Inorganics (ug/L)							
Antimony	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Arsenic	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Barium	25.7 J	28 R	93.1 J	25.7 J	22.5 J	16.3 J	16.3 J
Beryllium	0.33 U	0.23 U	0.46 U	0.23 U	0.23 U	0.23 U	0.33 U
Cadmium	0.4 U	0.34 U	0.96 U	0.34 U	0.34 U	0.82 U	0.72 U
Chromium	0.95 U	1.2 J	0.95 U	2.9 J	0.95 U	3 J	3.6 J
Cobalt	3.6 J	3.5 J	12.8 J	2.2 J	3.7 J	1.6 J	3.3 J
Copper	1.6 J	1.6 U	2.8 J	1.9 J	1.5 U	1.5 U	1.6 J
Lead	2.7 U	1.8 U	2 U	2.1 U	14.9	1.8 U	1.8 U
Mercury	1.1	1.2	0.1 U	0.28	0.1 U	0.1 U	0.17 J
Nickel	1.3 J	5.4 J	17.4 J	4.3 J	2.2 U	5.7 J	6.5 J
Selenium	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U	3.6 U
Silver	1 J	1.1 U	0.96 U	0.96 U	0.96 U	0.96 U	1.4 J
Thallium	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U
Tin	9.5 J	5.1 J	6.2 J	5.1 U	5.1 U	5.2 J	5.1 U
Vanadium	23.8	8.6 J	28.3	28.1	9.2 J	10.7 J	11.5 J
Zinc	5.3 U	12.5 U	23.3	11.1 U	5.5 U	5.7 U	7.8 U
Total Inorganics (ug/L)							
Antimony	2.9 U	2.9 U	2.9 U	3.7 J	2.9 U	2.9 U	2.9 U
Arsenic	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Barium	30 J	17.3 R	83.8 J	26.9 J	24.8 J	17.9 J	18.2 J
Beryllium	0.24 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U	0.23 U
Cadmium	0.34 U	0.34 U	0.85 J	0.34 U	0.34 U	0.91 J	0.4 J
Chromium	0.95 U	1.2 U	2.7 U	3.4 U	1.7 U	3.4 U	2.9 U
Cobalt	3.2 J	1.5 J	9.5 J	1.3 J	3 J	2.1 J	0.83 J
Copper	2.8 J	1.5 U	6.5	2.5 J	5 J	2.9 J	3 J
Lead	1.8 U	2 U	2.7 U	1.8 U	17.7	2.2 U	2.3 U
Mercury	0.97	1.4	0.1 U	0.19 J	0.1 U	0.13 J	0.22
Nickel	1.6 U	3.7 U	16.9 U	4.5 U	2.4 U	6.2 U	5 U
Selenium	3.6 UJ	3.9 J	3.6 UJ	3.6 UJ	3.6 UJ	3.6 UJ	4.5 J
Silver	1 J	1.3 J	1.2 U	0.96 U	0.96 U	0.96 U	0.96 U
Thallium	5.3 U	5.3 U	5.6 J	5.3 U	5.3 U	5.3 U	5.3 U
Tin	7.9 J	5.5 J	8 J	6.2 J	6.3 J	8.8 J	5.1 U
Vanadium	24.4	6.5 J	37.5	29.6	15.5 J	13.6 J	11.8 J
Zinc	5.7 U	9.4 U	28	10.1 U	9.5 U	11 U	10.6 U

Notes:

- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable

CONCRETE WIPE

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, CONCRETE WIPE
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57WS01	57WS02	57WS03	57WS04	57WS04
Sample ID	57WS01	57WS02	57WS03	57WS04	57WS04D
Sample Date	1/30/2010	1/30/2010	1/30/2010	1/30/2010	1/30/2010
Semivolatiles (ug/wipe)					
1,2,4,5-Tetrachlorobenzene	170 U	170 U	170 U	340 U	340 U
1,2,4-Trichlorobenzene	170 U	170 U	170 U	340 U	340 U
1,2-Dichlorobenzene (o-)	170 U	170 U	170 U	340 U	340 U
1,3,5-Trinitrobenzene (TNB)	170 U	170 U	170 U	340 U	340 U
1,3-Dichlorobenzene (m-)	170 U	170 U	170 U	340 U	340 U
1,3-Dinitrobenzene (m-)	170 U	170 U	170 U	340 U	340 U
1,4-Dichlorobenzene (p-)	170 U	170 U	170 U	340 U	340 U
1,4-Naphthoquinone	170 U	170 U	170 U	340 U	340 U
1,4-Phenylenediamine	1700 R	1700 R	1700 R	3400 R	3400 R
1-Naphthylamine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
2,2'-Oxybis[1-chloropropane]	170 U	170 U	170 U	340 U	340 U
2,3,4,6-Tetrachlorophenol	330 U	330 U	330 U	660 U	660 U
2,4,5-Trichlorophenol	330 U	330 U	330 U	660 U	660 U
2,4,6-Trichlorophenol	330 U	330 U	330 U	660 U	660 U
2,4-Dichlorophenol	330 U	330 U	330 U	660 U	660 U
2,4-Dimethylphenol	330 U	330 U	330 U	660 U	660 U
2,4-Dinitrophenol	330 U	330 U	330 U	660 U	660 U
2,4-Dinitrotoluene (DNT)	170 U	170 U	170 U	340 U	340 U
2,6-Dichlorophenol	330 U	330 U	330 U	660 U	660 U
2,6-Dinitrotoluene (DNT)	170 U	170 U	170 U	340 U	340 U
2-Acetylaminofluorene	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
2-Chloronaphthalene	170 U	170 U	170 U	340 U	340 U
2-Chlorophenol	330 U	330 U	330 U	660 U	660 U
2-Methyl-5-nitroaniline	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
2-Methylnaphthalene	8.3 U	8.3 U	8.3 U	17 U	17 U
2-Methylphenol (o-Cresol)	330 U	330 U	330 U	660 U	660 U
2-Naphthylamine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
2-Nitroaniline	170 U	170 U	170 U	340 U	340 U
2-Nitrophenol	330 U	330 U	330 U	660 U	660 U
2-Picoline	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
3,3'-Dichlorobenzidine	170 U	170 U	170 U	340 U	340 U
3,3'-Dimethylbenzidine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
3-Methylcholanthrene	170 U	170 U	170 U	340 U	340 U
3-Methylphenol (m-Cresol)	250 U	250 U	250 U	500 U	500 U
3-Nitroaniline	170 U	170 U	170 U	340 U	340 U
4,6-Dinitro-2-methylphenol	330 U	330 U	330 U	660 U	660 U
4-Aminobiphenyl	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
4-Bromophenyl-phenylether	170 U	170 U	170 U	340 U	340 U
4-Chloro-3-methylphenol	330 U	28 J	330 U	660 U	660 U
4-Chloroaniline	170 U	170 U	170 U	340 U	340 U
4-Chlorophenyl-phenylether	170 U	170 U	170 U	340 U	340 U
4-Dimethylaminoazobenzene (p-)	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, CONCRETE WIPE
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57WS01	57WS02	57WS03	57WS04	57WS04
Sample ID	57WS01	57WS02	57WS03	57WS04	57WS04D
Sample Date	1/30/2010	1/30/2010	1/30/2010	1/30/2010	1/30/2010
Semivolatiles (ug/wipe) (Cont)					
4-Methylphenol (p-Cresol)	250 U	250 U	250 U	500 U	500 U
4-Nitroaniline	170 U	170 U	170 U	340 U	340 U
4-Nitrophenol	330 U	330 U	330 U	660 U	660 U
4-Nitroquinoline-1-oxide	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
7,12-Dimethylbenz(a)anthracene	170 U	170 U	170 U	340 U	340 U
Acenaphthene	1.4 J	2.1 J	1 J	1.6 J	1.5 J
Acenaphthylene	8.3 U	8.3 U	0.89 J	17 U	17 U
Acetophenone	170 U	170 U	170 U	340 U	340 U
Aniline	170 U	170 U	170 U	340 U	340 U
Anthracene	8.3 U	8.3 U	8.3 U	17 U	17 U
Aramite	170 UJ	170 UJ	170 U	340 U	340 UJ
Benzo(a)anthracene	8.3 U	8.3 U	8.3 U	17 U	17 U
Benzo(a)pyrene (BaP)	8.3 U	8.3 U	8.3 U	17 U	17 U
Benzo(b)fluoranthene	8.3 U	8.3 U	8.3 U	17 U	17 U
Benzo(g,h,i)perylene	8.3 U	8.3 U	8.3 U	17 U	17 U
Benzo(k)fluoranthene	8.3 U	8.3 U	8.3 U	17 U	17 U
Benzyl Alcohol	170 U	170 U	170 U	340 U	340 U
Bis(2-chloroethoxy)methane	170 U	170 U	170 U	340 U	340 U
Bis(2-chloroethyl)ether	170 U	170 U	170 U	340 U	340 U
Bis(2-ethylhexyl) Phthalate (BEHP)	340 U	220 U	170 U	340 U	340 U
Butyl Benzyl Phthalate	170 U	170 U	170 U	340 U	340 U
Chrysene	8.3 U	8.3 U	8.3 U	17 U	17 U
Diallate	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
Diallate (cis)	170 U	170 U	170 U	340 U	340 U
Diallate (trans)	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
Dibenz(a,h)anthracene	8.3 U	8.3 U	8.3 U	17 U	17 U
Dibenzofuran	170 U	170 U	170 U	340 U	340 U
Diethyl Phthalate (DEP)	170 U	170 U	170 U	340 U	340 U
Dimethyl Phthalate	170 U	170 U	170 U	340 U	340 U
Di-n-butyl Phthalate (DBP)	170 U	170 U	170 U	340 U	340 U
Di-n-octyl Phthalate	170 U	170 U	170 U	340 U	340 U
Dinoseb	170 U	170 U	170 U	340 U	340 U
Ethyl Methane Sulfonate (EMS)	170 U	170 U	170 U	340 U	340 U
Fluoranthene	8.3 U	8.3 U	8.3 U	17 U	17 U
Fluorene	1 J	1.4 J	0.73 J	0.96 J	1.2 J
Hexachloro-1,3-butadiene	170 U	170 U	170 U	340 U	340 U
Hexachlorobenzene	170 U	170 U	170 U	340 U	340 U
Hexachlorocyclopentadiene	170 U	170 U	170 U	340 U	340 U
Hexachloroethane	170 U	170 U	170 U	340 U	340 U
Hexachloropropene	170 U	170 U	170 U	340 U	340 U
Indeno(1,2,3-cd)pyrene	8.3 UJ	8.3 UJ	8.3 UJ	17 UJ	17 UJ
Isophorone	170 U	170 U	170 U	340 U	340 U
Isosafrole	170 U	170 U	170 U	340 U	340 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, CONCRETE WIPE
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57WS01	57WS02	57WS03	57WS04	57WS04
Sample ID	57WS01	57WS02	57WS03	57WS04	57WS04D
Sample Date	1/30/2010	1/30/2010	1/30/2010	1/30/2010	1/30/2010
Semivolatiles (ug/wipe) (Cont)					
Methapyrilene	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
Methyl Methane Sulfonate	170 UJ	170 UJ	170 U	340 U	340 UJ
Naphthalene	8.3 U	8.3 U	8.3 U	17 U	17 U
Nitrobenzene	170 U	170 U	170 U	340 U	340 U
n-Nitrosodiethylamine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
n-Nitrosodimethylamine (NDMA)	170 UJ	170 UJ	170 U	340 U	340 UJ
n-Nitroso-di-n-butylamine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
n-Nitrosodi-n-propylamine	170 U	170 U	170 U	340 U	340 U
n-Nitrosodiphenylamine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
n-Nitrosomethylethylamine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
n-Nitrosomorpholine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
n-Nitrosopiperidine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
n-Nitrosopyrrolidine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
o-Toluidine	170 UJ	170 UJ	170 UJ	340 UJ	340 UJ
Pentachlorobenzene	170 U	170 U	170 U	340 U	340 U
Pentachloronitrobenzene	170 U	170 U	170 U	340 U	340 U
Pentachlorophenol	330 U	330 U	330 U	660 U	660 U
Phenacetin	170 U	170 U	170 U	340 U	340 U
Phenanthrene	2.8 J	3.7 J	1.7 J	2.8 J	2.9 J
Phenol	330 U	330 U	330 U	660 U	660 U
Pronamide	330 U	330 U	330 U	660 U	660 U
Pyrene	8.3 U	8.3 U	8.3 U	17 U	17 U
Pyridine	170 U	170 U	170 U	340 U	340 U
Safrole	170 U	170 U	170 U	340 U	340 U
PCB (ug/wipe)					
Aroclor-1016	1.3 U				
Aroclor-1221	3.8 U				
Aroclor-1232	1.8 U				
Aroclor-1242	1 U	1 U	1 U	1 U	1 U
Aroclor-1248	1.3 U				
Aroclor-1254	0.63 U				
Aroclor-1260	0.93 U				
TPH (mg/wipe)					
Diesel Range Organics (DRO)	2.1	1.9	1.9	1.8	2.2

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, CONCRETE WIPE
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57WS01	57WS02	57WS03	57WS04	57WS04
Sample ID	57WS01	57WS02	57WS03	57WS04	57WS04D
Sample Date	1/30/2010	1/30/2010	1/30/2010	1/30/2010	1/30/2010
Inorganics (ug/wipe)					
Antimony	0.29 U	0.48 J	0.29 U	0.29 U	0.29 J
Arsenic	0.29 U				
Barium	2.3 U	6.9 U	7.2 U	4.2 U	3 U
Beryllium	0.03 U	0.07 U	0.07 U	0.06 U	0.04 U
Cadmium	0.03 U	0.03 U	0.2 U	0.03 U	0.03 U
Chromium	0.56 J	0.76 J	1.4	0.55 J	0.49 J
Cobalt	0.08 U	0.08 U	0.13 J	0.08 U	0.08 U
Copper	0.45 J	0.87 J	2	0.56 J	0.49 J
Lead	0.8 J	0.96 J	1.5 J	1.3 J	0.87 J
Nickel	0.1 J	0.23 J	23.1	0.1 U	0.1 J
Selenium	0.36 U	0.36 U	0.5 J	0.47 J	0.36 U
Silver	0.1 U				
Thallium	0.53 U				
Tin	1.3 J	1.8 J	1.4 J	1.3 J	1.8 J
Vanadium	0.36 U	0.59 U	1 U	0.39 U	0.44 U
Zinc	4.9	7.3	6.5	10.6 J	5.5 J

Notes:

- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable

CONCRETE CHIP

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, CONCRETE CHIP
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57CC01	57CC02	57CC03	57CC04	57CC04
Sample ID	57CC01	57CC02	57CC03	57CC04	57CC04D
Sample Date	1/30/2010	1/30/2010	1/30/2010	1/30/2010	1/30/2010

Semivolatiles (ug/kg)

1,2,4,5-Tetrachlorobenzene	8100 U	5200 U	5400 U	5200 U	5200 U
1,2,4-Trichlorobenzene	8100 U	5200 U	5400 U	5200 U	5200 U
1,2-Dichlorobenzene (o-)	8100 U	5200 U	5400 U	5200 U	5200 U
1,3,5-Trinitrobenzene (TNB)	8100 U	5200 U	5400 U	5200 U	5200 U
1,3-Dichlorobenzene (m-)	8100 U	5200 U	5400 U	5200 U	5200 U
1,3-Dinitrobenzene (m-)	8100 U	5200 U	5400 U	5200 U	5200 U
1,4-Dichlorobenzene (p-)	8100 U	5200 U	5400 U	5200 U	5200 U
1,4-Naphthoquinone	8100 U	5200 U	5400 U	5200 R	5200 R
1,4-Phenylenediamine	81000 R	53000 R	54000 R	53000 R	52000 R
1-Naphthylamine	8100 UJ	5200 UJ	5400 UJ	5200 R	5200 R
2,2'-Oxybis[1-chloropropane]	8100 U	5200 U	5400 U	5200 U	5200 U
2,3,4,6-Tetrachlorophenol	16000 U	10000 U	10000 U	10000 U	10000 U
2,4,5-Trichlorophenol	16000 U	10000 U	10000 U	10000 U	10000 U
2,4,6-Trichlorophenol	16000 U	10000 U	10000 U	10000 U	10000 U
2,4-Dichlorophenol	16000 U	10000 U	10000 U	10000 U	10000 U
2,4-Dimethylphenol	16000 U	10000 U	10000 U	10000 U	10000 U
2,4-Dinitrophenol	16000 U	10000 U	10000 U	10000 R	10000 R
2,4-Dinitrotoluene (DNT)	8100 U	5200 U	5400 U	5200 U	5200 U
2,6-Dichlorophenol	16000 U	10000 U	10000 U	10000 U	10000 U
2,6-Dinitrotoluene (DNT)	8100 U	5200 U	5400 U	5200 U	5200 U
2-Acetylaminofluorene	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
2-Chloronaphthalene	8100 U	5200 U	5400 U	5200 U	5200 U
2-Chlorophenol	16000 U	10000 U	10000 U	10000 U	10000 U
2-Methyl-5-nitroaniline	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
2-Methylnaphthalene	8100 U	5200 U	5400 U	5200 U	5200 U
2-Methylphenol (o-Cresol)	16000 U	10000 U	10000 U	10000 U	10000 U
2-Naphthylamine	8100 R	5200 R	5400 R	5200 R	5200 R
2-Nitroaniline	8100 U	5200 U	5400 U	5200 U	5200 U
2-Nitrophenol	16000 U	10000 U	10000 U	10000 U	10000 U
2-Picoline	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
3,3'-Dichlorobenzidine	8100 U	5200 U	5400 U	5200 U	5200 U
3,3'-Dimethylbenzidine	8100 R	5200 R	5400 R	5200 R	5200 R
3-Methylcholanthrene	8100 U	5200 U	5400 U	5200 U	5200 U
3-Methylphenol (m-Cresol)	12000 U	7700 U	8000 U	7700 U	7600 U
3-Nitroaniline	8100 U	5200 U	5400 U	5200 U	5200 U
4,6-Dinitro-2-methylphenol	16000 U	10000 U	10000 U	10000 U	10000 U
4-Aminobiphenyl	8100 R	5200 R	5400 R	5200 R	5200 R
4-Bromophenyl-phenylether	8100 U	5200 U	5400 U	5200 U	5200 U
4-Chloro-3-methylphenol	16000 U	10000 U	10000 U	10000 U	10000 U
4-Chloroaniline	8100 U	5200 U	5400 U	5200 U	5200 U
4-Chlorophenyl-phenylether	8100 U	5200 U	5400 U	5200 U	5200 U
4-Dimethylaminoazobenzene (p-)	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, CONCRETE CHIP
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57CC01	57CC02	57CC03	57CC04	57CC04
Sample ID	57CC01	57CC02	57CC03	57CC04	57CC04D
Sample Date	1/30/2010	1/30/2010	1/30/2010	1/30/2010	1/30/2010
Semivolatiles (ug/kg) (Cont)					
4-Methylphenol (p-Cresol)	12000 U	7700 U	8000 U	7700 U	7600 U
4-Nitroaniline	8100 U	5200 U	5400 U	5200 U	5200 U
4-Nitrophenol	16000 U	10000 U	10000 U	10000 U	10000 U
4-Nitroquinoline-1-oxide	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
7,12-Dimethylbenz(a)anthracene	8100 U	5200 U	5400 U	5200 U	5200 U
Acenaphthene	8100 U	5200 U	5400 U	5200 U	5200 U
Acenaphthylene	8100 U	5200 U	5400 U	5200 U	5200 U
Acetophenone	8100 U	5200 U	5400 U	5200 U	5200 U
Aniline	8100 U	5200 U	5400 U	5200 U	5200 U
Anthracene	8100 U	5200 U	5400 U	5200 U	5200 U
Aramite	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 U
Benzo(a)anthracene	8100 U	5200 U	5400 U	5200 U	5200 U
Benzo(a)pyrene (BaP)	8100 U	5200 U	5400 U	5200 U	5200 U
Benzo(b)fluoranthene	8100 U	5200 U	5400 U	5200 U	5200 U
Benzo(g,h,i)perylene	8100 U	5200 U	5400 U	5200 U	5200 U
Benzo(k)fluoranthene	8100 U	5200 U	5400 U	5200 U	5200 U
Benzyl Alcohol	8100 U	5200 U	5400 U	5200 R	5200 R
Bis(2-chloroethoxy)methane	8100 U	5200 U	5400 U	5200 U	5200 U
Bis(2-chloroethyl)ether	8100 U	5200 U	5400 U	5200 U	5200 U
Bis(2-ethylhexyl) Phthalate (BEHP)	8100 U	5200 U	5400 U	1400 J	5200 U
Butyl Benzyl Phthalate	8100 U	5200 U	5400 U	5200 U	5200 U
Chrysene	8100 U	5200 U	5400 U	5200 U	5200 U
Diallate	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
Diallate (cis)	8100 U	5200 U	5400 U	5200 U	5200 U
Diallate (trans)	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
Dibenz(a,h)anthracene	8100 U	5200 U	5400 U	5200 U	5200 U
Dibenzofuran	8100 U	5200 U	5400 U	5200 U	5200 U
Diethyl Phthalate (DEP)	8100 U	5200 U	5400 U	5200 U	5200 U
Dimethyl Phthalate	8100 U	5200 U	5400 U	5200 U	5200 U
Di-n-butyl Phthalate (DBP)	8100 U	5200 U	5400 U	5200 U	5200 U
Di-n-octyl Phthalate	8100 U	5200 U	5400 U	5200 U	5200 U
Dinoseb	8100 U	5200 U	5400 U	5200 U	5200 U
Ethyl Methane Sulfonate (EMS)	8100 U	5200 U	5400 U	5200 U	5200 UJ
Fluoranthene	8100 U	5200 U	5400 U	5200 U	5200 U
Fluorene	8100 U	5200 U	5400 U	5200 U	5200 U
Hexachloro-1,3-butadiene	8100 U	5200 U	5400 U	5200 U	5200 U
Hexachlorobenzene	8100 U	5200 U	5400 U	5200 U	5200 U
Hexachlorocyclopentadiene	8100 U	5200 U	5400 U	5200 U	5200 U
Hexachloroethane	8100 U	5200 U	5400 U	5200 U	5200 U
Hexachloropropene	8100 U	5200 U	5400 U	5200 U	5200 U
Indeno(1,2,3-cd)pyrene	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
Isophorone	48000	1200 J	6000	11000	1700 J
Isosafrole	8100 U	5200 U	5400 U	5200 U	5200 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, CONCRETE CHIP
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57CC01	57CC02	57CC03	57CC04	57CC04
Sample ID	57CC01	57CC02	57CC03	57CC04	57CC04D
Sample Date	1/30/2010	1/30/2010	1/30/2010	1/30/2010	1/30/2010
Semivolatiles (ug/kg) (Cont)					
Methapyrilene	8100 UJ	5200 UJ	5400 UJ	5200 R	5200 R
Methyl Methane Sulfonate	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 U
Naphthalene	8100 U	5200 U	5400 U	5200 U	5200 U
Nitrobenzene	8100 U	5200 U	5400 U	5200 U	5200 U
n-Nitrosodiethylamine	8100 UJ	5200 UJ	5400 UJ	5200 R	5200 R
n-Nitrosodimethylamine (NDMA)	8100 UJ	5200 UJ	5400 UJ	5200 R	5200 R
n-Nitroso-di-n-butylamine	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
n-Nitrosodi-n-propylamine	8100 U	5200 U	5400 U	5200 U	5200 U
n-Nitrosodiphenylamine	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
n-Nitrosomethylethylamine	8100 UJ	5200 UJ	5400 UJ	5200 R	5200 R
n-Nitrosomorpholine	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
n-Nitrosopiperidine	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
n-Nitrosopyrrolidine	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
o-Toluidine	8100 UJ	5200 UJ	5400 UJ	5200 UJ	5200 UJ
Pentachlorobenzene	8100 U	5200 U	5400 U	5200 U	5200 U
Pentachloronitrobenzene	8100 U	5200 U	5400 U	5200 U	5200 U
Pentachlorophenol	16000 U	10000 U	10000 U	10000 R	10000 R
Phenacetin	8100 U	5200 U	5400 U	5200 U	5200 U
Phenanthrene	8100 U	5200 U	5400 U	5200 U	5200 U
Phenol	16000 U	10000 U	10000 U	10000 U	10000 U
Pronamide	16000 U	10000 U	10000 U	10000 U	10000 U
Pyrene	8100 U	5200 U	5400 U	5200 U	5200 U
Pyridine	8100 U	5200 U	5400 U	5200 R	5200 R
Safrole	8100 U	5200 U	5400 U	5200 U	5200 U
PCBs (ug/kg)					
Aroclor-1016	240 UJ	230 UJ	240 UJ	230 UJ	230 UJ
Aroclor-1221	190 UJ	190 UJ	190 UJ	190 UJ	180 UJ
Aroclor-1232	80 UJ	77 UJ	80 UJ	77 UJ	77 UJ
Aroclor-1242	110 UJ				
Aroclor-1248	80 UJ	77 UJ	80 UJ	77 UJ	77 UJ
Aroclor-1254	64 UJ	62 UJ	64 UJ	62 UJ	61 UJ
Aroclor-1260	96 UJ	93 UJ	96 UJ	93 UJ	92 UJ
TPH (mg/kg)					
Diesel Range Organics (DRO)	20 J	200	72	130	70

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, CONCRETE CHIP
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Site ID	57CC01	57CC02	57CC03	57CC04	57CC04
Sample ID	57CC01	57CC02	57CC03	57CC04	57CC04D
Sample Date	1/30/2010	1/30/2010	1/30/2010	1/30/2010	1/30/2010
Inorganics (mg/kg)					
Antimony	0.3 UJ	0.29 UJ	0.88 UJ	0.53 UJ	0.29 UJ
Arsenic	2.3	1.7	3.1	1.5	1.4
Barium	184	81.1	150	109	94.4
Beryllium	0.55	0.22 J	0.37 J	0.39 J	0.28 J
Cadmium	2.8 J	0.2 J	1.3 J	2.9 J	1.5 J
Chromium	13.3	7.2	19.1	8.1	7
Cobalt	1.4	1.9	2.5	1.5	1.8
Copper	12.1 J	13.3 J	31.2 J	23 J	12.9 J
Lead	13.4	7.6	8.3	6.6 J	4.5 J
Mercury	0.017 U	0.017 U	0.016 U	0.017 U	0.016 U
Nickel	5.3	3.6 J	12.8	5.2	4.1
Selenium	0.37 R	0.36 R	0.37 R	0.37 R	0.36 R
Silver	0.1 U	0.09 U	0.1 U	0.1 U	0.1 U
Thallium	0.54 U	0.52 U	0.55 U	0.54 U	0.52 U
Tin	2.8 U	1.9 U	2.5 U	2.3 U	1.6 U
Vanadium	17.6	18.5	18.6	18	16.5
Zinc	16.7 J	17.3 J	23.2 J	19.2 J	27.4 J

Notes:

- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable

QA/QC DATA

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57TB01	57TB02	57TB03	57TB04 ⁽¹⁾	57TB05	57TB06	57TB07
Sample Date	1/26/2010	1/26/2010	1/27/2010	2/1/2010	2/1/2010	2/2/2010	5/20/2010
Volatiles (ug/L)							
1,1,1,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
1,1,2,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
1,2,3-Trichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 U	0.5 R	0.5 U	NA	NA
1,2-Dibromoethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
1,2-Dichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
cis-1,3-Dichloropropene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
trans-1,3-Dichloropropene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
trans-1,4-Dichloro-2-butene	2 U	2 U	2 U	2 U	2 U	NA	NA
1,4-Dioxane	25 R	25 R	25 R	25 R	25 R	NA	NA
2-Butanone	2.5 R	2.5 R	2.5 R	2.5 R	2.5 R	NA	NA
2-Chloro-1,3-butadiene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
2-Hexanone	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	NA	NA
3-Chloropropene (Allyl Chloride)	0.96 U	0.96 U	0.96 U	0.96 U	0.96 U	NA	NA
4-Methyl-2-pentanone	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	NA	NA
Acetone	3.5 U	3.5 U	3.5 R	3.5 R	3.5 R	NA	NA
Acetonitrile	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Acrolein	8.1 U	8.1 R	8.1 R	8.1 R	8.1 R	NA	NA
Acrylonitrile	5 R	5 R	5 R	5 R	5 R	NA	NA
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Bromoform	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Bromomethane	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	NA	NA
Carbon Disulfide	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	NA	NA
Carbon Tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Chloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Chloroform	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Chloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Dibromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Dibromomethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Dichlorodifluoromethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Ethyl Methacrylate	5 U	5 U	5 U	5 U	5 U	NA	NA
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Isobutyl Alcohol	25 R	25 R	25 R	25 R	25 R	NA	NA
Methyl Acrylonitrile	5 U	5 U	5 U	5 U	5 U	NA	NA
Methyl Iodide	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	NA	NA
Methyl Methacrylate	5 U	5 U	5 U	5 U	5 U	NA	NA

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**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57TB01	57TB02	57TB03	57TB04 ⁽¹⁾	57TB05	57TB06	57TB07
Sample Date	1/26/2010	1/26/2010	1/27/2010	2/1/2010	2/1/2010	2/2/2010	5/20/2010
Volatiles (ug/L) (Cont)							
Methylene Chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Pentachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Propionitrile	25 R	25 R	25 R	25 R	25 R	NA	NA
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Toluene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Trichlorofluoromethane	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 UJ	NA	NA
Vinyl Acetate	1 U	1 U	1 U	1 U	1 U	NA	NA
Vinyl Chloride	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
m/p-Xylene	1 U	1 U	1 U	1 U	1 U	NA	NA
o-Xylene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
total Xylenes	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	NA
Semivolatiles (ug/L)							
1,2,4,5-Tetrachlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,2-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,3,5-Trinitrobenzene	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	NA	NA	NA	NA
1,4-Naphthoquinone	NA	NA	NA	NA	NA	NA	NA
1,4-Phenylenediamine	NA	NA	NA	NA	NA	NA	NA
1-Naphthylamine	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis[1-chloropropane]	NA	NA	NA	NA	NA	NA	NA
2,3,4,6-Tetrachlorophenol	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA
2,6-Dichlorophenol	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA
2-Acetylaminofluorene	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA
2-Methyl-5-nitroaniline	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol (o-Cresol)	NA	NA	NA	NA	NA	NA	NA
2-Naphthylamine	NA	NA	NA	NA	NA	NA	NA
2-Nitroaniline	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	NA	NA	NA	NA	NA	NA	NA
2-Picoline	NA	NA	NA	NA	NA	NA	NA

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**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57TB01	57TB02	57TB03	57TB04 ⁽¹⁾	57TB05	57TB06	57TB07
Sample Date	1/26/2010	1/26/2010	1/27/2010	2/1/2010	2/1/2010	2/2/2010	5/20/2010
Semivolatiles (ug/L) (Cont)							
3,3'-Dichlorobenzidine	NA	NA	NA	NA	NA	NA	NA
3,3'-Dimethylbenzidine	NA	NA	NA	NA	NA	NA	NA
3-Methylcholanthrene	NA	NA	NA	NA	NA	NA	NA
3-Methylphenol (m-Cresol)	NA	NA	NA	NA	NA	NA	NA
3-Nitroaniline	NA	NA	NA	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA	NA	NA	NA	NA	NA
4-Aminobiphenyl	NA	NA	NA	NA	NA	NA	NA
4-Bromophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	NA	NA	NA	NA	NA	NA	NA
4-Chloroaniline	NA	NA	NA	NA	NA	NA	NA
4-Chlorophenyl-phenylether	NA	NA	NA	NA	NA	NA	NA
4-Dimethylaminoazobenzene	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA
4-Nitroaniline	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA
4-Nitroquinoline-1-oxide	NA	NA	NA	NA	NA	NA	NA
7,12-Dimethylbenz(a)anthracene	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA
Acetophenone	NA	NA	NA	NA	NA	NA	NA
Aniline	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA
Aramite	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA
Benzyl Alcohol	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethoxy)methane	NA	NA	NA	NA	NA	NA	NA
Bis(2-chloroethyl)ether	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl) Phthalate	NA	NA	NA	NA	NA	NA	NA
Butyl Benzyl Phthalate	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA
Diallate	NA	NA	NA	NA	NA	NA	NA
Diallate (cis)	NA	NA	NA	NA	NA	NA	NA
Diallate (trans)	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA
Diethyl Phthalate	NA	NA	NA	NA	NA	NA	NA
Dimethyl Phthalate	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl Phthalate	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl Phthalate	NA	NA	NA	NA	NA	NA	NA

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SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57TB01	57TB02	57TB03	57TB04 ⁽¹⁾	57TB05	57TB06	57TB07
Sample Date	1/26/2010	1/26/2010	1/27/2010	2/1/2010	2/1/2010	2/2/2010	5/20/2010
Semivolatiles (ug/L) (Cont)							
Dinoseb	NA	NA	NA	NA	NA	NA	NA
Ethyl Methane Sulfonate	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	NA	NA	NA	NA	NA	NA	NA
Hexachlorocyclopentadiene	NA	NA	NA	NA	NA	NA	NA
Hexachloroethane	NA	NA	NA	NA	NA	NA	NA
Hexachloropropene	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA
Isophorone	NA	NA	NA	NA	NA	NA	NA
Isosafrole	NA	NA	NA	NA	NA	NA	NA
Methapyrilene	NA	NA	NA	NA	NA	NA	NA
Methyl Methane Sulfonate	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiethylamine	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodimethylamine	NA	NA	NA	NA	NA	NA	NA
n-Nitroso-di-n-butylamine	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodi-n-propylamine	NA	NA	NA	NA	NA	NA	NA
n-Nitrosodiphenylamine	NA	NA	NA	NA	NA	NA	NA
n-Nitrosomethylethylamine	NA	NA	NA	NA	NA	NA	NA
n-Nitrosomorpholine	NA	NA	NA	NA	NA	NA	NA
n-Nitrosopiperidine	NA	NA	NA	NA	NA	NA	NA
n-Nitrosopyrrolidine	NA	NA	NA	NA	NA	NA	NA
o-Toluidine	NA	NA	NA	NA	NA	NA	NA
Pentachlorobenzene	NA	NA	NA	NA	NA	NA	NA
Pentachloronitrobenzene	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA
Phenacetin	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA
Pronamide	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA
Pyridine	NA	NA	NA	NA	NA	NA	NA
Safrole	NA	NA	NA	NA	NA	NA	NA
PCB (ug/L)							
Aroclor-1016	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	NA	NA	NA	NA	NA	NA	NA

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**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57TB01	57TB02	57TB03	57TB04 ⁽¹⁾	57TB05	57TB06	57TB07
Sample Date	1/26/2010	1/26/2010	1/27/2010	2/1/2010	2/1/2010	2/2/2010	5/20/2010
TPH (mg/L)							
Diesel Range Organics	NA	NA	NA	NA	NA	NA	NA
Gasoline Range Organics	0.051 J	0.031 J	0.034 J	0.036 J	NA	0.029 J	0.036 J
Total Inorganics (ug/L)							
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA
Tin	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA

Notes:

- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusable

⁽¹⁾The VOCs and TPH GRO results are from 2/2/2010

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**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57ER01	57ER02	57ER03	57ER04	57ER05	57ER06	57ER07
Sample Date	1/26/2010	1/27/2010	1/28/2010	1/29/2010	1/30/2010	1/31/2010	2/1/2010
Volatiles (ug/L)							
1,1,1,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
1,1,1-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
1,1,2-Trichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
1,1-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
1,1-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
1,2,3-Trichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 R	0.5 U
1,2-Dibromoethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
1,2-Dichloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
trans-1,2-Dichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
1,2-Dichloropropane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
cis-1,3-Dichloropropene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
trans-1,3-Dichloropropene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
trans-1,4-Dichloro-2-butene	2 U	2 U	2 U	2 U	NA	2 U	2 U
1,4-Dioxane	25 R	25 R	25 R	25 R	NA	25 R	25 R
2-Butanone	2.2 J	1.4 J	1.3 J	0.61 J	NA	0.67 J	0.94 J
2-Chloro-1,3-butadiene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
2-Hexanone	2.5 U	2.5 U	2.5 U	2.5 U	NA	2.5 U	2.5 U
3-Chloropropene (Allyl Chloride)	0.96 U	0.96 U	0.96 U	0.96 U	NA	0.96 U	0.96 U
4-Methyl-2-pentanone	2.5 U	2.5 U	2.5 U	2.5 U	NA	2.5 U	2.5 U
Acetone	4.6	4	3.7	3 J	NA	2.9 J	2.5 J
Acetonitrile	0.26 J	0.5 U	0.32 J	0.23 J	NA	0.5 U	0.26 J
Acrolein	8.1 R	8.1 R	8.1 R	8.1 R	NA	8.1 R	8.1 R
Acrylonitrile	5 R	5 R	5 R	5 R	NA	5 R	5 R
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Bromodichloromethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Bromoform	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Bromomethane	1.4 U	1.4 U	1.4 U	1.4 U	NA	1.4 U	1.4 U
Carbon Disulfide	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 UJ	0.5 U
Carbon Tetrachloride	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Chlorobenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Chloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Chloroform	0.19 J	0.19 J	0.16 J	0.17 J	NA	0.2 J	0.18 J
Chloromethane	0.46 J	0.5 U	0.31 J	0.5 U	NA	0.5 U	0.5 U
Dibromochloromethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Dibromomethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Dichlorodifluoromethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Ethyl Methacrylate	5 U	5 U	5 U	5 U	NA	5 U	5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Isobutyl Alcohol	25 R	25 R	25 R	25 R	NA	25 R	25 R
Methyl Acrylonitrile	5 U	5 U	5 U	5 U	NA	5 U	5 U
Methyl Iodide	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 UJ	0.5 U
Methyl Methacrylate	5 U	5 U	5 U	5 U	NA	5 U	5 U

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**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57ER01	57ER02	57ER03	57ER04	57ER05	57ER06	57ER07
Sample Date	1/26/2010	1/27/2010	1/28/2010	1/29/2010	1/30/2010	1/31/2010	2/1/2010
Volatiles (ug/L) (Cont)							
Methylene Chloride	13	14	13	12	NA	14	13
Pentachloroethane	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Propionitrile	25 R	25 R	25 R	25 R	NA	25 R	25 R
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Tetrachloroethene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Toluene	5.1	4.8	3.7	3.3	NA	4.5	4.8
Trichloroethene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Trichlorofluoromethane	0.5 U	0.5 U	0.5 U	0.5 UJ	NA	0.5 U	0.5 UJ
Vinyl Acetate	1 U	1 U	1 U	1 U	NA	1 U	1 U
Vinyl Chloride	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
m/p-Xylene	1 U	1 U	1 U	1 U	NA	1 U	1 U
o-Xylene	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
total Xylenes	0.5 U	0.5 U	0.5 U	0.5 U	NA	0.5 U	0.5 U
Semivolatiles (ug/L)							
1,2,4,5-Tetrachlorobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
1,2,4-Trichlorobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
1,2-Dichlorobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
1,3,5-Trinitrobenzene	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U
1,3-Dichlorobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
1,3-Dinitrobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
1,4-Dichlorobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
1,4-Naphthoquinone	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
1,4-Phenylenediamine	52 R	54 R	55 R	55 R	53.7 R	52 R	51 R
1-Naphthylamine	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 R	5.1 R	5 R
2,2'-Oxybis[1-chloropropane]	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U
2,3,4,6-Tetrachlorophenol	10 UJ	10 UJ	11 U	11 U	10.5 U	10 U	10 U
2,4,5-Trichlorophenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
2,4-Dinitrophenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
2,4-Dinitrotoluene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
2,6-Dichlorophenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
2,6-Dinitrotoluene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
2-Acetylaminofluorene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
2-Chloronaphthalene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
2-Chlorophenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
2-Methyl-5-nitroaniline	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
2-Methylnaphthalene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.068 J
2-Methylphenol (o-Cresol)	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
2-Naphthylamine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
2-Nitroaniline	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U
2-Nitrophenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
2-Picoline	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57ER01	57ER02	57ER03	57ER04	57ER05	57ER06	57ER07
Sample Date	1/26/2010	1/27/2010	1/28/2010	1/29/2010	1/30/2010	1/31/2010	2/1/2010
Semivolatiles (ug/L) (Cont)							
3,3'-Dichlorobenzidine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
3,3'-Dimethylbenzidine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
3-Methylcholanthrene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
3-Methylphenol (m-Cresol)	8.2 U	8.4 U	8.6 U	8.6 U	8.42 U	8.2 U	8 U
3-Nitroaniline	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
4,6-Dinitro-2-methylphenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
4-Aminobiphenyl	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
4-Bromophenyl-phenylether	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
4-Chloro-3-methylphenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
4-Chloroaniline	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
4-Chlorophenyl-phenylether	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
4-Dimethylaminoazobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
4-Methylphenol	8.2 U	8.4 U	8.6 U	8.6 U	8.42 U	8.2 U	8 U
4-Nitroaniline	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
4-Nitrophenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
4-Nitroquinoline-1-oxide	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
7,12-Dimethylbenz(a)anthracene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Acenaphthene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.08 J
Acenaphthylene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.011 J
Acetophenone	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Aniline	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Anthracene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.085 J
Aramite	5.1 U	5.3 U	5.4 U	5.4 U	5.26 R	5.1 R	5 R
Benzo(a)anthracene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.044 J
Benzo(a)pyrene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.2 U
Benzo(b)fluoranthene	0.21 UJ	0.21 UJ	0.22 UJ	0.22 UJ	0.21 U	0.21 U	0.2 U
Benzo(g,h,i)perylene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.013 J
Benzo(k)fluoranthene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 UJ	0.21 UJ	0.2 UJ
Benzyl Alcohol	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U
Bis(2-chloroethoxy)methane	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Bis(2-chloroethyl)ether	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Bis(2-ethylhexyl) Phthalate	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Butyl Benzyl Phthalate	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Chrysene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.039 J
Diallate	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 UJ	5.1 UJ	5 UJ
Diallate (cis)	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U
Diallate (trans)	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 UJ	5.1 UJ	5 UJ
Dibenz(a,h)anthracene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.2 U
Dibenzofuran	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Diethyl Phthalate	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Dimethyl Phthalate	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Di-n-butyl Phthalate	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U
Di-n-octyl Phthalate	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U

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**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57ER01	57ER02	57ER03	57ER04	57ER05	57ER06	57ER07
Sample Date	1/26/2010	1/27/2010	1/28/2010	1/29/2010	1/30/2010	1/31/2010	2/1/2010
Semivolatiles (ug/L) (Cont)							
Dinoseb	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Ethyl Methane Sulfonate	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U
Fluoranthene	0.21 U	0.21 U	0.022 J	0.22 U	0.21 U	0.21 U	0.081 J
Fluorene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.06 J
Hexachloro-1,3-butadiene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Hexachlorobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Hexachlorocyclopentadiene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Hexachloroethane	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Hexachloropropene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Indeno(1,2,3-cd)pyrene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.011 J
Isophorone	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U
Isosafrole	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Methapyrilene	5.1 U	5.3 R	5.4 R	5.4 R	5.26 UJ	5.1 UJ	5 UJ
Methyl Methane Sulfonate	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U
Naphthalene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.2 U
Nitrobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
n-Nitrosodiethylamine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
n-Nitrosodimethylamine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
n-Nitroso-di-n-butylamine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
n-Nitrosodi-n-propylamine	5.1 U	5.3 U	5.4 UJ	5.4 UJ	5.26 U	5.1 U	5 U
n-Nitrosodiphenylamine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
n-Nitrosomethylethylamine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
n-Nitrosomorpholine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
n-Nitrosopiperidine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
n-Nitrosopyrrolidine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
o-Toluidine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 UJ	5.1 UJ	5 UJ
Pentachlorobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Pentachloronitrobenzene	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Pentachlorophenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
Phenacetin	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Phenanthrene	0.21 U	0.21 U	0.22 U	0.22 U	0.21 U	0.21 U	0.25
Phenol	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
Pronamide	10 U	10 U	11 U	11 U	10.5 U	10 U	10 U
Pyrene	0.21 U	0.21 U	0.028 J	0.22 U	0.21 U	0.21 U	0.12 J
Pyridine	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
Safrole	5.1 U	5.3 U	5.4 U	5.4 U	5.26 U	5.1 U	5 U
PCB (ug/L)							
Aroclor-1016	1.3 U	1.4 U	1.3 U				
Aroclor-1221	3.8 U	4.2 U	3.8 U	3.9 U	3.9 U	3.8 U	3.8 U
Aroclor-1232	1.8 U	1.9 U	1.8 U				
Aroclor-1242	1 U	1.1 U	1 U	1.1 U	1.1 U	1 U	1 U
Aroclor-1248	1.3 U	1.4 U	1.3 U				
Aroclor-1254	0.65 U	0.7 U	0.63 U	0.66 U	0.66 U	0.63 U	0.63 U
Aroclor-1260	0.95 U	1 U	0.93 U	0.98 U	0.98 U	0.93 U	0.93 U

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**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57ER01	57ER02	57ER03	57ER04	57ER05	57ER06	57ER07
Sample Date	1/26/2010	1/27/2010	1/28/2010	1/29/2010	1/30/2010	1/31/2010	2/1/2010
TPH (mg/L)							
Diesel Range Organics	0.5 U	0.53 U	0.5 U	0.53 U	0.56 U	0.53 U	0.51 U
Gasoline Range Organics	0.048 J	0.038 J	0.043 J	0.03 J	NA	0.029 J	0.035 J
Total Inorganics (ug/L)							
Antimony	2.9 U	2.9 U					
Arsenic	2.9 U	2.9 U					
Barium	0.29 U	0.29 U					
Beryllium	0.23 U	0.23 U					
Cadmium	0.34 U	0.34 U					
Chromium	0.95 U	0.95 U					
Cobalt	0.75 U	0.75 U					
Copper	1.5 U	1.5 U	1.5 J	1.5 U	1.5 U	1.5 U	1.6 J
Lead	2.2 J	1.8 J	1.8 U	2.9 J	1.8 U	2.5 J	2.7 J
Mercury	0.1 U	0.1 U					
Nickel	0.96 U	0.96 U	2.1 J	0.96 U	0.96 U	0.96 U	0.96 U
Selenium	3.6 U	3.6 U					
Silver	0.96 U	0.96 U					
Thallium	5.3 U	5.3 U					
Tin	5.1 U	5.1 U					
Vanadium	0.68 U	0.68 U					
Zinc	1.3 J	7.8 J	2.9 J	1.2 J	1.7 J	6.8 J	34.5

Notes:

U - Not detected

UJ - Reported quantitation limit is qualified as estimated

J - Analyte present - Reported value is estimated

R - Result is rejected and unusab

⁽¹⁾The VOCs and TPH GRO result

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**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57ER08	57FB01	57FB02
Sample Date	5/20/2010	1/26/2010	2/1/2010
Volatiles (ug/L)			
1,1,1,2-Tetrachloroethane	NA	0.5 U	0.5 U
1,1,1-Trichloroethane	NA	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	NA	0.5 U	0.5 U
1,1,2-Trichloroethane	NA	0.5 U	0.5 U
1,1-Dichloroethane	NA	0.5 U	0.5 U
1,1-Dichloroethene	NA	0.5 U	0.5 U
1,2,3-Trichloropropane	NA	0.5 U	0.5 U
1,2-Dibromo-3-chloropropane	NA	0.5 U	0.5 R
1,2-Dibromoethane	NA	0.5 U	0.5 U
1,2-Dichloroethane	NA	0.5 U	0.5 U
trans-1,2-Dichloroethene	NA	0.5 U	0.5 U
1,2-Dichloropropane	NA	0.5 U	0.5 U
cis-1,3-Dichloropropene	NA	0.5 U	0.5 U
trans-1,3-Dichloropropene	NA	0.5 U	0.5 U
trans-1,4-Dichloro-2-butene	NA	2 U	2 U
1,4-Dioxane	NA	25 R	25 R
2-Butanone	NA	1.8 J	4 J
2-Chloro-1,3-butadiene	NA	0.5 U	0.5 U
2-Hexanone	NA	2.5 U	2.5 U
3-Chloropropene (Allyl Chloride)	NA	0.96 U	0.96 U
4-Methyl-2-pentanone	NA	2.5 U	2.5 U
Acetone	NA	5.7	8.3 J
Acetonitrile	NA	0.5 U	0.5 U
Acrolein	NA	8.1 R	8.1 R
Acrylonitrile	NA	5 R	5 R
Benzene	NA	0.5 U	0.5 U
Bromodichloromethane	NA	0.5 U	1.1
Bromoform	NA	0.5 U	2.1
Bromomethane	NA	1.4 U	1.4 U
Carbon Disulfide	NA	0.5 U	0.5 UJ
Carbon Tetrachloride	NA	0.5 U	0.5 U
Chlorobenzene	NA	0.5 U	0.5 U
Chloroethane	NA	0.5 U	0.5 U
Chloroform	NA	0.18 J	4.8
Chloromethane	NA	0.5 U	0.5 U
Dibromochloromethane	NA	0.5 U	1.2
Dibromomethane	NA	0.5 U	0.5 U
Dichlorodifluoromethane	NA	0.5 U	0.5 U
Ethyl Methacrylate	NA	5 U	5 U
Ethylbenzene	NA	0.5 U	0.5 U
Isobutyl Alcohol	NA	25 R	25 R
Methyl Acrylonitrile	NA	5 U	5 U
Methyl Iodide	NA	0.5 U	0.5 UJ
Methyl Methacrylate	NA	5 U	5 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57ER08	57FB01	57FB02
Sample Date	5/20/2010	1/26/2010	2/1/2010
Volatiles (ug/L) (Cont)			
Methylene Chloride	NA	12	0.58
Pentachloroethane	NA	0.5 U	0.5 U
Propionitrile	NA	25 R	25 R
Ethenylbenzene	NA	0.5 U	0.5 U
Tetrachloroethene	NA	0.5 U	0.5 U
Toluene	NA	4.9	0.5 U
Trichloroethene	NA	0.5 U	0.5 U
Trichlorofluoromethane	NA	0.5 U	0.5 U
Vinyl Acetate	NA	1 U	1 U
Vinyl Chloride	NA	0.5 U	0.5 U
m/p-Xylene	NA	1 U	1 U
o-Xylene	NA	0.5 U	0.5 U
total Xylenes	NA	0.5 U	0.5 U
Semivolatiles (ug/L)			
1,2,4,5-Tetrachlorobenzene	NA	5.1 U	5 U
1,2,4-Trichlorobenzene	NA	5.1 U	5 U
1,2-Dichlorobenzene	NA	5.1 U	5 U
1,3,5-Trinitrobenzene	NA	5.1 U	5 U
1,3-Dichlorobenzene	NA	5.1 U	5 U
1,3-Dinitrobenzene	NA	5.1 U	5 U
1,4-Dichlorobenzene	NA	5.1 U	5 U
1,4-Naphthoquinone	NA	5.1 U	5 U
1,4-Phenylenediamine	NA	52 R	51 U
1-Naphthylamine	NA	5.1 U	5 R
2,2'-Oxybis[1-chloropropane]	NA	5.1 U	5 U
2,3,4,6-Tetrachlorophenol	NA	10 UJ	10 U
2,4,5-Trichlorophenol	NA	10 U	10 U
2,4,6-Trichlorophenol	NA	10 U	10 U
2,4-Dichlorophenol	NA	10 U	10 U
2,4-Dimethylphenol	NA	10 U	10 U
2,4-Dinitrophenol	NA	10 U	10 U
2,4-Dinitrotoluene	NA	5.1 U	5 U
2,6-Dichlorophenol	NA	10 U	10 U
2,6-Dinitrotoluene	NA	5.1 U	5 U
2-Acetylaminofluorene	NA	5.1 U	5 UJ
2-Chloronaphthalene	NA	5.1 U	5 U
2-Chlorophenol	NA	10 U	10 U
2-Methyl-5-nitroaniline	NA	5.1 U	5 UJ
2-Methylnaphthalene	NA	0.21 U	0.019 J
2-Methylphenol (o-Cresol)	NA	10 U	10 U
2-Naphthylamine	NA	5.1 U	5 UJ
2-Nitroaniline	NA	5.1 U	5 U
2-Nitrophenol	NA	10 U	10 U
2-Picoline	NA	5.1 U	5 UJ

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57ER08	57FB01	57FB02
Sample Date	5/20/2010	1/26/2010	2/1/2010

Semivolatiles (ug/L) (Cont)

3,3'-Dichlorobenzidine	NA	5.1 U	5 U
3,3'-Dimethylbenzidine	NA	5.1 U	5 UJ
3-Methylcholanthrene	NA	5.1 U	5 U
3-Methylphenol (m-Cresol)	NA	8.2 U	8 U
3-Nitroaniline	NA	5.1 U	5 U
4,6-Dinitro-2-methylphenol	NA	10 U	10 U
4-Aminobiphenyl	NA	5.1 U	5 UJ
4-Bromophenyl-phenylether	NA	5.1 U	5 U
4-Chloro-3-methylphenol	NA	10 U	10 U
4-Chloroaniline	NA	5.1 U	5 U
4-Chlorophenyl-phenylether	NA	5.1 U	5 U
4-Dimethylaminoazobenzene	NA	5.1 U	5 UJ
4-Methylphenol	NA	8.2 U	8 U
4-Nitroaniline	NA	5.1 U	5 U
4-Nitrophenol	NA	10 U	10 U
4-Nitroquinoline-1-oxide	NA	5.1 U	5 UJ
7,12-Dimethylbenz(a)anthracene	NA	5.1 U	5 U
Acenaphthene	NA	0.21 U	0.2 U
Acenaphthylene	NA	0.21 U	0.2 U
Acetophenone	NA	5.1 U	5 U
Aniline	NA	5.1 U	5 U
Anthracene	NA	0.21 U	0.2 U
Aramite	NA	5.1 U	5 U
Benzo(a)anthracene	NA	0.21 U	0.2 U
Benzo(a)pyrene	NA	0.21 U	0.2 U
Benzo(b)fluoranthene	NA	0.21 UJ	0.2 U
Benzo(g,h,i)perylene	NA	0.21 U	0.2 U
Benzo(k)fluoranthene	NA	0.21 U	0.2 UJ
Benzyl Alcohol	NA	5.1 U	0.6 J
Bis(2-chloroethoxy)methane	NA	5.1 U	5 U
Bis(2-chloroethyl)ether	NA	5.1 U	5 U
Bis(2-ethylhexyl) Phthalate	NA	5.1 U	5 U
Butyl Benzyl Phthalate	NA	5.1 U	5 U
Chrysene	NA	0.21 U	0.2 U
Diallate	NA	5.1 U	5 UJ
Diallate (cis)	NA	5.1 U	5 U
Diallate (trans)	NA	5.1 U	5 UJ
Dibenz(a,h)anthracene	NA	0.21 U	0.2 U
Dibenzofuran	NA	5.1 U	5 U
Diethyl Phthalate	NA	5.1 U	5 U
Dimethyl Phthalate	NA	5.1 U	5 U
Di-n-butyl Phthalate	NA	5.1 U	5 U
Di-n-octyl Phthalate	NA	5.1 U	5 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57ER08	57FB01	57FB02
Sample Date	5/20/2010	1/26/2010	2/1/2010

Semivolatiles (ug/L) (Cont)

Dinoseb	NA	5.1 U	5 U
Ethyl Methane Sulfonate	NA	5.1 U	5 U
Fluoranthene	NA	0.21 U	0.2 U
Fluorene	NA	0.21 U	0.2 U
Hexachloro-1,3-butadiene	NA	5.1 U	5 U
Hexachlorobenzene	NA	5.1 U	5 U
Hexachlorocyclopentadiene	NA	5.1 U	5 U
Hexachloroethane	NA	5.1 U	5 U
Hexachloropropene	NA	5.1 U	5 U
Indeno(1,2,3-cd)pyrene	NA	0.21 U	0.2 U
Isophorone	NA	5.1 U	5 U
Isosafrole	NA	5.1 U	5 U
Methapyrilene	NA	5.1 U	5 UJ
Methyl Methane Sulfonate	NA	5.1 U	5 U
Naphthalene	NA	0.21 U	0.067 J
Nitrobenzene	NA	5.1 U	5 U
n-Nitrosodiethylamine	NA	5.1 U	5 UJ
n-Nitrosodimethylamine	NA	5.1 U	5 U
n-Nitroso-di-n-butylamine	NA	5.1 U	5 R
n-Nitrosodi-n-propylamine	NA	5.1 U	5 U
n-Nitrosodiphenylamine	NA	5.1 U	5 UJ
n-Nitrosomethylethylamine	NA	5.1 U	5 UJ
n-Nitrosomorpholine	NA	5.1 U	5 UJ
n-Nitropiperidine	NA	5.1 U	5 UJ
n-Nitrosopyrrolidine	NA	5.1 U	5 UJ
o-Toluidine	NA	5.1 U	5 UJ
Pentachlorobenzene	NA	5.1 U	5 U
Pentachloronitrobenzene	NA	5.1 U	5 U
Pentachlorophenol	NA	10 U	10 U
Phenacetin	NA	5.1 U	5 U
Phenanthrene	NA	0.21 U	0.2 U
Phenol	NA	10 U	10 U
Pronamide	NA	10 U	10 U
Pyrene	NA	0.21 U	0.2 U
Pyridine	NA	5.1 U	5 U
Safrole	NA	5.1 U	5 U

PCB (ug/L)

Aroclor-1016	NA	1.3 U	1.4 U
Aroclor-1221	NA	3.8 U	4.2 U
Aroclor-1232	NA	1.8 U	1.9 U
Aroclor-1242	NA	1 U	1.1 U
Aroclor-1248	NA	1.3 U	1.4 U
Aroclor-1254	NA	0.63 U	0.7 U
Aroclor-1260	NA	0.93 U	1 U

APPENDIX D

**SUMMARY OF ANALYTICAL RESULTS, QUALITY ASSURANCE / QUALITY CONTROL
SWMU 57 – FACILITY NO. 278 POL DRUM STORAGE AREA
PHASE I RFI REPORT
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO**

Sample ID	57ER08	57FB01	57FB02
Sample Date	5/20/2010	1/26/2010	2/1/2010
TPH (mg/L)			
Diesel Range Organics	NA	0.5 U	0.5 U
Gasoline Range Organics	0.04 J	0.048 J	0.03 J
Total Inorganics (ug/L)			
Antimony	NA	2.9 U	2.9 U
Arsenic	NA	2.9 U	2.9 U
Barium	NA	0.29 U	0.29 U
Beryllium	NA	0.23 U	0.28 J
Cadmium	NA	0.34 U	0.34 U
Chromium	NA	0.95 U	0.95 U
Cobalt	NA	0.75 U	0.75 U
Copper	NA	1.5 U	1.5 U
Lead	NA	1.8 U	1.8 U
Mercury	NA	0.1 U	0.1 U
Nickel	NA	0.96 U	0.96 U
Selenium	NA	3.6 U	3.6 U
Silver	NA	0.96 U	0.96 U
Thallium	NA	5.3 U	5.3 U
Tin	NA	5.1 U	5.1 U
Vanadium	NA	0.68 U	0.68 U
Zinc	NA	0.53 U	0.96 J

Notes:

- U - Not detected
- UJ - Reported quantitation limit is qualified as estimated
- J - Analyte present - Reported value is estimated
- R - Result is rejected and unusab

⁽¹⁾The VOCs and TPH GRO result



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BAKER ENVIRONMENTAL, INC. AIRSIDE BUSINESS PARK 100 AIRSIDE DRIVE MOON TOWNSHIP PA, 15108	Project: NAPR SWMU57/DO-119197.6.2 ON ISLAND Project Number: NAPR SWMU57/DO# /N62470-07-D-30 Project Manager: MARK KIMES	Reported: 02/26/2010 12:20
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57IDW01
1002031-02 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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COMPUCHEM

WET CHEMISTRY PARAMETERS

Corrosivity-pH	7.9		pH Units	1	0020921	02/09/2010 10:19	02/12/2010 12:07	EPA 9040B
Ignitability by Flashpoint	>140		degree F	1	0020920	02/09/2010 10:18	02/12/2010 12:06	EPA 1010
Reactive Cyanide	ND	250	mg/L	1	0020918	02/09/2010 10:16	02/12/2010 12:16	EPA 9014
Reactive Sulfide	ND	250	mg/L	1	0020919	02/09/2010 10:17	02/12/2010 12:05	EPA 9034

COMPUCHEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



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BAKER ENVIRONMENTAL, INC.
AIRSIDE BUSINESS PARK 100 AIRSIDE DRIVE
MOON TOWNSHIP PA, 15108

Project: NAPR SWMU57/DO-119197.6.2 ON ISLAND
Project Number: NAPR SWMU57/DO# /N62470-07-D-30
Project Manager: MARK KIMES

Reported:
02/26/2010 12:20

Notes and Definitions

>140 >140
DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

COMPUCHEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Preeti Khare For Cathy Dover, Project Manager

Page 5 of 5

SW846 - METALS

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

571DW01

Lab Name: COMPUCHEM Contract: _____
 Lab Code: LIBERTY Case No.: _____ SAS No.: _____ SDG No.: 1002031
 Matrix (soil/water): LEACHATE Lab Sample ID: 1002031-01
 Level (low/med): LOW Date Received: 2/3/2010
 % Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	3.2	B		P
7440-39-3	Barium	64.3	B		P
7440-43-9	Cadmium	0.71	B		P
7440-47-3	Chromium	2.1	B		P
7439-92-1	Lead	30.1	B		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	3.6	U		P
7440-22-4	Silver	0.96	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

57IDW01

Lab Name: COMPUCHEM Method: 8260B-1311W
 Lab Code: LIBRTY Case No.: SAS No.: SDG No.: 1002031
 Matrix: (soil/water) LEACHATE Lab Sample ID: 1002031-01
 Sample wt/vol: 5 (g/ml) ML Lab File ID: 1002031-0159
 Level: (low/med) LOW Date Received: 02/03/10
 % Moisture: not dec. _____ Date Analyzed: 02/16/10
 GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4-----	Vinyl Chloride	5.0	U
75-35-4-----	1,1-Dichloroethene	5.0	U
78-93-3-----	2-butanone	15	U
67-66-3-----	Chloroform	3.0	J
56-23-5-----	Carbon Tetrachloride	5.0	U
71-43-2-----	Benzene	5.0	U
107-06-2-----	1,2-Dichloroethane	5.0	U
79-01-6-----	Trichloroethene	5.0	U
127-18-4-----	Tetrachloroethene	5.0	U
108-90-7-----	Chlorobenzene	5.0	U

FORM I VOA



CompuChem

A Division Of
Liberty Analytical Corp.

BAKER ENVIRONMENTAL, INC.
AIRSIDE BUSINESS PARK 100 AIRSIDE DRIVE
MOON TOWNSHIP PA, 15108

Project: NAPR SWMU57/DO-119197.6.2 ON ISLAND
Project Number: NAPR SWMU57/DO# /N62470-07-D-30
Project Manager: MARK KIMES

Reported:
02/26/2010 13:28

57IDW02
1002032-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
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COMPUCHEM

WET CHEMISTRY PARAMETERS

Corrosivity-pH	8.0		pH Units	1	0020925	02/09/2010 10:26	02/12/2010 13:27	EPA 9040B
Ignitability by Flashpoint	>140		degree F dry	1	0020924	02/09/2010 10:24	02/12/2010 13:25	EPA 1010
Reactive Cyanide	ND		148 mg/kg dry	1	0020922	02/09/2010 10:21	02/12/2010 13:23	EPA 9014
Reactive Sulfide	ND		148 mg/kg dry	1	0020923	02/09/2010 10:23	02/12/2010 13:24	EPA 9034

COMPUCHEM

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

SW846 - METALS

-1-

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

571DW02

Lab Name: COMPUCHEM Contract: _____
 Lab Code: LIBRTY Case No.: _____ SAS No.: _____ SDG No.: 1002032
 Matrix (soil/water): LEACHATE Lab Sample ID: 1002032-01
 Level (low/med): LOW Date Received: 2/3/2010
 % Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	8.2	B		P
7440-39-3	Barium	90.6	B		P
7440-43-9	Cadmium	0.34	U		P
7440-47-3	Chromium	3.2	B		P
7439-92-1	Lead	4.2	B		P
7439-97-6	Mercury	0.10	U		CV
7782-49-2	Selenium	15.9	B		P
7440-22-4	Silver	0.96	U		P

Color Before: COLORLESS Clarity Before: CLEAR Texture: _____

Color After: COLORLESS Clarity After: CLEAR Artifacts: _____

Comments: _____

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

57IDW02

Lab Name: COMPUCHEM Method: 8260B-1311S
 Lab Code: LIBRTY Case No.: SAS No.: SDG No.: 1002032
 Matrix: (soil/water) LEACHATE Lab Sample ID: 1002032-01
 Sample wt/vol: 5 (g/ml) ML Lab File ID: 1002032-0159
 Level: (low/med) LOW Date Received: 02/03/10
 % Moisture: not dec. _____ Date Analyzed: 02/15/10
 GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 5.0
 Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	25	U
75-35-4	1,1-Dichloroethene	25	U
78-93-3	2-butanone	74	U
67-66-3	Chloroform	25	U
56-23-5	Carbon Tetrachloride	25	U
71-43-2	Benzene	25	U
107-06-2	1,2-Dichloroethane	25	U
79-01-6	Trichloroethene	72	U
127-18-4	Tetrachloroethene	25	U
108-90-7	Chlorobenzene	25	U

FORM I VOA

APPENDIX E
PHASE I RFI DATA VALIDATION SUMMARIES

COMPUCHEM SDG 1001159

Michael Baker, Jr., Inc.
 Airside Business Park
 100 Airside Drive
 Moon Township, PA 15108

April 15, 2010
 SDG# 1001159, CompuChem
 NAPR SWMU 57, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1001159. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, January 2006- SOP #HW-24, 8270D-Rev 3, October 2006-SOP #HW-22, and 8082A-Rev 1, October 2006-SOP HW-45) and professional judgment. Region II has not developed a validation checklist SOP for the methods used to assess the organic methods for hydrocarbons and inorganic methods in this SDG (SW-846 methods 8015_DRO, 8015_GRO, 6010B and 7471A). Therefore, alternative worksheets were provided. Region II flagging conventions were used. 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	VOA App IX	SVOA App IX w/ LL PAH	PCBs	GRO	DRO	Metals
57SB02-00	1001159-01	soil	X	X	X	X	X	X
57SB02-01	1001159-02	soil	X	X	X	X	X	X
57SB02-05	1001159-03	soil	X	X	X	X	X	X
57SB03-00	1001159-04	soil	X	X	X	X	X	X
57SB03-01	1001159-05	soil	X	X	X	X	X	X
57SB03-05	1001159-06	soil	X	X	X	X	X	X
57SB04-00	1001159-15	soil	X	X	X	X	X	X
57SB04-01	1001159-16	soil	X	X	X	X	X	X
57SB04-05	1001159-17	soil	X	X	X	X	X	X
57SB05-00	1001159-07	soil	X	X	X	X	X	X
57SB05-01	1001159-08	soil	X	X	X	X	X	X
57SB05-01D	1001159-09	soil	X	X	X	X	X	X
57SB05-05	1001159-10	soil	X	X	X	X	X	X
57SB06-00	1001159-18	soil	X	X	X	X	X	X
57SB06-01	1001159-19	soil	X	X	X	X	X	X
57SB06-05	1001159-20	soil	X	X	X	X	X	X
57SB07-00	1001159-11	soil	X	X	X	X	X	X
57SB07-00D	1001159-12	soil	X	X	X	X	X	X
57SB07-001	1001159-13	soil	X	X	X	X	X	X
57SB07-05	1001159-14	soil	X	X	X	X	X	X
57SB07-001 MS	1001159-13MS	soil	X	X	X	X	X	X
57SB07-001 MSD	1001159-13MSD	soil	X	X	X	X	X	X

The following quality control samples were provided with this SDG: sample 57SB05-01D-field duplicate of sample 57SB05-01; and sample 57SB07-00D-field duplicate of sample 57SB07-00.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times *
- GC/MS Tuning *
- GC Performance *
- Initial/Continuing Calibrations
- ICSA/ICSAB Standards *
- CRDL Standards *
- Blanks
- Internal Standards
- Surrogate Recoveries
- Laboratory Control Samples
- Matrix Spike Recoveries
- Matrix Duplicate RPDs *
- Serial Dilutions
- Field Duplicates
- Identification/Quantitation
- Reporting Limits *
- Tentatively Identified Compounds NA

* - 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. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page.

VOA

The initial and continuing calibrations exhibited some compounds with low RRF values, which resulted in qualifying non-detected values as rejected for these compounds. Due to

Michael Baker, Jr., Inc.
NAPR SWMU 57, Puerto Rico
SDG# 1001159

Page 2

002

high %D values, in the continuing calibrations, some compounds were qualified as estimated.

Blank contamination was noted in the method and/or QC blanks associated with samples in this batch. Qualifications were added to the data.

One sample exhibited low recoveries for internal standards that resulted in qualifying positive results as estimated and non-detect results as rejected.

SVOA

Due to high %RSDs and %D values, in the initial and continuing calibrations, some compounds were qualified as estimated.

Blank contamination was noted in the method and/or QC blanks associated with samples in this batch. Qualifications were added to the data.

Three samples exhibited high surrogate recoveries that resulted in qualifications to the data.

Due to below 10% recoveries for LCS samples, the associated sample non-detect results were qualified as rejected for one or more compounds.

The matrix spike and matrix spike duplicate exhibited low recoveries that resulted in qualifications to the associated sample.

PCBs

The field duplicate pair of samples 57SB07-00/57SB07-00D exhibited a high RPD for the compound AR1260. This compound was qualified as estimated in the field duplicate pair only.

GRO

Blank contamination was noted in the method blank associated with samples in this batch. Qualifications were added to the data.

The matrix spike and matrix spike duplicate exhibited low recoveries that resulted in qualifications to the associated sample.

DRO

One sample was re-extracted outside of holding time due to a high surrogate recovery. The RE sample was rejected in favor of the original extraction. No qualifications were

Metals

Blank contamination was noted and qualification was required in the samples in this SDG.

The matrix spikes pair submitted in this SDG exhibited non-compliant recoveries in both the MS and the MSD for several analytes for which qualifications/rejections were required.

The serial dilution submitted in this SDG exhibited a non-compliant %D for the analyte lead. All results for lead in the metals samples were qualified as estimated J/UJ.

The field duplicate pair of sample 57SB05-01/57SB05-01D exhibited several analytes with non-compliant RPDs or absolute value results. These analytes were flagged based on Region II guidance in the field duplicate pair only.

The field duplicate pair of sample 57SB07-00/57SB07-00D exhibited several analytes with non-compliant RPDs or absolute value results. These analytes were flagged based on Region II guidance in the field duplicate pair only.

All results reported at concentrations between the method detection limit and the reporting limits (B flagged by the laboratory) were qualified as estimated J.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the GRO fraction as a portion of the data package was missing. The laboratory was contacted and the required information was submitted and added to the package. Resubmissions were required for the PCB fraction because extraction records were not included in the original submission of the data package. These records were requested and received from the laboratory. A correction was also required on the PCB case narrative. Resubmissions were required for the SVOA fraction as the submitted LCS Form IIIs did not have all percent recoveries listed. The laboratory was contacted and updated forms were submitted. A copy of the e-mail correspondence is included in the validation worksheets.

Technical Holding Times

According to chain of custody records, sampling was performed on 01/26-28/10 and samples were received at the laboratory 1/27-29/10. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Initial/Continuing Calibration

VOA

Calibration standards exhibited %Ds and RRF values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC 1/27/10	acrolein propionitrile 1,4-dioxane	0.038 0.037 0.002	57SB02-00	J/R
CC 2/04/10	propionitrile isobutyl alcohol	0.035 0.012	57SB02-00	J/R
	dichlorodifluoromethane chloromethane vinyl acetate ethylmethacrylate trans-1,4-dichloro-2-butene	-23.32 -24.85 -20.90 -27.93 -23.74		J/UJ
IC 2/09/10	acrolein propionitrile isobutyl alcohol 1,4-dioxane	0.022 0.019 0.006 0.002	57SB03-05, 57SB02-01, 57SB02-05, 57SB03-00, 57SB03-01, 57SB05-00, 57SB05-01, 57SB05-01D, 57SB05-05, 57SB07-00, 57SB07-00D, 57SB07-01, 57SB07-05, 57SB04-00, 57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	J/R

SVOA

Calibration standards exhibited %RSDs and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC full scan 2/26/10	p-phenylenediamine methapyrilene	26.13 15.10	57SB07-01, 57SB07-05, 57SB02-00, 57SB02-01, 57SB02-05, 57SB03-00, 57SB03-01, 57SB03-05, 57SB05-00, 57SB05-01, 57SB05-01D, 57SB05-05, 57SB07-00, 57SB07-00D	J/UJ
CC full scan 3/01/10	n-nitroso-di-n-butylamine	21.88	57SB07-01, 57SB07-05, 57SB02-00, 57SB02-01, 57SB02-05, 57SB03-00, 57SB03-01, 57SB03-05	J/UJ

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
CC full scan 3/02/10	aniline bis(2-chloroethyl)ether 2,2'-oxybis(1-chloropropane) n-nitrosopyrrolidine n-nitroso-di-n-propylamine n-nitrosomorpholine bis(2-chloroethoxy)methane n-nitroso-di-n-butylamine isosafrole 2-nitroaniline dimethylphthalate 1,3-dinitrobenzene 2,6-dinitrotoluene acenaphthylene diolate (trans isomer) diolate (cis isomer) diolate total aramite	21.26 23.07 31.94 27.00 25.22 25.40 22.24 44.60 20.22 30.62 20.68 24.24 22.82 22.38 26.95 20.63 26.57 21.83	57SB05-00, 57SB05-01, 57SB05-01D, 57SB05-05, 57SB07-00, 57SB07-00D	J/UJ
IC full scan 3/08/10	n-nitrosopyrrolidine n-nitrosomorpholine p-phenylenediamine 4-chloro-3-methylphenol 1-naphthylamine 2-naphthylamine diolate (trans isomer) pentachlorophenol 4-nitroquinoline-1-oxide diolate (total)	15.52 16.96 23.97 17.70 20.99 18.32 26.79 15.34 16.24 22.10	57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	J/UJ
CC full scan 3/12/10	ethyl methanesulfonate benzyl alcohol 2,2'-oxybis(1-chloropropane) n-nitroso-di-n-propylamine isophorone 2-nitroaniline 1,3,5-trinitrobenzene diolate (cis isomer) di-n-butylphthalate methapyrilene 3,3'-dimethylbenzidine	25.37 24.77 20.42 25.39 21.83 28.16 38.33 28.29 31.88 39.49 20.99	57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	J/UJ

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC full scan 3/17/10	2-picoline	22.65	57SB04-00	J/UJ
	nitrosomethylethylamine	22.00		
	n-nitrosodiethylamine	21.76		
	n-nitrosopyrrolidine	24.94		
	n-nitrosomorpholine	22.93		
	o-toluidine	22.52		
	n-nitrosopiperidine	24.19		
	p-phenylenediamine	28.82		
	1-naphthylamine	27.26		
	2-naphthylamine	30.30		
	5-nitro-o-toluidine	27.60		
	n-nitrosodiphenylamine	16.39		
	diallate (trans isomer)	23.23		
	4-aminophenyl	24.87		
	4-nitroquinoline-1-oxide	19.69		
	methapyrilene	29.06		
	p-dimethylaminoazobenzene	25.39		
	3,3'-dimethylbenzidine	29.79		
	2-acetylaminofluorene	24.07		
	indeno(1,2,3-cd)pyrene	19.78		
diallate total	19.30			
CC full scan 3/18/10	benzo(k)fluoranthene	-21.98	57SB04-00	J/UJ
	aramite	0.044		J/R
CC-SIM 3/04/10	benzo(b)fluoranthene	29.30	LL PAH: 57SB07-00	J/UJ
CC-SIM 3/04/10	naphthalene	21.29	LL PAH: 57SB04-00, 57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	J/UJ
	acenaphthylene	22.79		
	fluorene	21.96		
	anthracene	21.11		
	benzo(g,h,i)perylene	-30.73		

Blanks

VOA

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	Reporting Limit	Action Level
57FB01	acetone	5.7	3.5	2X RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
57SB03-00	acetone	RL

SVOA

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	Reporting Limit	Action Level
SBLKCU	di-n-butylphthalate	20J ug/Kg	170 ug/Kg	RL
SBLKFL(SIM)	naphthalene	0.94J	8.3 ug/Kg	RL
	pyrene	0.66J	8.3	RL
57ER03	fluoranthene	0.022J ug/L	0.22 ug/L	RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
LL PAH: 57SB04-00, 57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	naphthalene	RL
LL PAH: 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	pyrene	RL
57SB02-01, 57SB07-00D	di-n-butylphthalate	RL
LL PAH: 57SB06-00, 57SB06-01, 57SB06-05	fluoranthene	RL

GRO

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	RL	Action Level
VBLKAC	GRO	0.063J mg/Kg	0.5 mg/Kg	RL
VBLKCF	GRO	0.037J	0.5	RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
all samples except 57SB02-01	GRO	RL

Metals

Associated blanks exhibited contamination as noted in the following table. The laboratory reported non-detect results to the MDL for this project. Therefore, the blank flagging actions were modified to take this into consideration. Please see the Glossary of Qualification Flags and Abbreviations for details.

Blank ID	Analyte	Concentration	Action Level
ICB	beryllium	0.3B ug/L	RL
	cadmium	0.4B ug/L	RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag
all samples >MDL up to RL	beryllium	U at reported concentration
	cadmium	U at reported concentration

Internal Standards

VOA

Sample 57SB02-00 exhibited below 25% internal standard area recoveries for all standards; therefore all positive results were qualified as estimated (J) and non-detect results qualified as rejected (R). According to the case narrative, there was insufficient sample available for re-analysis.

Surrogates

SVOA

The following samples exhibited high surrogate recoveries; qualifications were applied as stated for all associated compounds.

Sample ID	Non-Compliant Surrogate	% Rec	% QC limit	Qualifier
57SB03-00	2-fluorophenol	122	45-105	J all +
	nitrobenzene-d5	115	35-100	
	2,4,6-tribromophenol	128	35-125	
	terphenyl-d14	129	30-125	
57SB03-05	2-fluorophenol	115	45-105	J B/N
	nitrobenzene-d5	106	35-100	
	2-fluorobiphenyl	107	35-105	
57SB05-05	2-fluorophenol	129	45-105	J all +
	phenol	108	40-100	
	nitrobenzene-d5	121	35-100	
	2-fluorobiphenyl	108	35-125	
	terphenyl-d14	128	30-125	

Laboratory Control Sample

SVOA

The LCS and or LCSD associated with samples 57SB04-00, 57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01 and 57SB06-05 exhibited zero percent recoveries for p-phenylenediamine, hexachloropropene and hexachlorocyclopentadiene; therefore positive results were qualified as estimated (J) and non-detect results were qualified as rejected (R) for these compounds.

The LCS associated with samples 57SB07-01, 57SB07-05, 57SB02-00, 57SB02-01, 57SB02-05, 57SB03-00, 57SB03-01, 57SB03-05, 57SB05-00, 57SB05-01, 57SB01D,

Michael Baker, Jr., Inc.
 NAPR SWMU 57, Puerto Rico
 SDG# 1001159
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57SB05-05, 57SB07-00 and 57SB07-00D exhibited zero percent recoveries for p-phenylenediamine; therefore positive results were qualified as estimated (J) and non-detect results were qualified as rejected (R) for this compound.

Matrix Spike

SVOA

The matrix spike and matrix spike duplicate associated with sample 57SB07-01 exhibited zero percent recoveries for p-phenylenediamine (QC limit 20-150%); therefore the non-detect result for this compound was qualified as rejected (R). Results for methapyrilene were qualified as estimated (UJ) due to low recoveries of 16% and 12% (QC limit 20-150%).

GRO

The matrix spike and matrix spike duplicate associated with sample 57SB07-01 exhibited low recovery at 62% and 62% (QC limit 75-125%); therefore the non-detect result was qualified as estimated (UJ).

Metals

The matrix spike analysis submitted in this SDG exhibited non-compliant %Rs for three analytes, requiring qualification or rejection in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

MS/MSD	Analytes	Samples	%R	Q Flag
57SB07-01	antimony	all samples	31.3/39.6	J/UJ
	copper		197.2/144.4	J+
	selenium		0/0	R

Serial Dilutions

Metals

The serial dilution analysis submitted in this SDG exhibited a non-compliant %D for lead, requiring qualification in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

SD	Analytes	Samples	%D	Q Flag
57SB07-01	lead	all samples	10.8	J/UJ

Field Duplicates

PCBs

010

The field duplicate pair of samples 57SB07-00/57SB07-00D exhibited a high RPD for the compound AR1260 (82%). This compound was qualified as estimated in the field duplicate pair only.

Metals

The field duplicate pairs exhibited non-compliant field duplicate reproducibility for the following analytes. These field duplicate pairs and analytes were flagged as noted in the table below based on Region II guidelines.

Sample ID	Analyte	RPD or Absolute Difference	Q Flag
57SB05-01/57SB05-01D	antimony	-0.700	J
	arsenic	-0.730	
	barium	54%	
	beryllium	42%	
	cobalt	52%	
	mercury	0.049	
57SB07-00/57SB07-00D	antimony	-0.600	J
	barium	52%	
	cobalt	42%	
	thallium	1.7	

Identification/Quantitation

DRO

The re-extraction of sample 57SB02-05 was rejected in favor of the results reported from the original analysis of the sample.

Metals

All results reported at concentrations between the method detection limit and the reporting limit (B flagged by the laboratory) were qualified as estimated J.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Laura Maschhoff
President

Michael Baker, Jr., Inc.
NAPR SWMU 57, Puerto Rico
SDG# 1001159
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Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag
57SB02-00	acrolein propionitrile 1,4-dioxane	+/-	J/R
57SB02-00	propionitrile isobutyl alcohol	+/-	J/R
57SB02-00	dichlorodifluoromethane chloromethane vinyl acetate ethylmethacrylate trans-1,4-dichloro-2-butene	+/-	J/UJ
57SB03-05, 57SB02-01, 57SB02-05, 57SB03-00, 57SB03-01, 57SB05-00, 57SB05-01, 57SB05-01D, 57SB05-05, 57SB07-00, 57SB07-00D, 57SB07-01, 57SB07-05, 57SB04-00, 57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	acrolein propionitrile isobutyl alcohol 1,4-dioxane	+/-	J/R
57SB03-00	acetone	+	RL
57SB02-00	all results	+/-	J/R

SVOA

Sample ID	Compound	Results	Q flag
57SB07-01, 57SB07-05, 57SB02-00, 57SB02-01, 57SB02-05, 57SB03-00, 57SB03-01, 57SB03-05, 57SB05-00, 57SB05-01, 57SB05-01D, 57SB05-05, 57SB07-00, 57SB07-00D	p-phenylenediamine methapyrilene	+/-	J/UJ
57SB07-01, 57SB07-05, 57SB02-00, 57SB02-01, 57SB02-05, 57SB03-00, 57SB03-01, 57SB03-05	n-nitroso-di-n-butylamine	+/-	J/UJ
57SB05-00, 57SB05-01, 57SB05-01D, 57SB05-05, 57SB07-00, 57SB07-00D	aniline bis(2-chloroethyl)ether 2,2'-oxybis(1-chloropropane) n-nitrosopyrrolidine n-nitroso-di-n-propylamine n-nitrosomorpholine bis(2-chloroethoxy)methane n-nitroso-di-n-butylamine isosaftrole 2-nitroaniline dimethylphthalate 1,3-dinitrobenzene 2,6-dinitrotoluene acenaphthylene diallate (trans isomer) diallate (cis isomer) diallate total aramite	+/-	J/UJ

Sample ID	Compound	Results	Q flag
57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	n-nitrosopyrrolidine n-nitrosomorpholine p-phenylenediamine 4-chloro-3-methylphenol 1-naphthylamine 2-naphthylamine diallate (trans isomer) pentachlorophenol 4-nitroquinoline-1-oxide diallate (total)	+/-	J/UJ
57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	ethyl methanesulfonate benzyl alcohol 2,2'-oxybis(1-chloropropane) n-nitroso-di-n-propylamine isophorone 2-nitroaniline 1,3,5-trinitrobenzene diallate (cis isomer) di-n-butylphthalate methapyrilene 3,3'-dimethylbenzidine	+/-	J/UJ
57SB04-00	2-picoline nitrosomethylethylamine n-nitrosodiethylamine n-nitrosopyrrolidine n-nitrosomorpholine o-toluidine n-nitrosopiperidine p-phenylenediamine 1-naphthylamine 2-naphthylamine 5-nitro-o-toluidine n-nitrosodiphenylamine diallate (trans isomer) 4-aminophenyl 4-nitroquinoline-1-oxide methapyrilene p-dimethylaminoazobenzene 3,3'-dimethylbenzidine 2-acetylaminofluorene indeno(1,2,3-cd)pyrene diallate total	+/-	J/UJ
57SB04-00	benzo(k)fluoranthene	+/-	J/UJ
57SB04-00	aramite	+/-	J/R
LL PAH: 57SB07-00	benzo(b)fluoranthene	+/-	J/UJ
LL PAH: 57SB04-00, 57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	naphthalene acenaphthylene fluorene anthracene benzo(g,h,i)perylene	+/-	J/UJ

Sample ID	Compound	Results	Q flag
LL PAH: 57SB04-00, 57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	naphthalene	+	RL
LL PAH: 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	pyrene	+	RL
57SB02-01, 57SB07-00D	di-n-butylphthalate	+	RL
LL PAH: 57SB06-00, 57SB06-01, 57SB06-05	fluoranthene	+	RL
57SB03-00, 57SB05-05	all results	+	J
57SB03-05	B/N results	+	J
57SB04-00, 57SB04-01, 57SB04-05, 57SB06-00, 57SB06-01, 57SB06-05	p-phenylenediamine, hexachloropropene, hexachlorocyclopentadiene	+/-	J/R
57SB07-01, 57SB07-05, 57SB02-00, 57SB02-01, 57SB02-05, 57SB03-00, 57SB03-01, 57SB03-05, 57SB05-00, 57SB05-01, 57SB01D, 57SB05-05, 57SB07-00, 57SB07-00D	p-phenylenediamine	+/-	J/R
57SB07-01	p-phenylenediamine	-	R
57SB07-01	methapyrilene	-	UJ

PCBs

Sample ID	Compound	Results	Q flag
57SB07-00, 57SB07-00D	AR1260	+	J

GRO

Sample ID	Compound	Results	Q flag
all samples except 57SB02-01	GRO	+	RL
57SB07-01	GRO	-	UJ

DRO

Sample ID	Compound	Results	Q flag
57SB02-05RE	DRO	+/-	R

Metals

Sample ID	Analyte	Results	Q flag
all samples >MDL up to RL	beryllium cadmium	>MDL up to RL	U
all samples	antimony	+/-	J/UJ
all samples	copper	+	J
all samples	selenium	+/-	R
all samples	lead	+/-	J/UJ

Sample ID	Analyte	Results	Q flag
57SB05-01, 57SB05-01D	antimony arsenic barium beryllium cobalt mercury	+	J
57SB07-00/57SB07-00D	antimony barium cobalt thallium	+	J
all samples	all analytes	+B	J

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
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

- No Action - The sample result is greater than the RL 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 RL, result is reported as non-detect at the reported concentration, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

- R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
- J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
- J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

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 RL 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 RL, result is reported as non-detect at the reported concentration, when the FB result is less or greater than the RL.

R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.

J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

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

COMPUCHEM SDG 1001160

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

April 15, 2010
SDG# 1001160, CompuChem
NAPR SWMU 57, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1001160. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, January 2006- SOP #HW-24, 8270D-Rev 3, October 2006-SOP #HW-22 and 8082A-Rev 1, October 2006-SOP HW-45) and professional judgment. Region II has not developed a validation checklist SOP for the methods used to assess the organic methods for hydrocarbons and inorganic methods in this SDG (SW-846 methods 8015_DRO, 8015_GRO, 6010B and 7470A/7471A). Therefore, alternative worksheets were provided. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualification is provided.

Sample ID	Lab ID	Matrix	VOA App IX	SVOA App IX w/ LL PAH	PCBs	GRO	DRO	Metals
57ER01	1001160-02	water	X	X	X	X	X	X
57ER02	1001160-05	water	X	X	X	X	X	X
57ER03	1001160-06	water	X	X	X	X	X	X
57ER04	100160-08	water		X	X	X	X	X
57FB01	1001160-03	water	X	X	X	X	X	X
57TB01	1001160-01	water	X			X		
57TB02	1001160-04	water	X			X		
57TB03	1001160-07	water	X			X		
57TB04	1001160-09	water				X		

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times
- GC/MS Tuning *
- GC Performance *
- Initial/Continuing Calibrations
- ICSA/ICSAB Standards *
- CRDL Standards *
- Blanks *

- Internal Standards *
- Surrogate Recoveries *
- Laboratory Control Samples
- Matrix Spike Recoveries NA
- Matrix Duplicate RPDs NA
- Serial Dilutions *
- Field Duplicates NA
- Identification/Quantitation
- Reporting Limits *
- Tentatively Identified Compounds NA

* - 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. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page.

VOA

The initial and continuing calibrations exhibited some compounds with low RRF values, which resulted in qualifying non-detected values as rejected for these compounds. Due to high %D values, in the continuing calibrations, some compounds were qualified as estimated.

SVOA

Due to high %RSDs and %D values, in the initial and continuing calibrations, some compounds were qualified as estimated.

Due to below 10% recoveries for LCS samples, the associated sample non-detect results were qualified as rejected for one or more compounds.

PCBs

No qualifications to the data were required.

GRO

Three samples exceeded holding time which resulted in qualifications to the data.

DRO

No qualifications to the data were required.

Metals

All results reported at concentrations between the method detection limit and the reporting limit (B flagged by the laboratory) were qualified as estimated J.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the PCB fraction because extraction records were not included in the original submission of the data package. These records were requested and received from the laboratory. A copy of the e-mail correspondence is included in the validation worksheets. This SDG consisted of four rinse blanks, one field blank and four trip blanks. Please note: Typographical errors were noted in the DRO fraction between the extraction records and the Form 1s for three samples. Corrections were made on the Form 1s by the validator and copies of the records are included in the validation worksheets. Resubmissions were required for the SVOA fraction as the submitted LCS Form IIIs did not have all percent recoveries listed. The laboratory was contacted and updated forms were submitted.

Technical Holding Times

According to chain of custody records, sampling was performed on 01/26-29/10 and samples were received at the laboratory 1/27/10-2/1/10. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exceptions.

GRO

Sample 57ER01, 57FB01 and 57TB02 exceeded the 14 day holding time by one day; therefore the positive result exhibited in all samples was qualified as estimated (J).

Initial/Continuing Calibration

VOA

Calibration standards exhibited %Ds and RRF values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC 1/28/10	acrylonitrile	0.041	57TB01	J/R
	2-butanone	0.046		
	propionitrile	0.013		
	isobutyl alcohol	0.003		
	1,4-dioxane	0.0008		
IC 2/04/10	acrolein	0.016	57ER01, 57FB01, 57TB02, 57ER02, 57ER03, 57TB03	J/R
	acrylonitrile	0.037		
	2-butanone	0.038		
	propionitrile	0.012		
	isobutyl alcohol	0.003		
	1,4-dioxane	0.001		
CC 2/05/10	trichlorofluoromethane	-26.40	57TB03	J/UJ
	acetone	0.020		J/R

SVOA

Calibration standards exhibited %RSDs and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
CC full scan 3/02/10	p-phenylenediamine	20.98	57ER01, 57FB01 57ER02	J/UJ
	2,3,4,6-tetrachlorophenol	-21.06		
IC full scan 3/08/10	p-phenylenediamine	23.97	57ER03, 57ER04	J/UJ
	1-naphthylamine	20.99		
	diallate (trans isomer)	26.79		
	diallate total	22.10		
CC full scan 3/11/10	methyl methanesulfonate	31.35	57ER03, 57ER04	J/UJ
	ethyl methanesulfonate	39.08		
	benzyl alcohol	27.52		
	2,2'-oxybis(1-chloropropane)	46.25		
	n-nitroso-di-n-propylamine	26.19		
	isophorone	21.75		
	2-nitroaniline	20.17		
	1,3,5-trinitrobenzene	30.38		
	diallate (cis isomer)	25.22		
	di-n-butylphthalate	22.27		
	methapyrilene	31.91		
CC-SIM 3/04/10	benzo(b)fluoranthene	29.30	LL PAH: all samples	J/UJ

Laboratory Control Sample

SVOA

The LCS and or LCSD associated with all samples exhibited zero percent recoveries for p-phenylenediamine; therefore positive results were qualified as estimated (J) and non-detect results were qualified as rejected (R) for these compounds.

The LCS associated with samples 57ER02, 57ER03 and 57ER04 exhibited zero percent recoveries for methapyrilene and ; therefore positive results were qualified as estimated (J) and non-detect results were qualified as rejected (R) for these compounds.

Identification/Quantitation

Metals

All results reported at concentrations between the method detection limit and the reporting limit (B flagged by the laboratory) were qualified as estimated J.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,



Laura Maschhoff
President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag
57TB01	acrylonitrile 2-butanone propionitrile isobutyl alcohol 1,4-dioxane	+/-	J/R
57ER01, 57FB01, 57TB02, 57ER02, 57ER03, 57TB03	acrolein acrylonitrile 2-butanone propionitrile isobutyl alcohol 1,4-dioxane	+/-	J/R
57TB03	trichlorofluoromethane	+/-	J/UJ
57TB03	acetone	+/-	J/R

SVOA

Sample ID	Compound	Results	Q flag
57ER01, 57FB01, 57ER02	p-phenylenediamine 2,3,4,6-tetrachlorophenol	+/-	J/UJ
57ER03, 57ER04	p-phenylenediamine 1-naphthylamine diallate (trans isomer) diallate total	+/-	J/UJ
57ER03, 57ER04	methyl methanesulfonate ethyl methanesulfonate benzyl alcohol 2,2'-oxybis(1-chloropropane) n-nitroso-di-n-propylamine isophorone 2-nitroaniline 1,3,5-trinitrobenzene diallate (cis isomer) di-n-butylphthalate methapyrilene	+/-	J/UJ
LL PAH: all samples	benzo(b)fluoranthene	+/-	J/UJ
all samples	p-phenylenediamine	+/-	J/R
57ER02, 57ER03, 57ER04	methapyrilene	+/-	J/R

PCBs

Sample ID	Compound	Results	Q flag
No qualifications were required			

Summary of Data Qualifications, continued

GRO

Sample ID	Compound	Results	Q flag
57ER01, 57FB01, 57TB02	GRO	+	J

DRO

Sample ID	Compound	Results	Q flag
No qualifications were required			

Metals

Sample ID	Analyte	Results	Q flag
all samples	all analytes	+B	J

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
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL 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 RL, result is reported as non-detect at the reported concentration, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

- R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
- J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
- J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

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 RL 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 RL, result is reported as non-detect at the reported concentration, when the FB result is less or greater than the RL.

R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.

J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

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

COMPUCHEM SDG 1001181

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
 Airside Business Park
 100 Airside Drive
 Moon Township, PA 15108

April 15, 2010
 SDG# 1001181, CompuChem
 NAPR SWMU 57, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1001181. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, January 2006- SOP #HW-24, 8270D-Rev 3, October 2006-SOP #HW-22 and 8082A-Rev 1, October 2006-SOP HW-45), and professional judgment. Region II has not developed a validation checklist SOP for the methods used to assess the organic methods for hydrocarbons and inorganic methods in this SDG (SW-846 methods 8015_DRO, 8015_GRO, 6020B and 7471A). Therefore, alternative worksheets were provided. Region II flagging conventions were used. All areas of concern are discussed in the body of the report and a summary of data qualification is provided.

Sample ID	Lab ID	Matrix	VOA App IX	SVOA App IX w/ LL PAH	PCBs	GRO	DRO	Metals
57SB01-00	1001181-01	soil	X	X	X	X	X	X
57SB01-01	1001181-02	soil	X	X	X	X	X	X
57SB01-05	1001181-05	soil	X	X	X	X	X	X
57SS08	1001181-10	soil	X	X	X		X	X
57SS09	1001181-11	soil	X	X	X		X	X
57SS09-D	1001181-12	soil	X	X	X		X	X
57SS10	1001181-13	soil	X	X	X		X	X
57SS11	1001181-14	soil	X	X	X		X	X
57SS12	1001181-15	soil	X	X	X		X	X

The following quality control samples were provided with this SDG: sample 57SS09-D was the field duplicate of sample 57SS09.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times
- GC/MS Tuning *
- GC Performance *
- Initial/Continuing Calibrations

- ICSA/ICSAB Standards *
- CRDL Standards *
- Blanks
- Internal Standards
- Surrogate Recoveries *
- Laboratory Control Samples
- Matrix Spike Recoveries NA
- Matrix Duplicate RPDs NA
- Serial Dilutions
- Field Duplicates
- Identification/Quantitation
- Reporting Limits *
- Tentatively Identified Compounds NA

* - 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. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page.

VOA

One sample was analyzed out of holding time which resulted in qualifications to the data.

The initial and continuing calibrations exhibited some compounds with low RRF values, which resulted in qualifying non-detected values as rejected for these compounds. Due to high %D values, in the continuing calibrations, some compounds were qualified as estimated.

Blank contamination was noted in the method and/or QC blanks associated with samples in this batch. Qualifications were added to the data.

SVOA

Due to high %RSDs and %D values, in the initial and continuing calibrations, some compounds were qualified as estimated.

Blank contamination was noted in the method and/or QC blanks associated with samples in this batch. Qualifications were added to the data.

Four samples exhibited low internal standard area recoveries that resulted in qualifications to the associated compounds. Samples were re-analyzed with low recoveries exhibited.

Due to non-comparable results in the field duplicate pair, some compound results were qualified as estimated.

Due to below 10% recoveries for LCS samples, the associated sample non-detect results were qualified as rejected for one or more compounds.

PCBs

One positive result exhibited a column quantitation %D greater than 25% (Region II lower QC limit) and was flagged as estimated J.

GRO

Blank contamination was noted in the method blank associated with samples in this batch. Qualifications were added to the data.

DRO

Qualifications were added to the data due to instrument blank contamination.

The field duplicate pair exhibited an RPD greater than 50%. The reported results were flagged as estimated J.

Metals

The serial dilution submitted in this SDG exhibited a non-compliant %D for the analyte barium. All results for barium in the metals samples were qualified as estimated J/UJ.

The field duplicate pair of sample 57SS09/57SS09-D exhibited several analytes with non-compliant RPDs or absolute value results. These analytes were flagged based on Region II guidance in the field duplicate pair only.

All results reported at concentrations between the method detection limit and the reporting limit (B flagged by the laboratory) were qualified as estimated J.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the PCB fraction because extraction records were not included in the original submission of the data package. These records were requested and received from the laboratory. Resubmissions were required for the SVOA fraction as the submitted LCS Form IIIs did not have all percent recoveries listed. The laboratory was contacted and updated forms were submitted. A copy of the e-mail correspondence is included in the validation worksheets.

Technical Holding Times

According to chain of custody records, sampling was performed on 01/28, 1/29 and 2/2/10 and samples were received at the laboratory 1/29-2/3/10. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exceptions.

VOA

Sample 57SS09-D was analyzed four days out of the 14-day holding time; therefore all positive results were qualified as estimated (J) and all non-detected results were qualified as rejected (R). According to the case narrative, there were problems with leaking during the first and second analysis of this sample which resulted in no reportable data. The third analysis was reported out of holding time.

Initial/Continuing Calibration

VOA

Calibration standards exhibited %Ds and RRF values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC 2/09/10	acrolein propionitrile isobutyl alcohol 1,4-dioxane	0.022 0.019 0.006 0.002	all samples	J/R
CC 2/11/10 CC 2/12/10	acrylonitrile	0.049/0.049	57SS08, 57SS09 57SS10, 57SS11 57SS12	J/R
CC 2/12/10	trans-1,3-dichloropropene trans-1,4-dichloro-2-butene	-21.25 -29.45	57SS12	J/UJ
CC 2/17/10	trichlorofluoromethane carbon disulfide	25.42 -26.20	57SS09-D	J/UJ

SVOA

Calibration standards exhibited %RSDs and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC full scan 3/08/10	n-nitrosopyrrolidine n-nitrosomorpholine p-phenylenediamine 4-chloro-3-methylphenol 1-naphthylamine 2-naphthylamine di-allylamine (trans isomer) pentachlorophenol 4-nitroquinoline-1-oxide di-allylamine total	15.5 16.9 23.9 17.1 20.9 18.3 26.7 15.3 16.2 22.1	all samples	J/UJ
CC full scan 3/13/10	ethyl methanesulfonate benzyl alcohol n-nitroso-di-n-propylamine 2-nitroaniline 1,4-naphthoquinone 1,3,5-trinitrobenzene di-allylamine (cis isomer) di-n-butylphthalate	20.99 26.06 34.06 24.72 20.88 30.17 27.72 26.22	57SB01-00, 57SB01-01 57SB01-05, 57SS08 57SS09, 57SS09-D 57SS10, 57SS11 57SS12	J/UJ
CC-SIM 3/04/10	naphthalene acenaphthylene fluorene anthracene benzo(g,h,i)perylene	21.29 22.79 21.96 21.11 -30.73	LL PAH: 57SB01-00, 57SB01-01, 57SB01-05, 57SS10, 57SS11	J/UJ
CC-SIM 3/05/10	benzo(b)fluoranthene benzo(g,h,i)perylene	32.47 -32.03	LL PAH: 57SS12, 57SS08RE, 57SS09, 57SS09-DRE	J/UJ

Blanks

VOA

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	Reporting Limit	Action Level
57ER03	acetone	3.7 ug/L	3.5 ug/L	2X RL
	methylene chloride	13	0.5	2X RL
57ER04	acetone	3J	3.5	2X RL
	methylene chloride	12	0.5	2X RL
57FB01	acetone	5.7	3.5	2X RL
	methylene chloride	12	0.5	2X RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
57SB01-00, 57SS11	acetone	RL
57SS08, 57SS10	acetone	U at reported value
57SS09-D	methylene chloride	RL

SVOA

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	Reporting Limit	Action Level
SBLKFL(SIM)	naphthalene	0.94J ug/Kg	8.3 ug/Kg	RL
	pyrene	0.66J	8.3	RL
57ER03	fluoranthene	0.022J ug/L	0.22 ug/L	RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
LL PAH: 57SB01-00, 57SB01-01, 57SB01-05, 57SS10, 57SS12, 57SS08RE, 57SS09, 57SS09DRE	naphthalene	RL
LL PAH: 57SB01-01, 57SB01-05, 57SS11, 57SS12, 57SS09	pyrene	RL
LL PAH: 57SB01-00, 57SB01-01, 57SB01-05, 57SS09, 57SS11, 57SS12	fluoranthene	RL

GRO

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	RL	Action Level
VBLKCK	GRO	0.064J mg/Kg	0.5 mg/Kg	RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
all samples	GRO	RL

DRO

The associated instrument blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	Action Level
PIBLKVN	DRO	0.26J mg/L	RL
PIBLKVO	DRO	0.21J mg/L	RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
all sample results >MDL and <RL	DRO	U at RL

Internal Standards

SVOA

The following samples exhibited low internal standard area recoveries for the standards listed; qualifications were applied as stated for all associated compounds.

Sample ID	Non-Compliant Internal Standard	Qualifier
LL PAH: 57SS10, 57SS12, 57SS08RE, 57SS09-DRE	perylene-d12	J/UJ

Serial Dilutions

Metals

The serial dilution analysis submitted in this SDG exhibited a non-compliant %D for barium, requiring qualification in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

SD	Analytes	Samples	%D	Q Flag
57SB01-00	barium	all samples	13.9	J/UJ

Field Duplicates

SVOA

Sample LL PAH 57SS09 and duplicate sample LL PAH 57SS09DRE exhibited non-comparable results for acenaphthylene with 164% RPD, fluoranthene with 200% RPD, pyrene with 200% RPD, benzo(a) anthracene with 165% RPD and chrysene with 159% RPD; therefore results for these compounds were qualified as estimated (J/UJ).

DRO

The field duplicate pair of samples 57SS09/57SS09-D exhibited non-compliant field duplicate reproducibility for DRO at 64%. The reported DRO results were flagged as estimated J in the field duplicate pair only.

Metals

The field duplicate pair of samples 57SS09/57SS09-D exhibited non-compliant field duplicate reproducibility for the following analytes. These analytes were flagged as noted in the table below based on Region II guidelines.

Sample ID	Analyte	RPD or Absolute Difference	Q Flag
57SS09, 57SS09-D	barium	72%	J/UJ
	lead	44%	
	mercury	100%	
	nickel	61%	
	selenium	-0.670	

Laboratory Control Sample

SVOA

The LCS and or LCSD associated with samples 57SB01-00, 57SB01-01, 57SB01-05, 57SS08, 57SS09, 57SS09-D, 57SS10, 57SS11 and 57SS12 exhibited zero percent recoveries for p-phenylenediamine, hexachloropropene and hexachlorocyclopentadiene; therefore positive results were qualified as estimated (J) and non-detect results were qualified as rejected (R) for these compounds.

Identification/Quantitation

SVOA

The following LL PAH samples were not used due to non-compliant internal standard area recoveries: 57SS08, 57SS09-D, 57SS10RE, 57SS12RE. The initial or re-analysis of these samples was used as more compliant recoveries were exhibited.

PCBs

The reported positive result for AR1260 in sample 57SS10 exhibited a column quantitation %D that was >25% but less than 70%. This result was qualified as estimated J based on Region II guidelines.

Metals

All results reported at concentrations between the method detection limit and the reporting limit (B flagged by the laboratory) were qualified as estimated J.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,



Laura Maschhoff
President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag
57SS09-D	all results	+/-	J/R
all samples	acrolein propionitrile isobutyl alcohol 1,4-dioxane	+/-	J/R
57SS08, 57SS09, 57SS10, 57SS11 57SS12	acrylonitrile	+/-	J/R
57SS12	trans-1,3-dichloropropene trans-1,4-dichloro-2-butene	+/-	J/UJ
57SS09-D	trichlorofluoromethane carbon disulfide	+/-	J/UJ
57SB01-00, 57SS11	acetone	+	RL
57SS08, 57SS10	acetone	+	U
57SS09-D	methylene chloride	+	RL

SVOA

Sample ID	Compound	Results	Q flag
all samples	n-nitrosopyrrolidine n-nitrosomorpholine p-phenylenediamine 4-chloro-3-methylphenol 1-naphthylamine 2-naphthylamine diallate (trans isomer) pentachlorophenol 4-nitroquinoline-1-oxide diallate total	+/-	J/UJ
57SB01-00, 57SB01-01, 57SB01-05, 57SS08 57SS09, 57SS09-D, 57SS10, 57SS11 57SS12	ethyl methanesulfonate benzyl alcohol n-nitroso-di-n-propylamine 2-nitroaniline 1,4-naphthoquinone 1,3,5-trinitrobenzene diallate (cis isomer) di-n-butylphthalate	+/-	J/UJ
LL PAH: 57SB01-00, 57SB01-01, 57SB01-05, 57SS10, 57SS11	naphthalene acenaphthylene fluorene anthracene benzo(g,h,i)perylene	+/-	J/UJ
LL PAH: 57SS12, 57SS08RE, 57SS09, 57SS09-DRE	benzo(b)fluoranthene benzo(g,h,i)perylene	+/-	J/UJ
LL PAH: 57SB01-00, 57SB01-01, 57SB01-05, 57SS10, 57SS12, 57SS08RE, 57SS09, 57SS09DRE	naphthalene	+	RL

Summary of Data Qualifications

SVOA, continued

Sample ID	Compound	Results	Q flag
LL PAH: 57SB01-01, 57SB01-05, 57SS11, 57SS12, 57SS09	pyrene	+	RL
LL PAH: 57SB01-00, 57SB01-01, 57SB01-05, 57SS09, 57SS11, 57SS12	fluoranthene	+	RL
LL PAH: 57SS10, 57SS12, 57SS08RE, 57SS09-DRE	all compounds associated with: perylene-d12	+/-	J/UJ
LL PAH: 57SS09, 57SS09DRE	acenaphthylene, fluoranthene, pyrene, benzo(a) anthracene, chrysene	+/-	J/UJ
LL PAH: 57SS08, 57SS09-D, 57SS10RE, 57SS12RE	all results	+/-	R
57SB01-00, 57SB01-01, 57SB01-05, 57SS08, 57SS09, 57SS09-D, 57SS10, 57SS11, 57SS12	p-phenylenediamine, hexachloropropene, hexachlorocyclopentadiene	+/-	J/R

PCBs

Sample ID	Compound	Results	Q flag
57SS10	AR1260	+	J

GRO

Sample ID	Compound	Results	Q flag
all samples	GRO	+J	U at RL

DRO

Sample ID	Compound	Results	Q flag
all sample results >MDL and <RL	DRO	+J	U at RL
57SS09, 57SS09-D	DRO	+	J

Metals

Sample ID	Analyte	Results	Q flag
all samples	barium	+/-	J/UJ
57SS09, 57SS09-D	barium lead mercury nickel selenium	+/-	J/UJ
all samples	all analytes	+B	J

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
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

- No Action - The sample result is greater than the RL 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 RL, result is reported as non-detect at the reported concentration, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

- R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
- J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
- J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

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 RL 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 RL, result is reported as non-detect at the reported concentration, when the FB result is less or greater than the RL.
- R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.
- J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

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

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

April 19, 2010
SDG# 1002019, CompuChem
NAPR SWMU57, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1002019. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8260B-Rev 2, January 2006- SOP #HW-24, 8270D-Rev 3, October 2006-SOP #HW-22, and 8082A-Rev 1, October 2006-SOP HW-45) and professional judgment. Region II has not developed a validation checklist SOP for the methods used to assess the organic methods for hydrocarbons and inorganic methods in this SDG (SW-846 methods 8015_DRO, 8015_GRO, 6010B and 7471A). Therefore, alternative worksheets were provided. Region II flagging conventions were used. 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	VOA App IX	SVOA App IX w/ LL PAH	PCBs	GRO	DRO	Metals
13GW07	1002019-02	water	X	X	X	X	X	X
57ER04	1002019-13	water	X					
57ER05	1002019-07	water		X	X		X	X
57ER06	1002019-08	water	X	X	X	X	X	X
57ER07	1002019-09	water	X	X	X	X	X	X
57FB02	1002019-10	water	X	X	X	X	X	X
57GW01	1002019-01	water	X	X	X	X	X	X
57GW02	1002019-03	water	X	X	X	X	X	X
57GW04	1002019-04	water	X	X	X	X	X	X
57GW05	1002019-12	water	X	X	X	X	X	X
57GW07	1002019-05	water	X	X	X	X	X	X
57GW07-D	1002019-06	water	X	X	X	X	X	X
57TB04	1002019-14	water	X					
57TB05	1002019-11	water	X					
57TB06	1002019-15	water				X		
57GW01 MS	1002019-01MS	water	X	X	X	X	X	X
57GW01 MSD	1002019-01MSD	water	X	X	X	X	X	X

The following quality control samples were provided with this SDG: sample 57GW07-D- field duplicate of sample 57GW07; samples 57ER04, 57ER06, and 57ER07-equipment blanks; sample 57FB02- field blank; and samples 57TB06, 57TB04 and 57TB05- trip blanks.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times
- GC/MS Tuning *
- GC Performance *
- Initial/Continuing Calibrations
- ICSA/ICSAB Standards *
- CRDL Standards *
- Blanks
- Internal Standards
- Surrogate Recoveries
- Laboratory Control Samples
- Matrix Spike Recoveries
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates *
- Identification/Quantitation
- Reporting Limits *
- Tentatively Identified Compounds NA

* - 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. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page.

VOA

One sample exceeded the required holding time which resulted in qualifications to the data.

The initial and continuing calibrations exhibited some compounds with low RRF values, which resulted in qualifying non-detected values as rejected for these compounds. Due to high %D values, in the continuing calibrations, some compounds were qualified as estimated.

Blank contamination was noted in the method and/or QC blanks associated with samples in this batch. Qualifications were added to the data.

Due to below 10% recoveries in the matrix spike samples, the associated sample non-detect result was qualified as rejected.

The LCS exhibited low recoveries that resulted in qualifications to the associated sample.

SVOA

Several samples were re-extracted due to non-compliant surrogate recoveries however the re-extraction was 40 days out of the 7-day holding time; therefore these samples were not used.

Due to high %RSDs and %D values, in the initial and continuing calibrations, some compounds were qualified as estimated. The continuing calibrations exhibited some compounds with low RRF values, which resulted in qualifying non-detected values as rejected for these compounds.

Blank contamination was noted in the method and/or QC blanks associated with samples in this batch. Qualifications were added to the data.

Low internal standard area recoveries resulted in qualifications to the associated compounds in three samples.

Six samples exhibited low surrogate recoveries that resulted in qualifications to the data.

Due to below 10% recoveries for LCS samples, the associated sample non-detect results were qualified as rejected for one or more compounds.

The matrix spike and matrix spike duplicate exhibited low recoveries that resulted in qualifications to the associated sample.

PCBs

One sample exhibited DCB recoveries that were below the QC limit on both columns. Reported results in this sample were qualified as estimated J/UJ.

GRO

Blank contamination was noted in the method blank associated with samples in this batch. Qualifications were added to the data.

The matrix spike and matrix spike duplicate exhibited low recoveries that resulted in qualifications to the associated sample.

DRO

No qualifications to the data were required.

Metals

Blank contamination was noted and qualification was required in the samples in this SDG.

The matrix spikes pair submitted in this SDG exhibited non-compliant recoveries in both the MS and the MSD for several analytes for which qualifications/rejections were required.

Some sample results required flagging due to high %difference values between total & dissolved metals results.

All results reported at concentrations between the method detection limit and the reporting limits (B flagged by the laboratory) were qualified as estimated J.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the SVOA fraction as the submitted LCS Form IIIs did not have all percent recoveries listed. The laboratory was contacted and updated forms were submitted. A typographical error was noted on the MS/MSD form 1s submitted for the DRO fraction. The extraction date was incorrectly recorded as 2/5/10. This date was hand corrected by the validator to 2/4/10 based on extraction records. Copies of pertinent e-mail correspondence and extraction records are included in the validation worksheets.

Technical Holding Times

According to chain of custody records, sampling was performed on 01/30-2/1/10 and samples were received at the laboratory 2/2/10. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exceptions.

VOA

Sample 57GW05 exhibited a pH 7 and exceeded the 7 day holding for water samples with greater than pH 2 by 5 days; therefore all positive results were qualified as estimated (J) and non detect results were qualified as rejected (R).

SVOA

The re-extraction of samples 13GW07, 57GW02, 57GW04, 57GW07 and 57GW07-D was done 40 days out of the 7-day holding time for waters; therefore these samples were not used in favor of the initial analysis.

Initial/Continuing Calibration

VOA

Calibration standards exhibited %Ds and RRF values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC 2/04/10	acrolein	0.016	all samples	J/R
	acrylonitrile	0.037		
	2-butanone	0.038		
	propionitrile	0.012		
	isobutyl alcohol	0.003		
	1,4-dioxane	0.001		
CC 2/05/10	trichlorofluoromethane	-26.40	57GW01, 13GW07, 57GW02, 57GW04, 57ER07, 57TB05, 57ER04	J/UJ
CC 2/10/10	iodomethane	22.13	57GW07, 57GW07-D 57ER06, 57FB02, 57TB04	J/UJ
	carbon disulfide	-25.04		
	1,2-dibromo-3-chloropropane	0.048		J/R
CC2/05/10 CC 2/10/10 CC 2/12/10	acetone	0.020/0.026/0.026	all samples	J/R
CC 2/12/10	trans-1,4-dichloro-2-butene	0.047	57GW05	J/R

SVOA

Calibration standards exhibited %RSDs and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC full scan 3/17/10	2-picoline	22.65	all samples	J/UJ
	nitrosomethylethylamine	22.00		
	n-nitrosodiethylamine	21.76		
	n-nitrosopyrrolidine	24.94		
	n-nitrosomorpholine	22.93		
	o-toluidine	22.52		
	n-nitrosopiperidine	24.19		
	p-phenylenediamine	28.82		
	1-naphthylamine	27.26		
	2-naphthylamine	30.30		
	5-nitro-o-toluidine	27.60		
	n-nitrosodiphenylamine	16.39		
	diallate (trans isomer)	23.23		
	4-aminophenyl	24.87		
	4-nitroquinoline-1-oxide	19.69		
	methapyrilene	29.06		
	p-dimethylaminoazobenzene	25.39		
	3,3'-dimethylbenzidine	29.79		
2-acetylaminofluorene	24.07			
indeno(1,2,3-cd)pyrene	19.78			
diallate total	19.30			
CC full scan 3/18/10	benzo(k)fluoranthene	-21.98	57GW01, 13GW07, 57GW02, 57GW04, 57GW07, 57GW07-D, 57ER06, 57ER05	J/UJ
	aramite	0.044		J/R
CC-SIM 3/05/10	benzo(k)fluoranthene	-23.43	LL PAH: all samples	J/UJ

Blanks

VOA

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	Reporting Limit	Action Level
57ER06	methylene chloride	14 ug/L	0.5 ug/L	2X RL
	toluene	4.5	0.5	RL
57ER07	methylene chloride	13	0.5	2X RL
	toluene	4.8	0.5	RL
57FB02	2-butanone	4	2.5	2X RL
	acetone	8.3	3.5	2X RL
	dibromochloromethane	1.2	0.5	RL
	chloroform	4.8	0.5	RL
	bromodichloromethane	1.1	0.5	RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
57GW02	2-butanone	RL
13GW07, 57GW04, 57GW07	acetone	RL
57GW02	acetone	U
57GW02, 13GW07	toluene	RL
57GW04	bromodichloromethane	RL
57GW02	bromodichloromethane	U
57GW02, 57GW04	dibromochloromethane	RL
13GW07, 57GW01, 57GW02, 57GW04, 57GW05, 57GW07, 57GW07-D	methylene chloride	RL
57GW01	chloroform	RL
57GW04, 57GW05	chloroform	U

SVOA

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	Reporting Limit	Action Level
SBLKEV	fluoranthene	0.014J ug/L	0.20 ug/L	2X RL
	pyrene	0.018J	0.20	
57FB02	2-methylnaphthalene	0.019J ug/L	0.20 ug/L	RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
13GW07, 57GW02, 57GW07, 57GW07-D	fluoranthene	RL
57GW01, 13GW07, 57GW02, 57GW07, 57GW07-D	pyrene	RL
LL PAH: 13GW07, 57GW04, 57GW05, 57GW07-D	2-methylnaphthalene	RL

GRO

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	RL	Action Level
VBLKAC	GRO	0.031J mg/Kg	0.5 mg/Kg	RL
VBLKCF	GRO	0.05J	0.5	RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
13GW07, 57GW01, 57GW02, 57GW04, 57GW07, 57GW07-D	GRO	RL

Metals

Associated blanks exhibited contamination as noted in the following table. The laboratory reported non-detect results to the MDL for this project. Therefore, the blank flagging actions were modified to take this into consideration. Please see the Glossary of Qualification Flags and Abbreviations for details.

Blank ID	Analyte	Concentration	Action Level	Q Flag
PBW	lead	2.836B ug/L	RL	U at reported concentration
CCV6	nickel	13.6B ug/L	RL	U at reported concentration
	chromium	1.4B ug/L	RL	U at reported concentration
CCV7	nickel	13.6B ug/L	RL	U at reported concentration
57ER06	zinc	6.8B ug/L	RL	U at reported concentration
57ER07	zinc	34.5 ug/L	RL	U at reported concentration

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag
57GW01, 57GW02, 57GW07, 57GW07-D	lead	U
all samples >MDL up to RL	chromium	U
all samples >MDL up to RL	nickel	U
57GW02	silver	U
13GW07	beryllium	U
13GW07, 57GW04, 57GW07, 57GW07-D, 57GW01, 57GW05	zinc	U

Internal Standards

SVOA

Sample 13GW07 exhibited low recovery for internal standard naphthalene-d8; therefore all compound results associated with this standard were qualified as estimated (J/UJ).

Sample 57GW02 exhibited below 25% recovery for internal standard naphthalene-d8; therefore all positive compound results associated with this standard were qualified as estimated (J) and all non detect results were qualified as rejected (R).

Sample 57GW04 exhibited below 25% recovery for internal standard naphthalene-d8; therefore all positive compound results associated with this standard were qualified as estimated (J) and all non detect results were qualified as rejected (R). Low recovery was also exhibited for internal standard perylene-d12; therefore all compound results associated with this standard were qualified as estimated (J/UJ).

Surrogates

SVOA

The following samples exhibited low surrogate recoveries; qualifications were applied as stated for all associated compounds. Samples were re-extracted, however due to grossly exceeded holding times the samples were not used in favor of the initial analysis.

Sample ID	Non-Compliant Surrogate	% Rec	% QC limit	Qualifier
57GW01	2-fluorophenol	23	50-110	J/UJ acid
	2,4,6-tribromophenol	39	40-125	
13GW-7	2-fluorophenol	0	50-110	J/R acid
	phenol	0	10-110	
	nitrobenzene-d5	259	40-110	
	2,4,6-tribromophenol	0	40-125	
57GW02	2-fluorophenol	6	50-110	J/R acid
	2,4,6-tribromophenol	13	40-125	
57GW04	2-fluorophenol	7	50-110	J/R acid
	2,4,6-tribromophenol	18	40-125	
57GW07	2-fluorophenol	15	50-110	J/UJ acid
	2,4,6-tribromophenol	27	40-125	
57GW07-D	2-fluorophenol	20	50-110	J/UJ acid
	2,4,6-tribromophenol	34	40-125	

PCBs

One sample, 57GW02, exhibited non-compliant recoveries for DCB on both columns (22%/21%). The reported results in sample 57GW02 were qualified as estimated J/UJ.

Laboratory Control Sample

VOA

The LCS and LCSD associated with samples 57GW01, 13GW07, 57GW02, 57GW04, 57ER07, 57TB05 and 57ER04 exhibited low recoveries for acrolein at 45% and 44% (QC limit 50-150%); therefore results were qualified as estimated (J/UJ) for this compound.

SVOA

The LCS associated with all samples exhibited zero percent recoveries for p-phenylenediamine and 6% recovery for 1-naphthylamine (QC limit 20-150%); therefore positive results were qualified as estimated (J) and non-detect results were qualified as rejected (R) for this compound.

Matrix Spike

VOA

The matrix spike duplicate associated with sample 57GW01 exhibited 4% recovery for styrene (QC limit 65-135%); therefore results for this compound were qualified as estimated.

SVOA

The matrix spike and matrix spike duplicate associated with sample 57GW01 exhibited zero or below 10% recoveries for pyridine, 2-picoline, aniline, benzyl alcohol, 3-methylphenol, 4-methylphenol, o-toluidine, 2,4-dimethylphenolp-phenylenediamine, isosafrole, 1-naphthylamine, 4-aminobiphenyl, pronamide, 4-nitroquinoline-1-oxide, methapyrilene, 3,3'-dimethylbenzidine and 3-methylcholanthrene; therefore the non-detect result for these compounds were qualified as rejected (R).

GRO

The matrix spike and matrix spike duplicate associated with sample 57GW01 exhibited low recovery at 71% and 69% (QC limit 75-125%); therefore the non-detect result was qualified as estimated (UJ).

Metals

The matrix spike analysis submitted in this SDG exhibited non-compliant %Rs for three analytes, requiring qualification or rejection in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

MS/MSD	Analytes	Samples	%R	Q Flag
57GW01	selenium	all samples	42.4/64.5	J/UJ

Field Duplicates

PCBs

The field duplicate pair of samples 57SB07-00/57SB07-00D exhibited a high RPD for the compound AR1260. This compound was qualified as estimated in the field duplicate pair only.

Identification/Quantitation

DRO

The re-extraction of sample 57SB02-05 was rejected in favor of the results reported from the original analysis of the sample.

Metals

The following samples/analytes required qualification/rejection as noted based on Region II guidelines regarding the comparison of total and dissolved metals results. The dissolved metals samples associated with the following total metals samples were analyzed in SDG 1002022. The flagging criteria are as follows: for results >5X analyte

MDL, if %D is between 20% & 50% results are flagged as estimated; if %D is >50% results are rejected; in both the total and the dissolved sample.

Total Sample ID	Analytes	%D	Q Flag
57GW01	barium	62%	R
57GW02	cobalt	35%	J

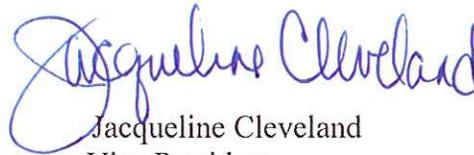
All results reported at concentrations between the method detection limit and the reporting limit (B flagged by the laboratory) were qualified as estimated J.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,



Laura Maschhoff
President



Jacqueline Cleveland
Vice President

Summary of Data Qualifications

VOA

Sample ID	Compound	Results	Q flag
57GW05	all results	+/-	J/R
all samples	acrolein acrylonitrile 2-butanone propionitrile isobutyl alcohol 1,4-dioxane	+/-	J/R
57GW01, 13GW07, 57GW02, 57GW04, 57ER07, 57TB05, 57ER04	trichlorofluoromethane	+/-	J/UJ
57GW07, 57GW07-D, 57ER06, 57FB02, 57TB04	iodomethane carbon disulfide	+/-	J/UJ
57GW07, 57GW07-D, 57ER06, 57FB02, 57TB04	1,2-dibromo-3-chloropropane	+/-	J/R
all samples	acetone	+/-	J/R
57GW05	trans-1,4-dichloro-2-butene	+/-	J/R
57GW02	2-butanone	+	RL
13GW07, 57GW04, 57GW07	acetone	+	RL
57GW02	acetone	+	U
57GW02, 13GW07	toluene	+	RL
57GW04	bromodichloromethane	+	RL
57GW02	bromodichloromethane	+	U
57GW02, 57GW04	dibromochloromethane	+	RL
13GW07, 57GW01, 57GW02, 57GW04, 57GW05, 57GW07, 57GW07-D	methylene chloride	+	RL
57GW01	chloroform	+	RL
57GW04, 57GW05	chloroform	+	U
57GW01, 13GW07, 57GW02, 57GW04, 57ER07, 57TB05, 57ER04	acrolein	+/-	J/UJ
57GW01	styrene	+/-	J/UJ

Summary of Data Qualifications

SVOA

Sample ID	Compound	Results	Q flag
re-extracted samples	all results	+/-	R
all samples	2-picoline nitrosomethylethylamine n-nitrosodiethylamine n-nitrosopyrrolidine n-nitrosomorpholine o-toluidine n-nitrosopiperidine p-phenylenediamine 1-naphthylamine 2-naphthylamine 5-nitro-o-toluidine n-nitrosodiphenylamine diallate (trans isomer) 4-aminophenyl 4-nitroquinoline-1-oxide methapyrilene p-dimethylaminoazobenzene 3,3'-dimethylbenzidine 2-acetylaminofluorene indeno(1,2,3-cd)pyrene diallate total	+/-	J/UJ
57GW01, 13GW07, 57GW02, 57GW04, 57GW07, 57GW07-D, 57ER06, 57ER05	benzo(k)fluoranthene	+/-	J/UJ
57GW01, 13GW07, 57GW02, 57GW04, 57GW07, 57GW07-D, 57ER06, 57ER05	aramite	+/-	J/R
LL PAH: all samples	benzo(k)fluoranthene	+/-	J/UJ
13GW07, 57GW02, 57GW07, 57GW07-D	fluoranthene	+	RL
57GW01, 13GW07, 57GW02, 57GW07, 57GW07-D	pyrene	+	RL
LL PAH: 13GW07, 57GW04, 57GW05, 57GW07-D	2-methylnaphthalene	+	RL
13GW07	all compounds associated with: naphthalene-d8	+/-	J/UJ
57GW02, 57GW04	all compounds associated with: naphthalene-d8	+/-	J/R
57GW04	all compounds associated with: perylene-d12	+/-	J/UJ
13GW-7, 57GW02, 57GW04	all acid fraction compounds	+/-	J/R
57GW01, 57GW07, 57GW07-D	all acid fraction compounds	+/-	J/UJ
all samples	p-phenylenediamine, 1-naphthylamine	+/-	J/R

Summary of Data Qualifications

SVOA

Sample ID	Compound	Results	Q flag
57GW01	pyridine, 2-picoline, aniline, benzyl alcohol, 3-methylphenol, 4-methylphenol, o-toluidine, 2,4-dimethylphenol p-phenylenediamine, isosafrole, 1-naphthylamine, 4-aminobiphenyl, pronamide, 4-nitroquinoline-1-oxide, methapyrilene, 3,3'-dimethylbenzidine, 3-methylcholanthrene	+/-	J/R

PCBs

Sample ID	Compound	Results	Q flag
57GW02	all compounds	+/-	J/UJ

GRO

Sample ID	Compound	Results	Q flag
13GW07, 57GW01, 57GW02, 57GW04, 57GW07, 57GW07-D	GRO	+	RL
57GW01	GRO	-	UJ

DRO

Sample ID	Compound	Results	Q flag
No qualifications were required			

Summary of Data Qualifications

Metals

Sample ID	Analyte	Results	Q flag
57GW01, 57GW02, 57GW07, 57GW07-D	lead	+B	U
all samples >MDL up to RL	chromium	+B	U
all samples >MDL up to RL	nickel	+B	U
57GW02	silver	+B	U
13GW07	beryllium	+B	U
13GW07, 57GW04, 57GW07, 57GW07-D, 57GW01, 57GW05	zinc	+B	U
all field samples	selenium	+/-	J/UJ
57GW01	barium	+	R
57GW02	cobalt	+	J
all samples	all analytes	+B	J

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
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

- No Action - The sample result is greater than the RL 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 RL, result is reported as non-detect at the reported concentration, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

- R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
- J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
- J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

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 RL 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 RL, result is reported as non-detect at the reported concentration, when the FB result is less or greater than the RL.

R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.

J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

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

COMPUCHEM SDG 1002020

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

April 21, 2010
SDG# 1002020, CompuChem
NAPR SWMU 57, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1002020. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8270D-Rev 3, October 2006-SOP #HW-22, and 8082A-Rev 1, October 2006-SOP HW-45) and professional judgment. Region II has not developed a validation checklist SOP for the methods used to assess the organic methods for hydrocarbons and inorganic methods in this SDG (SW-846 methods 8015_DRO, and 6010B). Therefore, alternative worksheets were provided. Region II flagging conventions were used. 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	SVOA App IX w/ LL PAH	PCBs	DRO	Metals
57WS01	1002020-01	wipe	X	X	X	X
57WS02	1002020-02	wipe	X	X	X	X
57WS03	1002020-03	wipe	X	X	X	X
57WS04	1002020-04	wipe	X	X	X	X
57WS04-D	1002020-05	wipe	X	X	X	X

The following quality control samples were provided with this SDG: sample 57WS04-D - field duplicate of sample 57WS04.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times *
- GC/MS Tuning *
- GC Performance *
- Initial/Continuing Calibrations
- ICSA/ICSAB Standards *
- CRDL Standards *
- Blanks

- Internal Standards *
- Surrogate Recoveries *
- Laboratory Control Samples
- Matrix Spike Recoveries *
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates
- Identification/Quantitation *
- Reporting Limits *
- Tentatively Identified Compounds NA

* - 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. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page.

SVOA

Due to high %RSDs and %D values, in the initial and continuing calibrations, some compounds were qualified as estimated.

Blank contamination was noted in the method and/or QC blanks associated with samples in this batch. Qualifications were added to the data.

Due to below 10% recoveries for LCS samples, the associated sample non-detect results were qualified as rejected for one or more compounds.

PCBs

No qualifications to the data were required.

DRO

No qualifications to the data were required.

Metals

Blank contamination was noted and qualification was required in the samples in this SDG. The laboratory had difficulty with high level contamination in the blank wipe used when the samples were extracted (2/5). After some investigation it turns out that the laboratory used the wrong blank (vendor/material). This blank was thrown out. The laboratory did a background analysis on the correct blank (Certi-gauze) and extracted a preparation blank to go with the wipes in this SDG on 2/24. However the samples were not re-extracted. Therefore, based on Region II guidance, the preparation blank extracted on 2/24 was not used to assess the samples extracted on 2/5. The analytes in the wipe samples were flagged as estimated J up to a concentration 10X the MDL. The analytes copper (up to a concentration of 1.5 ug/wipe), lead (up to a concentration of 1.8 ug/wipe) and selenium (up to a concentration of 3.6 ug/wipe) were flagged as estimated J.

The field duplicate pair of sample 57WS04/57WS04-D exhibited one analyte with a non-compliant RPD. This analyte was flagged based on Region II guidance in the field duplicate pair only.

All results reported at concentrations between the method detection limit and the reporting limits (B flagged by the laboratory) were qualified as estimated J.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the metals fraction because of a units error on the submitted Form 1s. The laboratory corrected the error and resubmitted the Form 1s and the EDD. A copy of the e-mail correspondence is included in the validation worksheets.

Technical Holding Times

According to chain of custody records, sampling was performed on 01/30/10 and samples were received at the laboratory 2/2/10. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Initial/Continuing Calibration

SVOA

Calibration standards exhibited %RSDs and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC full scan 3/17/10	2-picoline nitrosomethylethylamine n-nitrosodiethylamine n-nitrosopyrrolidine n-nitrosomorpholine o-toluidine n-nitrosopiperidine p-phenylenediamine 1-naphthylamine 2-naphthylamine 5-nitro-o-toluidine n-nitrosodiphenylamine diallate (trans isomer) 4-aminophenyl 4-nitroquinoline-1-oxide methapyrilene p-dimethylaminoazobenzene 3,3'-dimethylbenzidine 2-acetylaminofluorene indeno(1,2,3-cd)pyrene diallate total	22.65 22.00 21.76 24.94 22.93 22.52 24.19 28.82 27.26 30.30 27.60 16.39 23.23 24.87 19.69 29.06 25.39 29.79 24.07 19.78 19.30	all samples	J/UJ
CC full scan 3/18/10 3/19/10	n-nitroso-di-n-butyl amine	-29.34/-22.0	all samples	J/UJ
CC full scan 3/19/10	n-nitrosodimethylamine methyl methanesulfonate aramite	20.97 25.40 24.15	57WS01, 57WS02, 57WS04-D	J/UJ
CC-SIM 3/07/10	indeno(1,2,3-cd)pyrene	23.86	LL PAH: all samples	J/UJ

Blanks

SVOA

The associated method and/or QC blanks exhibited contamination as noted in the following table. Compounds for which there was no action required, are not included in the following table, see worksheets for full list of compounds.

Blank ID	Compound	Concentration	Reporting Limit	Action Level
SBLKGO	bis(2-ethylhexyl)phthalate	40J ug/wipe	170 ug/wipe	2X RL
SBLKGP LL PAH	2-methylnaphthalene	0.81J	8.3	RL
	anthracene	0.57J	8.3	RL
	pyrene	0.64J	8.3	RL
	chrysene	0.64J	8.3	RL
	benzo(b)fluoranthene	0.74J	8.3	RL
	benzo(a)pyrene	0.55J	8.3	RL

Associated samples and required qualifications are noted in the following table.

Sample ID	Compound	Q Flag
57WS04-D	bis(2-ethylhexyl)phthalate	RL
57WS01, 57WS02	bis(2-ethylhexyl)phthalate	U
57WS03, 57WS02, 57WS01, 57WS04, 57WS04-D	pyrene	RL
LL PAH: 57WS02, 57WS01	2-methylnaphthalene	RL
LL PAH: 57WS01	anthracene	RL
LL PAH: 57WS01	benzo(a)pyrene	RL
LL PAH: 57WS04-D	chrysene	RL
LL PAH: 57WS04-D	benzo(b)fluoranthene	RL

Metals

Associated blanks exhibited contamination as noted in the following table. The laboratory reported non-detect results to the MDL for this project. Therefore, the blank flagging actions were modified to take this into consideration. Please see the Glossary of Qualification Flags and Abbreviations for details.

Blank ID	Analyte	Concentration	Action Level	Q Flag
ICB	beryllium	0.3B ug/L	RL	U at reported concentration
	cadmium	0.4B ug/L	RL	U at reported concentration
	vanadium	1.0B ug/L	RL	U at reported concentration
CCB8	barium	0.5B ug/L	RL	U at reported concentration

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag
all samples	beryllium	U
57WS03	cadmium	U
all samples	vanadium	U
all samples	barium	U

The laboratory had difficulty with high level contamination in the blank wipe used when the samples were extracted (2/5). After some investigation it turns out that the laboratory used the wrong blank (vendor/material). This blank was thrown out. The laboratory did a background analysis on the correct blank (Certi-gauze) and extracted a preparation blank to go with the wipes in this SDG on 2/24. However the samples were not re-extracted. Therefore, based on Region II guidance, the preparation blank extracted on 2/24 was not used to assess the samples extracted on 2/5. The analytes in the wipe samples were flagged as estimated J up to a concentration 10X the MDL. The analytes copper (up to a concentration of 1.5 ug/wipe), lead (up to a concentration of 1.8 ug/wipe) and selenium (up to a concentration of 3.6 ug/wipe) were flagged as estimated J.

Laboratory Control Sample

SVOA

The LCS associated with all samples exhibited zero percent recoveries for p-phenylenediamine (QC limit 20-150%); therefore positive results were qualified as estimated (J) and non-detect results were qualified as rejected (R) for this compound.

Field Duplicates

Metals

The field duplicate pair exhibited non-compliant field duplicate reproducibility for the following analyte. These field duplicate pair and analyte were flagged as noted in the table below based on Region II guidelines.

Sample ID	Analyte	RPD or Absolute Difference	Q Flag
57WS04/57WS04-D	zinc	63%	J

Identification/Quantitation

Metals

All results reported at concentrations between the method detection limit and the reporting limit (B flagged by the laboratory) were qualified as estimated J.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,



Laura Maschhoff
President



Jacqueline Cleveland
Vice-President

Summary of Data Qualifications

SVOA

Sample ID	Compound	Results	Q flag
all samples	2-picoline nitrosomethylethylamine n-nitrosodiethylamine n-nitrosopyrrolidine n-nitrosomorpholine o-toluidine n-nitrosopiperidine p-phenylenediamine 1-naphthylamine 2-naphthylamine 5-nitro-o-toluidine n-nitrosodiphenylamine diallate (trans isomer) 4-aminophenyl 4-nitroquinoline-1-oxide methapyrilene p-dimethylaminoazobenzene 3,3'-dimethylbenzidine 2-acetylaminofluorene indeno(1,2,3-cd)pyrene diallate total	+/-	J/UJ
all samples	n-nitroso-di-n-butyl amine	+/-	J/UJ
57WS01, 57WS02, 57WS04-D	n-nitrosodimethylamine methyl methanesulfonate aramite	+/-	J/UJ
LL PAH: all samples	indeno(1,2,3-cd)pyrene	+/-	J/UJ
57WS04-D	bis(2-ethylhexyl)phthalate	+	RL
57WS01, 57WS02	bis(2-ethylhexyl)phthalate	+	U
57WS03, 57WS02, 57WS01, 57WS04, 57WS04-D	pyrene	+	RL
LL PAH: 57WS02, 57WS01	2-methylnaphthalene	+	RL
LL PAH: 57WS01	anthracene	+	RL
LL PAH: 57WS01	benzo(a)pyrene	+	RL
LL PAH: 57WS04-D	chrysene	+	RL
LL PAH: 57WS04-D	benzo(b)fluoranthene	+	RL
all samples	p-phenylenediamine	+/-	J/R

PCBs

Sample ID	Compound	Results	Q flag
No qualifications			

DRO

Sample ID	Compound	Results	Q flag
No qualifications			

Michael Baker, Jr., Inc.
NAPR SWMU 57, Puerto Rico
SDG# 1002020

Summary of Data Qualifications

Metals

Sample ID	Analyte	Results	Q flag
all samples	beryllium	+B	U
57WS03	cadmium	+B	
all samples	vanadium	+B	
all samples	barium	+B	
all samples	copper lead selenium	+ up to 10X MDL	J
57WS04, 57WS04-D	zinc	+	J
all samples	all analytes	+B	J

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
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL 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 RL, result is reported as non-detect at the reported concentration, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

- R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
- J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
- J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

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 RL 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 RL, result is reported as non-detect at the reported concentration, when the FB result is less or greater than the RL.

R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.

J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

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

COMPUCHEM SDG 1002021

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

April 21, 2010
SDG# 1002021, CompuChem
NAPR SWMU 57, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1002021. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, the Region II Standard Operating Procedures for the Validation of Organic Data Acquired Using SW-846 Methods (8270D-Rev 3, October 2006-SOP #HW-22, and 8082A-Rev 1, October 2006-SOP HW-45) and professional judgment. Region II has not developed a validation checklist SOP for the methods used to assess the organic methods for hydrocarbons and inorganic methods in this SDG (SW-846 methods 8015_DRO, 6010B and 7471A). Therefore, alternative worksheets were provided. Region II flagging conventions were used. 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	SVOA App IX	PCBs	DRO	Metals
57CC01	1002021-01	concrete	X	X	X	X
57CC02	1002021-02	concrete	X	X	X	X
57CC03	1002021-03	concrete	X	X	X	X
57CC04	1002021-04	concrete	X	X	X	X
57CC04-D	1002021-05	concrete	X	X	X	X
57CC04-D MS	1002021-05MS	concrete	X	X	X	X
57CC04-D MSD	1002021-05MSD	concrete	X	X	X	X

The following quality control samples were provided with this SDG: sample 57CC04-D - field duplicate of sample 57CC04.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times *
- GC/MS Tuning *
- GC Performance *
- Initial/Continuing Calibrations *
- ICSA/ICSAB Standards *
- CRDL Standards *

- Blanks
- Internal Standards *
- Surrogate Recoveries
- Laboratory Control Samples
- Matrix Spike Recoveries
- Matrix Duplicate RPDs
- Serial Dilutions *
- Field Duplicates *
- Identification/Quantitation
- Reporting Limits *
- Tentatively Identified Compounds NA

* - 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. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page.

SVOA

Due to high %RSDs and %D values, in the initial and continuing calibrations, some compounds were qualified as estimated.

Due to recoveries below 10% for LCS samples, all associated sample non-detect results were qualified as rejected for several compounds.

Due to recoveries below 10% in the matrix spike samples, the associated sample non-detect result was qualified as rejected.

PCBs

The surrogate compound DCB was low on both columns in all samples. Therefore, results were qualified as estimated J/UJ.

DRO

No qualifications to the data were required.

Metals

Blank contamination was noted and qualification was required in the samples in this SDG.

The matrix spikes pair submitted in this SDG exhibited non-compliant recoveries in both the MS and the MSD for three analytes for which qualifications/rejections were required.

The matrix duplicate submitted in this SDG exhibited non-compliant RPDs for three analytes. All results for these analytes in the metals samples were qualified as estimated J/UJ.

The field duplicate pair of sample 57CC04/57CC04-D exhibited two analytes with non-compliant RPDs. These analytes were flagged based on Region II guidance in the field duplicate pair only.

All results reported at concentrations between the method detection limit and the reporting limits (B flagged by the laboratory) were qualified as estimated J.

Specific Evaluation of Data

Data Completeness

Resubmissions were required for the PCB fraction because of missing raw data in the original submission of the data package. This missing sample raw data was requested and received from the laboratory. A copy of the e-mail correspondence is included in the validation worksheets.

Technical Holding Times

According to chain of custody records, sampling was performed on 01/30/10 and samples were received at the laboratory 2/2/10. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Initial/Continuing Calibration

SVOA

Calibration standards exhibited %RSDs and %D values that were non-compliant. A summary of these non-compliances and affected samples are noted in the following table. Sample results are qualified as indicated.

Standard ID	Compound(s)	RRF, %RSD, %D	Samples	Q Flag
IC full scan 3/17/10	2-picoline nitrosomethylethylamine n-nitrosodiethylamine n-nitrosopyrrolidine n-nitrosomorpholine o-toluidine n-nitrosopiperidine p-phenylenediamine 1-naphthylamine 2-naphthylamine 5-nitro-o-toluidine n-nitrosodiphenylamine diallate (trans isomer) 4-aminophenyl 4-nitroquinoline-1-oxide methapyrilene p-dimethylaminoazobenzene 3,3'-dimethylbenzidine 2-acetylaminofluorene indeno(1,2,3-cd)pyrene diallate total	22.65 22.00 21.76 24.94 22.93 22.52 24.19 28.82 27.26 30.30 27.60 16.39 23.23 24.87 19.69 29.06 25.39 29.79 24.07 19.78 19.30	all samples	J/UJ
CC full scan 3/19/10 3/19/10	n-nitroso-di-n-butyl amine	-22.0/-30.66	all samples	J/UJ
CC full scan 3/19/10	n-nitrosodimethylamine methyl methanesulfonate aramite	20.97 25.40 24.15	57CC01, 57CC02, 57CC03, 57CC04	J/UJ
CC full scan 3/19/10	ethyl methanesulfonate	-35.46	57CC04-D	J/UJ

Blanks

Metals

Associated blanks exhibited contamination as noted in the following table. The laboratory reported non-detect results to the MDL for this project. Therefore, the blank flagging actions were modified to take this into consideration. Please see the Glossary of Qualification Flags and Abbreviations for details.

Blank ID	Analyte	Concentration	Action Level	Q Flag
PBLK	tin	0.965B mg/Kg	RL	U at reported concentration
CCB7	antimony	3.1B ug/L	RL	U at reported concentration

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag
all samples >MDL up to RL	tin	U
	antimony	U

Surrogate Recoveries

PCBs

All of the field samples exhibited low DCB recoveries on both analytical columns. Therefore, all reported positive and non-detect results in the samples were qualified as estimated J/UJ.

Laboratory Control Sample

SVOA

The LCS associated with all samples exhibited zero percent recovery for p-phenylenediamine (QC limit 20-150%), 5% for 2-naphthylamine (QC limit 20-150%), 9% recovery for 4-aminobiphenyl (QC limit 20-150%) and 3% recovery for 3,3'-dimethylbenzidine (QC limit 20-150%); therefore positive results were qualified as estimated (J) and non-detect results were qualified as rejected (R) for these compounds.

Matrix Spike

SVOA

The matrix spike and matrix spike duplicate associated with sample 57CC04 and field duplicate 57CC04-D exhibited zero or below 10% recoveries for n-nitrosodimethylamine, pyridine, nitrosomethylethylamine, n-nitrosodiethylamine, benzyl alcohol, p-phenylenediamine, 2,4-dinitrophenol, 1-naphthylamine, 2-naphthylamine, 4-aminobiphenyl, pentachlorophenol, methapyrilene, 3,3'-dimethylbenzidine, 1,4-naphthoquinone; therefore the non-detect result for these compounds were qualified as rejected (R).

Matrix Spikes

Metals

The matrix spike analysis submitted in this SDG exhibited a non-compliant %R for three analytes that resulted in qualification in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

MS/MSD	Analytes	Samples	%D	Q Flag
57CC04	selenium	all samples	0/0	R
	antimony		40.8/32.6	J/UJ
	copper		54.8/63.1	J/UJ

Matrix Duplicates

Metals

The matrix duplicate results exhibited a non-compliant RPD for three analytes that resulted in qualification in the field samples. A summary of these non-compliances and affected samples are noted in the following table.

MD	Analytes	Samples	RPD	Q Flag
57CC04	cadmium	all samples	58.4	J/UJ
	copper		61	
	zinc		46.9	

Field Duplicates

Metals

The field duplicate pair exhibited non-compliant field duplicate reproducibility for the following analytes. This field duplicate pair and analytes were flagged as noted in the table below based on Region II guidelines.

Sample ID	Analyte	RPD or Absolute Difference	Q Flag
57CC04/57CC04-D	copper	56%	J
	lead	38%	

Identification/Quantitation

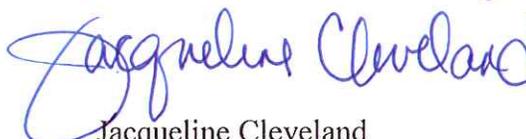
Metals

All results reported at concentrations between the method detection limit and the reporting limit (B flagged by the laboratory) were qualified as estimated J.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,


 Laura Maschhoff
 President


 Jacqueline Cleveland
 Vice-President

Summary of Data Qualifications

SVOA

Sample ID	Compound	Results	Q flag
all samples	2-picoline nitrosomethylethylamine n-nitrosodiethylamine n-nitrosopyrrolidine n-nitrosomorpholine o-toluidine n-nitrosopiperidine p-phenylenediamine 1-naphthylamine 2-naphthylamine 5-nitro-o-toluidine n-nitrosodiphenylamine diallate (trans isomer) 4-aminophenyl 4-nitroquinoline-1-oxide methapyrilene p-dimethylaminoazobenzene 3,3'-dimethylbenzidine 2-acetylaminofluorene indeno(1,2,3-cd)pyrene diallate total	+/-	J/UJ
all samples	n-nitroso-di-n-butyl amine	+/-	J/UJ
57CC01, 57CC02, 57CC03, 57CC04	n-nitrosodimethylamine methyl methanesulfonate aramite	+/-	J/UJ
57CC04-D	ethyl methanesulfonate	+/-	J/UJ
all samples	p-phenylenediamine, 2-naphthylamine, 4-aminobiphenyl 3,3'-dimethylbenzidine	+/-	J/R
57CC04, 57CC04-D	n-nitrosodimethylamine, pyridine, nitrosomethylethylamine, n-nitrosodiethylamine, benzyl alcohol, p-phenylenediamine, 2,4-dinitrophenol, 1-naphthylamine, 2-naphthylamine, 4-aminobiphenyl, pentachlorophenol, methapyrilene, 3,3'-dimethylbenzidine, 1,4-naphthoquinone	+/-	J/R

Summary of Data Qualifications

PCBs

Sample ID	Compound	Results	Q flag
all samples	all compounds	+/-	J/UJ

DRO

Sample ID	Compound	Results	Q flag
No qualifications were required			

Metals

Sample ID	Analyte	Results	Q flag
all samples >MDL up to RL	tin antimony	>MDL up to RL	U
all samples	antimony copper	+/-	J/UJ
all samples	selenium	+/-	R
all samples	cadmium copper lead	+/-	J/UJ
57CC04, 57CC04-D	copper lead	+	J
all samples	all analytes	+B	J

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
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

- No Action - The sample result is greater than the RL 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 RL, result is reported as non-detect at the reported concentration, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

- R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
- J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
- J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

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 RL 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 RL, result is reported as non-detect at the reported concentration, when the FB result is less or greater than the RL.

R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.

J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

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

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
Airsides Business Park
100 Airside Drive
Moon Township, PA 15108

April 20, 2010
SDG# 1002022, CompuChem
NAPR SWMU 57, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1002022. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory and professional judgment. Region II has not developed a validation checklist SOP for the method used to assess the inorganic analytes in this SDG (SW-846 Methods 6010B and 7471A). Therefore, alternative worksheets were provided. Region II flagging conventions were used. 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	Dissolved Metals
13GW07	1002022-02	water	X
57GW01	1002022-01	water	X
57GW02	1002022-03	water	X
57GW04	1002022-04	water	X
57GW05	1002022-12	water	X
57GW07	1002022-05	water	X
57GW07-D	1002022-06	water	X
57GW01 MS	1002022-01MS	water	X
57GW01 MSD	1002022-01MSD	water	X

The following quality control sample was provided with this SDG: sample 57GW07-D-field duplicate of sample 57GW07.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times *
- Initial/Continuing Calibrations *
- ICSA/ICSAB Standards *
- CRDL Standards *
- Blanks *
- Laboratory Control Samples *
- Matrix Spike Recoveries *
- Matrix Duplicate RPDs *

- Serial Dilutions *
- 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. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page.

Dissolved Metals

Blank contamination was noted and qualification was required in the samples in this SDG.

Some sample results required flagging due to high %difference values between total & dissolved metals results.

All results reported at concentrations between the method detection limit and the reporting limits (B flagged by the laboratory) were qualified as estimated J.

Specific Evaluation of Data

Data Completeness

The data package was received complete and intact. No resubmissions were required.

Technical Holding Times

According to chain of custody records, sampling was performed on 01/30-2/1/10 and samples were received at the laboratory 2/2/10. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Blanks

Dissolved Metals

Associated blanks exhibited contamination as noted in the following table. The laboratory reported non-detect results to the MDL for this project. Therefore, the blank flagging actions were modified to take this into consideration. Please see the Glossary of Qualification Flags and Abbreviations for details.

Blank ID	Analyte	Concentration	Action Level	Q Flag
PBW	lead	1.920B ug/L	RL	U at reported concentration
CCV3	cadmium	0.6B ug/L	RL	U at reported concentration
	copper	2.4B ug/L	RL	U at reported concentration
	silver	1.6B ug/L	RL	U at reported concentration
CCV4	beryllium	0.5B ug/L	RL	U at reported concentration
	cadmium	0.5B ug/L	RL	U at reported concentration
CCV5	beryllium	0.3B ug/L	RL	U at reported concentration
	cadmium	0.6B ug/L	RL	U at reported concentration
CCV6	nickel	13.6B ug/L	RL	U at reported concentration
57ER06	zinc	6.8B ug/L	RL	U at reported concentration
57ER07	zinc	34.5 ug/L	RL	U at reported concentration

Associated samples and required qualifications are noted in the following table.

Sample ID	Analyte	Q Flag
13GW07, 57GW04, 57GW02, 57GW07-D	lead	U
all field samples >MDL but <RL	beryllium	U
all field samples >MDL but <RL	cadmium	U
57GW01	copper	U
57GW01	silver	U
57GW05	nickel	U
57GW01, 57GW04, 57GW05, 57GW07, 57GW07-D, 13GW07	zinc	U

Identification/Quantitation

Dissolved Metals

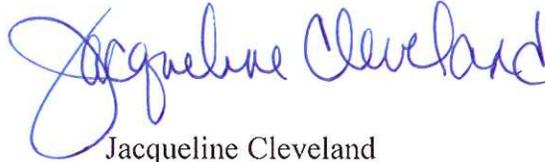
The following samples/analytes required qualification/rejection as noted based on Region II guidelines regarding the comparison of total and dissolved metals results. The total metals samples associated with the following dissolved metals samples were analyzed in SDG 1002019. The flagging criteria are as follows: for results >5X analyte MDL, if %D is between 20% & 50% results are flagged as estimated; if %D is >50% results are rejected; in both the total and the dissolved sample.

Total Sample ID	Analytes	%D	Q Flag
57GW01	barium	62%	R
57GW02	cobalt	35%	J

All results reported at concentrations between the method detection limit and the reporting limit (B flagged by the laboratory) were qualified as estimated J.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,



Jacqueline Cleveland
Vice President

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
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

- No Action - The sample result is greater than the RL 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 RL, result is reported as non-detect at the reported concentration, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

- R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
- J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
- J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

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 RL 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 RL, result is reported as non-detect at the reported concentration, when the FB result is less or greater than the RL.
- R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.
- J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

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

COMPUCHEM SDG 1005168/1005169

DataQual

Environmental Services, LLC

Michael Baker, Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

May 26, 2010
SDG# 1005168 & 1005169, CompuChem
NAPR SWMU 57, Puerto Rico

Dear Mr. Kimes,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1005168 & 1005169. The data validation was performed in accordance with the SW-846 method utilized by the laboratory and professional judgment. Region II has not developed a validation checklist SOP for the method used to assess the hydrocarbon parameter (SW-846 method 8015_GRO). Therefore, alternative worksheets were provided. Region II flagging conventions were used. 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	GRO
57SS08	1005168-01	soil	X
57SS09	1005168-02	soil	X
57SS09D	1005168-06	soil	X
57SS10	1005168-03	soil	X
57SS11	1005168-04	soil	X
57SS12	1005168-05	soil	X
57ER08	1005169-01	water	X
57TB07	1005169-02	water	X
57SS12MS	1005168-05MS	soil	X
57SS12MSD	1005168-05MSD	soil	X

The following quality control samples were provided with this SDG: sample 57ER08-rinse blank, sample 57TB07-trip blank, and sample 57SS09D-field duplicate of sample 57SS09.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition *
- Technical Holding Times *
- GC Performance *
- Initial/Continuing Calibrations *
- Blanks *
- Internal Standards NA
- Surrogate Recoveries *

- Laboratory Control Samples *
- Matrix Spike Recoveries
- 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. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page.

GRO

The matrix spike and matrix spike duplicate exhibited low recoveries that resulted in qualifications to the associated samples.

Specific Evaluation of Data

Data Completeness

The data package was received complete and intact.

Technical Holding Times

According to chain of custody records, sampling was performed on 05/20/10 and samples were received at the laboratory 5/21/10. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

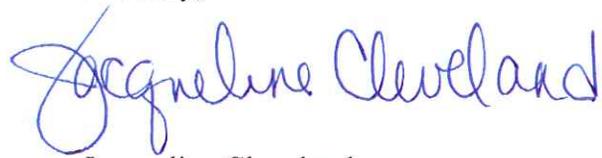
Matrix Spike

GRO

The matrix spike and matrix spike duplicate associated with sample 57SS12 exhibited low recoveries at 28% and 28% (QC limit 75-125%); therefore the non-detect results in the field samples were qualified as estimated (UJ).

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,



Jacqueline Cleveland
Vice President

Summary of Data Qualifications

GRO

Sample ID	Compound	Results	Q flag
all field samples	GRO	-	UJ

004

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
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the RL (2X sample RL for common laboratory contaminants) when the blank value is less than the RL. The sample result for the blank contaminant is not qualified with any blank qualifiers.
U*	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is qualified as non-detect U at the reported concentration.
RL**	The sample result for the blank contaminant is less than the RL (2X sample RL for common laboratory contaminants) but greater than the MDL when the blank value is less than the RL. The sample result for the blank contaminant is changed to the RL and qualified as non-detect U.

* This guideline is used when the laboratory is reporting non-detects to the MDL. ** This guideline is used when the laboratory is reporting non-detects to the RL.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL 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 RL, result is reported as non-detect at the reported concentration, when the ICB/CCB/PB result is less or greater than the RL.

Glossary of Qualification Flags and Abbreviations, continued

- R - Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
- J - Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
- J/UJ - Sample result is less than 10X RL when blank result is below the negative RL.

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- No Action - The sample result is greater than the RL 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 RL, result is reported as non-detect at the reported concentration, when the FB result is less or greater than the RL.
- R - Sample result is greater than the RL and less than the FB value when the FB value is greater than the RL.
- J - Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the RL.

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

PUERTO RICAN CHEMIST CERTIFICATION

Daliz Estades Santalíz

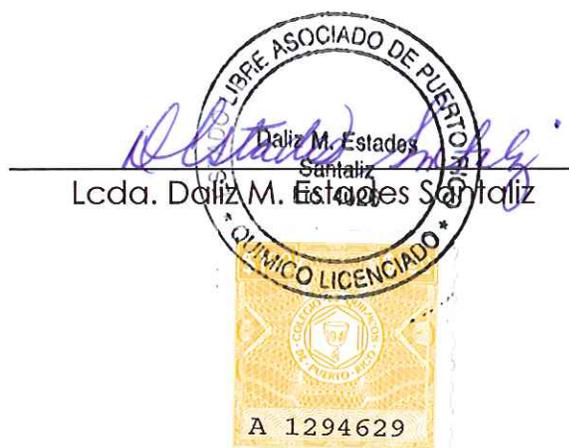
Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for semivolatile organics, following Method 8270C from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001159-01
1001159-02
1001159-03
1001159-04
1001159-05
1001159-06
1001159-07
1001159-08
1001159-09
1001159-10

1001159-11
1001159-12
1001159-13
1001159-14
1001159-15
1001159-16
1001159-17
1001159-18
1001159-19
1001159-20



Lcda. Daliz M. Estades Santaliz

PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Diesel and Oil range organics fraction, following Method 8015B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001159-01	1001159-11
1001159-02	1001159-12
1001159-03	1001159-13
1001159-04	1001159-14
1001159-05	1001159-15
1001159-06	1001159-16
1001159-07	1001159-17
1001159-08	1001159-18
1001159-09	1001159-19
1001159-10	1001159-20



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for volatile fraction, following Method 8260B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001159-01	1001159-11
1001159-02	1001159-12
1001159-03	1001159-13
1001159-04	1001159-14
1001159-05	1001159-15
1001159-06	1001159-16
1001159-07	1001159-17
1001159-08	1001159-18
1001159-09	1001159-19
1001159-10	1001159-20



Lcda. Daliz M. Estades Santaliz

PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for PCB fraction, following Method 8082 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001159-01	1001159-11
1001159-02	1001159-12
1001159-03	1001159-13
1001159-04	1001159-14
1001159-05	1001159-15
1001159-06	1001159-16
1001159-07	1001159-17
1001159-08	1001159-18
1001159-09	1001159-19
1001159-10	1001159-20



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for APPIX metals & mercury, following Method SW846 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001159-01	1001159-11
1001159-02	1001159-12
1001159-03	1001159-13
1001159-04	1001159-14
1001159-05	1001159-15
1001159-06	1001159-16
1001159-07	1001159-17
1001159-08	1001159-18
1001159-09	1001159-19
1001159-10	1001159-20



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for PCB fraction, following Method 8082 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001160-01
1001160-02
1001160-03
1001160-04
1001160-05

1001160-06
1001160-07
1001160-08
1001160-09



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

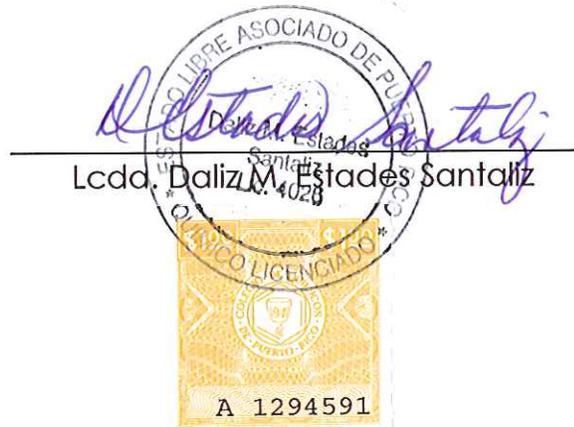
Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Gasoline range organics fraction, following Method 8015B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001160-01
1001160-02
1001160-03
1001160-04
1001160-05

1001160-06
1001160-07
1001160-08
1001160-09



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Diesel and Oil range organics fraction, following Method 8015B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001160-01
1001160-02
1001160-03
1001160-04
1001160-05

1001160-06
1001160-07
1001160-08
1001160-09



PO Box 727
Dorado, PR 00646-0727

Daliz Estados Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estados Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for APPIX metals & mercury, following Method SW846 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001160-01
1001160-02
1001160-03
1001160-04
1001160-05

1001160-06
1001160-07
1001160-08
1001160-09



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for semivolatile organics, following Method 8270C from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001160-01
1001160-02
1001160-03
1001160-04
1001160-05

1001160-06
1001160-07
1001160-08
1001160-09



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for volatile fraction, following Method 8260B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001160-01
1001160-02
1001160-03
1001160-04
1001160-05

1001160-06
1001160-07
1001160-08
1001160-09

Lcda. Daliz M. Estades Santaliz



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for volatile fraction, following Method 8260B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001181-01
1001181-02
1001181-03
1001181-10
1001181-11
1001181-12
1001181-13
1001181-14
1001181-15



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Diesel and Oil range organics fraction, following Method 8015B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001181-01
1001181-02
1001181-03
1001181-04
1001181-05
1001181-06
1001181-07
1001181-08
1001181-09



PO Box 727
Dorado, PR 00646-0727

Daliz Estados Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estados Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Gasoline range organics fraction, following Method 8015B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001181-01
1001181-02
1001181-03



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for APPIX metals & mercury, following Method SW846 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001181-01
1001181-02
1001181-03
1001181-04
1001181-05
1001181-06
1001181-07
1001181-08
1001181-09



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Dorado, PR 00646-0727

Daliz Estades Santalíz

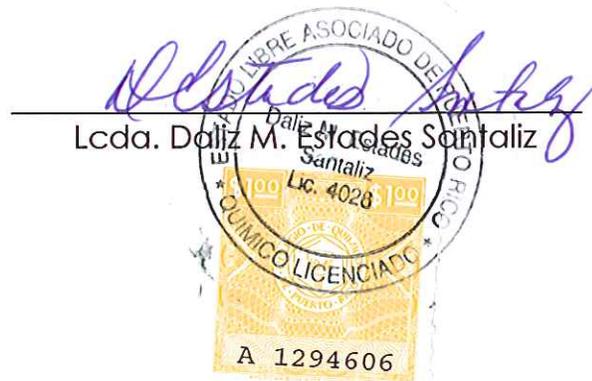
Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for PCB fraction, following Method 8082 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001181-01
1001181-02
1001181-03
1001181-04
1001181-05

1001181-06
1001181-07
1001181-08
1001181-09



Lcda. Daliz M. Estades Santalíz

PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for semivolatile organics, following Method 8270C from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1001181-01
1001181-02
1001181-03
1001181-04
1001181-05

1001181-06
1001181-07
1001181-08
1001181-09



PO Box 727
Dorado, PR 00646-0727

Daliz Estados Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estados Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for semivolatile fraction, following Method 8270C-SIM from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002020-01
1002020-02
1002020-03
1002020-04
1002020-05



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for PCB fraction, following Method 8082 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002020-01
1002020-02
1002020-03
1002020-04
1002020-05



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for APPIX metals, following Method SW846 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002020-01
1002020-02
1002020-03
1002020-04
1002020-05



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Diesel and Oil range organics fraction, following Method 8015B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002020-01
1002020-02
1002020-03
1002020-04
1002020-05



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Dorado, PR 00646-0727

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1002019-01
1002019-02
1002019-03
1002019-04
1002019-05
1002019-06

1002019-07
1002019-08
1002019-09
1002019-10
1002019-12



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Daliz Estades Santaliz

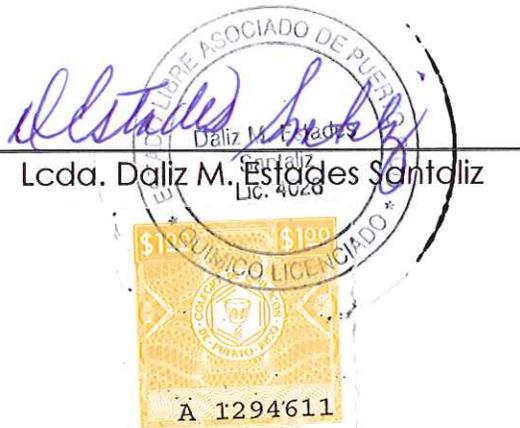
Licensed Chemist

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I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Gasoline range organics fraction, following Method 8015B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002019-01
1002019-02
1002019-03
1002019-04
1002019-05
1002019-06

1002019-08
1002019-09
1002019-10
1002019-12
1002019-15



Lcda. Daliz M. Estades Santaliz

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Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

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1002019-01
1002019-02
1002019-03
1002019-04
1002019-05
1002019-06

1002019-07
1002019-08
1002019-09
1002019-10
1002019-12


Lcda. Daliz M. Estades Santaliz



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for PCB fraction, following Method 8082 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002019-01
1002019-02
1002019-03
1002019-04
1002019-05
1002019-06

1002019-07
1002019-08
1002019-09
1002019-10
1002019-12


Lcda. Daliz M. Estades Santaliz



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for volatile fraction, following Method 8260B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002019-01
1002019-02
1002019-03
1002019-04
1002019-05
1002019-06
1002019-08

1002019-09
1002019-10
1002019-11
1002019-12
1002019-13
1002019-14



Lcda. Daliz M. Estades Santalíz

PO Box 727
Dorado, PR 00646-0727

Daliz Estados Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estados Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for semivolatile organics, following Method 8270C from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002019-01
1002019-02
1002019-03
1002019-04
1002019-05
1002019-06
1002019-07

1002019-08
1002019-09
1002019-10
1002019-12



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for semivolatile fraction, following Method 8270C from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002021-01
1002021-02
1002021-03
1002021-04
1002021-05



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Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for PCB fraction, following Method 8082 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002021-01
1002021-02
1002021-03
1002021-04
1002021-05



PO Box 727
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Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for APPIX metals, following Method SW846 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002021-01
1002021-02
1002021-03
1002021-04
1002021-05



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Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Diesel and Oil range organics fraction, following Method 8015B from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002021-01
1002021-02
1002021-03
1002021-04
1002021-05



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Daliz Estades Santalíz

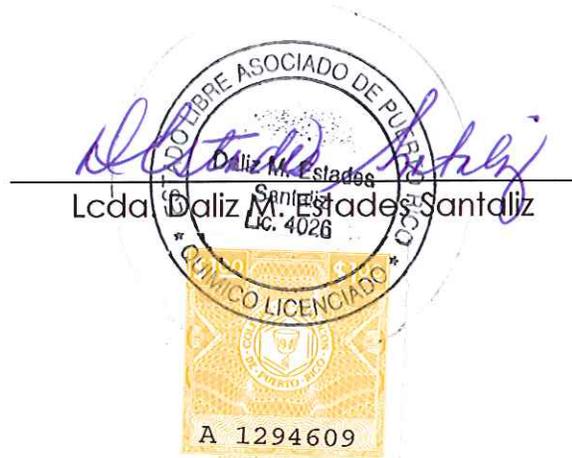
Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for APPIX metals & mercury, following Method SW846 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002022-01
1002022-02
1002022-03
1002022-04
1002022-05

1002022-06
1002022-07



PO Box 727
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Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for TCLP metals, following Method SW846 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002031-01



PO Box 727
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Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for PCB fraction, following Method 8082 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002031-02



PO Box 727
Dorado, PR 00646-0727

Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Wet Chemistry fraction, following EPA Methods from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002031-02



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Dorado, PR 00646-0727

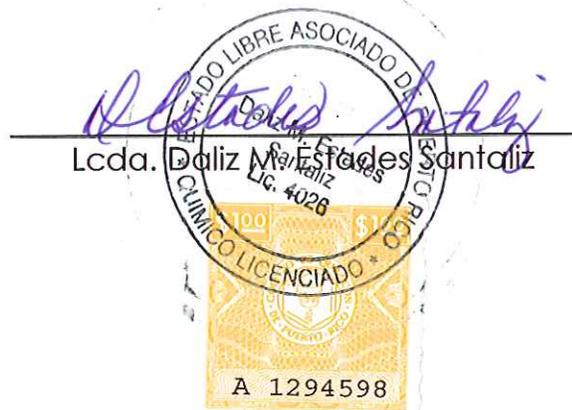
Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Toxicity Characteristics Leaching Procedure (TCLP), following Method 1311 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002031-01



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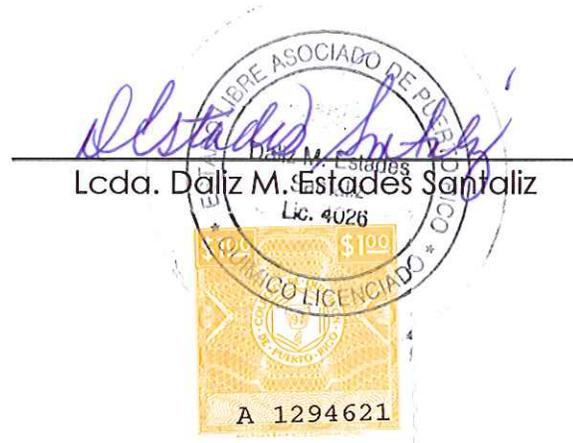
Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for TCLP metals, following Method SW846 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002032-01



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Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Wet Chemistry fraction, following EPA Methods from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002032-02



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Dorado, PR 00646-0727

Daliz Estades Santaliz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santaliz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for Toxicity Characteristics Leaching Procedure (TCLP), following Method 1311 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002032-01



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Dorado, PR 00646-0727

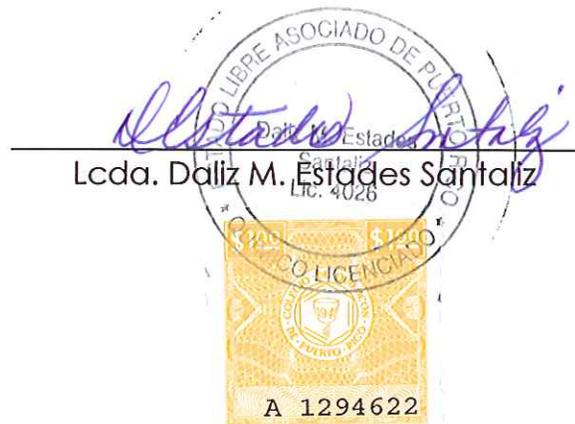
Daliz Estades Santalíz

Licensed Chemist

To Whom It May Concern:

I, Daliz M. Estades Santalíz, in my capacity as Puerto Rico Certified Chemist, hereby certify the attached Analytical Results of samples analyzed for PCB fraction, following Method 8082 from Project Name NAPR SWMU57/DO, and Laboratory ID Numbers.

1002032-02



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