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Roger SooHoo, Remedial Project Manager
Engineering Field Activity West
Naval Facilities Engineering Command
San Bruno, California

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CONFIRMATION STUDY
NAVAL WEAPONS STATION CONCORD, CALIFORNIA

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Prepared By

PRC ENVIRONMENTAL MANAGEMENT, INC.
135 Main Street, Suite 1800
San Francisco, California 94105
(415) 543-4880

John Bosche, Project Manager

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ABBREVIATIONS AND ACRONYMS

AWQC	Ambient Water Quality Criteria
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-Term Environmental Action Navy
CLP	Contract Laboratory Program
COC	Chain-of-Custody
COPC	Chemicals of Potential Concern
CTO	Contract Task Order
DTSC	State of California Department of Toxic Substances Control
EFA	Engineering Field Activity
EPA	U.S. Environmental Protection Agency
FFSRA	Federal Facility Site Remediation Agreement
µg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
msl	Mean Sea Level
O&G	Oil and grease
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PRC	PRC Environmental Management, Inc.
PRG	Preliminary Remediation Goals
RCRA	Resource Conservation and Recovery Act
RES	Riedel Environmental Services, Inc.
RI	Remedial Investigation
RFA	RCRA Facility Assessment
RI/FS	Remedial Investigation and Feasibility Study
RWQCB	San Francisco Bay Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
STLC	Soluble Threshold Limit Concentration
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TBT	Tributyltin
TCA	Trichloroethane
TOC	Total Organic Carbon
TOG	Total Oil and Grease
TPH	Total Petroleum Hydrocarbons
TPHd	Total Petroleum Hydrocarbons as Diesel
TPHg	Total Petroleum Hydrocarbons as Gasoline
TPHmo	Total Petroleum Hydrocarbons as Motor Oil
TRPH	Total Recoverable Petroleum Hydrocarbons
TTLC	Total Threshold Limit Concentration
USC	United States Code
USGS	U.S. Geological Service
UST	Underground Storage Tank

ABBREVIATIONS AND ACRONYMS
(Continued)

VOC	Volatile Organic Compound
WET	Waste Extraction Test
WPNSTA	Naval Weapons Station

EXECUTIVE SUMMARY

In June 1992, the State of California Department of Toxic Substances Control (DTSC) performed a Resource Conservation and Recovery Act (RCRA) facility assessment (RFA) at Naval Weapons Station (WPNSTA) Concord. The RFA was performed to evaluate the potential release of hazardous substances from 24 solid waste management units (SWMU). Recently, the Navy performed an RFA confirmation study to further evaluate the State's RFA findings. This RFA confirmation study report summarizes the results of the evaluation and provides recommendations for either no further action or for additional investigation of the 24 SWMUs at WPNSTA Concord.

The RFA confirmation study included performing the activities outlined in the field sampling and analysis plan as appropriate at each SWMU site and included collection of soil, surface water, groundwater, and septic tank samples; laboratory analysis of the samples; and evaluation of the analytical results.

Based on the RFA confirmation study results, 22 of the 24 SWMU sites will be appropriate for no further action under the RCRA corrective action program. As described below, 15 sites are appropriate for no further action because hazardous soil and/or groundwater conditions were not discovered. Four sites will require cleanup first before they are transferred to no further action status, and three sites are appropriate for removal from the RCRA corrective action program and transfer to the Navy's underground storage tank (UST) program because USTs containing petroleum hydrocarbons are or were present. The remaining two sites are recommended for further action as installation restoration sites under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The recommended status of groups of sites is summarized as follows:

- Fifteen sites are recommended for no further action. Soil and/or groundwater samples collected from 14 of the 15 sites recommended for no further action did not contain concentrations of constituents that pose a threat to human health or the environment.

  One of the 15 sites (SWMU 2) is recommended for no further action under RCRA because laboratory analysis did not detect soil contamination that poses a threat to human health or the environment. Although groundwater contamination has been detected at SWMU 2, the source of constituents in groundwater does not appear related to the former site activities at SWMU 2. The source of groundwater contamination at SWMU 2 should be determined under the authority of a CERCLA remedial investigation (RI) associated with SWMUs 5 and 18 as described below.

- Four SWMU sites are recommended for cleanup activities. Following the completion of the cleanup, these sites are recommended for no further action under RCRA. Three of these SWMU sites are recommended for interim RCRA corrective actions in 1996 (SWMUs 13, 16, and 40). The interim RCRA corrective actions were recently completed at SWMUs 16 and 40. A summary of the interim RCRA corrective actions completed is being prepared by the Navy's Public Works Center, which conducted the cleanup.

  At one SWMU site (SWMU 13), the septic tank contents should be removed because of the hazardous waste concentration of constituents detected. Although hazardous waste was detected in the sewer water samples, no constituents were detected in soil at concentrations that pose a threat to human health or the environment. Following removal of the septic tank contents under an interim RCRA corrective action, no further action will be appropriate. The removal of the septic tank contents at this site is scheduled for 1996.

  At one SWMU site (SWMU 14), the septic tank contents should be removed as a precaution against future releases because of an elevated concentration of nickel in the septic tank water. The septic tank water is not hazardous waste and therefore does not require removal under an interim RCRA corrective action. The removal of the septic tank contents at this site is scheduled for 1996.

- Hydrocarbon-contaminated soils at three SWMU sites (SWMUs 1, 7, and 50) should be addressed under the Navy's UST program. These three sites are appropriate for no further action under the RCRA program.

- Two SWMU sites (SWMUs 5 and 18) are recommended for further investigation under the authority of a CERCLA process RI to evaluate the groundwater contamination in the Inland Area industrial area.

All SWMUs are listed in the following Table ES-1. Several of the SWMU sites are similar, and are first discussed below.

Three sites (SWMUs 1, 2, and 7) have hydrocarbon- or VOC-contaminated groundwater at low concentrations (up to 6 μg/L for VOCs at SWMU 1 and up to approximately 800 μg/L for hydrocarbons at SWMU 2 and 7). Although the petroleum hydrocarbons were stored storage in USTs at SWMUs 1 and 7, the soil conditions at these sites do not suggest that on-site SWMU activities are responsible for the detected constituents in groundwater. The site conditions in the immediate vicinity of these SWMUs are not recommended for further investigation under the RCRA corrective action program, and SWMUs 1 and 7 are appropriate for transfer to the Navy's UST program. SWMU 2 is recommended for no further action because soils at the site do not pose a threat to human health or the environment. Although none of the sites is recommended for further action under the RCRA corrective action program, the groundwater conditions at these sites should be investigated to evaluate the source(s) of VOCs and

hydrocarbons. The investigation in the vicinity of these SWMUs should be conducted upgradient (and possibly downgradient) of each SWMU site under the authority of a CERCLA process RI that also includes SWMUs 5 and 18.

Phenol was consistently detected at low concentrations at half of the SWMU sites (SWMUs 13, 14, 17, 22, 23, 24, 25, 44, 51, 52, 53, and 54). At these sites, phenol was detected in 57 samples at a concentrations ranging from 0.1 to 4 mg/kg. The average of detectable concentrations was 0.5 mg/kg. The source of phenol at these sites has not been determined. The U.S. Environmental Protection Agency's (EPA) residential preliminary remediation goal (PRG) for phenol is 39,000, and phenol is not considered a constituent of potential concern at concentrations of up to 4 mg/kg. The concentration of phenol detected at each SWMU site is not further considered in this executive summary.

SWMU sites, site usage, findings, conclusions, and recommended actions are summarized in Table ES-1.

TABLE ES-1
SUMMARY OF SWMU SITE USES, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS
NAVAL WEAPONS STATION CONCORD

SWMU SITE	SITE USE	FINDINGS	CONCLUSIONS, AND RECOMMENDATIONS
1	Former UST site and possible site of hazardous materials discharge to grounds.	Hydrocarbons were detected in soil and groundwater samples. There is no evidence of any hazardous (nonpetroleum) constituents in soil. VOCs have been detected in groundwater in all wells including those from upgradient and crossgradient locations and there is no onsite source for VOCs in groundwater.	The site should be transferred to the Navy's UST program and the SWMU site should be removed from the RCRA corrective action program because hazardous constituents were not detected in soil and there is no evidence of a release of hazardous materials from the site. A CERCLA process RI is recommended at SWMUs 5 and 18 to determine the source of VOCs detected in groundwater at SWMU 1 and to evaluate remedial alternatives for in the area.
2	Former burn area.	Hydrocarbons were detected sporadically in soil samples (to concentrations of up to 3,400 mg/kg) and were also detected in groundwater samples (to concentrations up to 130 µg/L). However, the hydrocarbons in groundwater are not related to soils containing hydrocarbons at this SWMU site because hydrocarbons in soil have not been found extending to groundwater. The source of hydrocarbons in groundwater has not been determined	Remediation of sporadic detections of hydrocarbons in soil is unnecessary because the hydrocarbons were not detected at concentrations that threaten human health or the environment.. The SWMU is recommended for no further action under the RCRA corrective action program because there is no evidence of site activities that have caused or contributed to the hydrocarbons detected in groundwater. Groundwater at SWMU 2 should be investigated under a CERCLA process RI of SWMUs 5 and 18 to determine the source of chemicals in groundwater and to evaluate remedial alternatives
5	Locomotive maintenance shop.	Hydrocarbons were detected sporadically in soil samples. Hydrocarbons and low concentration VOCs were detected in groundwater.	The site should be investigated under a CERCLA process RI to determine the source of contamination in chemicals in groundwater and to evaluate remedial alternatives.

TABLE ES-1 (Continued)
SUMMARY OF SWMU SITE USES, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS
NAVAL WEAPONS STATION CONCORD

SWMU SITE	SITE USE	FINDINGS	CONCLUSIONS, AND RECOMMENDATIONS
7	Paint storage/disposal and USTs.	Hydrocarbons were consistently detected in the soil samples collected in the vicinity of the USTs. Chemicals were not detected in soil at concentrations suggesting a potential spill or release of paints to the soil and groundwater in the vicinity of the paint storage and handling areas. Hydrocarbons and VOCs were detected in groundwater. There was no hazardous soil contamination detected and no detected relationship between the site paint handling operations and constituents in groundwater.	The USTs should be removed under the Navy's UST program (including soil and groundwater remediation as necessary). Because there is no evidence of hazardous materials affecting soils at SWMU 7, the site is recommended for no further action under the RCRA corrective action program. The VOC contamination of groundwater should be investigated under a CERCLA process RI of SWMUs 5 and 18 to determine the source of chemicals in groundwater and to evaluate remedial alternatives
12/20	Septic tank and leach field.	The septic tank and leach field at SWMU 12/20 is located in the vicinity of IR site 17. Low concentrations of VOCs (0.004 to 0.005 mg/kg) were detected in samples at depths of 10 to 15 feet. Potentially significant concentrations (that exceed PRGs) of metals (manganese concentration of 12,100 mg/kg and thallium concentration of 15.6 mg/kg) were detected in one soil sample at a depth of 15 feet.	Manganese and thallium detected in soils exceeding PRGs are limited in lateral extent and were deeply buried. There is no pathway for human or environmental exposure for these constituents. Elevated concentrations of manganese and thallium were not detected in soil samples collected at IR site 17. The concentrations of VOCs were low and did not exceed PRGs (when applicable). Because hazardous constituents are not a threat at the site, and because there is no known source for these constituents, the SWMU site is recommended for no further action under the RCRA corrective action program.

TABLE ES-1 (Continued)
SUMMARY OF SWMU SITE USES, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS
NAVAL WEAPONS STATION CONCORD

SWMU SITE	SITE USE	FINDINGS	CONCLUSIONS, AND RECOMMENDATIONS
13	Septic tank and leach field site.	Surface soil located in the vicinity of a storm drain outfall contained oil and grease (920 mg/kg) and a trace concentration of endosulfan II (0.004 mg/kg). Hazardous waste was detected in the septic tank.	The hazardous waste present in the septic tank is proposed for removal under an interim RCRA corrective action before the end of 1996. After the septic tank waste is removed, potentially harmful concentrations of hazardous materials will not be present at the site. At that time, the SWMU site will not pose significant threat to human health or the environment. Following the septic tank waste removal, the SWMU site is recommended for no further action under the RCRA corrective action program.
14	Septic tank and leach field.	Nickel was detected in soil (164 and 256 mg/kg) above the estimated ambient limit concentration and residential PRG (150 mg/kg) in two soil samples at depths of 10.5 and 16 feet. Nickel was also detected in a sample of the septic tank sewer water.	The nickel detected in soil is deeply buried and generally does not exceed the PRG by a significant amount. As such, the SWMU site poses no threat to human health and the environment; however, the septic tank sewer water may be contributing to the elevated concentration of nickel in soil. The septic tank sewer water should be removed for treatment or off-site disposal. After removal and off-site disposal of the septic tank sewer water, the SWMU site is recommended for no further action under the RCRA corrective action program.

TABLE ES-1 (Continued)
SUMMARY OF SWMU SITE USES, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS
NAVAL WEAPONS STATION CONCORD

SWMU SITE	SITE USE	FINDINGS	CONCLUSIONS, AND RECOMMENDATIONS
15	Possible former paint storage area.	Several metals (barium concentration of 1,520 mg/kg, manganese concentration of 9,090 mg/kg, and thallium concentration of 11.0 mg/kg) were detected in one soil sample at potentially elevated concentrations The one soil sample buried below a concrete slab at a depth of 4 feet. Elevated concentrations of metals were not detected in other soil samples. Because the metals were detected in only one soil sample, a very limited quantity of the site soils is likely affected.	There is no pathway for human or environmental exposure to the metals detected in soil because of the depth and surface cover. The small volume of soil material containing elevated metals further limits the possibility of exposure. The SWMU site presents no threat to human health and the environment and is recommended for no further action under the RCRA corrective action program.
16	Fluorescent tube crushing, asbestos handling, and pesticide storage and mixing.	High concentrations of pesticides were detected in the soils. The pesticide-contaminated soils have been cleaned up under an interim RCRA corrective action. Confirmation soil samples were taken at the limits of the excavation area and results are pending.	An interim RCRA corrective action has been completed. Upon receipt of the appropriate confirmation sample results, the site is recommended for no further action under the RCRA corrective action program.
17	Septic tank and leach field.	Potentially harmful concentrations of hazardous materials were not detected.	The SWMU site poses no threat to human health and the environment and is recommended for no further action under the RCRA corrective action program.
18	Former steam cleaning area and locomotive turntable.	The site is entirely covered with asphalt. The underlying soil is sporadically contaminated with hydrocarbons (to concentrations of up to 9,700 mg/kg). Hydrocarbons were also detected in groundwater samples (to concentrations of 740 µg/L). Although hydrocarbons were detected in near surface soils, the field investigation consistently did not detect deeper soil samples containing hydrocarbons.	The hydrocarbons in groundwater do not appear related to the hydrocarbons detected in soil because soil contamination was not found extending to groundwater. Because of the asphalt covering of the site, there is no exposure pathway for human and ecological receptors. A CERCLA process RI should be conducted in the vicinity of SWMUs 5 and 18 to evaluate the source of constituents detected in groundwater and evaluate possible remedial alternatives.

TABLE ES-1 (Continued)
SUMMARY OF SWMU SITE USES, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS
NAVAL WEAPONS STATION CONCORD

SWMU SITE	SITE USE	FINDINGS	CONCLUSIONS, AND RECOMMENDATIONS
22	Septic tank and leach field.	Potentially harmful concentrations of hazardous materials were not detected.	The SWMU site poses no threat to human health and the environment and is recommended for no further action under the RCRA corrective action program.
23	Septic tank and leach field.	Potentially harmful concentrations of hazardous materials were not detected.	The SWMU site poses no threat to human health and the environment and is recommended for no further action under the RCRA corrective action program.
24	Septic tank and leach field.	A trace concentration of chloroform (0.002 mg/kg) was detected in one soil sample. Potentially harmful concentrations of hazardous materials were not detected.	The SWMU site poses no threat to human health and the environment and is recommended for no further action under the RCRA SWMU corrective action program.
25	Septic tank and leach field.	Potentially harmful concentrations of hazardous materials were not detected.	The SWMU site poses no threat to human health and the environment and is recommended for no further action under the RCRA corrective action program.
37	Waste wood and treated wood storage area.	This site is located in the vicinity of IR Site 11. Potentially harmful concentrations of hazardous materials were not detected in soil or filtered samples of groundwater.	The SWMU site poses no threat to human health and the environment and is recommended for no further action under the RCRA corrective action program.
40	Former PCB-containing electrical transformer.	Soil samples contained trace concentrations of PCBs and pesticides. The Navy has conducted an interim RCRA corrective action, including a limited site excavation and capping of PCB- and pesticide-contaminated soil with an impervious surface.	The interim RCRA corrective action clean up has been completed and the SWMU site is recommended for no further action under the RCRA corrective action program.
44	Septic tank and leach field.	Potentially harmful concentrations of hazardous materials were not detected.	The SWMU site poses no threat to human health and the environment and is recommended for no further action under the RCRA corrective action program.

TABLE ES-1 (Continued)
SUMMARY OF SWMU SITE USES, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS
NAVAL WEAPONS STATION CONCORD

SWMU SITE	SITE USE	FINDINGS	CONCLUSIONS, AND RECOMMENDATIONS
50	Former UST.	Hydrocarbons were detected in soil and groundwater.	The SWMU site should be transferred to the Navy's UST program and removed from the RCRA corrective action program.
51	Septic tank and leach field.	Potentially harmful concentrations of hazardous materials were not detected.	The SWMU site poses no threat to human health and the environment and is recommended for no further action under the RCRA corrective action program.
52	Septic tank and leach field.	The septic tank and leach field at SWMU 52 is located in the vicinity of IR Site 22. Arsenic (65.4 mg/kg) and lead (165 mg/kg) were detected in surface soil samples.	Arsenic and lead did not originate from the SWMU septic tank because the surface soils are located above the septic tank leach field and because the surface soils containing arsenic are widely distributed at the site. The potential hazards associated with arsenic and lead at the site are more fully evaluated in the RI of IR Site 22. The septic tank and leach field system at SWMU 52 poses no threat to human health and the environment. Because potentially harmful concentrations of hazardous materials were not detected, the SWMU site is recommended for no further action under the RCRA corrective action program.
53	Septic tank and leach field.	Potentially harmful concentrations of hazardous materials were not detected.	The SWMU site poses no threat to human health and the environment and is recommended for no further action under the RCRA corrective action program.
54	Septic tank and leach field containing two septic tanks and two leach fields.	Potentially harmful concentrations of hazardous materials were not detected.	The SWMU site poses no threat to human health and the environment and is recommended for no further action under the RCRA corrective action program.

TABLE ES-1 (Continued)
SUMMARY OF SWMU SITE USES, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS
NAVAL WEAPONS STATION CONCORD

Notes:

CERCLA	=	Comprehensive Environmental Response, Compensation, and Liability Act
IR	=	Installation Restoration
mg/kg	=	milligrams per kilogram
PCB	=	polychlorinated biphenyls
PRG	=	Preliminary Remediation Goal
RCRA	=	Resource Conservation and Recovery Act
RI	=	Remedial Investigation
SVOC	=	semivolatile organic compounds
SWMU	=	solid waste management unit
UST	=	underground storage tank
VOC	=	volatile organic compounds
µg/L	=	micrograms per liter

1.0 INTRODUCTION

The Department of the Navy, Naval Facilities Engineering Command, Engineering Field Activity West (EFA WEST) authorized PRC Environmental Management, Inc. (PRC) under Comprehensive Long-term Environmental Action Navy Contract No. N62474-88-D-5086 (CLEAN I), Contract Task Order (CTO) No. 0283, to investigate and further evaluate the findings of a Resource Conservation and Recovery Act (RCRA) facility assessment (RFA) prepared by the State of California Department of Toxic Substances Control (DTSC) in June 1992 (DTSC 1992). The RFA was prepared to evaluate the potential release of hazardous substances from solid waste management units (SWMU) at Naval Weapons Station (WPNSTA) Concord, California. This RFA confirmation study report summarizes the results of PRC's investigation and provides recommendations for closure or further investigation of 24 SWMUs in the Inland Area and Tidal Area of WPNSTA Concord.

1.1 HISTORY OF THE SOLID WASTE MANAGEMENT UNIT PROGRAM

DTSC conducted the RFA (DTSC 1992) to evaluate the potential for release of hazardous materials to the environment as a result of past disposal practices at 49 SWMUs at WPNSTA Concord. As part of the RFA, DTSC conducted a visual site inspection on September 4 and 10, 1991, to look for evidence of releases for selected SWMUs. Interviews were also conducted with WPNSTA Concord personnel to gather additional information regarding potential releases. In addition, DTSC reviewed inspection reports, permit applications, and files at other regulatory agencies. No samples were collected or analyzed as part of the RFA.

The RFA also included sites where non-RCRA regulated wastes (for example, asbestos and waste oil) are managed; however, the RFA did not evaluate sites being addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLA sites have already been identified as potentially contaminated, and investigations under CERCLA are being conducted by the Navy in coordination with the U. S. Environmental Protection Agency (EPA), DTSC, and the Regional Water Quality Control Board, San Francisco Bay Region (RWQCB).

The 49 sites investigated under the RFA included 33 Inland Area sites, 15 Tidal Area sites, and a site located at the Radiographic Facility in Pittsburg, California. Of the 49 SWMUs, 25 were recommended

for no further action and 24 were recommended for further action. WPNSTA Concord is required under the RCRA Hazardous Waste Facility Permit (effective July 31, 1993), Section V.A.2, to further investigate these 24 SWMUs.

WPNSTA Concord is also required under its Hazardous Waste Facility Permit (Section V.F.) to notify DTSC of any newly identified SWMU. One such SWMU (SWMU 50) was added in March 1994 after petroleum hydrocarbons were detected in soils during a construction project. Four additional SWMUs were identified in April 1994 after it was discovered that they contained septic tanks that were not addressed in the RFA. Because hazardous waste may have been dumped into the septic tank system, these SWMUs were included in this RFA confirmation study and are designated SWMUs 51, 52, 53, and 54. With the addition of SWMUs 50 through 54, a total of 29 SWMUs are recommended for further action. Of the 29 SWMUs, 5 are addressed under separate programs and are not included in this report. Twenty-four SWMUs are addressed in this report. The 5 SWMUs not included in this report that are recommended for further action, and that are being investigated under separate programs, are listed as follows:

- SWMU 8 (building IA-20) is being investigated under the Installation Restoration (IR) Program as IR Site 20 (CLEAN I, CTO 303).
- SWMU 26 (building 178) has undergone investigation and remediation under CLEAN I, CTOs 109 and 238. Further site monitoring will be performed under Contract No. N62474-94-D-7609 (CLEAN II), CTO 89.
- SWMU 30 (UNOCAL Corp.) has undergone investigation and remediation. It awaits closure approval from the Contra Costa County Environmental Health Division.
- SWMU 33 (site 6LC98) has been investigated by WPNSTA Concord. It awaits closure approval from the Contra Costa County Environmental Health Division.
- SWMU 46 (site E-111) is being investigated under CLEAN I, CTO 240.

A description of the 24 remaining SWMU sites and the RFA confirmation study results are presented in Sections 5.1 through 5.23 of this report. SWMU 12 and 20 are located adjacent to each other and were investigated together; therefore, SWMU 12 and 20 are jointly discussed in this report.

1.2 PROJECT OBJECTIVES

The specific objectives of the RFA confirmation study for the 24 SWMUs are as follows:

- Characterize site conditions underlying the SWMU.
- Identify potential sources at the SWMUs that have released hazardous constituents to the environment.
- Evaluate the extent of hazardous chemicals present in groundwater, soil, surface water, and sediment.
- Determine which SWMUs are appropriate for closure without further action and which SWMUs require further investigation or remedial activities.

1.3 PROJECT APPROACH

This RFA confirmation study addresses 24 separate SWMUs, each with different operational histories, environmental conditions, types of chemicals potentially present, and potential exposure pathways and receptors. The quantity, quality, and completeness of the preexisting RFA data were insufficient to estimate the nature and extent of hazardous materials in environmental media at these SWMUs.

Additional data collection activities were carried out at each SWMU site, including field investigations; collection of soil, surface water, groundwater, and septic tank samples; laboratory analysis of the samples; evaluation of the analytical results; and preparation of this report. Descriptions of the site conditions, evaluation, and conclusions and recommendations for each SWMU are presented in Section 5.0 of this report.

All data have been assessed to determine which of the following categories of recommended actions are appropriate for each site:

- SWMU is appropriate for no further investigation under the RCRA corrective action program.
- SWMU is appropriate for further investigation or remediation under the Navy's underground storage tank (UST) program. SWMU sites that are transferred to the Navy's UST program are appropriate for no further action under the RCRA corrective action program.
- SWMU is appropriate for interim RCRA corrective actions, to minimize a release or threat of a release that may pose a threat to human health or the environment.

- SWMU is appropriate for a CERCLA remedial investigation and feasibility study (RI/FS) to further evaluate the contamination.

2.0 ENVIRONMENTAL SETTING

The following sections describe the location, land use, climate, physiography and topography, geology, and hydrology of WPNSTA Concord.

2.1 LOCATION

WPNSTA Concord is the major naval munitions transshipment facility on the West Coast and is located in the north-central portion of Contra Costa County, California, approximately 30 miles northeast of San Francisco (Figure 1). The facility, which encompasses approximately 13,000 acres, is bounded by Suisun Bay to the north and by the city of Concord to the south and west. Currently, the facility contains two primary land holdings: the Tidal Area and the Inland Area.

WPNSTA Concord property north of Los Medanos Hills has been designated the Tidal Area. The Tidal Area includes 6,077 acres of mainland and six islands (including Ryer Island) in Suisun Bay that total 1,571 acres. The Inland Area encompasses approximately 5,100 acres between Los Medanos Hills and the city of Concord. Three public roads cross the Inland Area: State Route 4, Willow Pass Road, and Bailey Road.

The SWMUs investigated during this RFA Confirmation study include SWMUs 1, 2, 5, 7, 12/20, 13, 14,15, 16, 17, 18, 22, 23, 24, 25, 37, 40, 44, 50, 51, 52, 53, and 54. These SWMUs are located in the Inland and Tidal Areas and are illustrated on Figures 2 and 3.

2.2 LAND USE

Land use in the vicinity of WPNSTA Concord is diverse, characterized by a mixture of industrial, residential, agricultural, and open space zones (Figure 4). WPNSTA Concord is bordered on the south by residential sections of the city of Concord. In addition, seven public schools and several parks parallel the Navy property line. Steep slopes and access problems have prevented extensive development along Kirker Pass Road and in the hills northeast of WPNSTA Concord. These areas are zoned for open

space and agricultural land use. The Concord Pavilion, a public entertainment facility, is constructed on Kirker Pass Road near the station's boundary.

Land to the north of State Route 4 and to the west of WPNSTA Concord is zoned for industrial development. Several firms have located here, particularly along Port Chicago Highway near the main gate of WPNSTA Concord. Phillips Petroleum Company and Monsanto Chemical Company maintain facilities along Solano Way near Waterfront Road. Los Medanos Hills separate the Tidal and Inland Areas and are the site of the Los Medanos underground gas storage field.

The majority of WPNSTA Concord operations take place in the Inland Area. Ammunition storage, which constitutes the largest single land use at WPNSTA Concord, is maintained in five magazine groups and two groups of barricaded railroad sidings. Various production facilities for the inspection and maintenance of ordnance are located throughout the Inland Area.

The majority of the facilities located in the greater Tidal Area are dedicated to ordnance operations and are located on the original property of the Naval Magazine, Port Chicago, acquired by the Navy in 1942. Within the 17,000 linear feet of waterfront in the Tidal Area are three explosives-handling piers, a barge pier, lighter moorings, and a tug basin. Barricaded rail car sidings, rail car classification yards, and a large holding lot for trucks are inland from the waterfront area and approximately 1,000 feet east of the Tidal Area Landfill site. Several open inert storage and parking aprons are associated with the piers and support activities.

2.3 CLIMATE

Contra Costa County normally experiences dry, warm summers and moderately rainy winters. The wind blows from southwest to west-northwest at a mean wind speed of 12 miles per hour 65 percent of the time. The average local temperature varies from 45° F in January to 75° F in August.

The mean annual precipitation for WPNSTA Concord is 14 inches (Ecology and Environment, Inc. 1983). As in most of northern California, about 84 percent of the rainfall occurs from November through March.

2.4 PHYSIOGRAPHY AND TOPOGRAPHY

The physiography and topography of the Tidal Area are shown on Figure 5. Originally, the Tidal Area consisted of three distinct land formations: salt wetlands along the shore of Suisun Bay, the upland colluvial slope, and the sandstone hills farthest from the water. A large section of the wetlands was modified when the original weapons station was constructed by the addition of large amounts of fill material. Almost all existing naval facilities in the Tidal Area were built in these filled areas (IT 1992). The colluvial slope is the most suitable for development because of its higher elevation and gentler grade. The area south of the Contra Costa Canal is characterized by steeply sloping terrain, beginning at a 100-foot mean sea level (msl) elevation and rising to more than 600 feet.

The physiography and topography of the Inland Area are shown in Figure 6. Most of the western half of the Inland Area is characterized by gently sloping land designated as colluvial slope. Steeply sloping terrain, beginning at 100 feet msl and rising to more than 800 feet msl, forms the northeast boundary of the Inland Area.

2.5 GEOLOGY

The regional geologic features are a reflection of several northwest-trending fault systems that divide Contra Costa County into large blocks of rocks. Up-thrown blocks form the hills, and down-thrown blocks form broad lowlands floored with thick, unconsolidated Pleistocene-age alluvial sediments eroded from the up-thrown blocks. Figure 7 is a geologic map of WPNSTA Concord showing a cross section of the major geologic formations. The uplifted bedrock feature that topographically separates the Inland and Tidal Areas is typical of the geology of Contra Costa County.

Figure 7 shows the two major faults known to exist in the WPNSTA Concord area: the Concord and Clayton Faults. The Concord Fault passes through the city of Concord approximately 2 miles from WPNSTA Concord. The Concord Fault is classified as active and is a right-lateral, strike-slip fault. The main trace of the Clayton Fault lies at the base of Los Medanos Hills as it passes through WPNSTA Concord. The Clayton Fault is classified as active or potentially active.

Tidal Area geology is dominated by Pleistocene and Holocene geomorphology. Subsurface geology is best described as a zone of interfingering alluvial and estuarine depositional environments. The Tidal

Area can be divided into three distinct landforms, all of Quaternary age: footslopes, floodplains, and marsh or wetland areas.

Alluvium in the Inland Area consists of beds of sandy, silty, and clayey soils. Silty soils appear to predominate. A 3-foot-thick layer of dark brown or gray, clayey soil is consistently present on the alluvium throughout the region.

Soils in the north-central portions of WPNSTA Concord are clay-rich alluvium derived from nearby hills. They are well sorted, pebbly alluvium from upstream areas of Mt. Diablo Creek. Soils in the central area tend to be coarser at shallow depths but grade comparatively finer than do soils in the north-central area.

The surface geology of the Inland Area sites is divided into two alluvial areas. The first is alluvial formations derived from erosion products associated with the geologic units of Los Medanos Hills. To the southwest are some low and gently sloped hills composed of a quaternary age sedimentary formation and alluvial byproducts. These two geologic areas are separated by the approximate alignment of Seal Creek.

2.6 HYDROLOGY

The hydrology of the region can be separated into surface water and groundwater. Surface water hydrology concerns streams, lakes, bays, and estuaries.

2.6.1 Surface Water

WPNSTA Concord is located in the Sacramento-San Joaquin Delta area. Three natural surface water bodies are located within or adjacent to the Tidal Area at WPNSTA Concord: Suisun Bay, Hasting Slough, and Belloma Slough (Figure 5). A drainage canal known as Otter Sluice has been constructed within the west side of the Tidal Area.

WPNSTA Concord lies within the Mt. Diablo-Seal Creek Watershed, which drains an area of about 36 square miles. The watershed is bounded on the south by the north peak of Mt. Diablo and on the north by Suisun Bay. Streams that drain the watershed have their headwaters on the slopes of Mt. Diablo and

flow by way of Mt. Diablo Creek through Clayton Valley and WPNSTA Concord to the outlet at Suisun Bay. Mt. Diablo Creek is referred to as Seal Creek where it enters WPNSTA Concord.

2.6.2 Groundwater

Groundwater beneath the Tidal Area generally flows to the west/southwest with a gradient of approximately 0.002 to 0.003 feet per feet. In November 1991, rising head aquifer tests (slug tests) were performed on several selected Tidal Area monitoring wells. Results from the slug tests indicate that the Tidal Area as a whole has an average hydraulic conductivity of 1.86×10^{-5} centimeters per second, with the highest conductivity occurring at well FTW-5 (1.16×10^{-4} centimeters per second) at IR Site 9 (the Froid and Taylor Roads site) and the lowest at well RDW-5 (2.05×10^{-6} centimeters per second) at IR Site 2 (the R Area Disposal site) (IT 1992).

Most of the Bay Area's water is supplied by treated surface water sources, although some wells in the vicinity of the Mallard Reservoir (Figure 8) are still used for water supply. Groundwater is available beneath the Inland Area in the unconsolidated formations and the bedrock. North of State Route 4, the water table ranges from 30 to 40 feet below ground surface (bgs) in low surface elevation areas and at deeper depths as ground surface rises. In the main industrial complex of the Inland Area, groundwater is present at a depth of approximately 20 feet bgs.

3.0 INVESTIGATION ACTIVITIES

The RFA confirmation study at WPNSTA Concord included the following activities: (1) surface and subsurface soil sampling using hand sampling equipment, test pits, drilled borings, and Geoprobe sampling equipment, (2) sampling of existing groundwater monitoring wells, (3) groundwater sampling, (4) monitoring well installation and sampling, (5) surface water sampling, and (6) sampling of sewage sludge and sewer water from septic tanks. This section presents an overview of the sampling equipment used and the procedures followed during the field activities. A detailed description of the procedures used in the field is presented in the SWMU Site Investigation Draft Final Field Sampling Plan (PRC 1994b). Field sampling activities of the SWMU sites at WPNSTA Concord were conducted in two phases. The first phase was conducted from February to May 1995 and the second was conducted in October 1995.

3.1 SOIL INVESTIGATION AND SAMPLING

Hollow-stem auger, Geoprobe, and hand-auger drilling methods were used in the soil investigation at WPNSTA Concord. One test pit was excavated as part of the investigation at SWMU 2 (Fire Station) in the Inland Area.

3.2 SURFACE WATER AND GROUNDWATER SAMPLING

Two monitoring wells were installed at Tidal Area SWMU 50 to support geologic, hydrogeologic, and contaminant characterization efforts. Groundwater samples were obtained from existing and new monitoring wells at SWMUs 1 and 50. Groundwater samples were collected using HydroPunch or Geoprobe sampling methods at SWMUs 2, 5, 7, 18, and 37. A surface water sample was collected at SWMU 52.

3.3 SEPTIC TANK INVESTIGATION

Septic tank sewer water was sampled from 15 septic tanks at 13 SWMU sites (SWMUs 12, 13, 14, 17, 22 [2 tanks], 23, 24, 25, 44, 51, 52, 53, and 54 [2 tanks]). Because of the small diameter of the access ports to some of the septic tanks, attempts to collect a sewage sludge sample with the sludge sampling equipment were unsuccessful. At other sites, only a thin layer of sludge was present in the tanks and a sufficient volume of sludge could not be collected for analysis. Three sludge samples were collected for analysis at three of the SWMU sites (SWMUs 13, 14, and 44). When necessary, the septic tanks were first uncovered by using a backhoe to remove overlying soil. When exposed, the septic tank manhole cover was then removed. In some cases, the septic tanks were sampled through an open access port.

3.4 SITE SURVEYING

The elevation (vertical control) for the natural ground surface for all monitoring wells was surveyed to within plus or minus 0.1 foot using the National Geodetic Vertical Datum of 1929. The north side of the uncapped well casing was surveyed to within plus or minus 0.01 foot. The surveyed point on the north side of the monitoring well casing was marked with a small notch cut into the casing. The notch was used as a reference point when water level elevations were measured.

The locations of most borings were surveyed horizontally relative to the WPNSTA Concord system to an accuracy of plus or minus 1 foot. Borings not surveyed were accurately measured by tape from established landmarks. The ground surface elevation of the borings was measured to within plus or minus 0.1 foot using the National Geodetic Vertical Datum of 1929.

4.0 SWMU SITE ANALYTICAL RESULTS AND EVALUATION

This section presents a summary of the general methodology for evaluating organic and inorganic constituents that was applied to each SWMU site. Section 4.1 presents the methodology used to screen the organic analytical results for each SWMU and Section 4.2 presents the methodology for screening the inorganic analytical results for each SWMU where metals analyses were performed.

A list of the soil samples collected and analyses performed for all SWMU sites is presented in Table 1. A list of the groundwater samples collected and groundwater analyses performed for all SWMU sites is presented in Table 2. As noted previously, only one surface water sample was collected, at SWMU 52. Table 3 provides a list of all septic tank sewage sludge samples collected and analyses performed. Table 4 provides a list of all septic tank sewer water samples collected and analyses performed. Tables 5 through 27 present a summary of analytical results of soil, surface water, and groundwater samples for each individual SWMU. Table 28 presents the analytical results of the septic tank sewage sludge samples, and Table 29 presents the analytical results of the septic tank water samples. Table 30 presents a statistical summary of the analytical results for all soil samples analyzed for inorganic constituents during this investigation.

4.1 EVALUATION OF ORGANIC CONSTITUENTS IN SOIL

Organic analyses were compared to U.S. Environmental Protection Agency (EPA) Region IX preliminary remediation goals (PRG), when available. Although WPNSTA Concord is an industrial facility, and this designation is not expected to change, the residential PRGs were used in this report rather than industrial PRGs as a conservative screening mechanism. Where residential PRGs were exceeded, the analytical results were also screened against industrial PRGs.

4.2 INORGANIC CONSTITUENTS IN SOIL

A statistical summary of the inorganic analytical results is presented in Table 30. Table 30 lists the following information: (1) the number of samples in which the analyte was detected; (2) a preliminary evaluation of the data set distribution (normal, lognormal, or nonparametric); (3) the maximum, minimum, and average concentrations of detected compounds; (4) the maximum and minimum sample quantitation limits; and (5) the residential and industrial PRGs for each metal.

The evaluation of inorganic constituents at the SWMU sites involved classifying the analytical results into one of three categories: (1) inorganic constituents without EPA PRGs; (2) analytical results that do not exceed residential PRGs; and (3) analytical results that exceed residential or industrial PRGs. Analytical results that fall into the first two categories are of no environmental concern; however, analytical results that fall into the third category indicate sites that are potentially hazardous to human health. These categories are discussed in the following subsections.

4.2.1 Inorganic Constituents without Calculated PRGs

Calcium, iron, magnesium, potassium, and sodium are essential nutrients and no EPA Region IX PRGs (EPA 1995) exist for these metals. Essential nutrients are not normally considered contaminants and are therefore not typically carried through the evaluation process. These constituents are not proposed for further evaluation.

4.2.2 Inorganic Constituents That Do Not Exceed Residential PRGs

Concentrations of metals that did not exceed residential PRGs in any soil samples collected at the SWMU sites include aluminum, antimony, barium, cadmium, total chromium, cobalt, copper, mercury, molybdenum, selenium, silver, vanadium, and zinc. The maximum detected concentrations of these constituents at WPNSTA Concord are from 2.3 to 340 times lower than the respective residential PRGs. Therefore, these constituents are not considered a threat to human health at the SWMU sites and are not proposed for further evaluation.

4.2.3 Inorganic Constituents That Exceed PRGs

In most cases, the PRGs are lower than the estimated ambient limit concentrations (sometimes referred to as "background" or "naturally occurring" concentrations) that exist at WPNSTA Concord. Therefore, a release of contaminants to the environment has not necessarily occurred in every instance where a PRG is exceeded. Potentially harmful contamination by inorganic constituents is suspected only when estimated ambient limit concentrations are exceeded. Consequently, the inorganic constituents that fall into the third category were also screened against estimated ambient limit concentrations, which have been developed during the Tidal Area and Inland Area RIs for three separate areas of WPNSTA Concord: the Tidal Area; the Inland Area underlain by the sandstone of Los Medanos Hills; and the Inland Area underlain by quaternary age alluvial deposits (PRC 1996a and PRC 1996b). The estimated ambient limit concentrations for inorganic compounds at WPNSTA Concord are currently under review by state and federal regulatory agencies. These estimated concentrations could be modified based on agency review comments. As a result, the estimated ambient limit concentrations should be considered proposed. A summary of the estimated ambient limit concentrations for each area is presented in Table 31.

For this RFA confirmation study, all sample results for each metal exceeding residential or industrial PRGs were plotted on a histogram to visually compare the analytical results to the estimated ambient limit concentrations. In all cases, the comparison of the histogram plots to the estimated ambient limit concentrations suggests that these values are an appropriate criteria for the screening of the inorganic data for this study.

The following evaluation screens the analytical results where residential or industrial PRGs were exceeded in addition to the estimated ambient limit concentrations developed during the RI. Metals that exceeded PRGs and estimated ambient limit concentrations are arsenic, beryllium, lead, manganese, nickel, and thallium. Each of these are discussed below.

Arsenic

The range of detected arsenic concentrations was typically uniform, varying from 1.4 to 65.4 milligrams per kilogram (mg/kg) in 193 samples where arsenic was detected.

Arsenic generally did not exceed the estimated ambient limit concentrations. The estimated ambient limit concentration for arsenic in the Tidal Area (SWMUs 37, 40, 44, and 50) of WPNSTA Concord is 24 mg/kg. For sites located on the sedimentary hills formation alluvial deposits (SWMUs 13, 15, 17, 24, 51, 52, and 53), the estimated ambient limit concentration is 15 mg/kg. For sites on deposits related to the Los Medanos Hills formation (SWMUs 1, 2, 5, 7, 12/20, 14, 16, 18, 22, 23, 25, and 54) the estimated ambient limit concentration for arsenic is 7.3 mg/kg. Results for seven samples at four of the SWMUs exceed these estimated ambient limit concentrations, as shown on the following table.

SOIL SAMPLE RESULTS EXCEEDING ESTIMATED AMBIENT LIMIT CONCENTRATIONS AND INDUSTRIAL PRG FOR ARSENIC

SWMU	Location (and geologic setting)	Boring I.D.	Sample Depth (feet)	Arsenic (mg/kg)	Estimated Ambient Limit Concentration for Geologic Setting (mg/kg)
2	Inland Area (Los Medanos Hills)	02-06	0.3 - 0.9	14.3	7.3
16	Inland Area (Los Medanos Hills)	16-04	0.5 - 1.5	8.3	7.3
16	Inland Area (Los Medanos Hills)	16-06	0.5 - 1.5	23.7	7.3
23	Inland Area (Los Medanos Hills)	23-01	5.0 - 6.0	8.8	7.3
52	Inland Area (Sedimentary Hills)	52-03	0 - 0.5	65.4	15
52	Inland Area (Sedimentary Hills)	52-04	0 - 0.5	38.0	15
52	Inland Area (Sedimentary Hills)	52-03	3.5 - 4.0	20.7	15

The residential PRG for arsenic is 0.38 mg/kg. All analytical results for arsenic exceeded the residential PRG, and most also exceeded the industrial PRG (2.4 mg/kg). Few of the PRG exceedences are likely to represent site contamination because the estimated ambient limit concentrations were only slightly exceeded. Each of these sample results is evaluated further in each applicable SWMU site section.

Beryllium

The estimated ambient limit concentration for beryllium in samples from the Tidal Area of WPNSTA Concord (SWMUs 37, 40, 44, and 50) is 0.12 mg/kg. For sites located on deposits related to sedimentary

formations (SWMUs 13, 15, 51, 52, and 53), the estimated ambient limit concentration is 0.12 mg/kg. For sites on deposits related to the Los Medanos Hills formation (SWMUs 1, 2, 5, 7, 12/20, 14, 16, 18, 22, 23, 25, and 54), the estimated ambient limit concentration is 0.56 mg/kg.

Results for beryllium in one sample slightly exceeded the estimated ambient limit concentration, as shown in the following table.

SOIL SAMPLE RESULTS EXCEEDING ESTIMATED AMBIENT LIMIT CONCENTRATIONS AND RESIDENTIAL PRG FOR BERYLLIUM

SWMU	Location (and geologic setting)	Boring	Sample Depth (feet)	Beryllium (mg/kg)	Estimated Ambient Limit Concentration for Geologic Setting (mg/kg)
51	Inland Area (Los Medanos Hills)	51-02	5.0 - 6.0	0.41	0.56

The concentration of beryllium in the sample from SWMU 51 is not necessarily representative of site contamination since the exceedance over estimated ambient limit concentrations is minimal.

The residential PRG for beryllium is 0.14 mg/kg, and the industrial PRG is 1.1 mg/kg. Of the 203 samples analyzed, beryllium was detected in only 20 samples. The industrial PRG was not exceeded in any of the samples. The maximum concentration of beryllium detected was 0.52 mg/kg. The sample quantitation limit varied from 0.02 to 0.38 mg/kg, while the detected concentrations varied from 0.22 to 0.52 mg/kg.

Because of the low concentrations detected and because industrial PRGs are not exceeded, beryllium is not proposed for further evaluation and is therefore not discussed in the SWMU 51 site evaluation section.

Lead

Analytical results for three soil samples at the SWMU sites exceeded the State of California modified residential PRG for lead (130 mg/kg). No samples exceeded EPA's industrial PRG for lead (1,000 mg/kg). The estimated ambient limit concentrations for lead, ranging from 18 mg/kg in the Inland Area to 61 mg/kg in the Tidal Area, are below the residential PRG. A list of sample results that exceed the residential PRG for lead are presented below.

SOIL SAMPLE RESULTS EXCEEDING ESTIMATED AMBIENT LIMIT CONCENTRATIONS AND RESIDENTIAL PRG FOR LEAD

SWMU	Location (and geologic setting)	Boring	Sample Depth (feet)	Lead (mg/kg)	Estimated Ambient Limit Concentration for Geologic Setting (mg/kg)
2	Inland Area (Los Medanos Hills)	02-06	0.3 - 0.9	334	18
7	Inland Area (Los Medanos Hills)	07-01	4.5 - 5.0	375	18
52	Inland Area (Sedimentary Hills)	52-03	0 - 0.5	165	32

Each of these sample results is evaluated further in each applicable SWMU site section.

Manganese

EPA recently revised the oral reference dose for manganese (EPA 1996), but the PRGs were not recalculated by the EPA. Using the same equations that EPA Region IX uses to derive the listed PRGs and the revised oral reference dose, the PRGs were recalculated by PRC. The revised residential PRG is 3,200 mg/kg and the industrial PRG is 8,300 mg/kg. Two samples containing manganese exceeded the residential PRG (3,200 mg/kg) and also exceeded the industrial PRG (8,300 mg/kg). The range of detected concentrations was typically uniform, varying from 75.1 to 12,100 mg/kg in 203 samples where manganese was detected.

The estimated ambient limit concentration for manganese in the Tidal Area of WPNSTA Concord (SWMUs 37, 40, 44, and 50) is 840 mg/kg. For sites located on deposits related to sedimentary formations (SWMUs 13, 15, 17, 24, 51, 52, and 53), the estimated ambient limit concentration is 1,300 mg/kg. For sites on deposits related to the Los Medanos Hills formation (SWMUs 1, 2, 5, 7, 12/20, 14, 16, 18, 22, 23, 25, and 54), the estimated ambient limit concentration for manganese is 870 mg/kg. The samples listed in the following table may represent site contamination as they exceed these estimated ambient limit concentrations and the residential PRG.

Manganese concentrations in seven samples exceed the estimated ambient limit concentration; however, only two of these sample results simultaneously exceeded the residential PRG for manganese.

Concentrations in all other samples ranged from 75.1 to 1,600 mg/kg. A list of sample results that exceed the PRG and estimated ambient limit concentrations for manganese are presented below.

SOIL SAMPLE RESULTS EXCEEDING ESTIMATED AMBIENT LIMIT CONCENTRATIONS AND RESIDENTIAL PRG FOR MANGANESE

SWMU	Location (and geologic setting)	Boring	Sample Depth (feet)	Manganese (mg/kg)	Estimated Ambient Limit Concentration for Geologic Setting (mg/kg)
12	Inland Area (Los Medanos Hills)	12-03	15.0 - 16.0	12,100	870
15	Inland Area (Sedimentary Hills)	15-03	4.0 - 4.5	9,090	1,300

Each of these sample results is evaluated further in the applicable SWMU site section.

Nickel

The concentration of nickel ranged from 6.3 mg/kg to 2,160 mg/kg in 197 samples where nickel was detected. The State of California modified residential PRG for nickel is 150 mg/kg. Nickel concentrations in six samples exceeded this PRG; however, none of the sample results exceeded the industrial PRG (34,000 mg/kg). The estimated ambient limit concentrations for nickel in the Tidal Area and Inland Areas of WPNSTA Concord are lower than the residential PRG. A list of sample results that exceed the residential PRG is presented below. Each of these sample results is evaluated further in each applicable SWMU site section.

SOIL SAMPLE RESULTS EXCEEDING ESTIMATED AMBIENT LIMIT CONCENTRATIONS AND RESIDENTIAL PRG FOR NICKEL

SWMU	Location (and geologic setting)	Boring	Sample Depth (feet)	Nickel (mg/kg)	Estimated Ambient Limit Concentration for Geologic Setting (mg/kg)
7	Inland Area (Los Medanos Hills)	07-01	4.5 - 5.0	2,160	86
12	Inland Area (Los Medanos Hills)	12-02	5.0 - 6.0	165	86
14	Inland Area (Los Medanos Hills)	14-02	10.5 - 11.0	164	86
14	Inland Area (Los Medanos Hills)	14-02	16.0 - 16.5	256	86
15	Inland Area (Sedimentary Hills)	15-03	4.0 - 4.5	196	100
24	Inland Area (Los Medanos Hills)	24-01	16.0 - 16.5	195	100

Thallium

EPA Region IX PRGs include a published value for thallic oxide but not for thallium. However, PRC has calculated an equivalent to the residential PRG for metallic thallium using the EPA methodology. PRC's calculation resulted in an equivalent PRG for thallium that is identical to EPA's PRG for thallic oxide. The residential EPA PRG for thallic oxide (and PRC's equivalent PRG for metallic oxide) is 5.4 mg/kg and the industrial EPA PRG for thallic oxide is 120 mg/kg. The residential PRG was exceeded in two samples, but the industrial PRG was not exceeded in any sample. The concentration of thallium ranged from 0.57 to 15.6 mg/kg in 38 samples where thallium was detected.

The estimated ambient limit concentrations for thallium in the Tidal and Inland Areas of WPNSTA Concord range from the analytical method detection limits to 1.4 mg/kg.

The two sample results that exceed the residential PRG for thallic oxide are presented below.

SOIL SAMPLE RESULTS EXCEEDING ESTIMATED AMBIENT LIMIT CONCENTRATIONS AND RESIDENTIAL PRG FOR THALLIUM

SWMU	Location (and geologic setting)	Boring	Sample Depth (feet)	Thallium (mg/kg)	Estimated Ambient Limit Concentration for Geologic Setting (mg/kg)
12	Inland Area (Los Medanos Hills)	12-03	15.0 - 16.0	15.6	Detection Limit
15	Inland Area (Sedimentary Hills)	15-03	4.0 - 4.5	11.0	Detection Limit

Each of these sample results is further evaluated in each applicable SWMU site section.

5.0 SWMU SITE DESCRIPTIONS, CONCLUSIONS, AND RECOMMENDATIONS

This section presents detailed descriptions of the site background, sampling performed, investigation results, and conclusions and recommendations for each of the 24 SWMU sites. SWMU 12 is combined with SWMU 20 because of the close proximity of the two.

The location of each SWMU is shown on a detailed site plan (refer to Figures 10 through 34). A standard legend for all of the detailed site plans appears on Figure 9. These site plans illustrate the pertinent site details such as locations of all soil borings and wells, and summaries of the analytical results for all soil and groundwater samples collected for this investigation.

5.1 SWMU 1 - BUILDING IA-6

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 1. A site plan of SWMU 1 is presented on Figure 10.

5.1.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 1.

Site Description

Building IA-6 was constructed in the 1940s and is located approximately 0.75 miles east of the main entrance and on the south side of Kinne Boulevard. The building is a boiler house that supplies heat to several structures in the Inland Area. It houses three steam boilers used for heating administrative and shop buildings. Two of the three boilers were configured to burn natural gas; the third boiler was configured to burn diesel fuel oil in case of loss of natural gas supply. The UST located about 15 feet south of building IA-6 was removed in 1989.

The ground surface in the vicinity of building IA-6 generally slopes to the southwest, and has an elevation of approximately 48 feet msl. Seal Creek, an intermittent stream, runs southwest of the site. The area south and west of building IA-6 is generally bordered by unpaved open space, with the exception of building IA-4 and the electric substation. The area to the east is a paved driveway and parking area. A gravel driveway that intersects Kinne Boulevard is located along the south and west sides of building IA-6.

Groundwater flow is in a northwest direction, approximately paralleling Kinne Boulevard

Along the west side of the building, a boiler purge water holding tank serves as a grease and sand trap and prevents oil and debris from entering the sanitary sewer system. This trap is inspected and cleaned every 3 months as required by the wastewater discharge permit from the Contra Costa County Sanitary District.

A 6-inch-diameter pipe was noted at the bottom of a 1-foot-deep hole in the ground located about 4 feet north of the purge water holding tank grease and sand trap. An area approximately 10 by 20 feet was saturated, and ponded water was noted adjacent to the purge water holding tank and to the east of the gravel road that crosses the west side of building IA-6. A visit to the SWMU on April 13, 1994, revealed that grass was not growing well in the area that had been saturated. The source of the ponded water is believed to be boiler purge water that leaked from a broken line leading to a purge water holding tank located near the western corner of building IA-6. While being operated, the boilers were purged after each shift. The boilers were removed from service during 1994.

Previous Investigations

In September 1987, water entered the UST through an open access portal while the lid was being removed for repairs, causing the UST to overflow. An estimated 1,900 gallons of diesel fuel was reportedly released from the UST. Following the fuel release, Riedel Environmental Services, Inc. (RES) conducted an environmental assessment. Trenches were excavated in December 1987 to explore the extent of soil contamination. In April 1988, RES installed monitoring well MW-1 approximately 20 feet west of the UST. Most trenches were excavated to the west of MW-1 and south of the former UST. None of the soil or water samples collected from the trenches contained detectable total petroleum hydrocarbons (TPH) reported as diesel (TPHd) (RES 1988).

RES removed the UST in June 1989. About 80 cubic yards of contaminated soil was excavated. At the time of UST removal, a soil sample collected from the west side of the UST excavation pit indicated the presence of TPHd. However, TPHd was not detected in a sample collected from the east side of the UST excavation pit (Fugro-McClelland 1993). Diesel fuel was detected in a groundwater sample collected from the bottom of the excavation.

After the UST was removed, monitoring wells MW-2 and MW-3 were installed, located 100 feet southeast and 100 feet south of building 1A-4, in July 1989. In August 1989, RES measured 0.40 feet of floating product in well MW-01. RES suspected that the measured product was not representative of product floating on groundwater. RES bailed the well and remeasured a product thickness of 0.01 feet on August 29 and August 31. In September 1990, PRC installed monitoring well MW-4, located approximately 120 feet northwest of the former UST. On September 16, 1990, PRC collected groundwater samples from monitoring wells MW-1, MW-2, MW-3, and MW-4. Floating product 1.5 inches thick was measured in well MW-1. TPHd was detected in the water from monitoring wells MW-2 and MW-4. PRC sampled the four wells again on November 15, 1990. TPHd was detected in a sample from well MW-1, and no petroleum hydrocarbons were detected in samples from well MW-2, MW-3, or MW-4. Fugro-McClelland sampled the four monitoring wells on August 12, 1992 and observed floating product in well MW-1. No TPHd or TPHg was detected in samples from any of the other three monitoring wells. Fugro-McClelland sampled all of the monitoring wells again on April 4, 1993 except for well MW-1 which was not accessible. Analytical results of groundwater samples did not indicate TPHd or benzene, toluene, ethylbenzene, and xylenes (BTEX). Analytical results confirmed the

presence of halogenated volatile organic compounds (VOC) in groundwater samples collected from each of the monitoring wells.

On September 2 and 3, 1993, Fugro-McClelland installed wells MW-5 and MW-6 and collected groundwater samples from monitoring wells MW-2, MW-3, MW-4, MW-5, and MW-6. Groundwater in monitoring well MW-1 was not sampled because a thin film of floating product was observed. No TPHd or BTEX was detected in samples from any of the monitoring wells that were sampled. Tetrachloroethene (PCE) was detected in all monitoring wells. At monitoring well MW-5, chloroform, 1,1-dichloroethene, and trichloroethene were detected.

Fugro-McClelland later prepared the soil excavation and removal design plan to remove an estimated 100 tons of diesel-contaminated soil, which represented the inferred extent of remaining hydrocarbon-contaminated soil. The excavation was later backfilled with clean fill.

In 1996, WPSTA Concord hired a contractor to excavate contaminated soil surrounding the location of the former UST. An excavation was performed and confirmation samples were obtained. On the basis of county and RWQCB review, additional excavation of the site was scheduled to remove significantly impacted soil. When site backfilling is complete, the site groundwater will be monitored on a quarterly basis for 1 year. Upon receipt of confirmation that little or no impact is detected off site, the UST case will be closed by the RWQCB without any requirement for further action.

5.1.2 RFA Confirmation Study Sampling

The RFA designated SWMU 1 as a high priority for future investigation because of the documented hydrocarbon release. This subsection describes the soil and groundwater sampling performed at SWMU 1 to investigate the hydrocarbon contamination and other potential contamination at the site. Boring locations are shown on Figure 10.

Soil

The objective of soil sampling at SWMU 1 was to (1) evaluate soils located in the vicinity of the purge water holding tank, grease and sand trap, and area where distressed vegetation was noted, and (2) to evaluate the extent of hydrocarbon contamination associated with the former diesel fuel spill. Six soil

borings (01-01 through 01-06) were advanced using Geoprobe sampling methods at the locations shown on Figure 10.

Groundwater

The objective of groundwater sampling was to evaluate groundwater underlying the SWMU. Previous analytical data indicated that groundwater contained dissolved VOCs and petroleum hydrocarbons. Groundwater samples were collected from monitoring wells MW-1 through MW-6 to verify the existence and concentrations of VOCs and petroleum hydrocarbons in groundwater.

5.1.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Tables 5A and 5B and on Figure 10.

Soil

The soil investigation at SWMU 1 was focused on two potential areas of contamination. The first was associated with boiler purging operations and the oil and grease sand trap located on the west side of building IA-6. In this area, ponded water and a sparse growth of grass were observed. PRC probed and sampled three borings in the area (01-01, 01-02, and 01-03). Three to four soil samples were collected from each boring between the ground surface and 15 feet bgs and were analyzed for TPH as gasoline (TPHg), TPHd, oil and grease (O&G), and VOCs. Oil and grease were detected to a maximum concentration of 130 mg/kg in a sample from boring 01-01. None of the other analytes were detected.

Borings 01-04, 01-05, and 01-06 were probed in the area surrounding the former UST at building IA-6. Two to three soil samples were collected from each boring and analyzed for TPHd, TPHg, and BTEX. TPHd and BTEX were detected in soil samples collected at depths of up to 14.5 feet. The maximum concentration of TPHd was detected 10 feet below the ground surface in boring 01-06 at a concentration of 350 mg/kg. TPH as motor oil (TPHmo) was also detected at some locations but, when present, was not as concentrated as TPHd.

Groundwater

Groundwater samples were collected from the six wells located at SWMU 1 and analyzed for TPHd, TPHg, O&G, BTEX, and VOCs.

TPHd and TPHmo were only detected in samples from wells MW-1 and MW-5, located downgradient from the former UST. The sample from well MW-1 contained 960 micrograms per liter (µg/L) of TPHd and 240 µg/L of TPHmo. The sample from well MW-5 contained 150 µg/L TPHmo but did not contain detectable TPHd.

PCE was the only VOC detected and was present in water samples from each well except the upgradient well (MW-2). PCE was consistently detected at low estimated (J qualified) concentrations of 5 to 6 µg/L, which is slightly below the EPA Contract Laboratory Program required detection limit of 10 µg/L. Although PCE was not detected in samples from well MW-2 during the recent sampling event, it was detected during sampling in September 1993. The recorded presence of PCE in all wells of SWMU 1 (including the upgradient well) indicates that the source of PCE is upgradient of and not associated with SWMU 1.

5.1.4 Conclusions and Recommendations

Oil and grease was detected in soil samples in the vicinity of the former oil water separator and boiler purge water holding tank. The oil and grease concentrations detected were less than 130 mg/kg in all soil samples. The oil and grease concentrations are relatively low and the method of analysis sometimes detects naturally occurring oils in the soil from plant organic matter. There is insufficient information to determine the source of the detected O&G. Because O&G was the only constituent detected in these borings surrounding the oil water separator and purge water holding tank and because the O&G was detected at a low concentration, the O&G is most likely from a naturally occurring source. Even if the O&G is the result of site contamination, because of its low levels, it does not pose any risk to human health or the environment. There is no evidence to suggest that the boiler purging or grease and sand trap have leaked hazardous constituents to the environment.

In September 1987, a significant diesel spill at SWMU 1 contaminated soil and groundwater. Soil and groundwater at the site still contain detectable contamination. The extent and concentration of

hydrocarbon contamination is well quantified at SWMU 1. The site can be described as a low-risk groundwater case per RWQCB guidance, as described in the following paragraphs.

A January 5, 1996 RWQCB memorandum provides RWQCB supplemental instructions to the State Water Board December 8, 1995, Interim Guidance on Required Cleanup at Low-Risk Fuel Sites. Specifically, the memorandum identifies six criteria that must be met to identify a low-risk groundwater case. The former UST at SWMU 1 qualifies as a low-risk groundwater site because it satisfies all six criteria as follows:

1. **The leak has been stopped and ongoing sources, including free product, removed or remediated.**

   The UST was removed in 1989 along with 80 cubic yards of surrounding contaminated soil. The excavation was backfilled with clean imported fill. Monitoring well MW-1 was sampled periodically since installation and was found to contain free product. In the latest monitoring event, free product was not found. Several borings in the area have contained TPHd. The maximum concentration of TPHd detected in soil is 460 mg/kg in boring DH-1.

   In April 1996, the site was excavated to remove significantly contaminated soil. Upon completion of that excavation, all sources of TPH will have been removed.

2. **The site has been adequately characterized.**

   The lateral limits of soil and groundwater contamination have been determined. The site is therefore adequately characterized.

3. **The dissolved hydrocarbon plume is not migrating.**

   The original spill occurred in 1987. The hydrocarbon contamination in soil during the recent field investigation (1995) exceeding 10 mg/kg is not present within a distance of 40 feet downgradient of the former UST. As illustrated in the following table, the concentrations of TPHd and TPHmo decrease rapidly with distance from the former source in groundwater (1995 data).

Well Identification	Distance from Former UST (feet)	Concentration of TPHd in Groundwater (µg/L)	Concentration of TPHmo in Groundwater (µg/L)
MW-1	25	960	240
MW-5	60	< 100	150
MW-6	120	< 100	< 100

4. **No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be affected.**

   Three wells were formerly located within approximately 3,000 feet of the site adjacent to Kinne Boulevard. These were abandoned and sealed by the Navy in 1995. The U.S. Geological Service (USGS) topographic map of the site area indicates a well for the golf course within about 2,000 feet of the site (Figure 8). In addition, the city of Concord has a number of municipal water wells that surround Mallard Reservoir more than 5,000 feet northwest of the site.

   The limits of groundwater impact from the former UST are bounded by well MW-6 located 120 feet away.

5. **The site presents no significant risk to human health.**

   There is no complete pathway for contaminated soil because the affected soils are not present in the upper 2 feet of soil. Since there are no drinking water wells in the vicinity of the site, the drinking water pathway need not be considered in this assessment.

6. **The site presents no significant risk to the environment.**

   Significantly contaminated soil is not present near the ground surface and there is no exposed surface water within the contaminated plume area that can be influenced.

Current site information indicates that the site is a low-risk groundwater case according to the RWQCB criteria. However, site groundwater has never been monitored quarterly to verify the groundwater information consistently through each season. The RWQCB management strategy for such cases includes monitoring for a minimum of 1 year to determine if conditions will remain stable or improve over time. Therefore, groundwater at SWMU 1 should be monitored on a quarterly basis for 1 year under the Navy's UST program. If the current status of groundwater is confirmed, the site can be closed under RWQCB lead as a low-risk groundwater case.

A low concentration of PCE present at SWMU 1 is associated with an upgradient off-site source. During the recent sampling, PCE at SWMU 1 was present at a concentration approximately equal to the Maximum Contaminant Level (MCL) for drinking water (5 µg/L), per Title 22 of the Code of California Regulations. There is no evidence of discharges of hazardous materials from the boiler cleaning operations at SWMU 1, and no hazardous constituents associated with SWMU 1 were detected in soil or groundwater. The site is recommended for no further action under the RCRA corrective action program. Since the source of PCE contamination in groundwater has not been determined, an RI should be pursued under the CERCLA process to determine the source of PCE contamination. The RI encompassing SWMUs 5 and 18 should be used to investigate the source and extent of PCE contamination at SWMU 1.

5.2 SWMU 2 - BUILDING IA-7

This section presents site background, sampling performed, investigation results, and conclusions and recommendations for SWMU 2. The features of the site are presented in Figure 11.

5.2.1 Site Background

Building IA-07 was constructed in the 1940s and is about one-half mile south of the main entrance, on the west side of Kinne Boulevard. The building is a fire station for the Inland Area. Between 1969 and 1973, fire-fighting training activities were conducted twice a year in a shallow pit located south of the fire station. Fuel oil and napalm were used in the practice burns. Extinguisher chemicals used included potassium chloride, sodium chloride, ammonium phosphate, and potassium carbonate. Between 1969 and 1973, residues of these chemicals were scraped off the ground and disposed of in the Seal Creek bed (usually dry), which runs just south of the fire station. Since 1973, practice burns were conducted in shallow metal pans. Chemical residues remaining in the pans were disposed of at approved sites.

Two storage facilities, building 114 and building 416, are located south of building 1A-07. The area south of building 114 slopes gradually toward Seal Creek, which is about 200 feet to the south. This area is overgrown with grass and trees.

The area east of building IA-07 is paved and used for parking vehicles. The parking area extends 300 feet east and approximately 200 feet to the south. Aerial photographs show that during the period from

1976 to 1986, the parking area was expanded to the south. The 1976 aerial photograph shows the parking lot boundary extending from building IA-07 east to building IA-08, and shows the area to the south of the parking lot as having been partially backfilled. The present parking lot extends 150 feet south of building IA-07.

A storm drain located 50 feet east of building IA-07 flows into the drainage ditch about 100 feet south of the building. The drainage ditch flows to the south into Seal Creek. This drainage was not present in the 1957 aerial photograph, and the storm drain may not have been in place then. Aerial photographs from 1969 show that the storm drain may have been installed during the period from 1957 to 1969. The aerial photograph from 1986 shows that the drainage from the storm drain outfall shifted slightly to the west when the parking lot was expanded to the south. One of the satellite accumulation points for hazardous waste is adjacent to the storm drain outfall. The hazardous waste is held in drums in a yellow metal shed until it is delivered to the hazardous waste storage facility at building 433

5.2.2 RFA Confirmation Study Sampling

The RFA designated SWMU 2 a high priority for future investigation because of a documented release consisting of burning napalm and dumping of residue at the burn pit. Investigations at SWMU 2 included soil sampling from borings and a trench excavation to investigate the area to determine if hazardous constituents were released because of these activities. These investigations are described below. Figure 11 shows the locations of the borings and the trench.

Soil

The objective of soil sampling at SWMU 2 was to evaluate soils underlying the former burn area and soils along the drainage to Seal Creek for potential contamination because of former fire fighting practices and potential spills of hazardous materials from the hazardous materials accumulation area. Four soil borings (02-01, 02-02, 02-03, and 02-04), spaced at approximately 50-foot intervals, were advanced to depths of 3 to 4.5 feet bgs along the drainage leading to Seal Creek. Two soil borings (02-07 and 02-08) were advanced to 4.5 and 5 feet bgs adjacent to the building located at the hazardous waste accumulation area. Two soil borings (02-05 and 02-06) were advanced to 4.5 feet bgs in the area of the former burn pit. Five additional borings (02-10, 02-11, 02-12, 02-13, and 02-14) were advanced to

depths of 6 to 7.0 feet bgs to delineate the extent of hydrocarbons detected and evaluated if hazardous materials were present.

One trench (02-09) located approximately 30 feet southeast of building 114 was excavated and sampled. The soil samples were collected from the ends and in the center of the trench. The trench was approximately 18 feet long, 16 inches wide, and 4.5 feet deep. Soil samples were collected from native soil. A log of the trench is presented in Appendix A.

Groundwater

The objective of groundwater sampling was to evaluate groundwater underlying the SWMU for potential hydrocarbon and VOC impacts. Groundwater samples were obtained from borings 02-10 and 02-14.

5.2.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Tables 6A and 6B and on Figure 11.

Soil in borings 02-01, 02-02, 02-03, 02-04, 02-05, 02-06, 02-07, 02-08, and trench 02-09 located along the drainage leading to Seal Creek and adjacent to the hazardous waste accumulation area and burn area was sampled to a maximum depth of 5.0 feet and analyzed for metals, hydrocarbons, BTEX, and anions. The soil was analyzed for anions because they are sometimes associated with fire fighting chemicals. Soil in borings 02-10, 02-11, 02-12, 02-13, and 02-14 located near the burn pit was sampled to a maximum depth of 7 feet and analyzed for TPHd, TPHg, and BTEX. Soil from boring 02-12 was also analyzed for VOCs, semivolatile organic compounds (SVOC), and metals. Elevated concentrations of TPHg and BTEX were not detected.

Low concentrations of TPHd and TPHmo (<36 mg/kg) were detected in some of the borings. Potentially elevated concentrations of anions may be present at some locations. At the concentrations detected, the TPHd, TPHmo, and anions are not considered a human or ecological risk.

One soil sample in boring 02-06 at a depth of 0.3 feet contained arsenic at a concentration of 14.3 mg/kg, which is above the estimated ambient limit concentration of 7.3 mg/kg and the residential PRG of 0.38

mg/kg. The same soil sample also contained lead at a concentration of 334 mg/kg, which is above the estimated ambient limit concentration of 18 mg/kg and the state of California modified PRG of 130 mg/kg. Although the lead and arsenic are in excess of the estimated ambient limit concentration in the near-surface sample of boring 02-06, elevated concentrations were not detected in any other soil sample at the site. Neither constituent is a known site contaminant.

The borings drilled in the former burn pit area contained hydrocarbon constituents (TPHd, TPHmo, and BTEX) in one or more soil samples. VOCs and SVOCs were analyzed in soil from boring 02-12, but were not detected. TPHg was not detected in any soil sample collected at SWMU 2. The depth and concentration of TPH constituents in soil were highly variable. Concentrations of TPHd as high as 130 mg/kg and TPHmo as high as 3,400 mg/kg were detected. The distribution of contaminated soils at SWMU 2 is random and without any identifiable source. Only three samples contained TPHmo in excess of 500 mg/kg. These included the sample from 0.3 feet in boring 02-06 (TPHmo = 3,400 mg/kg), the sample from 2 feet in boring 02-13 (TPHmo = 1,100 mg/kg), and the sample from 0.3 feet in 02-05 (TPHmo = 680 mg/kg). Both vertically and laterally, no pattern of hydrocarbon contamination was identified. In all cases, the concentrations of these constituents diminished significantly with depth and there was no soil contamination identified that extended to the depth of groundwater.

Groundwater

Groundwater samples collected at the site contained TPHd (up to 130 μg/L), TPHmo (up to 120 μg/L), and BTEX (up to 4.90 μg/L). No other VOCs were detected in any groundwater samples.

5.2.4 Conclusions and Recommendations

VOCs and SVOCs were not detected in soil samples at the site. TPHmo was detected in three soil samples at concentrations exceeding 500 mg/kg. Generally, each of the soil samples was collected in areas where surrounding samples (laterally and vertically) did not indicate significantly elevated hydrocarbons. All three soil samples containing a TPHmo concentration in excess of 500 mg/kg were underlain by soil samples containing less than 30 mg/kg TPHmo. As evidenced by surrounding soil samples, the volume of TPH-contaminated soil is limited to a small surface area(s).

Arsenic and lead in the shallow soil sample in boring 02-06 were detected above estimated ambient limit concentrations; however, soil samples collected from immediately below the shallow soil sample and from the surrounding borings did not contain arsenic or lead at concentrations above the estimated ambient limit concentrations. Based on the observed distribution of lead and arsenic detected, it appears that metals exceeding residential PRGs are isolated in lateral and vertical extent. The low incidence of arsenic and lead concentrations exceeding both the residential PRG and estimated ambient limit concentrations also suggests that a relatively low volume of soil exceeds both these criteria. A low volume of potentially impacted soil tends to limit the soil's potential to act as a source of contamination to other areas and also limits the risk associated with direct exposure. Another factor that tends to limit the potential threat of these constituents is their tendency to adsorb to fine-grained soils. For the above reasons, no further investigation or evaluation of arsenic and lead are recommended for the site.

TPHg was not detected at SWMU 2. Extractable TPH (TPHd and TPHmo) does not have any applicable regulatory criteria or a PRG for soils. Extractable TPH constituents (diesel range and motor oil range) cleanup goals of 500 to 1,000 mg/kg have been negotiated at various sites in the past (lower concentrations have also been used). Three soil samples at SWMU 2 contained extractable TPH exceeding 500 mg/kg. Each of these samples was located adjacent to another sample with significantly lower or nondetected concentrations of hydrocarbons (vertically or laterally). The low and dispersed incidence of these higher concentrations of TPH suggests a relatively low volume of significantly impacted soils. A low volume of impacted soil tends to limit the soil's potential to act as a source of contamination to other areas and also limits the risk associated with direct exposure. Because of the limited extent of extractable TPH in soil, there is a low risk to human health and the environment. In addition, extractable TPH constituents have a strong tendency to adsorb to soil particles, and thus the migration potential for these constituents is very limited. Because of the heterogeneous nature of soil contamination (evidenced by the limited lateral extent of contaminated soil) and lack of hazardous constituents detected, no removal or further investigation of soil is currently recommended at SWMU 2. Because there has been no significant soil contamination detected, SWMU 2 is recommended for no further action under the RCRA corrective action program.

Although extractable TPH was detected in soil samples at SWMU 2, none of the samples with potentially significant concentrations TPH were collected from depths near the ground water table. As such, there is no evidence that the TPH affected soil at SWMU 2 has caused or contributed to the detected TPH in groundwater at SWMU 2. The source of TPH detected in groundwater is unknown and should be

determined. Additional investigation is recommended to locate the source, determine that there is no ongoing release, and evaluate remedial alternatives. Additional sampling and analysis of groundwater should be conducted upgradient of the site to locate the source of the groundwater contamination and to evaluate the lateral extent of contaminated groundwater. Since the source and extent of groundwater contamination is unknown, and several SWMU sites in the vicinity exhibit groundwater contamination, including hazardous constituents at some locations, a CERCLA process RI is recommended. The RI encompassing SWMUs 5 and 18 should be used to evaluate the source and lateral extent of constituents in groundwater in the vicinity of SWMU 2.

5.3 SWMU 5 - BUILDING IA-12

This section presents site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 5. Figure 12 shows the locations of significant site features at SWMUs.

5.3.1 Site Background

Building IA-12 was constructed in the early 1940s and is in the main industrial complex of WPNSTA Concord, approximately 1 mile east of the main entrance and north of Kinne Boulevard. The building houses the locomotive repair shop where approximately 1,100 pieces of railway, automotive, construction, and weight-handling equipment were maintained.

Battery maintenance and recharging was conducted at the northeast corner of building IA-12. Water was added to batteries that were low in liquid. This procedure was discontinued in early 1992. Batteries, that are recycled, are stored in a satellite accumulation point on the north side of building IA-12. Approximately 49 automotive batteries are recycled annually. Approximately 24 locomotive batteries have also been recycled from this facility in the past 5 years. Battery acids from automotive and locomotive batteries are drained into a 5-gallon carboy, which is then delivered to Mare Island Naval Ship Yard for recycling. The outside of the battery casings are rinsed and neutralized prior to recycling. A grease and sand trap is located along the northwest interior wall of building IA-12.

Waste is generated and accumulated at various locations around building IA-12. A locomotive and rail car steam cleaning area was approximately 60 feet west of building IA-12. (A new railcar steam

cleaning facility and wastewater collection system was constructed in 1995 at the same location.) Wash water from the steam cleaning area was collected from the north and west sides of the pad. Records show that the pad steam cleaning area was installed in 1976 to collect oily wastes for processing through an oil/water separator. The oil/water separator, located about 5 feet west of the steam cleaning area, was a single-walled, 6-inch-thick concrete sump with a 200-gallon capacity. The separator was about 4 feet wide, 9 feet long, and 7 feet deep. The oil/water separator was also known as Sump Container No. IA-12B. It was periodically cleaned by a contractor who pumped the contents to a vacuum truck. The water from the separator was drained into a manhole through 6-inch-diameter vitrified clay pipe located about 190 feet west of the separator. The water was then discharged to the sewer system with the approval of the Contra Costa County Sanitation District.

A diesel fuel transfer pump is located at the northwest corner of building IA-12. The dispenser is connected to a 10,000-gallon UST located about 50 feet north of building 1A-12 and built in 1944.

A 500-gallon capacity waste oil UST was located along the south side of building IA-12. It was used to store waste oil generated from locomotives. A sink on the outside platform delivered the waste oil to the UST. The UST was removed during 1993 as part of a RCRA closure.

Stained asphalt is visible along the northeast wall of building 1A-12. A stained area (approximately 3 by 10 feet) was also observed along the southeast wall. Staining was observed around the diesel fuel transfer pump. Based on visual examination, the staining appears to be associated with the use of fuels and oils or the storage of batteries.

5.3.2 RFA Confirmation Study Sampling

The RFA identified several hazardous waste accumulation areas at SWMU 5 and designated SWMU 5 as a medium-priority site for future investigation because of visible oil or hazardous waste stains. Since there was no confirmed released of hazardous constituents at the site, the priority of the SWMU was not elevated. Soil and groundwater sampling investigations were performed at SWMU 5. These investigations are summarized below. Figure 12 shows the soil boring locations.

Soil

The objective of soil sampling at SWMU 5 was to investigate site soils for potential releases of hazardous constituents at each of the five areas where hazardous wastes were stored or surface staining was observed.

One soil boring (05-03) was advanced to 20.5 feet bgs adjacent to the grease and sand trap, and one soil boring (05-04) was advanced to 21 feet bgs within 5 feet of the edge of the oil/water separator. Samples from both of these borings were analyzed for metals, TPHd, TPHmo, O&G, VOCs and SVOCs.

One soil boring (05-02) was advanced to 26 feet bgs within 5 feet of the edge of the fuel dispenser. Samples from this boring were analyzed for TPHg, TPHd, TPHmo, and BTEX.

Two soil borings (05-07 and 05-08) were advanced to 5.5 and 4.5 feet bgs, and one soil boring (05-01) was advanced to 20.5 feet bgs in a paved area along the north wall of building IA-12 (battery accumulation area). Soils from each of these borings were analyzed for metals.

Two soil borings (05-05 and 05-06) were advanced to 6 feet bgs along the southeast wall where staining was observed on the asphalt. The soils from these borings were analyzed for TPHd, TPHmo, BTEX, and O&G.

Groundwater

The objective of groundwater sampling was to evaluate representative groundwater samples for the presence of contaminants in the immediate vicinity of suspected sources; however, groundwater was also evaluated at widely distributed locations to evaluate overall groundwater quality at the site. Groundwater samples were collected from four soil borings (05-01, 05-02, 05-03, and 05-04). All groundwater samples were analyzed for metals, TPHg, TPHd, TPHmo, O&G, VOCs, SVOCs, and pH.

5.3.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 7A and 7B and on Figure 12.

Soil

Soil samples from the soil borings adjacent to the grease and sand trap (05-03) and near the edge of the oil/water separator (05-04) did not detect metals at concentrations in excess of PRGs or estimated ambient limit concentrations. Soil samples from these borings did not contain detectable TPHd. TPHmo was detected at a concentration of 8 mg/kg in one sample from boring 05-03. O&G was detected in seven of the eight samples from these borings, but the detected concentrations of O&G did not exceed 100 mg/kg. VOCs were not detected in any soil samples collected from these borings with the exception of a concentration of 1,1,1-trichloroethane (0.003 J mg/kg [estimated]) from the sample in 05-04 at a depth of 21 feet. SVOCs were not detected in any of the soil samples.

Soil samples from the soil boring near the fuel dispenser (05-02) did not contain metals at concentrations in excess of PRGs or the estimated ambient limit concentrations. Soil samples from this boring did not contain detectable TPHg or TPHd. TPHmo was detected at concentrations of 6 and 7 mg/kg in four of five soil samples from boring 05-02. BTEX was not detected in any soil sample from the boring.

Soil samples from the soil borings collected near the building IA-12 battery accumulation area (05-01, 05-07, and 05-08) did not contain metals above residential PRGs or Inland Area estimated ambient limit concentrations.

Soil samples from the two soil borings advanced along the southeast wall of building IA-12 where staining was observed (05-05 and 05-06) did not contain TPHd or BTEX above detection limits. TPHmo and O&G were detected at maximum concentrations of 14 and 74 mg/kg, respectively.

Groundwater

Groundwater was sampled in four borings at SWMU 5 (05-01, 05-02, 05-03, and 05-04). Metals were detected in all groundwater samples. Although the data was not screened against any specific criteria, review of the data did not reveal any indication of site contamination. Groundwater samples from these borings consistently contained hydrocarbons, but the constituents and concentrations were varied. The groundwater sample from boring 05-01 contained 1,500 µg/L of TPHmo. Other organic contaminants were not detected.

The groundwater sample from boring 05-02 contained 470 µg/L of TPHd and 140 µg/L of TPHmo but other organic contaminants were not detected.

The groundwater sample from boring 05-03 contained 32 µg/L of TPHg, 760 µg/L of TPHd, 780 µg/L of TPHmo, 6 µg/L of O&G, 11 µg/L of VOCs (6 µg/L of 1,1-dichloroethane and 5 µg/L of 1,2-dichloroethene), and 4 µg/L of SVOCs (3 µg/L of 2-methylnaphthalene and 1 µg/L of naphthalene).

The groundwater sample from boring 05-04 contained 73 µg/L of TPHg, 510 µg/L of TPHd, 380 µg/L of TPHmo, and 10 µg/L VOCs (7 µg/L of PCE and 3 µg/L of trichloroethene). O&G and VOCs were not detected.

5.3.4 Conclusions and Recommendations

The soil sample collected from 21 feet bgs in boring 05-04 contained 1,1,1-trichloroethane at a low concentration. Since the overlying samples did not contain 1,1,1-trichloroethane, the contaminant detected in the 21 foot deep sample was likely transported from an upgradient source by groundwater. Significant concentrations of petroleum hydrocarbon constituents and O&G were not consistently detected in any soil boring. Soil analyses at SWMU 5 did not detect significant organic or inorganic contaminants.

However, groundwater has been contaminated by TPHg, TPHd, TPHmo, VOC, and SVOCs. Since the soils analyses at SWMU 5 did not detect these constituents at significant concentrations , the source of these contaminants has not been established. Additional investigation is necessary to establish the location of the source and to determine whether contaminants are migrating through soil. It is possible that the USTs located to the north of building IA-12 may be contributing to groundwater contamination. Upgradient areas should be investigated to evaluate whether the groundwater contamination originates from building IA-12. Because of the confirmed presence of VOCs in groundwater, a CERCLA process RI should be conducted in the area surrounding building IA-12. Groundwater contamination has also been detected at SWMU 18, upgradient of SWMU 5. Both SWMUs 5 and 18 should be investigated under a CERCLA process RI to evaluate the source and extent of groundwater contamination in the area.

5.4 SWMU 7 - BUILDING IA-16

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 7. Figure 13 shows the locations of building IA-16 and other features.

5.4.1 Site Background

Building IA-16 was constructed in the 1940s and is located in the main industrial complex of WPNSTA Concord, approximately 1 mile east of the main entrance and north of Kinne Boulevard. About 20 painters worked out of building IA-16 prior to 1960. They were responsible for interior and exterior painting of base buildings. Much of the paint they used was oil-based. Furthermore, much of the exterior paint was lead-based. Prior to the 1970s, all waste paint, thinners, and cans were likely disposed of in the Tidal Area Landfill (IR Site 1). Paint usage was estimated at 700 gallons per year, generating approximately three drums of solid waste per year. By the early 1960s, the paint shop crew was reduced to three painters responsible for touch-up and repair work and minor interior finishing. Major finishing jobs are now performed by contractors who are responsible for cleanup and disposal of their materials.

A paint shop, storage shed, and paint locker are located northeast of building IA-16. A satellite accumulation area for waste paints and thinners is near the storage shed northeast of the building. Leftover paint from 1- and 5-gallon cans is drained into a 55-gallon drum. Empty paint cans are allowed to dry and then are disposed of as nonhazardous waste at a municipal trash bin.

Asphalt in a 10- by 40-foot area along the northeast wall was observed to be cracked and stained with paint. The area of cracked and stained asphalt is illustrated on Figure 13. Some paint staining was observed around the paint locker.

Four 10,000-gallon USTs are located beneath the paved area between buildings IA-12 and IA-16 (two gasoline USTs and two diesel fuel USTs). Three of the USTs (2, 3, and 4) are located adjacent to the southeast corner of building IA-16 and supply fuel to a gas station located 60 feet southeast of building IA-6. The fourth UST (UST 1) supplies diesel fuel to the fuel dispenser at the northwest corner of building IA-12 (SWMU 5).

5.4.2 RFA Confirmation Study Sampling

The RFA designated SWMU 7 a low-priority site for future investigation because of potential releases from the hazardous waste accumulation area. The low potential volume of the releases was responsible for the low priority assigned. Soil and groundwater sampling investigations were completed at SWMU 7. These investigations are summarized below. Figure 13 shows the soil boring locations.

Soil

The objective of the soil sampling was to investigate potential contamination of two areas: the satellite accumulation area for waste paints and thinners; and the area near the four 10,000-gallon USTs.

The satellite accumulation area for waste paints and thinners (including visibly stained areas) was investigated as follows: three soil borings were advanced adjacent to the paint locker (07-03, 07-04, and 07-05) to depths of 0.5 to 1.5 feet bgs; two soil borings were advanced to 4.5 and 6.0 feet bgs (07-01 and 07-02); and one soil boring was advanced to 16 feet bgs (07-06) along the north wall of building IA-16. Soil samples from each of these borings were analyzed for metals and VOCs. Because of lead detected in a soil sample from boring 07-01 and TPHmo detected in the groundwater sample from boring 07-06, four additional borings (07-10, 07-11, 07-12, and 07-13) were completed at SWMU 7. Soil samples from the borings were analyzed for one or more of the following constituents: TPHd, BTEX, and metals.

The area near the four existing gasoline and diesel fuel USTs was investigated as follows: three soil borings (07-07, 07-08, and 07-09) were advanced from 25.5 to 26 feet bgs in the vicinity of the USTs. Data from previous investigations at building IA-6 (Fugro-McClelland 1993) and building 178 (PRC 1994b) indicated groundwater flow is in a northwest direction. One of the soil borings was located downgradient (07-07) of USTs 2, 3, and 4, and approximately 10 feet from the edge of UST 1. A second soil boring was located upgradient (07-09), northeast of USTs 2, 3, and 4, but no more than 10 feet from the edge of UST 4. A third soil boring (07-08) was located downgradient, but no more than 10 feet from the edge of UST 2. Soil from each of these borings was analyzed for TPHg, TPHd, and BTEX.

In December 1995, Harding Lawson Associates, Inc., drilled two borings (B-1 and B-2) in the vicinity of the USTs at the site (HLA 1996). Soil samples from those borings were analyzed for TPH and BTEX. The results of these analyses are illustrated on Figure 13.

Groundwater

The objective of groundwater sampling was to investigate impacts to groundwater from the documented hydrocarbon release. Groundwater samples were collected from six soil borings (07-06 through 07-09 and 07-11 through 07-13) using a HydroPunch sampler. Groundwater samples from borings 07-06 through 07-09 were analyzed for metals, TPHg, TPHd, TPHmo, and VOCs. Groundwater samples from borings 07-11 through 07-13 were analyzed for TPHd, TPHmo, and BTEX.

5.4.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Tables 8A and 8B, and on Figure 13. The analytical results from the Harding Lawson Associates borings are also summarized on Figure 13.

Soil

Borings 07-01, 07-02, 07-03, 07-04, 07-05, 07-06, 07-10, 07-11, 07-12, and 07-13 were completed in the vicinity of the paint locker and building IA-16. Soil samples from these borings did not contain metals in excess of the estimated ambient limit concentration and PRG concentrations, except for lead (375 mg/kg) and nickel (2,160 mg/kg) in a soil sample collected from boring 07-01 at a depth of 4.5 feet. Soil samples from six of these borings were analyzed for VOCs but none were detected.

Soil borings 07-07, 07-08, 07-09, 07-11, 07-12, and 07-13 were completed in the vicinity of the four USTs and in the area to the north of the USTs. All soil samples from boring 07-07 were heavily contaminated with TPHd (concentrations up to 3,400 mg/kg). Some of the soil samples from borings 07-08, 07-12, and 07-13 also contained detectable TPHd or TPHmo, but at lower concentrations (up to 1,300 mg/kg). Soil samples from boring 07-09 did not contain detectable hydrocarbons. BTEX constituents, typically at low concentrations, were detected in a number of soil samples. The maximum total BTEX concentration detected at SWMU 7 was 0.016 mg/kg except in boring 07-07, where high concentrations of diesel were detected. In boring 07-07, the maximum total BTEX concentration was 1 mg/kg.

Groundwater

Groundwater samples were collected from seven soil borings. Groundwater samples throughout SWMU 7 contain levels of petroleum hydrocarbons. Groundwater samples collected from borings 07-07 and 07-08 contained 130,000 and 25,000 µg/L of TPHd, respectively. Detectable TPH or BTEX was present in every groundwater sample obtained from SWMU 7, although the concentrations were significantly lower than those detected in borings 07-07 and 07-08.

The groundwater samples were also analyzed for VOCs. The groundwater sample collected from boring 07-08 contained 2 µg/L of 1,2-dichloroethane. No other VOCs (including BTEX) were detected in any of the groundwater samples.

5.4.4 Conclusions and Recommendations

Elevated concentrations of lead and nickel were detected in the 4.5-foot-deep soil sample from boring 07-01. However, borings subsequently drilled in the vicinity of boring 07-01 did not detect lead and nickel exceeding estimated ambient limit concentrations and residential PRGs. Neither lead nor nickel concentrations exceeded their industrial PRGs (1,000 mg/kg and 34,000 mg/kg, respectively) in the 4.5-foot-deep sample at boring 07-01. In addition, the 0.5-foot soil sample in boring 07-01 also did not contain elevated concentrations of lead or nickel. The source of the lead and nickel in boring 07-01 has not been established. However, concentrations of lead and nickel in excess of the PRGs and estimated ambient limit concentrations have not been detected beyond the vicinity of the 4.5-foot soil sample from soil boring 07-01, and there is no identifiable impact to groundwater from lead and nickel. The low incidence of lead and nickel concentrations exceeding both the residential PRG and estimated ambient limit concentrations suggests that a relatively low volume of soil exceeds both these criteria. A low volume of potentially impacted soil tends to limit the soil's potential to act as a source of contamination to other areas and also limits the risk associated with its direct exposure. Lead and nickel tend to adsorb to fine-grained soils, thus limiting their potential for migration or leaching. Because of the asphalt concrete surface cover at the site, there is no complete exposure pathway for human contact. For these reasons, there is a low risk that lead and nickel detected at the site could adversely impact human health or the environment. As such, no further investigation of the area for lead and nickel contamination is necessary.

Analysis of the soil and groundwater samples collected in the vicinity of building IA-16 did not detect concentrations of metals or VOCs that indicate that spilled paint has contaminated soil or groundwater at the site. As a result, no further investigation of the area is necessary to evaluate the potential impacts from paint spillage in the vicinity of the paint locker and Building IA-16.

Soil and groundwater samples collected from the borings drilled around the four existing USTs indicate that there are significant impacts to the site from leakage from one or more of these tanks (and not from SWMU 7 activities). All of the tanks are scheduled for replacement under Military Construction Project # P075. The lateral extent of soil and groundwater contamination should be determined and remedial alternatives evaluated. Because the impacts to soil and groundwater at the site originate from the USTs, investigation and removal of the four USTs should proceed under the Navy's UST program. As a result SWMU 7 is recommended for no further action under the RCRA corrective action program.

The source of 1,2-dichloroethane detected in groundwater has not been established. Because 1,2-dichloroethane was not detected in any soil samples from SWMU 7, there is no evidence that suggests an on-site source of this VOC in groundwater. The lateral extent, concentration, and source of 1,2-dichloroethane should be further investigated in the area. The CERCLA process RI proposed for the investigation of nearby SWMUs 5 and 18 is an appropriate program and should be used to conduct the evaluation of groundwater in the vicinity of SWMU 7.

5.5 SWMU 12/20 - BUILDINGS IA-24 AND IA-55

Because of their proximity to one another, SWMU 12 and 20 (buildings IA-24 and IA-55) were combined during the investigation and therefore are discussed together here. This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 12/20.

SWMU 12/20 is located at the same site as IR Site 17, which is currently undergoing a CERCLA process RI. SWMU 12/20 is specifically associated with the operation of septic tanks that service the buildings included in Site 17. However, previous investigations of IR Site 17 are also discussed in the sections that follow.

Figure 14 shows the locations of buildings IA-24 and IA-55, and other features.

5.5.1 Site Background

This section provides the site description and summary of previous investigations for SWMU 12/20.

Site Description

Building IA-24 was constructed in the 1940s and is located 60 feet north of Kinne Boulevard, approximately 3 miles from the front gate. Building IA-24 is used for maintenance of forklift equipment. Some of the hazardous wastes generated are used oil, absorbent materials soaked with oil, used paint spray cans from touch-up painting jobs, and batteries, which are recycled. The building has a satellite accumulation area for these wastes.

Building IA-55 was constructed in the early 1950s and is located south of building IA-24. Building IA-55 is an office building where tools and supplies are issued and returned. Hazardous wastes generated include used paint spray cans and adhesives. The building serves as one of the hazardous waste satellite accumulation points for used paint spray cans.

All solid wastes generated in building IA-24 were probably disposed of in the Tidal Area Landfill (IR Site 1) until 1978. These wastes included oily wastes, battery casings, rags, old parts and tools, and cans containing small amounts of paints and solvents.

Also, as part of forklift maintenance, the forklifts and batteries are steam cleaned to remove oil and grease. The steam cleaner discharges through a line from the southwest side of building IA-24 and drains into Seal Creek, but the steam cleaning pad has not been used since 1988. In addition, WPNSTA Concord personnel park 3-ton trucks on the unpaved areas between buildings IA-24 and IA-55.

A 2,000-gallon diesel UST is located along the southeast wall of building IA-24. The integrity of the UST was first checked by precision testing in January 1988 and annually thereafter. The UST failed the tests twice because of piping leaks. The leaks were repaired and the UST and piping retested. The UST again failed the test and was then taken out of service. Adjacent to the UST is a shallow vadose-zone well that was installed in December 1987 to monitor vadose zone vapors in the vicinity of the UST (ERM-West 1989). While drilling the vadose-zone well, a petroleum odor was reported starting at a depth of 4 feet down to 8 feet bgs.

A 1,000-gallon diesel UST is located near the northwest corner of building IA-55. In December 1987, a shallow vadose-zone well was installed to monitor vadose zone vapors in the vicinity of the UST and a faint diesel odor was detected from the ground surface to a depth of 5 feet (ERM-West 1989).

Building IA-24 has a sink and sanitary sewer system that drains into two septic tanks through a 6-inch vitrified clay pipe. The sewer line that drains from building IA-24 to the septic tanks is connected to a sewer that drains from building IA-55. The septic tanks are about 200 feet south of building IA-24 and are 20 feet from each other. Sewage from building IA-55 drains through a 6-inch cast iron sanitary sewer pipe and connects with the 6-inch vitrified clay pipe, which connects to the two septic tanks. Railroad tracks are located 40 feet to the north of the septic tanks and parallel to Kinne Boulevard.

The septic tanks are partially covered with dirt. The outlet of each septic tank splits into two 4-inch open-joint unglazed clay pipes that run parallel to the drain field. The two unglazed clay pipe drains are about 10 feet apart. Each leach field drain trench is about 2 feet wide and 2.5 feet deep.

Previous Investigations

The dumping of battery acid, reported in the Initial Assessment Study (Ecology and Environment 1983), may have caused a low pH and possible lead contamination in the groundwater. The Initial Assessment Study also concluded that the acid would probably be neutralized from contact with the soil and that lead would bind to the soil, reducing its migration into groundwater. Given the absence of groundwater usage in the area, the Initial Assessment Study recommended no further investigation at this site (Ecology and Environment 1983).

During site investigations (SI) field work, conducted by PRC and Montgomery Watson in 1992, soil and groundwater were sampled southeast of the forklift parking lot in an attempt to verify the location of the disposal sump. Several shallow trenches (see trench detail A, Figure 14) were excavated with a backhoe in an area of stained soil presumed to be associated with the former acid sump. A total of 16 soil samples were collected from 12 locations (ACS-1 through ACS-5 and ACS-7 through ACS-13) within the trenches, at 2 to 5 feet bgs. Two of these samples were collected from areas where surface soil staining was visually identified, and the remaining samples were evenly spaced throughout the trenches. Of the soil samples collected, only one sample contained TPHd above the detection limit (soil sample ACS-13-SB-02.0).

A 43-foot-deep soil boring (ACS-06-SB) was drilled adjacent to ACS-10, and soil samples were collected at 5-foot intervals until groundwater was encountered at 34 feet. TPHd was detected in three samples. TPHg was detected in four samples. The TPHg was detected in the samples from 0 to 20 feet bgs, while TPHd was detected in the samples from 20 to 30 feet bgs. A temporary well was set within the deep soil boring (ACS-06-SB) and screened from 33 to 43 feet bgs. The groundwater level was measured at 34 feet bgs under unconfined conditions. TPHd, methylene chloride, and trichloroethene were detected in a sample from this temporary well.

Additionally, surface soil samples were collected at the termini of two runoff locations. The first sample, ACS-01-SFC, was collected near the culvert that drains storm water from the suspected acid sump area. Storm water from this area flows into a drainage ditch that discharges into a field. TPHd and sulfate were detected in the soil sample. The second surface sample, ACS-02-SFC, was collected at the end of the steam cleaning discharge line where it discharges into Seal Creek. TPHd and TPHg were detected in this soil sample.

One of the septic tanks was sampled on August 17, 1993. TRPH and total oil and grease (TOG) were detected in the sludge sample.

As part of the ongoing effort to replace or remove old USTs, an investigation was conducted by Harding Lawson Associates on September 9, 1993. One soil boring (No. 5) was drilled adjacent to the 2,000-gallon UST to a depth of 10.5 feet bgs. Analytical results indicated that no petroleum hydrocarbons, specifically TPHd, were present in the soil above the detection limits.

The detection of TPH and hazardous constituents in the vicinity of buildings IA-24 and IA-55 has led to further investigation of these buildings as IR Site 17 under the CERCLA RI. The results of the RI samples collected in the vicinity of SWMU 12/20 are discussed below with the results of the sampling conducted for this investigation. The RI report will be completed by PRC in the fall of 1996.

5.5.2 RFA Confirmation Study Sampling

The RFA assigned SWMU 12/20 a medium priority for future investigation because of the presence of septic tanks that may have released hazardous constituents to the environment. There are no documented releases associated with SWMU 12/20.

Soil and septic tank sampling was conducted at SWMU 12/20. The RI of IR Site 17 included sampling in the vicinity of the SWMU 12/20 septic tanks. The locations of selected borings for the investigation of IR Site 17 are discussed below and are illustrated on Figure 14.

Soil

The objective of soil sampling at SWMU 12/20 was to investigate potential impacts of hazardous wastes on soils in the vicinity of the septic tank and leach field system. Three 10- to 15-foot-deep soil borings were completed at the site. One boring (12/20-02) was located between the two leach field systems and the other two (12/20-01 and 12/20-03) were located downgradient from the septic tanks or leach field systems; adjacent to the deeply incised Seal Creek drainage channel. The soil samples from these borings were analyzed for O&G, VOCs, SVOCs, and metals

Seven borings were also completed during the RI to investigate IR Site 17 in the vicinity of SWMU 12/20. Selected soil samples from these borings were analyzed for TPHg, TPHd, TPHmo, VOCs, SVOCs, metals, and Waste Extraction Test (WET) metals. Some of these samples were collected from the drainage channel of Seal Creek and are listed as sediment samples in Table 9.

Septic Tank

The objective of the septic tank sampling was to determine if hazardous constituents are present within the tank for eventual release to soil or groundwater from the leach field system. The septic tank sewer water was analyzed for VOCs, SVOCs, metals, and O&G.

5.5.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 9A and on Figure 14.

Soil

O&G and TPH

Seven of the eight soil samples from the three SWMU 12/20 borings contained detectable concentrations of oil and grease to a maximum concentration of 64 mg/kg. The source of oil and grease in these samples has not been established; however, it is likely attributable to naturally occurring plant oils from organic materials in the soil.

Soil samples analyzed for the RI at IR Site 17 did not include O&G analysis but did include analyses for TPHg, TPHd, and TPHmo. In samples collected near SWMU 12/20, TPHmo was detected at concentrations up to 4,100 mg/kg.

VOCs

All of the soil samples collected to investigate SWMU 12/20 were analyzed for VOCs; 1,2-dichloropropane was detected at a concentration of 0.06 mg/kg in boring 12/20-02 at a depth of 10 feet; however, 1,2-dichloropropane was not detected in any other soil sample. For comparison, the residential PRG is 0.68 mg/kg.

Another VOC, 4-methyl-2-pentanone, was detected in soil samples at a depth of 15 feet in borings 12/20-01 and 12/20-03 at concentrations of 0.005 and 0.004 mg/kg, respectively. Soil samples above that depth did not contain detectable VOCs. There is no published EPA PRG for 4-methyl-2-pentanone.

VOCs were not detected in soil samples collected near SWMU 12/20 as part of the RI for IR Site 17.

SVOCs

All of the soil samples collected to investigate SWMU 12/20 were analyzed for SVOCs. The SVOC phenol was detected at a concentration of up to 0.8 mg/kg in four of the eight soil samples analyzed for SVOCs at SWMU 12/20. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg.

Two surface soil samples collected during the RI near SWMU 12/20 (from locations ACSSB039 and ACSSB040) contained several SVOCs in the surface sample. The combined concentration of SVOC (total SVOC) in each sample was less than 1 mg/kg. Both samples also contained TPHmo at concentrations from 570 to 1,300 mg/kg.

Inorganics

Manganese, nickel, and thallium were detected at concentrations exceeding residential PRGs and their estimated ambient limit concentrations. Manganese was detected at a concentration of 12,100 mg/kg in the 15-foot-deep soil sample from boring 12/20-03; the estimated ambient limit concentration for manganese is 870 mg/kg. Thallium was detected in the same soil sample at a concentration of 15.6 mg/kg; the estimated ambient limit concentration for thallium is equal to the analytical test method detection limits. Nickel was detected at a concentration of 165 mg/kg at a depth of 5 feet in boring 12-02; the estimated ambient limit concentration for nickel is 86 mg/kg and the residential PRG is 150 mg/kg.

Soil samples analyzed in the vicinity of SWMU 12/20 for the RI of Site 17 did not contain metals exceeding both residential PRGs and estimated ambient limit concentrations except for lead, detected in boring ACSSB039 at a concentration of 224 mg/kg. The California modified residential PRG for lead is 130 mg/kg and the estimated ambient limit concentration is 18 mg/kg at SWMU 12/20.

Septic Tank

A sample of the septic tank sewer water was analyzed and a complete list of analytical results is presented on Table 29. Three VOC constituents (bromodichloromethane, chloroform, and dibromochloromethane) were detected at concentrations of less than 3 µg/L (estimated) each. Four SVOC constituents (1, 2- dichlorobenzene [89 µg/L (estimated)], 2-methylnaphthalene [54 µg/L (estimated)], 4-methylphenol [180 µg/L (estimated)]), and phenanthrene [37 µg/L (estimated)]) were detected. A number of metals were detected; however, there are no screening criteria for metals in septic tank water. There is no identifiable correlation between the detected nickel, manganese, and thallium in the septic tank water and the elevated (exceeding the estimated ambient limit concentration and residential PRGs) concentration of nickel in one soil sample or the elevated concentration of manganese and thallium in a different soil sample.

5.5.4 Conclusions and Recommendations

Although several constituents were detected in one or more samples from the three borings at SWMU 12/20, none were present at concentrations that suggest a potential for site contamination capable of harming human health or the environment. In addition, there is no indication that the constituents detected in the septic tank have caused significant impacts to soil in the vicinity and downgradient of the leach field systems. A more detailed summary follows.

O&G were detected in soil at concentrations of less than 100 mg/kg. The source of the O&G has not been determined. Because the soil samples were not analyzed for petroleum hydrocarbons, the analyses are inadequate to determine whether the O&G is derived from naturally occurring oils from plant organic matter or from petroleum hydrocarbons. However, in either case, the concentrations are low and do not suggest a potential threat to receptors of any type.

Manganese, nickel, and thallium were detected in soil samples at concentrations exceeding the estimated ambient limit concentrations and PRGs. The source of these constituents has not been determined. This RFA confirmation study has not identified a correlation between the elevated concentrations of manganese and thallium in the 15-foot-deep soil sample from boring 12/20-03 and any other soil sample at the site. The elevated concentration of nickel was present in only one soil sample (boring 12/20-02 at a depth of 5 feet). The nickel concentration (165 mg/kg) only slightly exceeds the residential PRG (150 mg/kg) and is well below the industrial PRG. This information suggests that elevated metals concentrations occur in isolated areas. In addition, soil containing elevated concentrations of these constituents is covered with more than 5 feet of soil and is therefore unavailable for exposure to humans or environmental receptors. The potential for future migration or leaching of these constituents is low because they tend to adsorb to fine-grained soil and the potential source volume is very limited. A low volume of potentially impacted soil not only limits the soil's potential to act as a source of contamination but also limits the risk associated with direct exposure. Because of the low hazard potential associated with metals at SWMU 12/20, no further investigation or evaluation of these constituents is recommended.

Two VOCs were detected in soil. Both were present at low concentrations and therefore do not appear to have a potential for significant migration. The VOC 1, 2-dichloropropane was detected at a

concentration of 10 times less than its PRG, and 4-methyl-2-pentanone was also detected at a low concentration, although no EPA PRG has been established.

The SVOC phenol was one of the most commonly detected constituents at WPNSTA Concord. Phenol was detected at concentrations of up to 0.8 mg/kg, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

Constituents detected at elevated concentrations in the borings completed to investigate IR Site 17 do not appear related to any constituents detected in the septic tank or soils surrounding the septic tank and leach field. Some of the same metals were detected; however, no metals in the RI soil samples exceeded PRGs except for lead, which was detected in a sample collected at the ground surface upgradient from the septic tanks. None of the same SVOCs were detected in the IR Site 17 borings except for phenanthrene, also detected in the surface soils located upgradient from the septic tanks.

Although some residential PRGs for metals were exceeded in some soil samples at SWMU 12/20, there is little risk to human health or the environment because the metals have a low incidence of detection above PRGs or estimated ambient limit concentrations. The risk to human health from VOCs in soil is low because of the low incidence of detection and the low concentrations detected. For the same reasons, there is no evidence to suggest that additional site investigation is warranted. As a result, the SWMU 12/20 is recommended for no further action under the RCRA corrective action program.

5.6 SWMU 13 - BUILDING IA-25

This section presents the site background, RFA confirmation study sampling performed, investigation results, and conclusions and recommendations for SWMU 13.

5.6.1 Site Background

This subsection provides the site description and summary of previous investigations at SWMU 13. Figure 15 shows the locations of building IA-25 and other features.

Site Description

Building IA-25 is 110 feet west of the end of L Street, which intersects Kinne Boulevard approximately 2.5 miles from the main entrance. The topography around building IA-25 slopes gradually to the northwest. The building was used exclusively for pilot-scale development of munitions. During the 1940s, when the building was put into service, hexahydro-1,3,5-trinitro-s-trianzine (RDX), pentaerythritol tetranitrate (PETN), lead styphnate, and lead azide were developed as military explosives. A paint booth used for repainting components was located in the southwest corner of the building. In addition to the nitrogen-based compounds, metals associated with casings, solvents, and pesticides are known to have been used in or around the facility. Pipes are wrapped in asbestos, and wall materials may also contain asbestos fibers. Building IA-25 has been renovated as a production facility for the rework of explosives. The renovation work included repair of (1) structural damage to walls and floor, (2) lighting systems, (3) ventilation and heating systems, and (4) removal of asbestos insulation on pipes and asbestos wallboard materials.

Building IA-25 has a sink and sanitary sewer system that drains into a septic tank through a 6-inch vitrified clay pipe. The septic tank is located about 120 feet north of building IA-25 and is partially buried. The outlet of the septic tank splits into two 4-inch open-joint tile drains.

A 6-inch storm drain line is connected from building IA-25 to the north side of L Street. The storm drain line discharges to an earthen pit that is filled with 0.5 cubic yard of 1.5- to 2-inch-diameter crushed rock.

Previous Investigations

In 1983, the Initial Assessment Study investigation team was told that a burn pit and solvent disposal area existed behind building IA-25 at one time. However, visual examination of the area revealed no environmental damage. The Initial Assessment Study indicated that up to 1,000 gallons of paints and solvents may have been disposed of at the site.

A contractor was hired in 1987 to perform an asbestos survey under building IA-25 (Pacific Environmental Services, Inc. 1988). The survey discovered an area of approximately 50 square feet beneath the building where pieces of pipe insulation containing asbestos fibers were found. The report stated that the general public would not be subject to any health hazards under normal conditions, but

that the asbestos area would be a hazard to maintenance workers or others who might disturb the soil beneath the building.

On November 10, 1988, Navy personnel collected soil samples from beneath building IA-25. Elevated soil concentrations of nitrates, potassium, and phosphorous were detected at all locations. VOCs, SVOCs, and pesticides were detected in various samples. Lead, zinc, and trivalent chromium were detected in one sample at concentrations above the State of California total threshold limit concentrations (TTLC). Two samples contained soluble lead concentrations that exceeded soluble threshold limit concentrations (STLC).

The area beneath building IA-25 was sampled again on June 28, 1989. Trace amounts of the pesticide 4,4'-DDT, herbicides, VOCs, and SVOCs were detected in soil samples SS-02 and SS-07 (IT 1990). Lead, zinc, and chromium were detected in all samples.

The septic tank was sampled on October 9, 1990, and on August 17, 1993. Total recoverable petroleum hydrocarbons (TRPH) and TOG were detected in the liquid sample from October 9, 1990. TOG was detected in the sludge sample from August 17, 1993. VOCs and SVOCs were detected only in the October 9, 1990 liquid sample. VOCs detected included 1,1-dichlorobenzene, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, total 1,2-dichloroethene, toluene, and trichloroethene. SVOCs detected were 4-methylphenol, di-n-octylphthalate, and 1,4-dichlorobenzene.

5.6.2 RFA Confirmation Study Sampling

The RFA assigned SWMU 13 a medium priority for future investigation because of the presence of a septic tank that may have released hazardous constituents to the environment. Soil and septic tank sampling investigations were therefore performed at SWMU 13 to investigate potential releases from the septic tank and leach field.

Soil

The objective of soil sampling at SWMU 13 was to investigate potential leakage of hazardous wastes from the septic tank and leach field system to nearby subsurface soils. An additional objective was to investigate if the existing storm drain outfall could have contaminated surface soils. Two soil borings

(13-01 and 13-02) were completed to depths of 15 to 15.5 feet and located downgradient of the leach field and septic tank. One soil boring (13-03) was completed to a depth of 3 feet bgs immediately below the storm drain outfall. Soil samples from all three borings were analyzed for metals, O&G, VOCs, SVOCs, and explosives. Soil samples from boring s13-01 and 13-02 were also analyzed for pesticides and PCBs.

Septic Tank

The objective of the septic tank sampling was to determine if hazardous constituents were present within the tank and therefore could be released to soil or groundwater from the leach field system. The septic tank sewer water was sampled and analyzed for metals, O&G, VOCs, SVOCs, pesticides/PCBs, and explosives. A sample of the septic tank sewage sludge was also collected and analyzed for the same constituents.

5.6.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 10A and on Figure 15.

Soil

Five of the eight soil samples from all three borings contained detectable concentrations of O&G. Four of the samples contained O&G at concentrations of 65 mg/kg and less. The source of O&G in these samples has not been established; however, it is likely attributable to naturally occurring plant oils from organic materials in the soil.

The highest concentration of O&G was detected in the surface soil sample at 13-03 located at the storm drain outfall (920 mg/kg). Neither the 3-foot-deep sample in the same boring nor the surface sample in the downgradient boring (13-01) contained any O&G above detection limits. The source of O&G at the storm drain outfall is likely associated with minor spills in the vicinity of building IA-25 that have been transported to the storm drain via storm water. The extent of contaminated soils is limited both laterally and vertically, as evidenced by adjacent soil samples.

Metals were not detected at concentrations exceeding the estimated ambient limit concentrations and residential PRGs. VOCs were not detected. SVOCs were not detected except for phenol, which was detected in one of eight soil samples at a concentration of 0.3 mg/kg. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg.

The pesticide endosulfan II was detected in the surface soil sample collected at the end of the storm drain outfall at a concentration (estimated) equal to the detection limit (0.004 mg/kg). This concentration of endosulfan is significantly less than the residential PRG of 3.3 mg/kg. Endosulfan was detected at a very low concentration in only one sample and was not present in detectable concentrations at downgradient locations, either vertically and horizontally. Because of its low concentration and limited lateral extent, endosulfan is not considered a significant site contaminant.

The explosive 4-nitrotoluene was detected in the 5-foot-deep soil sample in boring 13-02 at a concentration of 1 mg/kg. For comparison, the residential PRG for 4-nitrotoluene (also known as p-nitrotoluene) is 650 mg/kg.

Septic Tank

A sludge sample and a septic tank sewer water sample were both collected from the septic tank at SWMU 13, and the complete results are presented on Tables 28 and 29. The sludge sample contained VOCs, SVOCs, pesticides, explosives, metals, and O&G. The septic tank sewer water sample contained VOCs, explosives, metals, and O&G.

A sample of the septic tank sludge was analyzed and results indicated the presence of an estimated 12,000 mg/kg of 1,1,1-trichloroethane and an estimated 2,700 mg/kg of trichloroethene. Several SVOCs were also detected, including 1,4-dichlorobenzene, 2-methylnaphthalene, 4-methlyphenol, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, naphthalene, phenanthrene, and pyrene. Of these constituents, only three were detected at concentrations greater than 2 mg/kg. These were 1,4-dichlorobenzene (33 mg/kg), 4-methlyphenol (34 mg/kg), and bis(2-ethylhexyl)phthalate (1,200 mg/kg). Several pesticides including 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, alpha-BHC, alpha-chlordane, beta-BHC, endosulfan II, gamma-chlordane, and heptachlor epoxide were detected in the sludge sample at concentrations ranging from 0.005 to 0.04 mg/kg. The explosive RDX was detected at a concentration of

0.9 mg/kg. All metals were detected except for selenium, silver, and thallium. O&G was detected at a concentration of 693 mg/kg.

A sample of the septic tank sewer water was also analyzed and a complete list of analytical results is presented on Table 29. The septic tank water sample contained the following VOCs: 1,1,1-trichloroethane (100 µg/L [estimated]), 1,1-dichloroethane (97 µg/L [estimated]), 1,1-dichloroethene (6 µg/L [estimated]), 1,2-dichloroethene (47 µg/L [estimated]), chloroform (4 µg/L [estimated]), and trichloroethene (32 µg/L [estimated]). No SVOCs or pesticides were detected. The explosive 2,6-dinitrotoluene was detected at a concentration of 1 µg/L (estimated). A number of metals were detected; however, there are no screening criteria for metals in septic tank water. O&G was detected at a concentration of 210 µg/L.

5.6.4 Interim RCRA Corrective Action

The septic tank sludge sample contained VOC concentrations that exceed hazardous waste criteria. To minimize the potential for future releases of these constituents to soil from standard operation of the septic tank, all sludge and sewer water is proposed for removal from the septic tank under an interim RCRA corrective action. The corrective action will be performed by the Navy Public Works Center. The corrective action is scheduled for completion before the end of 1996. Following completion of the work, the Navy Public Works Center will issue a report summarizing the interim RCRA corrective action for SWMU 13.

5.6.5 Conclusions and Recommendations

The most significant detections of constituents were in the septic tank at SWMU 13. As a result, an interim RCRA corrective action is planned to remove the septic tank contents. Although constituents were detected in the septic tank at concentrations exceeding hazardous waste criteria, these constituents were not detected in samples of the soil at SWMU 13. The most significant detection of constituents in soil was from the surface soil sample located by the storm drain outfall (boring 13-03). The soil sample contained 920 mg/kg of O&G, 0.004 mg/kg of endosulfan II, and 1 mg/kg of 4-nitrotoluene. O&G were detected in soil at concentrations of less than 100 mg/kg. However, none of these constituents is present at concentrations of concern with regard to human health. The lateral extent of these constituents appears limited in both vertical and horizontal extent. Adjacent soil samples in the same boring (13-03)

from a depth of 3 feet and the surface soil sample located downgradient (in boring 13-01) did not contain these constituents at concentrations above detection limits. Because of the immobility of these constituents in the environment at SWMU 13 and the low concentrations detected, there is no evidence of a significant release of contaminants to soil. The low concentrations and limited lateral extent of detected organic constituents suggest a low risk to potential environmental receptors. In addition, there are no detectable impacts on soils in the vicinity of the septic tank and leach field system from the constituents detected within the septic tank water and sludge samples.

Phenol was detected at a concentration of 0.3 mg/kg in one soil sample, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

Per standard protocol at WPNSTA Concord, care should be taken to handle all hazardous constituents at the site in accordance with the applicable RCRA regulations. Proper future operations will be sufficient to protect the septic tank from recontamination. Following the completion of the interim RCRA corrective action to remove the septic tank contents, the site is recommended for no further action under the RCRA corrective action program.

5.7 SWMU 14 - BUILDING IA-27

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 14. Figure 16 shows the locations of building IA-27 and other features.

5.7.1 Site Background

This section provides the site description for SWMU 14.

Site Description

Building IA-27 was constructed in the mid-1940s and is located 100 feet south of Kinne Boulevard, approximately 2.5 miles from the main entrance. The building was used to house the carpenter shop;

however, the building now provides storage for the furniture of Marines housed on base. Carpentry personnel often used paints and thinners.

The building is surrounded by a 16-foot-high berm on the north and south sides. A paved parking area is between building IA-27 and the south berm. Railroad tracks are adjacent to the north side of building IA-27 and run parallel to the south side of the north berm. A large parking area is between the north berm and Kinne Boulevard. West of L Street is a paved, fenced area used to store equipment and supplies.

Building IA-35 (boiler house) is located about 100 feet south of building IA-27, and building IA-44 is about 120 feet to the south. A UST was removed from the south side of building IA-35 in 1992. No petroleum hydrocarbons were detected in excavated soil.

Building IA-27 has a sink and sanitary sewer system that drains into a manhole connecting to a septic tank through a 6-inch vitrified clay pipe. The septic tank is located about 200 feet south of building IA-27, adjacent to the southwest corner of building IA-44. The reinforced concrete septic tank is about 11 feet long, 4 feet wide, and 7.5 feet deep. It is accessible through a 2-foot by 3-foot opening at the top of the tank at the ground surface. The outlet of the septic tank splits into two 4-inch open-joint tile drains that run parallel to the drain field. The two tile drains are about 10 feet apart. Each distribution field is about 2 feet wide and 2.5 feet deep. The drain field is located about 40 feet from Seal Creek. During previous septic tank sampling events, the septic tank was dry and could not sampled.

5.7.2 RFA Confirmation Study Sampling

The RFA assigned SWMU 14 a medium priority for future investigation because of the presence of a septic tank that may have released hazardous constituents to the environment. Soil and septic tank sampling investigations were performed at SWMU 14 to evaluate the potential release of contaminants from the septic tank. Figure 16 shows the soil boring locations.

Soil

The objective of soil sampling at SWMU 14 was to investigate potential leakage of hazardous wastes from the septic tank and leach field system to nearby subsurface soils. Two 16-foot soil borings (14-01

and 14-02) were completed near the septic tank and drain field. Soil boring 14-01 was advanced between the drain field and Seal Creek because chemicals of potential concern (COPC) may have migrated into Seal Creek. Seal Creek is at an elevation approximately 20 feet lower than the drain field, the edge of the drain field is approximately 40 feet from Seal Creek, and drainage channels have cut approximately to the edge of the drain field. The second soil boring (14-02) was completed adjacent to the west end of the septic tank. The soil samples were analyzed for VOCs, SVOCs, O&G, and metals.

Septic Tank

The objective of the septic tank sampling was to determine if hazardous constituents are present within the tank and may be released to soil or groundwater from the leach field system. Water and sludge samples were collected from the septic tank. During previous sampling attempts, the septic tank was dry. The last attempt occurred during August 1993, the driest period of the year. Also, building 1A-27 is not now used. The septic tank sewer water and sludge samples were obtained in April 1995 from these borings and were analyzed for metals, O&G, VOCs, and SVOCs.

5.7.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 11A and on Figure 16.

Soil

Except for nickel detected in two samples from boring 14-02, metals were not present at SWMU 14 above the estimated ambient limit concentrations or residential PRG screening levels. The samples containing nickel above these screening criteria were located at depths of 10.5 and 16.0 feet and the concentrations were 164 and 256 mg/kg, respectively. The California modified PRG for nickel is 150 mg/kg and the estimated ambient limit concentration at SWMU 14 is 86 mg/kg.

O&G was not detected in the samples, nor were VOCs. SVOCs were not detected except for phenol. The phenol was detected at concentrations up to 0.6 mg/kg in five of the six soil samples analyzed at SWMU 14. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg.

Septic Tank

A sample of the septic tank sludge was analyzed and the complete results are presented on Table 28. The VOCs 1,1,1,-trichloroethane and trichloroethene were detected at concentrations of 0.03 and 0.003 mg/kg (each was estimated) in a sample of the septic tank sludge. The SVOCs benzo(b)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, fluoranthene, and pyrene were detected at concentrations (all were estimated) ranging from 0.09 to 0.3 mg/kg in samples of the septic tank sludge. Most metals, including nickel, were detected in the sludge. O&G was detected at a concentration of 3,600 mg/kg.

A sample of the septic tank sewer water was also analyzed and a complete list of analytical results is presented on Table 29. No VOCs or SVOCs were detected in the septic tank water. A number of metals were detected; however, there are no screening criteria for metals in septic tank water. There is no identifiable correlation between the detected nickel in the septic tank water and the elevated (exceeding the estimated ambient limit concentration and residential PRGs) concentration of nickel in two soil samples at SWMU 14. O&G was detected in the septic tank sewer water at 6.6 µg/L.

5.7.4 Conclusions and Recommendations

Based on the analysis of samples collected in the vicinity of the septic tank and leach field, there are no hazardous constituents present in soil at concentrations that pose a threat to human health or the environment.

Phenol was detected at concentrations of up to 0.6 mg/kg in soil samples, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

No metals were detected that exceeded either their estimated ambient limit concentrations or PRGs except for nickel. Nickel was detected in two soil samples at depths of 10.5 and 16.0 feet at concentrations of 164 and 256 mg/kg, respectively. The California modified residential PRG for nickel is 150 mg/kg: however, the industrial PRG for nickel is 34,000 mg/kg. The concentration of nickel in that soil sample exceeds the residential PRG but is significantly less that the industrial PRG. In addition, nickel, like most metals, tends to adsorb to fine-grained soils, so its migration or leaching potential is limited. Nickel was the only constituent in soil at SWMU 14 that exceeded both the estimated ambient

limit concentration and PRG concentrations. Furthermore, these exceeded concentrations occurred in only two samples. The source of the nickel in soil has not been established. Regardless of the source, because these samples were located at depth rather than near the surface, they do not pose a threat to human or ecological receptors.

The septic tank sewer water sample contained an elevated concentration of nickel as well as a number of other metals. Because the septic tank and leach field may be contributing nickel detected in soil at 10.5 and 16 feet, the septic tank should be pumped free of sewer water, which should be disposed of at a permitted facility. Future septic tank operations at the site will adhere to standard WPNSTA Concord protocol, and should not adversely impact the area.

The nickel detected in soil does not constitute a threat to human health and the environment, because its occurrence is isolated and migration of the nickel is unlikely. The site is therefore recommended for no further action under the RCRA corrective action program as soon as the septic tank contents are removed for disposal.

5.8 SWMU 15 - BUILDING IA-41

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 15.

5.8.1 Site Background

This subsection provides the site description for SWMU 15. Figure 17 shows the locations of building IA-41 and other features.

Building IA-41 is located about 800 feet south of the old airport and 1,800 feet east of building IA-56, and was used as a paint storage shop. According to the RFA, this building has a sink and sanitary sewer system that drains into a septic tank. However, the septic tank was not located during the septic tank sampling event performed at all septic tanks in August 1993. Review of available engineering drawings by WPNSTA Concord did not reveal the presence of a septic tank. Also, the small bunker is a one-room building and visual inspection did not reveal evidence of a former sink or drainage system.

The building is a bunker covered with fill material on three sides. A transmission line that belongs to the Bureau of Reclamation runs directly above building IA-41. The area around building IA-41 is flat and used for grazing. The nearest housing is located a quarter-mile south of SWMU 15, just outside the base boundary.

5.8.2 RFA Confirmation Study Sampling

The RFA assigned SWMU 15 a medium priority for future investigation because of the assumed presence of a septic tank that may have released hazardous constituents to the environment. However, there is no evidence that a sink or septic tank ever existed at the site.

The objective of sampling at building IA-41 was to investigate site soils for contamination that could have resulted from paint storage and spills from both inside and outside the structure. The floor of the building is cracked. Because paints and paint thinners may have leaked to the soils through the cracks, one soil boring was advanced to a depth of 4 feet bgs through the floor of the building (15-03). Two soil borings were advanced to depths of 6 and 5 feet bgs outside the door of the building (15-01 and 15-02), where paint or paint thinners may have been dumped. The soil samples from these borings were analyzed for metals, VOCs, and SVOCs.

5.8.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 12A and on Figure 17.

Six soil samples were collected and analyzed for metals at SWMU 15. Of these, one soil sample contained concentrations of three metals that exceeded residential PRGs and estimated ambient limit concentrations. The sample was collected from a depth of 4 feet in boring 15-03 and contained manganese (9,090 mg/kg), nickel (196 mg/kg), and thallium (11.0 mg/kg). No other metals were detected above residential PRGs or estimated ambient limit concentrations.

The SVOC phenol was detected at concentrations up to 1 mg/kg in four of the six soil samples analyzed for SVOCs at SWMU 15. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg. No other VOC or SVOC constituents were detected.

5.8.4 Conclusions and Recommendations

Phenol was detected at concentrations of up to 1.0 mg/kg in soil samples, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

The site soils at SWMU 15 did not contain any substances above PRGs except for the one sample from boring 15-03, which contained the three metals listed above. The sample was overlain by soils that do not contain metals above the residential PRG or estimated ambient limit concentrations. In addition, surrounding samples do not contain manganese, nickel, or thallium above residential PRGs or estimated ambient limit concentrations. The incidence of manganese, nickel, and thallium concentrations exceeding both the residential PRG and estimated ambient limit concentrations suggests that a relatively low volume of soil exceeds both these criteria. A low volume of potentially impacted soil tends to limit the soil's potential to act as a source of contamination to other areas and also limits the risk associated with direct exposure. Another factor that tends to limit the potential threat of these constituents is their tendency to adsorb to fine-grained soils. The adsorption to fine-grained soil limits potential migration or leaching of these inorganic constituents. For these reasons, there is a low risk of impacts to human health and the environment associated with SWMU 15. Because of the low risk, the SWMU is recommended for no further action under the RCRA corrective action program.

5.9 SWMU 16 - BUILDING IA-46

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 16.

5.9.1 Site Background

This subsection provides the site description for SWMU 16. Figure 18 shows the locations of building IA-46 and other features.

Building IA-46 was constructed in the 1940s and is located in the main industrial complex of WPNSTA Concord, approximately 1 mile east of the main entrance and north of Kinne Boulevard, off of D Street. The building is fenced on all sides, with the entrance on the west side. Building IA-49 is located 80 feet

northwest, and building 433 is located 60 feet east of building IA-46. Several buildings for storage of paint, oxygen, and acetylene are located south of building IA-46. Along the south fence is a storage area for construction supplies. Suspected releases of asbestos from packing operations in drums were noted in the RFA; however, no asbestos piping or residue was noted during the site visit.

A fluorescent light tube crusher, located at the east end of building IA-46, is used to reduce the bulk of used fluorescent light bulbs generated at WPNSTA Concord. Approximately 10 to 20 fluorescent light tubes are crushed bi-monthly. The crusher operates by feeding the fluorescent light tubes through a cylindrical metal tube attached to a 55-gallon drum. Any particulates from the operation are entrained by a bag attached to the tube crusher's pump. Once the drum is filled, it is transferred to building 433, which is one of the five permitted hazardous waste management units at WPNSTA Concord. It is included in the Hazardous Waste Facility Permit effective July 31, 1993. The RFA noted the possibility of releases of mercury from fluorescent light tube crushing operations; however, no mercury residues were observed on the walls, floor, or ceiling of the room where the fluorescent light tube crusher is located.

A storage shed for accumulation of asbestos waste was located at the west end of building IA-46. Friable asbestos was stored in drums that were disposed of at a permitted Class II disposal facility. Nonfriable asbestos pipe, used for minor repairs, was also stored near the shed. This shed was also used to mix pesticides. Mixing was performed according to instructions on container labels. Empty cans were triple-rinsed and the rinse water was deposited in the spray tanks. The empty containers were then suitable for disposal as solid waste. A sink in the shed was used to provide water for pesticide mixing. Occasional spills were reported. The Initial Assessment Study stated that in 1966 an agricultural lessee complained that poisonous chemicals had been spilled into a drain that flowed into his cattle grazing area located south of the intersection of Kinne Boulevard and D Street. A drainage ditch flows underneath Kinne Boulevard 200 feet east of the intersection of Kinne Boulevard and D Street. A drain was then installed to connect the storage shed to the sewer system. Public works personnel at WPNSTA Concord acknowledged that chemical wastes from the pesticide storage and mixing area may have been dumped into an adjacent gutter on D Street that flowed toward the area in question.

5.9.2 RFA Confirmation Study Sampling

The RFA designated SWMU 16 as a low priority for future investigation because of potential releases of mercury from tube crushing operations. There were also suspected releases of asbestos. The use of the

site for storage and mixing of pesticides was not documented in the RFA. The objectives of soil sampling at SWMU 16 were to investigate the site for the possible presence of mercury, asbestos, and pesticides.

Three soil borings were drilled to 5 feet bgs along the south boundary fence (16-01, 16-02, and 16-03) in areas where asbestos was suspected or where staining was apparent. Soil samples from these borings were all analyzed for asbestos.

Since pesticides were noted to have been spilled into the drainage ditch adjacent to D Street, two borings were installed to 5 feet bgs (16-04 and 16-05) and one boring was completed to 14 feet bgs (16-06) in the former shed area along the west edge of building IA-46. Significantly elevated concentrations of several pesticides were detected in soil samples from each of these three borings. Consequently, seven additional borings (16-07 through 16-13) were drilled to delineate the lateral and vertical extent of pesticides in the area.

5.9.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 13A and on Figures 18 and 19.

Analysis of all samples collected from borings 16-01, 16-02, and 16-03 did not detect asbestos.

More than 3,000 mg/kg of pesticides were detected in the 0.5 foot soil sample from boring 16-05. A sample collected from a depth of 5 feet in the same boring contained less than 0.5 mg/kg of pesticides. The near-surface samples from borings 16-04, 16-06, 16-07, 16-10, and 16-11 contained concentrations of pesticides ranging from less than 0.1 mg/kg to less than 3 mg/kg. Of these borings, only 16-04, 16-05, and 16-06 contained pesticides at concentrations exceeding residential PRGs. In all cases, the concentrations of pesticides diminished rapidly with depth and the 5-foot sample from most soil borings did not contain detectable pesticides. Furthermore, no sample collected from 5 feet bgs contained concentrations of pesticides in excess of residential PRGs. Soil samples from borings 16-08, 16-09, and 16-12 did not contain detectable concentrations of pesticides in any samples. One surface soil sample was collected at boring 16-13 in the off site drainage area to evaluate whether pesticides were transported off site by storm water flows. Although pesticides were detected in that boring, none were present at

concentrations exceeding PRGs. A summary of the pesticides detected in soils at SWMU 16 is presented in the following table.

SUMMARY OF PESTICIDES DETECTED IN SOIL SAMPLES AT SWMU 16
(reported in mg/kg)

BORING ID	DEPTH (feet)	Aldrin	Chlordanes (Total)	DDD	DDE	DDT	Dieldrin	Heptachlor
16-04	0.5	0.02	0.8	ND	0.05	0.09	0.1	0.009
16-04	0.5 duplicate	0.02	1.6	ND	0.08	0.2	0.1	0.02
16-04	5.0	ND	0.04	ND	ND	ND	0.005	ND
16-05	0.5	ND	680	120	43	2100	170	160
16-05	5.0	ND	0.2	ND	ND	0.2	0.02	0.01
16-05	5.0 duplicate	ND	0.2	ND	ND	0.2	0.02	0.01
16-06	0.5	ND	0.8	ND	0.06	0.6	0.2	0.04
16-06	0.5 duplicate	ND	1.3	ND	0.09	1	0.2	0.05
16-06	5.0	ND	0.001	ND	ND	ND	0.002	ND
16-06	11.0	ND	ND	ND	ND	ND	ND	ND
16-06	14.0	ND	ND	ND	ND	ND	ND	ND
16-07	0.5	ND	0.0038	0.0024	ND	0.009	ND	ND
16-07	5.0	ND	ND	ND	ND	0.0022	ND	ND
16-08	1.0	ND	ND	ND	ND	ND	ND	ND
16-08	4.5	ND	ND	ND	ND	ND	ND	ND
16-09	0.5	ND	ND	ND	ND	ND	ND	ND
16-09	5.0	ND	ND	ND	ND	ND	ND	ND
16-10	0.0	ND	0.051	0.015	0.031	0.15	0.014	ND
16-10	2.0	ND	ND	ND	ND	ND	ND	ND
16-10	4.5	ND	ND	ND	ND	ND	ND	ND
16-11	0.5	ND	ND	ND	ND	0.0051	ND	ND
16-11	2.0	ND	ND	ND	ND	ND	ND	ND
16-11	5.0	ND	0.0054	ND	ND	0.0047	ND	0.0012
16-12	0.5	ND	ND	ND	ND	ND	ND	ND
16-12	5.0	ND	ND	ND	ND	ND	ND	ND
16-13	0.0	ND	0.024	0.0087	0.006	0.076	0.0068	ND
EPA Residential PRGs		0.026	0.34	1.9	1.3	1.3	0.028	0.099
EPA Industrial PRGs		0.11	1.5	7.9	5.6	5.6	0.12	0.42

Notes: 1) Data qualifiers are applicable to some of the above results but are not reported in this table.
2) Shaded areas indicate analytical results that exceed EPA residential PRGs.

Eight soil samples were collected and analyzed for metals at SWMU 16. Of these, two soil samples contained concentrations of arsenic exceeding the residential PRG (0.38 mg/kg) and the estimated ambient limit concentration (7.3 mg/kg). The samples were collected from a depth of 0.5 feet in boring

16-04 (8.3 mg/kg) and 16-06 (23.7 mg/kg). No other metals were detected above residential PRGs or the estimated ambient limit concentration.

5.9.4 Interim RCRA Corrective Action

The surface soil samples from borings 16-04, 16-05, and 16-06 contained concentrations of pesticides that exceed both the residential and industrial PRGs. The site was almost entirely paved; however, a portion of the site was not paved, and the exposed surface soils posed a potential human health risk. As a result, access to the area was immediately restricted. Later, an interim RCRA corrective action was performed to remove and dispose of all soils containing pesticides that exceed the industrial PRGs. The interim RCRA corrective action was performed by the Navy's Public Works Center. The corrective action site excavation was completed during the summer of 1996.

During the excavation, sampling was performed to evaluate the success of the pesticide removal and guide additional excavation until all pesticides exceeding the industrial PRG were removed. Final confirmation samples were collected at the limits of the excavation.

Pesticide- and arsenic-contaminated soils have been removed from SWMU 16. Removal of the pesticide-contaminated soil has provided incidental removal of soil containing arsenic exceeding the residential PRG and estimated ambient limit concentration.

The low incidence of arsenic concentrations exceeding both the residential PRG and estimated ambient limit concentration suggests that a relatively low volume of soil exceeded these criteria. A low volume of potentially impacted soil tends to limit the soil's potential to act as a source of contamination to other areas and also limits the risk associated with direct exposure. These factors reduce the significance of detectable arsenic at the site. Consequently, confirmation samples did not include analysis for metals.

The Navy Public Works Center will issue a report summarizing the interim RCRA corrective action for SWMU 16.

5.9.5 Conclusions and Recommendations

Pesticide- and arsenic-contaminated soil has been removed at SWMU 16 to concentrations of less than the industrial PRG and, therefore, no longer constitute a threat to industrial workers at the site. The site is recommended for no further action under the RCRA corrective action program.

5.10 SWMU 17 - BUILDING IA-50

This section presents the site background, RFA Confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 17.

5.10.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 17. Figure 20 shows the locations of building IA-50 and other features.

Site Description

Building IA-50 was constructed in the early 1950s and is located about 100 feet south of Kinne Boulevard, 2.7 miles from the main entrance. Six years ago, building IA-50 was used as a transfer station for ordnance materials. Packages of ordnance materials were frequently broken down and repackaged inside the building. Ordnance was labeled using stencil and paint spray cans. The used spray cans were the hazardous wastes generated at that time.

Building IA-50 functioned as a rail/truck transfer depot. Both sides of the building have a platform leading to a railroad spur.

Building IA-50 has a sink and sanitary sewer system that drains into a septic tank through a 6-inch vitrified clay pipe. The septic tank is located about 80 feet south of building IA-50. The outlet of the septic tank splits into two 4-inch open-joint tile drains that run parallel to each other. The two tile drains are about 10 feet apart. Each distribution field is about 2 feet wide and 2 feet deep.

Seal Creek is located approximately 100 feet from the edge of the drain field and is approximately 20 feet lower in elevation.

Previous Investigations

TRPH was detected in a septic tank sample collected on October 9, 1990 and total organic carbon (TOC) was detected in a septic tank sample collected on August 17, 1993. The SVOC 1,4-dichlorobenzene and the VOCs benzene and chlorobenzene were detected in the October 9, 1990, liquid sample.

5.10.2 RFA Confirmation Study Sampling

The RFA assigned SWMU 17 a medium priority for future investigation because of the presence of a septic tank that may have released hazardous constituents to the environment. The soils and septic tank were sampled at SWMU 17 during the RFA Confirmation study. These investigations are discussed below.

Soil

The objective of soil sampling at SWMU 17 was to investigate potential leakage of hazardous wastes from the septic tank and leach field system to nearby subsurface soils. Two soil borings were advanced to depths of 15 to 15.5 feet bgs (17-01 and 17-02).

Soil boring (17-01) was located between the drain field and Seal Creek. The second soil boring (17-02) was located adjacent to the south end of the septic tank. Soil samples from the two borings were analyzed for metals, O&G, VOCs, and SVOCs.

Septic Tank

The objective of the septic tank sampling was to determine whether hazardous constituents were present within the tank and therefore could be released to soil or groundwater via the leach field system. The septic tank sewer water was sampled and analyzed for VOCs, SVOCs, metals, and O&G.

5.10.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 14A and on Figure 20.

Soil

No VOCs were present in soil samples at concentrations above detection limits. The SVOC phenol was detected at concentrations of up to 0.8 mg/kg in four of the six soil samples analyzed for SVOCs at SWMU 17. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg.

No metals were detected in soil samples at concentrations above estimated ambient limit concentrations or residential PRGs. O&G was detected in two of the six soil samples at concentrations of up to 41 mg/kg.

Septic Tank

A complete list of analytical results for the septic tank sewer sample is presented on Table 29. One VOC constituent, chlorobenzene, was detected at a concentration of 2 µg/L (estimated); however, SVOC constituents were not detected in the septic tank sewer water. A number of metals were detected; however, there are no screening criteria for metals in septic tank water. O&G was detected at a concentration of 22 µg/L (estimated).

5.10.4 Conclusions and Recommendations

Phenol, metals, and O&G were the only constituents detected in the soil samples at SWMU 17, and none of these were present at concentrations that suggest potential site contamination.

In addition, there is no indication that the constituents detected in the septic tank have caused impacts to soil in the vicinity and downgradient of the leach field system. A more detailed summary follows.

Metals were not present in soils at concentrations in excess of PRGs and are therefore not recommended for further investigation.

O&G was detected in soil at concentrations less than 50 mg/kg. Because the soil samples were not analyzed for petroleum hydrocarbons, the analyses are insufficient to determine if the O&G is derived from naturally occurring oils from plant organic matter or from petroleum hydrocarbons. However, in either case, the concentrations are low and do not suggest a potential for constituent mobility or a threat to receptors of any type.

Metals were detected in the septic tank sewer water sample. However, metals were not detected at elevated concentrations in the septic tank, none were detected simultaneously at elevated concentrations (exceeding the estimated ambient limit concentrations and residential PRGs) in the soil samples.

SVOCs were not detected in the septic tank sewer water sample and with only one exception were not present in soil samples from SWMU 17. The exception was phenol, which has been detected frequently at WPNSTA Concord. Phenol was detected at concentrations of up to 0.8 mg/kg, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

Hazardous constituents are not present in the septic tank at concentrations of potential concern. Therefore, the septic tank does not require cleaning or any modification in operating methods.

Residential PRGs were not exceeded in any soil samples at SWMU 17. Furthermore, there appears to be no relationship between constituents present in septic tank sewer water and those present in site soil (with the exception of low concentrations of O&G). As a result, there is no evidence of site contamination at SWMU 17 and the site is recommended for no further action under the RCRA corrective action program.

5.11 SWMU 18 - BUILDING IA-51

This section presents the site background, RFA Confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 18.

5.11.1 Site Background

This subsection provides the site description. Figure 21 shows the locations of building IA-51 and other features.

Building IA-51 was constructed in the 1940s and is located in the main industrial complex. The building was used as a steam cleaning facility for locomotives, trucks, and other vehicles. The steam cleaner was deactivated in the mid-1970s, when the steam cleaning unit west of building IA-12 became operational. Oily waste generated by the steam cleaning operations drained directly into the sump (Container No. IA-51). The oil was pumped out by a contractor's vacuum truck, and the sump was periodically cleaned by the contractor.

Prior to the early 1960s, a zinc chromate rust inhibitor was added to motor antifreeze and waste antifreeze was disposed of by a contractor. After the early 1960s, antifreeze which was believed to be free of chromates was typically discharged to the ground and into storm drains. In 1978, chromates were detected in Seal Creek. When it was discovered that the new antifreeze contained zinc chromate, the type of antifreeze was changed and biodegradable rust and scale inhibitor was added.

The area along the west side of the building is currently used to store old tires. Railroad tracks run east to west along the north and south sides of the building. A 40-foot long splash wall is located approximately 20 feet east of the building. A sump installed in 1945 is located 12 feet east of the splash wall, is made of concrete 6 inches thick, and had a capacity of 40 gallons. The sump was filled with concrete when the steam cleaning unit was deactivated.

Aerial photographs show that a turntable for locomotives, approximately 44 feet in diameter, existed 100 feet east of building IA-51 until at least 1969. A semicircular crack in the asphalt indicates where the turntable existed. The turntable is not present in the 1976 aerial photograph. Though the exact nature of activities occurring in the vicinity of the former turntable is not evident from the aerial photograph, base personnel who work at building IA-51 say that an incinerator, used to destroy classified documents, was present in the excavation for the former turntable in 1976. A drop pit to collect steam cleaning water was formerly located 10 feet north of the turntable. The drop pit was destroyed when the turntable was removed.

5.11.2 RFA Confirmation Study Sampling

The RFA designated SWMU 18 as a high priority for future investigation because of documented releases of oily waste to the sump and because of the documented release of zinc chromates to Seal Creek from the storm drains. Soil and groundwater sampling investigations were performed at SWMU 18. These investigations are discussed below.

Soil

The objective of soil sampling at SWMU 18 was to investigate site soils for the presence of hydrocarbons in the vicinity of the oil sump, vehicle maintenance area, locomotive steam cleaning area, and railroad turntable, and to investigate the storm drainage outfall for residual contamination from surface discharges in the area.

One soil boring (18-01) was advanced to 15.5 feet bgs at a location as close to the former sump as practicable and one soil boring (18-02) was advanced to 15.5 feet bgs in the area of the former turntable. Soil samples from both borings were analyzed for metals, TPHd, TPHmo, and O&G. Soil samples from boring 18-01 were additionally analyzed for BTEX, and soil samples from 18-02 were also analyzed for VOCs and SVOCs.

Three soil borings (18-03, 18-04, and 18-05) were advanced along the storm drainage outfall south and east of building IA-8 (refer to Figure 22). The soil samples from these borings were analyzed for metals.

Based on the analytical results of samples collected from borings 18-01 and 18-02, an additional seven borings were probed in an attempt to locate the source of TPHmo detected in soil and groundwater. Borings 18-06, 18-07, 18-08, 18-09, 18-10, 18-11, and 18-12 were probed in the vicinity of the former sump pit, former drop pit, and former locomotive turntable. These borings were analyzed for TPHd, TPHmo, and BTEX.

Groundwater

The objective of groundwater sampling was to investigate whether releases of hydrocarbons have caused impacts to groundwater. Groundwater samples were collected from two soil borings (18-01 and 18-02).

Surface Water

Surface water was not present during field activities in February 1995. Therefore, no surface water samples were collected.

5.11.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Tables 15A and 15B and on Figures 21 and 22.

Soil

Soil samples from borings 18-01 and 18-02 did not contain detectable TPHd or VOCs. In addition, metals were not present at concentrations greater than residential PRGs or estimated ambient limit concentrations. TPHmo was detected at a concentration of 1,100 mg/kg in boring 18-02 at a depth of 5 feet; however, soil samples collected at three deeper depths in the same boring did not contain more than 10 mg/kg TPHmo. Soil samples from four of the eight borings surrounding boring 18-02 contained TPHmo at concentrations of 340 to 9,700 mg/kg in soils at depths of 1.5 to 2.5 feet bgs. The remaining four borings contained TPHmo ranging from the method detection limits to 34 mg/kg in soils less than 3 feet deep. In all cases where deeper soil samples were collected, the concentration of TPHmo diminished to nondetectable at a depth of 9.5 feet.

Several SVOCs were detected at concentrations of less than 0.1 mg/kg in the shallow soil sample in boring 18-02; however, none of these exceeded residential PRGs. In addition, SVOCs were not detected in any deeper soil sample.

Analytical results of shallow soil borings 18-03, 18-04, and 18-05 did not include concentrations of metals exceeding residential PRGs and estimated ambient limit concentrations.

Groundwater

Groundwater was measured at a depth of 22 feet in two soil borings (18-01 and 18-02) at SWMU 18. A groundwater sample was collected from each boring using a HydroPunch sampler. TPHd, O&G, VOCs, and SVOCs were not present in the groundwater samples above detection limits. Metals were detected in the two groundwater samples. However, since the samples were not filtered, the concentration of metals detected could be falsely elevated because of particulate matter within the samples. TPHmo was detected at a concentration of 740 µg/L in boring 18-01 and at a concentration of 540 µg/L in boring 18-02.

5.11.4 Conclusions and Recommendations

TPHmo was detected at concentrations of 1,100 to 9,700 mg/kg in four soil samples and at depths of 5 feet and less. In several cases, nearby soil borings did not contain high concentrations of TPHmo. At three out of these four locations where higher concentrations of TPHmo were detected, deeper soil samples contained less than 10 mg/kg TPHmo.

One of the soil samples (with a TPHmo concentration of 1,100 mg/kg) was analyzed for VOCs and SVOCs. VOCs were not detected and SVOCs were not present at concentrations greater than residential PRGs.

TPHmo was detected in groundwater at concentrations of 540 to 740 µg/L.

Based on this information, the following conclusions can be drawn:

- The source of TPHmo contamination of groundwater has not been determined. The soil samples that were collected at the site between 10 feet and 22 feet, the approximate depth of the groundwater table, were not significantly contaminated.
- TPHmo at SWMU 18 has been detected in some areas of the site in the shallow soils; however, the horizontal pattern of detections above a concentration of 500 mg/kg appears random.
- The lateral limits of TPHmo to the east of borings 18-06 and 18-11, and north of boring 18-06, are not defined.
- Where TPHmo is detected in shallow soils, it diminishes in concentration rapidly with depth and is not present above a concentration of 10 mg/kg at depths of 10 feet and greater.

- Hazardous constituents have not been detected at the site at concentrations above residential PRGs.

Based on the above site investigation and conclusions, the following recommendations have been developed:

- The source of groundwater contamination with TPH at SWMU 18 should be determined. A CERCLA process RI should be conducted to evaluate the source of contamination to groundwater. The RI should encompass SWMU 5 and SWMU 18 because of their relatively close proximity to one another.

- Although TPHmo has been detected in soil samples at SWMU 18, there is no evidence that the TPHmo is likely to spread or is potentially harmful to humans. In its current state, the entire area is covered with pavement, and there is no exposure pathway for human or environmental receptors even if hazardous constituents were present. At present, there is no evidence to suggest that soil remediation in the vicinity of SWMU 18 is necessary because of the immobility of the TPHmo and the lack of hazardous constituents.

5.12 SWMU 22 - BUILDING 81

This section presents the site background, RFA Confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 22.

5.12.1 Site Background

This subsection provides the site description and summary of previous investigations. Figure 23 shows the locations of building 81 and other features.

Site Description

Building 81 was constructed during the late 1950s and is located on Chosin Road approximately 1 mile east of the intersection of Kinne Boulevard and Willow Pass Road. Fuses and hydraulic fluids are tested in this building for handling and temperature sensitivity. In addition, ordnance is maintained in building 81. As part of regular maintenance, labels are painted on the ordnance using stencils and paint spray cans. The hazardous waste satellite accumulation point for used paint spray cans is located in building 82.

Building 81 has cells or small rooms with reinforced walls and screened ceilings for safety. Each room has a fuse-detonating machine the size of a small oven where small quantities of ordnance fuses are detonated. Small volumes of air emissions, if any, are carried out of the building through exhaust fans. No permit from the Bay Area Air Quality Management District is needed because of the small volume of the emissions.

Three USTs are located between building 83 and building 86. The USTs, used to fuel the boilers in the boiler house and a generator, are scheduled to be removed and replaced under a separate program.

The area around the buildings is flat and covered with asphalt. The topography dips steeply from the parking lot to the southeast and south. To the north and northwest the topography climbs steeply. A drainage outfall exits from underneath Chosin Drive approximately 120 feet east of the northeast corner of building 81. A septic tank is located down slope from the drainage outfall and 80 feet from building 81.

Building 81 has a sink and sanitary sewer system that drains through an 8-inch vitrified clay pipe to manhole No. 2, then drains through manhole No. 1 into a septic tank located south of building 81. The septic tank discharges through a 4-inch vitrified clay pipe and connects to a splitter box, which divides the flow.

A second septic tank is located west of buildings 81 and 82. The extent of this septic tank's leach field system is not known.

Previous Investigations

A sludge sample collected from the southern septic tank on October 9, 1990, contained TRPH, TOG, SVOCs, and one VOC, 1,2-dichloroethene. A second sludge sample collected on August 17, 1993 contained TRPH and the SVOCs 1,4-dichlorobenzene and 4-methylphenol. One VOC was detected in the October 9, 1990, liquid sample.

Harding Lawson Associates conducted an investigation in the vicinity of the existing USTs on September 8, 1993. A soil boring was drilled to a depth of 21.5 feet bgs and sampled at 15.25 feet bgs and 21.0 feet bgs. The analytical results indicated that TPHd was present in the 15.25-foot sample. The

analysis of the 21.0-foot sample did not indicate any TPHd above detection limits. TPHd was also detected in samples of groundwater, which was encountered at 17.0 feet bgs.

5.12.2 RFA Confirmation Study Sampling

The RFA assigned SWMU 22 a medium priority for future investigation because of the presence of the southern septic tank that may have released hazardous constituents to the environment. Soils and the septic tanks were sampled at SWMU 22. Each is discussed below.

Soil

The objective of soil sampling at SWMU 22 was to investigate potential leakage of hazardous wastes from the septic tanks and from the leach field system to subsurface soils. Three borings were advanced to 15.5 feet bgs (22-01, 22-02, and 22-03). Borings 22-01 and 22-02 were advanced near the southern septic tank and leach field system. Soil boring 22-03 was advanced near the western septic tank.

Two soil borings were advanced to 4 feet bgs (22-04 and 22-05) by hand auger along the drainage south of the southern septic tank. Soil samples were collected from 0 to 0.5 feet and 5 to 5.5 feet bgs.

All soil samples collected from the borings were analyzed for metals, O&G, VOCs, SVOCs, and explosives.

Septic Tank

The objective of the septic tank sampling was to determine whether hazardous constituents were present within the tanks and therefore could be released to soil or groundwater from the leach field system. The sewer water samples from the southern septic tank (identification number of S22SP015) and western septic tank (sample identification number of S22SP016) were each analyzed for metals, O&G, VOCs, SVOCs, and explosives.

5.12.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 16A and on Figure 23.

Soil

Soil samples from all of the borings were analyzed for explosives, VOCs, and SVOCs. No explosives, VOCs, and SVOCs were detected except that the SVOC phenol was detected at concentrations up to 1.0 mg/kg in eight of the 13 soil samples analyzed for SVOCs at SWMU 22. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg.

No metals were present above residential PRGs or estimated ambient limit concentrations. O&G was detected in five of 13 samples at a maximum concentration of 150 mg/kg.

Septic Tank

The water sample from the southern septic tank contained low concentrations (less than 1 μg/L [all were estimated]) of benzene, chlorobenzene, and toluene. No other VOCs, SVOCs, explosives, or O&G were detected. A number of metals were detected; however, there are no screening criteria for metals in septic tank water. A complete list of analytical results for both samples is presented on Table 29.

The sample from the western septic tank contained low concentrations (less than 5 μg/L [all were estimated]) of the following VOCs: 1,2-dichloroethene, carbon disulfide, and trichloroethene. The sample contained the SVOC 4-methylphenol (7 μg/L [estimated]), the explosive RDX (0.2 μg/L [estimated]), and O&G (10 μg/L [estimated]). No other VOCs, SVOCs, or explosives were detected. A number of metals were detected; however, there are no screening criteria for metals in septic tank water.

5.12.4 Conclusions and Recommendations

Hazardous constituents have been detected in the septic tanks, but at only trace concentrations. There is no evidence that a release of these constituents has caused detectable impacts to soils. There is a low risk

that the detected constituents could cause future impacts at the low concentrations detected in the septic tanks.

O&G was detected in some of the soil samples, but at relatively low concentrations (150 mg/kg and less). The source of the O&G has not been determined. Because the soil samples were not analyzed for petroleum hydrocarbons, it cannot be determined if the O&G is derived from naturally occurring oils from plant organic matter or from petroleum hydrocarbons. However, in either case, the concentrations are low and do not suggest a potential threat to receptors of any type.

Phenol was detected at concentrations of up to 1.0 mg/kg in soil samples, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

Since there is no evidence of a release of hazardous constituents at the site and there is a low risk of releases in the future based upon standard WPNSTA Concord waste handling protocol, the site is recommended for no further action under the RCRA corrective action program.

5.13 SWMU 23 - BUILDING 87

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 23.

5.13.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 23. Figure 24 shows the locations of building 87 and other features.

Site Description

Building 87 was constructed in the late 1950s and is located on Inchon Drive approximately 1 mile east of the intersection of Kinne Boulevard and Willow Pass Road. Minor maintenance, such as labeling of ordnance using stencil and paint spray cans, was done at this building. Hazardous wastes generated

included used paint spray cans, oil, and solvents. No hazardous waste is now generated at this site. WPNSTA Concord no longer conducts the missile work at this facility.

Buildings 88 and 89 are located south of building 87. A 6,000-gallon steel UST for diesel fuel storage is located about 25 feet west of building 87. Associated gauge, oil suction/return, and vent lines are connected to the UST.

Building 87 has a sink and sanitary sewer system that drains from a 4-inch cast iron pipe to a 6-inch vitrified clay pipe that ultimately drains into a septic tank. The septic tank is located about 70 feet west of the southwest corner of building 87. The effluent from the septic tank is divided into three distribution boxes. Each distribution box splits flow into three drain lines. Each drain line then flows along the entire length (100 feet) of the drain field. The UST is located 8 feet from the edge of the drain field. A parking lot has been constructed over the drain field.

Previous Investigations

A liquid sample collected from the septic tank on August 17, 1993 contained TOG. SVOCs diethylphthalate, butyl benzyl phthalate, bis(2-ethylhexyl)phthalate, and benzoic acid were also detected in the sample.

5.13.2 RFA Confirmation Study Sampling

The RFA assigned SWMU 23 a medium priority for future investigation because of the presence of a septic tank that may have released hazardous constituents to the environment. Soils and the septic tank were sampled at SWMU 23. Each of these is discussed below.

Soil

The objective of soil sampling at SWMU 23 was to investigate potential leakage of hazardous wastes from the septic tank and from the leach field system to subsurface soils. Two soil borings were advanced to 15.5 feet bgs (23-01 and 23-02) using the Geoprobe. All soil samples from these borings were analyzed for explosives, metals, O&G, VOCs, and SVOCs.

Septic Tank

The objective of the septic tank sampling was to determine whether hazardous constituents were present within the tank. A sample of the septic tank sewer water was collected and analyzed for VOCs, SVOCs, metals, and O&G.

5.13.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 17A and on Figure 24.

Soil

No explosives, VOCs, or SVOCs were detected in any soil sample except that the SVOC phenol was detected at concentrations up to 1.0 mg/kg in three of the six soil samples analyzed for SVOCs at SWMU 23. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg.

No metals were present above the residential PRGs or estimated ambient limit concentrations, except for arsenic, which was detected at a concentration of 8.8 mg/kg in boring 23-01 at a depth of 5 feet bgs. The residential PRG for arsenic is 0.38 mg/kg, and the estimated ambient limit concentration is 7.3 mg/kg.

O&G was detected in all six samples at concentrations up to 140 mg/kg.

Septic Tank

The analytical results for the sewer water sample from the septic tank are presented in Table 29. The sample from the septic tank contained concentrations of the VOCs 2-butanone (72 µg/L [estimated]) and acetone (2,800 µg/L [estimated]) and the SVOCs 4-methylphenol (640 µg/L [estimated]), fluoranthene (14 µg/L [estimated]), and phenanthrene (13 µg/L [estimated]). No other VOCs or SVOCs were detected. A concentration of 84 µg/L (estimated) O&G was also detected. A number of metals were detected; however, there are no screening criteria for metals in septic tank water.

5.13.4 Conclusions and Recommendations

O&G was detected in all of the soil samples, but at relatively low concentrations (140 mg/kg and below). The source of the O&G has not been determined. Because the soil samples were not analyzed for petroleum hydrocarbons, the analyses are inadequate to determine whether the O&G is derived from naturally occurring oils from plant organic matter or from petroleum hydrocarbons; however, in either case, the concentrations are low and do not suggest a potential threat to receptors of any type.

Phenol was detected at concentrations of up to 1.0 mg/kg in soil samples, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

Arsenic was detected in a soil sample at a concentration exceeding the estimated ambient limit concentration and residential PRG. The estimated ambient limit concentration is 7.3 mg/kg, and the detected concentration of arsenic was 8.8 mg/kg. The arsenic concentration appears to be naturally occurring rather than related to site activities. Even if the 8.8 mg/kg of arsenic was partially associated with site activities, the detected concentration only slightly exceeds the estimated ambient limit concentration. The low incidence of arsenic exceeding the residential PRG and estimated ambient limit concentration suggest that a low volume of soil exceeds both these criteria. A low volume of potentially impacted soil tends to limit the soil's potential to act as a source of contamination to other areas and also limits the risk associated with direct exposure. Another factor that tends to limit the potential threat of these constituents is their tendency to adsorb to fine-grained soils. No other metals exceeded both the estimated ambient limit concentrations and PRGs. Because of the limited extent of arsenic and low potential risk, no further evaluation or investigation is recommended with regard to the arsenic detected at SWMU 23.

There is no evidence of a release to the environment at SWMU 23 that could have an adverse effect on human or ecological receptors. As such, the site is recommended for no further action under the RCRA corrective action program.

5.14 SWMU 24 - BUILDING 93

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 24.

5.14.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 24. Figure 25 shows the locations of building 93 and other features.

Site Description

Building 93 was constructed in the early 1960s and is located on the south side of Kinne Boulevard at the east end of WPNSTA Concord. Building 93 appears to be the site of one of the largest generators of hazardous wastes at WPNSTA Concord. These wastes include used paint spray cans, solvents, and adhesives. Generated wastes are stored at a satellite accumulation point at building 429, located west of Building 93.

Sewage from building 93 is discharged through a 6-inch vitrified clay pipe to manhole A located 100 feet west of building 93. Manhole A discharges to a 2,500-gallon prefabricated steel septic tank, located about 240 feet northwest of the manhole, through an 8-inch vitrified clay pipe. The outlet of the septic tank connects to a splitter box that divides the effluent into 13 4-inch open-joint vitrified clay pipe drains that run parallel to the distribution fields. The 13 vitrified clay pipe drains are each at least 7 feet apart. Each distribution field is about 2 feet wide and 2 feet deep.

The area to the west of building 93 is grass covered and slopes gradually to the edge of Seal Creek, which is located approximately 400 feet west of the drain field. The elevation drops approximately 20 feet between the top of the grassy field and the bottom of Seal Creek.

Previous Investigations

A liquid sample collected from the septic tank on October 9, 1990 contained the SVOCs phenol, 4-methyphenol, and benzoic acid, and the VOC toluene. A second sample collected on August 17, 1993 contained TRPH and TOG. The VOC detected in the October 9, 1990, liquid sample was toluene.

5.14.2 RFA Confirmation Study Sampling

The RFA assigned SWMU 24 a medium priority for future investigation because of the presence of a septic tank that may have released hazardous constituents to the environment. Soils and the septic tank were sampled at SWMU 24. These investigations are discussed below.

Soil

The objective of soil sampling at SWMU 24 was to investigate potential leakage of hazardous wastes from the septic tank and from the leach field system to subsurface soils. Three soil borings were advanced to depths ranging from 10.5 to 16 feet bgs (24-01, 24-02, and 24-03) using the Geoprobe. All soil samples were analyzed for metals, O&G, VOCs, and SVOCs.

Septic Tank

The objective of the septic tank sampling was to determine whether hazardous constituents were present within the tank. A sample of the septic tank sewer water was collected and analyzed for VOCs, SVOCs, metals, and O&G.

5.14.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 18A and on Figure 25.

Soil

No VOCs or SVOCs were detected except for the VOC chloroform, detected in one of eight samples at a concentration of 0.002 mg/kg (estimated), and the SVOC phenol, detected in seven of the eight samples

at concentrations of up to 0.6 mg/kg. For comparison, the EPA residential PRG for chloroform is 0.53 mg/kg, and the residential PRG for phenol is 39,000 mg/kg.

Metals were not present above the residential PRGs or estimated ambient limit concentrations. One exception was noted for nickel, detected at a concentration of 195 mg/kg in boring 24-01 at a depth of 16 feet bgs.

O&G was detected in six of the eight samples at a maximum concentration of 64 mg/kg.

Septic Tank

One sewer water sample from the septic tank was collected and analyzed. A complete list of analytical results for the sample is presented on Table 29. The sample from the septic tank contained concentrations of the VOCs carbon disulfide (2 µg/L [estimated]) and toluene (270 µg/L [estimated]) and the SVOC 4-methylphenol (320 µg/L [estimated]). No other VOCs or SVOCs were detected. A concentration of 9.4 µg/L (estimated) O&G was also detected. A number of metals were detected; however, there are no screening criteria for metals in septic tank water.

5.14.4 Conclusions and Recommendations

Chloroform was detected in one sample at a concentration of 0.002 mg/kg (estimated), which is significantly lower than the EPA residential PRG of 0.53 mg/kg. The low incidence of detection and the low concentration of chloroform indicates that chloroform does not pose a threat to human health or the environment. No further investigation of chloroform at the site is recommended.

Phenol was detected at concentrations of up to 0.6 mg/kg in soil samples, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

O&G was detected in some of the soil samples, but at relatively low concentrations (64 mg/kg and below). The source of the O&G has not been determined. Because the soil samples were not analyzed for petroleum hydrocarbons, the analyses are inadequate to determine whether the O&G is derived from

naturally occurring oils from plant organic matter or from petroleum hydrocarbons. However, in either case, the concentrations are low and do not suggest a potential threat to receptors of any type.

No metals were detected that exceeded either the estimated ambient limit concentrations or PRGs except for nickel, which was detected in one soil sample at a concentration of 195 mg/kg at a depth of 16 feet. The residential PRG for nickel is 150 mg/kg and the industrial PRG is 34,000 mg/kg, and the estimated ambient limit concentration is 100 mg/kg. The concentration of nickel in that soil sample exceeds the residential PRG but is significantly less that the industrial PRG. In addition, nickel, like most metals, tends to adsorb to fine-grained soils, so the migration or leaching potential is limited. The low incidence of nickel concentrations exceeding the residential PRG suggests that a relatively low volume of soil contains nickel at concentrations exceeding the criteria. A low volume of potentially impacted soil tends to limit the soil's potential to act as a source of contamination to other areas and limits the risk associated with direct exposure. Nickel was the only constituent in soil that exceeded both the estimated ambient limit concentration and PRG concentrations, and only one sample exceeded these criteria. The source of the nickel in soil is therefore not established. Regardless of the source, the sample was collected from a depth of 16 feet bgs and is therefore assumed to not pose a risk to human or ecological receptors.

The septic tank sewer water sample contained an elevated concentration of nickel as well as a number of other metals. Because the septic tank and leach field may be contributing to the nickel detected in soil at 16 feet bgs, the septic tank should be pumped free of sewer water, which should be disposed of at a permitted facility. Future septic tank operations at the site are not likely to adversely impact the area.

The nickel detected in soil does not constitute a threat to human health and the environment since its occurrence appears isolated and because migration of the nickel is unlikely. The site is therefore recommended for no further action under the RCRA corrective action program provided the septic tank contents are removed for disposal.

5.15 SWMU 25 - BUILDING 97

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 25.

5.15.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 25. Figure 26 shows the locations of building 97 and other features.

Site Description

Building 97 was constructed in the early 1960s and is located at the east end of WPNSTA Concord at the end of R Street. The building was an ordnance assembly building for the Rocket Maintenance Facility of the Guided Missile Department in the Inland Area. Maintenance operations included the rebuilding of rocket motors, cleaning and painting rocket parts, and testing rocket engine components. The facility is currently unused but is being refurbished. Three USTs used to store JP-5 fuel were removed from the north side of the building in 1990, and a 4,000-gallon diesel UST was removed from the south side of building 96 during April 1994.

The Initial Assessment Study reported that hazardous wastes generated at building 97 included trichloroethane, epoxy, ethyl alcohol, contact cleaners, corrosion preventatives, oil, JP-5 rocket fuel, and solvent wastes. The hazardous wastes were collected per the WPNSTA Concord RCRA permit and disposed of off base. Paint sludge was bagged and handled similarly. Until about 1978, the Tidal Area Landfill (IR Site 1) probably received all wastes generated from the building.

Building 97 has a sink and sanitary sewer system that drains to a septic tank through a 6-inch vitrified clay pipe. The 2,500-gallon prefabricated steel septic tank is located about 200 feet southwest of building 97. The outlet of the septic tank connects to a splitter box which divides the effluent into nine 4-inch open-joint vitrified clay pipe drains that run parallel to the drain field. The nine vitrified clay pipe drains are at least 7 feet apart. Each leach line trench is about 2 feet wide and 2 feet deep.

Previous Investigations

A liquid sample collected from the septic tank on October 9, 1990 contained TOG and SVOCs, including phenol, benzo(a)anthracene, 1,4-dichlorobenzene, 4-methylphenol, benzo(b)fluoranthene, benzo(k)-fluoranthene, benzo(a)pyrene, chrysene, and dibenz(a,h)anthracene. A second sample collected on

August 17, 1993 contained TOG and SVOCs, including 1,4-dichlorobenzene, phenol, and 4-methylphenol.

On December 9, 1990, the three USTs north of building 97 were removed. Analytical results of soil samples collected from the UST excavation were below the method detection limit (Minter & Fahy 1991). The excavation was overseen by the Contra Costa County Environmental Health Division. No analytical results were available for the removal of the 4,000-gallon UST at the time this report was prepared.

5.15.2 RFA Confirmation Study Sampling

The RFA assigned SWMU 25 a medium priority for future investigation because of the presence of a septic tank that may have released hazardous constituents to the environment. Soils and the septic tank were sampled at SWMU 25. These investigations are discussed below.

Soil

The objective of the soil sampling at SWMU 25 was to investigate potential leakage of hazardous wastes from the septic tank and from the leach field system to subsurface soils. Two soil borings were advanced to 5 feet bgs (25-01 and 25-02) using the Geoprobe. Boring 25-01 met refusal at a depth of 8 feet. A third boring (25-03) was attempted adjacent to boring 25-01; however, it also met refusal at 14 feet. All soil samples were analyzed for metals, O&G, VOCs, and SVOCs.

Septic Tank

The objective of the septic tank sampling was to determine whether hazardous constituents were present within the tank. A sample of the septic tank sewer water was collected and analyzed for VOCs, SVOCs, metals, and O&G.

5.15.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 19A and on Figure 26.

Soil

No VOCs or SVOCs were detected, except for the SVOC phenol detected in three of the five samples at concentrations of up to 0.8 mg/kg. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg. No metals were present above the residential PRGs and estimated ambient limit concentrations. O&G was detected in three of the five samples at a maximum concentration of 37 mg/kg.

Septic Tank

Analytical results for the sewer water sample from the septic tank are presented in Table 29. The sample from the septic tank contained a concentration of the SVOC 4-methylphenol (370 µg/L [estimated]). No VOCs or other SVOCs were detected. An estimated 27 µg/L of O&G was also detected. A number of metals were detected; however, there are no screening criteria for metals in septic tank water.

5.15.4 Conclusions and Recommendations

O&G was detected in some of the soil samples, but at relatively low concentrations (37 mg/kg and below). The source of the O&G has not been determined. Because the soil samples were not analyzed for petroleum hydrocarbons, the analyses are inadequate to determine whether the O&G is derived from naturally occurring oils from plant organic matter or from petroleum hydrocarbons. However, in either case, the concentrations are low and do not suggest a potential threat to receptors of any type.

Phenol was detected at concentrations of up to 0.8 mg/kg in soil samples, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

No metals in soil were detected that exceeded either the estimated ambient limit concentrations or PRGs.

The septic tank sewer water sample contained an elevated concentration of one SVOC and several metals. However, the one SVOC was not present at detectable concentrations in the soil sampled and metals were not detected above the screening criteria in soils. Constituents of potential concern are present in the septic tank at low concentrations but have not caused a detectable impact on soils. Because of the low concentrations of constituents present in the septic tank, the potential for future

impacts to soil is low, provided that hazardous materials are not released to the septic tank. WPNSTA Concord's operating permit under RCRA prohibits such releases. Because of the low environmental risk associated with the continued operation of the septic tank and leach field system, the site is recommended for no further action under the RCRA corrective action program.

5.16 SWMU 37 - BUILDING A-29

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 37.

SWMU 37 is surrounded on three sides by IR Site 11 (except to the northeast). IR Site 11 is undergoing a RI for a variety of potential contaminants. Previous investigations of IR Site 11 are discussed in the sections that follow.

5.16.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 37. Figure 27 shows the locations of building A-29 and other features.

Site Description

Building A-29 is located at the end of Davidson Road adjacent to the Wood Hogger site (IR Site 11), which is being investigated under the Installation Restoration Program. SWMU 37 includes areas that have not been investigated under the Installation Restoration Program. The boundaries of SWMU 37 include Davidson Road to the south and east, building A-29 to the west, and the open field to the north. The Wood Hogger site is located to the south and west.

Approximately 600 cubic yards of treated wood debris were removed from the dunnage area in 1992. Most of this wood waste was chemically treated. Dark brown wood was treated with creosote, light brown wood was treated with pentachlorophenol, and greenish wood was treated with copper arsenate. Most treated wood waste items, such as used railroad ties or wharf timbers, are recycled on base or off base through other federal or state agencies for projects such as landscaping and retaining walls, or are

sold to contractors who reuse the timbers for applications requiring use of treated wood. Some scrap treated wood was stockpiled near building A-29.

A storage yard, at this SWMU, is currently paved with asphalt. Aerial photographs from as far back as 1952 show this storage yard was active, with railroad tracks providing access to the storage yard from the northeast corner of the site. The storage yard now contains scrap metal and wood, and other surplus materials, and is generally covered with weathered wood chips. Current storage practices in the storage yard and information derived from historical photographs indicate that a variety of wood and metal materials have been stored in sections of the yard at various times.

Previous Investigations

IT Corporation conducted an SI at the Wood Hogger site during 1989 through 1991. The SI included installing four monitoring wells located around and north of the Wood Hogger equipment (two of these wells are located near SWMU 37), collecting 12 surface water and 8 sediment samples, and sampling 15 soil borings. Groundwater samples were also collected.

Forty soil samples were collected from the soil borings. A total of 31 organic compounds were detected in the soil samples. VOCs detected included acetone, 2-butanone, carbon disulfide, methylene chloride, and PCE. SVOCs detected included 2-methylnaphthalene, 3,3'-dichlorobenzene, benzoic acid, polynuclear aromatic hydrocarbons (PAH), and phthalates. The chlorinated pesticides 4,4'-DDT and chlordane were detected five times. Three explosive compounds were detected in two soil borings. Four of the six metals were detected above the background values determined by IT Corporation (IT 1992).

Eight sediment samples were collected from throughout the Wood Hogger site. Four VOCs were detected in the samples, but all of the chemicals detected were common laboratory contaminants or a naturally occurring compound in the bay environment. Two phthalates were detected at all of the sample locations and are common laboratory contaminants. Copper and zinc were detected along the southern portion of the site above the background values determined by IT Corporation (IT 1992).

Groundwater samples were collected from the IR Site 11 monitoring wells for four quarters. The only VOC detected was acetone. Five SVOCs were detected in the groundwater. Five of the six metals with

background values were detected at concentrations exceeding background values determined by IT Corporation (IT 1992).

The surface water samples were collected from four locations. The two VOCs detected were methylene chloride and acetone. No metals were detected above the background values determined by IT Corporation for the site (IT 1992).

Between June 1995 and May 1996, PRC collected samples of soil and groundwater in the areas surrounding SWMU 37. The sampling was conducted as a part of the tidal area RI at WPNSTA Concord. During the RI, detected metals, pesticides, PCBs, SVOCs, and hydrocarbons were detected in soil samples collected near SWMU 37. Metals were detected in the groundwater samples exceeding the U. S. EPA chronic ambient water quality criteria for protection of marine life. The results of the RI have been summarized in an interim draft report (PRC 1996a).

5.16.2 RFA Confirmation Study Sampling

The RFA designated SWMU 37 as a medium priority for future investigation because of the potential for the release of small amounts of hazardous contaminants to soil and groundwater because of leaching from treated scrap wood. Soil and groundwater sampling investigations were performed at SWMU 37. These investigations are discussed below.

Soil

The objective of soil sampling at SWMU 37 was to investigate whether hazardous constituents including metals (specifically copper), creosote, and pentachlorophenol may have contaminated site soils. Seven soil borings were installed to depths of 0 to about 5 feet bgs (37-01, 37-02, 37-03, 37-04, 37-05, 37-06, and 37-07) and were located either between wood piles, in areas where staining is evident, or in areas where wood may have been stored on soil. Soil borings were sited at accessible locations and no wood piles were moved. Two soil borings were installed to 5 and 4.5 feet bgs (37-08 and 37-09) and were located adjacent to the west side of building A-29. Two soil borings were advanced up to 7 feet below the groundwater table borings (37-11 and 37-12). Soil boring 37-12 was located adjacent to the west end of building A-29, where treated wood was stored. Soil boring 37-11 was located along the north boundary of the dunnage area. Soil samples were collected at 0 to 0.5 feet bgs and 5 to 5.5 feet bgs.

All soil samples were analyzed for metals, VOCs, SVOCs, pesticides/PCB, TOC, and explosives.

Groundwater

The objective of groundwater sampling at SWMU 37 was to investigate whether hazardous constituents have leached from the piles of treated scrap wood and have impacted groundwater. Groundwater samples were collected from the two soil borings (37-11 and 37-12). The groundwater samples were collected using Geoprobe sampling methods. One of the groundwater samples was analyzed for metals, VOCs, SVOCs, pesticides, PCBs, and explosives. The other groundwater sample was analyzed only for metals.

5.16.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 20A and 20B and on Figure 27.

Soil

VOCs were not detected in the soil samples. The SVOC phenol was detected at concentrations up to 0.3 mg/kg (estimated) in 4 of the 23 soil samples analyzed for SVOCs at SWMU 37. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg. No other SVOCs were detected.

One or more of the pesticides 4,4-DDD, 4,4-DDT, and endrin ketone were detected in three of the 23 soil samples analyzed for pesticides, at maximum concentrations of 0.004 mg/kg (estimated). No other pesticides were detected.

The explosive 1,3-dinitrobenzene was detected in one of 23 soil samples analyzed for explosives at a concentration of 0.1 mg/kg. No other explosives were detected.

Metals were not detected above estimated ambient limit concentrations or EPA residential PRGs.

Groundwater

Two unfiltered groundwater samples were collected from two Geoprobe borings during the investigation. No VOCs, SVOCs, pesticides, or explosives were detected. Metals were also not detected at elevated concentrations with the exception of arsenic, which was detected at a concentration of 404 μg/L in boring 37-11. At a later date, a new boring was advanced adjacent to boring 37-11, and a second water sample was collected and analyzed for arsenic. This time, the water sample was filtered in the field using a 5.0 micron filter prior to shipment to the laboratory, and arsenic was detected at a concentration of 4.1 μg/L.

5.16.4 Conclusions and Recommendations

One or more of the pesticides 4,4-DDD, 4,4-DDT, and endrin ketone were detected at maximum concentrations of 0.004 mg/kg (estimated) in three of the 23 soil samples analyzed for pesticides. The lowest residential PRGs for these constituents are 1.9 mg/kg, 1.3 mg/kg, and 20 mg/kg, respectively.

The explosive constituent 1,3-dinitrobenzene was detected at a concentration of 0.1 mg/kg in one of 23 soil samples analyzed for explosives. The residential PRG for 1, 3-dinitrobenzene is 6.5 mg/kg.

Phenol was detected at concentrations of up to 0.3 mg/kg in soil samples, which is substantially lower than the EPA residential PRG of 39,000 mg/kg.

Potential soil contaminants were detected infrequently and at low concentration at five out of the 12 locations sampled. With the exception of 4,4-DDT and phenol, none of these constituents were detected in more than one soil sample at SWMU 37. No constituents were detected in soil at concentrations exceeding residential PRGs. Because the distribution and concentration of pesticides, 1,3-dinitrobenzene, and phenol detected at the site do not pose a threat to human health or the environment, no further investigation of these constituents is recommended.

Groundwater samples did not contain any organic contaminants, and only one inorganic constituent (arsenic) in one sample was detected at a concentration of potential concern. However, since there was no elevated concentration of arsenic in the soil from the boring, the analytical result was suspected to be elevated because of soil particulate matter suspended in the water sample. A filtered groundwater

sample was obtained later, and the arsenic concentration was 100 times lower. Because most soil particles cannot migrate with groundwater, the filtered groundwater sample is considered to be more representative of concentration of arsenic in groundwater than the unfiltered sample. Based on the results of the filtered groundwater sample, it appears that arsenic has not affected groundwater.

There is no evidence that treated wood storage and handling on the site has caused impacts to soil or groundwater. As a result, SWMU 37 is recommended for no further action under the RCRA corrective action program.

5.17 SWMU 40 - BUILDING 174

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 40.

5.17.1 Site Background

Figure 28 shows the location of building 174 and other features. Building 174 is located at the southeast corner of the intersection of White Road and Anderson Road. The building serves as an electric substation which houses the electrical transformer that steps power down to distribution voltage levels. The transformer does not contain PCBs. In the past, this site housed a PCB transformer and may have been used to temporarily store PCB transformers that were not in use. Drip pans were used to contain leaks from the transformers being stored in building 174.

5.17.2 RFA Confirmation Study Sampling

The RFA designated SWMU 40 as a low priority site for future investigation because of the possible leakage of PCB-contaminated transformer oil from the transformer storage facility. Three soil borings were advanced to depths of 0 to a maximum of 5 feet bgs (40-01, 40-02, and 40-03) around the perimeter of building 174.

All soil samples were analyzed for BTEX, TPHd, TPHmo, and pesticides/PCBs.

5.17.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 21A and on Figure 28.

BTEX constituents were not detected in any of the soil samples from the site. TPHd was detected in two samples at concentrations up to 8 mg/kg (estimated). Motor oil was detected in four of the five samples at concentrations up to 26 mg/kg.

Two soil samples from borings 40-02 and 40-03 contained PCBs and pesticides, including alpha-chlordane (up to 0.008 mg/kg), Aroclor 1248 (up to 0.4 mg/kg), Aroclor 1254 (up to 0.2 mg/kg), Aroclor 1260 (up to 0.07 mg/kg), and gamma-chlordane (up to 0.005 mg/kg). Of these concentrations, only Aroclor 1248 and Aroclor 1260 exceed residential PRGs.

5.17.4 Interim RCRA Corrective Action

Based on the recommendation of the RWQCB to address the PCBs detected in soil at the site, an interim RCRA corrective action to pave over the area of concern was pursued by the Navy. The Navy's Public Works Center excavated the vicinity of the site containing detectable concentrations of PCBs. The site was excavated to a depth of 2 feet. At that depth, one confirmation soil sample was collected from the center of the excavation. The confirmation soil sample was analyzed for PCBs, and PCBs were not present in the sample above detection limits. The area was backfilled with clean compacted soil and then paved with a 6-inch concrete slab.

The Navy Public Works Center will issue a report summarizing the interim RCRA corrective action for SWMU 40.

5.17.5 Conclusions and Recommendations

All detectable PCB-contaminated soil at the site was removed during the interim RCRA corrective action. The only remaining detectable constituents included low concentrations of TPHd, TPHmo, and pesticides. The remaining constituents do not exceed PRGs and do not threaten human health or the

environment because of the low concentrations and limited lateral extent. The site is recommended for no further action under the RCRA corrective action program.

5.18 SWMU 44 - BUILDING 350

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 44.

5.18.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 44. Figure 29 shows the locations of building 350 and other features.

Site Description

Building 350 is located at the east end of the Tidal Area, 200 feet south of Port Chicago Highway. The building is located within a double fenced area, known as the "Q" Area, and was formerly guarded by U.S. Marine Corps personnel. Used paint spray cans, rags, and solvents were generated at the site. Building 350 is one of the satellite accumulation points for hazardous waste.

Building 350 contains two USTs that were used for diesel fuel oil storage: UST 350A and UST 350B. UST 350A was used to fuel the steam boiler that provides heating to this building, and UST 350B provided fuel to an emergency electrical generator for the building. The USTs were installed in 1981 and have a capacity of 2,000 gallons each. These USTs are tested for leaks annually, and the results are submitted to the Contra Costa County Environmental Health Division. In June 1991, a pressure gage leaked about 20 gallons of diesel fuel oil onto the floor in building 350. Navy personnel contained and cleaned up the spill using absorbent materials.

According to records, building 350 and building 351 (a former Marine guard post) have sinks and sanitary sewer systems that drain into a common septic tank. The septic tank is located 55 feet from the southeast corner of Building 350. Sanitary sewer lines from building 350 and building 351 hook into a common manhole located 12 feet southwest of the septic tank. The drain field extends north of the septic tank and parallels the eastern wall of building 350.

Previous Investigations

Analysis of a liquid sample from the septic tank collected on August 17, 1993 detected TOG. The only SVOC detected in the liquid sample was 4-methylphenol. VOCs detected in the liquid sample were 1,4-dichlorobenzene and toluene.

5.18.2 RFA Confirmation Study Sampling

The RFA assigned SWMU 44 a medium priority for future investigation because of the presence of a septic tank that may have released hazardous constituents to the environment. Soils and the septic tank were sampled at SWMU 44. These investigations are discussed below.

Soil

The objective of soil sampling at SWMU 44 was to investigate potential leakage of hazardous wastes from the septic tank and leach field system. An additional objective was to investigate whether diesel fuel from the nearby 2,000-gallon tanks had contaminated soil in their vicinity. Two soil borings were advanced to depths of about 15.5 feet bgs (44-01 and 44-02). Soil samples were collected at 5.0 feet bgs and at the water table from each soil boring.

All soil samples were analyzed for metals, TPHd, TPHmo, O&G, VOCs, and SVOCs.

Septic Tank

The objective of the septic tank sampling was to determine whether hazardous constituents were present within the tank and, therefore, could be released to soil or groundwater in the leach field system. One sample of septic tank sewer water was collected and one sample of septic tank sewage sludge was collected. Both samples were analyzed for VOCs, SVOCs, TPHd, TPHmo, metals, and O&G.

5.18.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 22A and on Figure 29.

Soil

None of the six soil samples analyzed for VOCs and SVOCs contained any constituents except for phenol, which was detected in two of the samples at a maximum concentration of 1.0 mg/kg. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg.

TPHd was detected in two of the six samples at concentrations of 6 mg/kg (estimated). TPHmo was also detected in two samples at a maximum concentration of 15 mg/kg. O&G was detected in four of the soil samples at a maximum concentration of 81.

No inorganic constituents were detected in soil exceeding both the estimated ambient limit concentrations and residential PRGs.

Septic Tank

A complete list of analytical results for the septic tank sewer water is presented on Table 29.

The septic tank sludge sample contained two VOCs: 1,1,1-trichloroethane (estimated 48 mg/kg) and trichloroethene (estimated 12 mg/kg). SVOCs detected included 2-methynaphthalene (estimated 2 mg/kg), 4-chloroaniline (estimated 9 mg/kg), and phenanthrene (estimated 2 mg/kg). The sludge does not exceed any state or federal hazardous waste criteria and is therefore classified as nonhazardous. TPHd was detected at a concentration of 16,000 mg/kg, and TPHmo was detected at a concentration of 51,000 mg/kg. O&G was detected at a concentration of 96,300 mg/kg.

The septic tank sewer water sample did not contain detectable VOCs. The SVOC 4-chloroaniline was detected at a concentration of 4 µg/L (estimated). TPHd was detected at a concentration of 20 µg/L (estimated), and TPHmo was detected at a concentration of 89 µg/L (estimated). O&G was detected at a concentration of 464 µg/L (estimated). A number of metals were detected; however, there are no screening criteria for metals in septic tank water.

5.18.4 Conclusions and Recommendations

O&G was detected in some of the soil samples, but at relatively low concentrations (81 mg/kg and less). The soil samples were also analyzed for petroleum hydrocarbons, but detections of TPHd and TPHmo did not strictly correlate with detections of O&G (the sample with the highest O&G did not contain any detectable TPH). The source of the O&G has not been determined. The O&G may be derived from naturally occurring oils from plant organic matter. TPHd and TPHmo were detected to maximum concentrations of 15 mg/kg. The concentrations of O&G, TPHd, and TPHmo are low and do not suggest a potential threat to receptors of any type. Although significant concentrations of O&G, TPHd, and TPHmo were detected in the septic tank sludge, this has not partitioned to the septic tank sewer water in significant concentrations, and the TPH also has not partitioned to soil at significant concentrations.

Phenol was detected at concentrations of up to 1.0 mg/kg, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

No inorganic soil constituents were detected in excess of both the estimated ambient limit concentrations and residential PRGs. The septic tank sewage sludge and sewer water samples contained elevated concentrations of a few VOCs, SVOCs, and several metals. However, none of these constituents are present in the soil at detectable concentrations. Constituents of potential concern are present in the septic tank at low concentrations but have not caused a detectable impact on soils. Because of the low concentration of these constituents present in the septic tank sewer water, the potential for future impacts to soil is low, provided that hazardous materials are not released to the septic tank. WPNSTA Concord's operating permit under RCRA prohibits such releases. Because of the low environmental risk associated with the continued operation of the septic tank and leach field system, the site is recommended for no further action under the RCRA corrective action program.

5.19 SWMU 50 - BUILDING E-108

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 50.

5.19.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 50. Figure 30 shows the locations of building E-108 and other features.

Site Description

Former building E-108 is located in a paved parking area south of the intersection of Christenbury Road and Born Road. Building E-108 was the boiler house that supplied heat to barracks located in this area. A 500-gallon fuel oil UST (E-108) was used to fire the boilers. The building was declared surplus in March 1965 and was removed from the site. It is not known whether the UST designated E-108 was removed or abandoned in place; however, excavations in the area where the most concentrated soil contamination has been observed have failed to uncover a UST. Based on the excavations to date, it appears that the UST was probably removed.

Building E-85 lies to the south of former building E-108. A 1,500-gallon fuel oil UST is located at the northeast corner of building E-85.

Previous Investigations

SWMU 50 was not identified in the RFA. The SWMU was designated as a management unit by the Navy because of the hydrocarbon contamination found in the site soils.

Construction to repair the parking lot north of building E-85 began in 1994. While leveling the parking lot, the foundation for the old boiler house was encountered. To determine the depth of the foundation, a test hole was excavated adjacent to the southwest corner of the foundation using a backhoe. Discoloration of the soil from 4 to 6 feet bgs and a small amount of organic matter at 6 feet bgs were observed. Samples of the soil and groundwater were collected on December 30, 1993, and analyzed for TPHd. The analysis showed the presence of TPHd in water and in soil at 2 feet and 4 feet. TOG was also detected in water. Additional holes were excavated 20 feet to the north, south, west, and east on January 20, 1994. The results showed that the TPHd was not present in soil samples from the north and east holes, but was present in the west hole (E-85 West). No TPHd was detected in the south hole, but

the soil was discolored. A groundwater sample was also collected from the monitoring well (MW1) adjacent to UST E-85. The results showed the presence of nondiesel petroleum hydrocarbons.

Harding Lawson Associates conducted an investigation in the vicinity of building E-85 on September 10, 1993. A soil boring (No. 7) was drilled adjacent to the building E-85 UST to a depth of 10 feet bgs and sampled at 4.25 and 7.5 feet bgs. The results indicated TPHd was present in the soil samples. TPHd was also detected in groundwater, which was encountered at 10.0 feet bgs.

5.19.2 RFA Confirmation Study Sampling

Soil and groundwater investigations were performed at SWMU 50 to evaluate the site for hydrocarbon contamination. These investigations are discussed below.

Soil

The objective of the soil sampling and analysis at the site was to confirm and evaluate the lateral and vertical limits of hydrocarbon contamination.

Borings were advanced to depths of 1 to 5 feet bgs (50-01, 50-02, 50-05, 50-06, 50-07, and 50-08) at locations north of building E-85 to evaluate the depth and lateral extent of soil contamination at the site. Two monitoring wells (50-03 and 50-04) were installed northwest of the former boiler house (building E-108).

All soil samples were analyzed for TPHd, TPHmo, and BTEX. The soil samples in borings 50-01, 50-02, 50-03, and 50-04 were also analyzed for O&G.

Groundwater

The objective of the groundwater sampling was to confirm and delineate hydrocarbon impacts to groundwater. Water samples were collected from the two new monitoring wells (50-03 and 50-04) and monitoring well MW-1, adjacent to UST E-85, in April 1995. The groundwater gradient and flow direction was determined from measurements of the groundwater elevations from these wells. The groundwater samples were analyzed for TPHd and TPHmo.

5.19.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Tables 23A and 23B and on Figure 30.

Soil

TPHd was detected in four of the 16 soil samples analyzed at SWMU 50. The maximum concentration of TPHd detected was 5,700 mg/kg. Only one sample contained TPHd at a concentration of greater than 500 mg/kg.

TPHmo was more widely detected than TPHd and was found in 11 of the 16 soil samples and at a maximum concentration of 1,800 mg/kg. Although the occurrence of TPHmo was more widespread, seven of the detectable results were at concentrations less than 100 mg/kg. The TPHmo was generally detected at higher concentrations where TPHd was detected, although TPHmo was not detected at the location where the highest concentration of TPHd was found. However, the TPHmo detection limit for that sample was elevated to 600 mg/kg.

BTEX constituents were detected in several samples although benzene was detected only once, at a concentration of 0.002 mg/kg. Ethylbenzene was detected in two samples at concentrations of up to 0.3 mg/kg. Toluene was detected in three samples at concentrations of up to 0.09 mg/kg. Total xylenes were detected in five samples at concentrations of up to 0.8 mg/kg.

Groundwater

Detectable TPHd (estimated 130 µg/L) and TPHmo (estimated 550 µg/L) were present only in the water sample from well 50-03. BTEX was not detected in any water sample.

5.19.4 Conclusions and Recommendations

All significant occurrences of TPHd, TPHmo, and BTEX are from borings 50-02, 50-05, and 50-06. Lower concentrations of these constituents are found in surrounding borings 50-01, 50-07, and 50-08 and in sample E-85N.

The lateral limits of soil contamination at the site appear well-defined and groundwater contamination with TPH is present in well 50-03. Because of the detectable hydrocarbon contamination, this site has known impacts to groundwater; however, the severity of the impacts have been measured only once. The extent of the groundwater contamination has not yet been delineated. The management strategy for closure of this site should be implemented under the Navy's UST program because of the known impacts to groundwater and the lack of RCRA authority for petroleum releases.

One of the following two management strategies are recommended for closure of the site under the Navy's UST program.

1. Excavate and remove the significantly contaminated site soils to remove the source of contamination to groundwater. At present there is no state or federal guidance for the selection of a soil remediation cleanup goal. The scientific determination of a remediation goal would require significant time and money. Because of the small size of this site and limited volume of contaminated material, it would be more cost effective and expedient to select a remediation goal that will reduce the source of TPH contamination to groundwater. A remediation goal for all soil containing TPHd or TPHmo at concentrations exceeding 500 mg/kg is recommended.

   After the contaminated soil exceeding the cleanup goal has been removed, quarterly or yearly groundwater monitoring would be required to demonstrate that the site's effect on groundwater is improving. After monitoring groundwater at the site, a petition to close the site would be forwarded to the regulatory agencies for review and approval.

2. Drill one or more groundwater monitoring wells to delineate the lateral extent of groundwater contamination. Petition the regulatory agencies to establish a "zone of compliance" and negotiate the terms of groundwater monitoring necessary to petition for site closure.

Each of these site management techniques depend on the results of future work; therefore, the duration of the closure is unknown at this time. However, either of the above management strategies (or some combination of the two) is recommended rather than the active removal and treatment of groundwater. Active groundwater remediation may not be technically feasible or cost-effective because of the clayey subsurface conditions and low concentrations of TPH that currently exist.

5.20 SWMU 51 - BUILDING IA-56

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 51.

5.20.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 51. Figure 31 shows the locations of building IA-56 and other features.

Site Description

Building IA-56 is at the old airport at the end of Beckman Road. Past operations of building IA-56 are not documented. It is believed that it was an administration building for the runway located at the site. The building is now being used as a forklift operator training school.

Building IA-56 has a sink and sanitary sewer system that drains through a 6-inch cast iron pipe into a septic tank about 50 feet northeast. The drain field was replaced in 1991, but the septic tank was not. The old drain field is located east of the new drain field, which partially overlaps the old drain field. The outlet of the septic tank connects to a splitter box, located about 25 feet north, via a 6-inch cast iron pipe. The splitter box divides effluent from the septic tank six ways through 4-inch-diameter polyvinyl chloride perforated pipes. The buried leach field trenches are about 2 feet wide and 3.5 feet deep.

Previous Investigations

SWMU 51 was not identified in the RFA. The SWMU was designated as a management unit by the Navy because of the presence of a septic tank that may have released hazardous constituents to the environment.

The septic tank was sampled on August 17, 1993. SVOCs detected in the liquid sample were benzoic acid, 4-methylphenol, and phenol.

5.20.2 RFA Confirmation Study Sampling

Soil sampling and septic tank investigations were performed at SWMU 51. These investigations are discussed below.

Soil

The objective of soil sampling at SWMU 51 was to investigate potential leakage of hazardous wastes from the septic tank and from the leach field system to subsurface soils. Two soil borings were advanced to 15.5 feet bgs (51-01 and 51-02). All soil samples were analyzed for metals, O&G, VOCs, and SVOCs.

Septic Tank

The objective of the septic tank sampling was to determine whether hazardous constituents were present within the tank. A sample of the septic tank sewer water was collected and analyzed for VOCs, SVOCs, metals, and O&G.

5.20.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 24A and on Figure 31.

Soil

VOCs and SVOCs were not detected in any of the soil samples collected at SWMU 51 except for the SVOC phenol, which was detected at a concentration of up to 0.9 mg/kg in five of the six soil samples. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg.

O&G was detected in each of the six soil samples analyzed at the site at concentrations ranging from 37 to 230 mg/kg. Although the maximum concentration of O&G detected was 230 mg/kg, no other sample exceeded a concentration of 100 mg/kg.

Metals were detected, but none was present above either the residential PRGs or the estimated ambient limit concentrations except for beryllium, which was detected at a maximum concentration of 0.41 mg/kg.

Septic Tank

The septic tank sewer water was sampled and analyzed. A complete list of analytical results is presented on Table 29.

VOCs were not detected in the septic tank sewer water sample. Three SVOCs were detected, including 4-methylphenol (98 µg/L [estimated]), bis(2-ethylhexyl)phthalate (8 µg/L [estimated]), and phenol (24 µg/L [estimated]). O&G was detected at a concentration of 28 µg/L (estimated). A number of metals were detected; however, there are no screening criteria for metals in septic tank water.

5.20.4 Conclusions and Recommendations

O&G was detected in all of the soil samples; however, it was generally detected at relatively low concentrations (100 mg/kg and less). The source of the O&G has not been determined. Because the soil samples were not analyzed for petroleum hydrocarbons, the analyses are inadequate to determine whether the O&G is derived from naturally occurring oils from plant organic matter or from petroleum hydrocarbons. In either case, however, the concentrations are not high (including the 230 mg/kg detected) and do not suggest a potential threat to receptors of any type.

Phenol was detected at concentrations of up to 0.9 mg/kg, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

No inorganic constituents were detected in soil exceeding both the estimated ambient limit concentrations and PRGs except for beryllium which was detected at a concentration of 0.41 mg/kg. The residential PRG for beryllium is 0.14 mg/kg, and the industrial PRG is 1.1 mg/kg. The estimated ambient limit concentration for beryllium at SWMU 51 is 0.12 mg/kg. The low incidence of beryllium concentrations exceeding the estimated ambient limit concentration suggests that a relatively low volume of soil exceeds the criteria. A low volume of potentially impacted soil tends to limit the soil's ability to

act as a source of contamination to other areas and limits the risk associated with direct exposure. The potential for future migration or leaching of beryllium is low because it tends to adsorb to fine-grained soil. Beryllium was not detected in the septic tank sewer water. Because the beryllium exceeds the residential PRG by a slight margin, does not exceed the industrial PRG, has a low detection frequency, is unlikely to migrate, and was not detected in the septic tank water, no further evaluation or investigation of the beryllium detected in soil is recommended.

The septic tank sewer water sample contained detectable concentrations of three SVOCs and metals. However, none of these constituents are present in the soil at detectable concentrations or concentrations exceeding PRGs or estimated ambient limit concentrations (except for phenol and O&G at low concentrations). Therefore, constituents of potential concern are present in the septic tank at low concentrations, but have not caused a detectable impact on soils (or significant impact in the case of phenol and O&G). Because of the low concentration of the constituents present in the septic tank sewer water, the potential for future impacts to soil is low, provided that additional hazardous materials are not released to the septic tank. WPNSTA Concord's operating permit under RCRA prohibits such releases. Because of the low environmental risk associated with the continued operation of the septic tank and leach field system, the site is recommended for no further action under the RCRA corrective action program.

5.21 SWMU 52 - BUILDING 7SH5

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 52.

SWMU 52 is located at the same site as IR Site 22. IR Site 22 is currently undergoing a RI; however, SWMU 52 was identified as a SWMU due to an existing septic tank and leach field system which is present at the site. As such, the SWMU designation is specifically associated with the operation of septic tank that services the building included in IR Site 22. Previous investigations of IR Site 22 are discussed in the sections that follow.

5.21.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 52. Figure 32 shows the locations of building 7SH5 and other features.

Site Description

SWMU 52 is located between Sixteenth and Seventeenth Streets, along the southwest portion of the Inland Area. Building 7SH5 was built in 1944 as an inert storehouse (Navy 1944) and converted to a missile wing and fin repair facility around 1957 (Navy 1957). The building is currently used for manufacturing mobile laboratories to be used during explosive ordnance evaluation activities. Historical activities at the building have included paint stripping, cleaning, and repainting missile wings and fins. The maintenance activities primarily used acetone, trichloroethane, methyl ethyl ketone, chloroethane, and several types of paint thinners. The quantity of wastes generated from activities in the building was probably less than 100 gallons per year. From 1970 to 1978, the Tidal Area Landfill (IR Site 1) reportedly received all wastes from Building 7SH5. After 1978, generated wastes have been disposed of off base (Ecology & Environment 1983).

The following are potential areas of contamination identified during previous investigations including the RI by PRC (PRC 1996). During the initial assessment study, there was suspected disposal of paints, oil, and solvents generated from Building 7SH5 in a 24-inch-deep earthen disposal pit or into a nearby drainage ditch near Building 7SH5 (Ecology & Environment 1983). The location of the disposal pit was determined by IT Corporation to be in the parking lot to the west of the south corner of Building 7SH5 (Figure 32), where a section of the pavement is missing. This alleged disposal practice has ceased, and the disposal pit has been backfilled (IT 1989). The procedure used to abandon the disposal pit is not known.

A 1,000-gallon steel UST for storing diesel is located along the west wall adjacent to the building. The UST was installed in 1944 to supply fuel to the three heaters in the building (Navy 1944). It is likely that the UST was filled by a railroad tanker car through a fill pipe located at the southeast corner of Building 7SH5, next to the railroad tracks. The fill pipe runs to the UST, approximately 3 feet bgs and 10 feet away from the building, along the southwest side of the building. Staining is visible on the ground surface around the fill pipe. Workers inside the building indicated that during a pressure test of the UST,

an unknown quantity of fuel was forced out the end of the fill pipe and onto the ground. Currently, the UST is filled by truck at a fill pipe next to the UST. The three heaters inside the building are connected to the UST by two 0.5-inch lines. These lines run approximately 5 feet from the western wall.

A concrete sand filter box (sump), 3.5 feet long by 2 feet wide, is located near the south corner of Building 7SH5. The sump has two chambers containing gravels and sands ranging from 3/8-inch gravel to 0.6-millimeter sand that screen particles from liquid. Construction drawings indicate that the sump may have been connected to Building 7SH5 and possibly to a paint booth (Navy 1975). The sump discharges to the earthen drainage ditch at the south end of the building, where a 4-inch polyvinyl chloride pipe is visible. The construction drawings show the drain pipe having 0.25-inch open slots and surrounded by gravel fill (Navy 1975). The sump is currently empty, and the paint booth inside Building 7SH5 is not used.

A 1.25-inch galvanized steel drain pipe is located along the western wall of Building 7SH5, near the UST. Construction drawings show that the drain was used for an environmental chamber that tested missile components exposure to water (Navy 1960). The drain is visible exiting the building but cannot be located within the western ditch. Construction drawings show the drain to be approximately 12 inches below existing grade and discharging into the ditch approximately 2.5 feet from the bottom (Navy 1960). The drain is currently not used and is plugged inside the building.

Building 7SH5 has a sink and on-site sanitary sewer system that drain into a 500-gallon septic tank through a 4-inch vitrified clay pipe. The septic tank is located about 18 feet northwest of building 7SH5. The septic tank is completely covered with soil to a depth of approximately 1.5 feet below the existing grade. The distribution box from the tank splits the effluent into four 4-inch, open joint unglazed clay pipes that run parallel to the drain field and are about 8 feet apart. Each leach field trench is about 2 feet wide and 3.5 feet deep. The septic system currently receives wastes from the toilets, sink, and a service sink inside the building.

A 1.5-inch galvanized steel drain line is located at the north end of Building 7SH5. The drain line is approximately 84 feet long and is visible at the top of the drainage ditch to the north of the building. The drain is currently not used. The exact use of the drain line is unknown; it may have been used to drain steam condensate from inside the building.

Previous Investigations

The following sections describes the five previous investigations conducted in the area of Building 7SH5. SWMU 52 was not identified in the RFA. The SWMU was later designated as a management unit by the Navy because of the presence of a septic tank that could contain hazardous waste and the potential for releases of these constituents to the environment from the leach field system.

Initial Assessment Study

A visual inspection of the site was conducted by Ecology and Environment during the IAS in 1983. No visual environmental impact was noted during the inspection (Ecology and Environment 1983).

This site was eliminated from consideration after the IAS because of the small quantity of wastes that might be present. Because of changes in regulations since the IAS (that is, CERCLA and Superfund Amendments and Reauthorization Act [SARA]) and the absence of records on disposal activities and pit abandonment, this site was included in the SI as IR Site 17 to determine whether it poses an environmental or health hazard under current regulations.

Site Investigation

The site investigation at IR Site 22 was conducted by PRC in June 1992 and included collecting and analyzing soil samples from three soil borings within the suspected disposal pit and collecting and analyzing one composite surface soil sample from the bottom of the drainage ditch.

Three soil borings were completed within the backfilled disposal pit. Two soil samples were collected from each of the three soil borings within the backfilled disposal pit at depths of approximately 2 and 4 feet bgs. The soil samples were analyzed for VOC, SVOCs, metals, tributyltin (TBT), TPH-purgeables, and TPH-extractables. The soil sample at the 3.5 foot depth from boring SB-1 contained TPHd at a concentration of 14.6 mg/kg. The sample at the 2-foot depth in the same soil boring did not contain any TPHd.

Three surface soil samples were also collected from the drainage ditch parallel and adjacent to Seventeenth Street. The three soil samples from the ditch were composited into one sample in the

laboratory for chemical analysis. The soil sample was analyzed for VOC, SVOC, metals, TBT, TPH-purgeables, and TPH-extractables. The composited soil sample contained TPHd at 9.23 mg/kg and toluene at 13 mg/kg.

UST Investigation

The UST located west of Building 7SH5 was investigated by Harding Lawson Associates in September 1993. A soil boring (No. 2) was drilled to a depth of 16.5 feet bgs and sampled at depths of 4.5, 8, and 16 feet. The soil sample results indicated that TPHd was present at 4.5 and 8 feet bgs at concentrations of 7,700 mg/kg and 1,600 mg/kg, respectively (Harding Lawson Associates 1995). SVOCs detected in the 4.5-foot soil sample included acenaphthene, fluorene, 2-methylnaphthalene, and naphthalene. The SVOC detected in the 8-foot soil sample was naphthalene. No SVOCs was detected in the 16-foot sample. The UST is scheduled for removal in late 1996.

Septic Tank Sampling

Analytical results of samples collected from the septic tank on October 9, 1990, indicated the presence of TOG, SVOCs including 4-methylphenol, and VOCs including 1,4-dichlorobenzene, toluene, and total 1,2-dichloroethene. An additional sample collected on August 17, 1993 contained the SVOCs 1,4-dichlorobenzene, 4-methylphenol, and naphthalene.

Phase I Remedial Investigation/Feasibility Study

In 1995, three areas around Building 7SH5 were sampled to gather data for the RI/FS (PRC 1995). These areas include the suspected disposal pit area, the drainage ditches, and the UST and associated piping. The Phase I RI/FS report from the Inland Areas, which includes IR Site 22, will be available in late 1996.

The suspected disposal pit area was excavated to approximately 5 feet bgs, and 12 soil samples were collected and analyzed for VOCs, SVOCs, TPH-extractables, and metals to determine whether this area was used to dispose of waste liquids. No VOCs and SVOCs were detected in any soil samples. TPHmo was detected only at the surface and to a depth of 4 feet bgs at a maximum concentration of 250 mg/kg.

Three soil borings (SB015, SB024 through SB027) were completed around Building 7SH5 in the drainage ditches along the south and west sides of the site to determine whether any waste was dumped into the ditches. Samples were analyzed for SVOCs, TPH-extractables, and metals.

Most surface soils at the site contained concentrations of arsenic that exceeded residential and industrial PRGs and the estimated ambient limit concentration. The maximum concentration of arsenic detected was 127 mg/kg in the surface soils. The source of the arsenic has not been determined. However, based upon the results of a human health risk assessment performed during the RI, the arsenic does not elevate the site risk beyond the risk range of $1x10^{-4}$ for excess cancer risk. SVOCs and TPH were detected in some of the samples at low concentrations.

To further define the extent and magnitude of soil contamination associated with the UST piping, nine shallow soil borings, SB001 through SB009, were advanced along the UST pipeline along the south and southwest side of Building 7SH5. Nine soil samples were collected and analyzed for VOCs, SVOCs, and TPH-extractables. TPHd was detected at two locations, next to the UST fill pipe in borings SB001 (35,000 mg/kg) and boring SB002 (370 mg/kg).

The soils from two of the deep borings (SB010 and SB011) were logged from the soil samples collected at IR Site 22. The soil at the site consists mostly of clay mixed with sands, gravels, and silts. The top 5 feet of soil is mostly a sandy soil that may be a fill material associated with site construction activities or utility line construction. The top of the water-bearing zone is located approximately 30 feet bgs, in a sandy and gravelly clay. The depth to groundwater at the site was determined from the well casing installed in the open boreholes. From these groundwater elevations measured May 5, 1995, the shallow groundwater flow direction appears to be approximately due west.

Groundwater samples were collected from each of the three deep borings. Samples were analyzed for VOCs, SVOCs, and TPH-extractables. The three groundwater samples contained TPHmo ranging from 630 to 380 µg/L. Two VOCs were also detected in groundwater: trichloroethene was detected at SB010 (27 µg/L), and trichloroethane (TCA) was detected in groundwater at SB011 (2 µg/L) and SB012 (1 µg/L). The MCL for trichloroethene in the groundwater is 5 µg/L (RWQCB 1995)

The data from previous sampling events for IR Site 22 indicate a release of TPH to soil and groundwater near Building 7SH5. This release is most likely from the UST, supply lines, and fill pipe near the

building. The groundwater also contained TCA and trichloroethene. The source of the VOCs is unknown but is most likely from past operations in the building.

Based upon the results of the phase I RI, a phase II site investigation is proposed to further characterize the vertical and lateral extent of soil and groundwater contamination. The phase II investigation is also intended to identify the source or sources of TPH and VOC contamination.

5.21.2 RFA Confirmation Study Sampling

Although an RI is under way in the vicinity of SWMU 52 (at IR Site 22), these investigations have not been concerned with the septic tank and leach field system at SWMU 52. Soil, surface water, and septic tank investigations were conducted at SWMU 52. These investigations are discussed below.

Soil

The objective of soil sampling at SWMU 52 was to investigate potential leakage of hazardous wastes from the septic tank and from the leach field system to subsurface soils. Two soil borings were installed to depths of 15 feet bgs (52-01 and 52-02) and two soil borings were installed to depths of 3.5 and 2 feet bgs (52-03 and 52-04).

Surface Water

The objective of surface water sampling was to evaluate whether potential releases from the septic tank and leach field system may have caused impacts to surface water. One surface water sample (52-SW014) was collected from accumulated standing water in one of the ditches during the field activities. The surface water sample was analyzed for VOCs, SVOCs, metals, and O&G.

Septic Tank

The objective of the septic tank sampling was to determine whether hazardous constituents were present within the tank for eventual release to soil or groundwater from the leach field system. The septic tank sewer water sample was analyzed for VOCs, SVOCs, metals, and O&G.

5.21.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 25A and 25B and on Figure 32.

Soil

None of the soil samples contained detectable VOCs or SVOCs except for the SVOC phenol, which was detected at concentrations up to 1.0 mg/kg in four of the 10 soil samples. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg.

Three of the soil samples contained O&G at a maximum concentration of 280 mg/kg.

Metals were not detected at concentrations exceeding either the residential PRGs or the estimated ambient limit concentrations except for arsenic and lead. Arsenic was detected at concentrations of 38.0 and 65.4 mg/kg in the surface samples from borings 52-03 and 52-04 and at a concentration of 20.7 mg/kg from boring 52-03 at a depth of 3.5 feet. Lead was detected at a concentration of 165 mg/kg in the surface soil sample from boring 52-03.

Surface Water

The surface water sample did not contain detectable VOCs, SVOCs, or O&G. However, metals were detected, including copper (estimated 21.5 μg/L) and lead (estimated 23.3 μg/L), which exceeded the following criteria. Copper exceeded the EPA's freshwater acute ambient water quality criteria (AWQC) (18 μg/L) and lead exceeded the EPA's freshwater chronic AWQC (3.2 μg/L). Lead did not exceed the freshwater acute AWQC (83 μg/L). The surface water sample was not filtered. Copper and lead are normal constituents of soil colloids and detections of these constituents at these concentrations are to be anticipated in unfiltered water samples. The detected concentrations are likely to be principally associated with soil colloids and, therefore, do not reflect significantly elevated copper and lead in surface water from the ditch.

Septic Tank

A sample of the septic tank sewer water was also analyzed and a complete list of analytical results is presented in Table 29. The septic tank sewer water contained a concentration of 100 μg/L (estimated) of 1,2-dichloroethene, and an estimated 4 μg/L of carbon disulfide. No other VOCs were detected. SVOCs were generally not detected except for concentrations of 1,4-dichlorobenzene (190 μg/L [estimated]), 4-methylphenol (180 μg/L [estimated]), and phenol (31 μg/L [estimated]). A concentration of 11 μg/L (estimated) O&G was detected. A number of metals were detected; however, there are no screening criteria for metals in septic tank water. There is no correlation between the detected arsenic and lead detected in the surface soils and the detection of these metals in the septic tank water because the only elevated concentrations of these constituents in soil were detected at the ground surface.

5.21.4 Conclusions and Recommendations

O&G was detected in four of the 11 soil samples. The O&G was generally detected at relatively low concentrations (280 mg/kg and less). The source of the O&G has not been determined. Because the soil samples were not analyzed for petroleum hydrocarbons, the analyses are inadequate to determine if the O&G is derived from naturally occurring oils from plant organic matter or from petroleum hydrocarbons. However, in either case, the concentrations are not high (including the 280 mg/kg detected) and do not suggest a potential for constituent mobility or a threat to receptors of any type.

Phenol was detected at concentrations of up to 1.0 mg/kg, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

No inorganic soil constituents were detected exceeding both the estimated ambient limit concentrations and residential PRGs except for arsenic, which was detected in the surface soil samples from borings 52-03 and 52-04, and lead which was detected in the surface soil samples from boring 52-03. Based on the soil sampling conducted for the RI of IR Site 22, the occurrence of elevated concentrations of lead in the surface soils is not typical. The detection of lead at a concentration of 165 mg/kg in boring 52-03 does not appear significant because it only slightly exceeds the residential PRG of 130 mg/kg and its occurrence appears isolated. Lead and arsenic are not expected to migrate or leach significantly because of their tendency to adsorb to fine-grained soils.

Conversely, the occurrence of arsenic is more widespread in surface soils at the site. Surface soils in the vicinity of SWMU 52/IR Site 22 typically contain arsenic above the estimated ambient limit concentration and residential PRGs. The elevated concentrations of arsenic appear mostly within surface soils, although exceptions have been noted at IR Site 22. The lateral extent of elevated concentrations of arsenic in surface soils has not been established. There are no known former operations at IR Site 22 that used arsenic. The presence of arsenic in surface soils is not associated with the septic tank or leach field system at SWMU 52. The significance of arsenic present in the surface soils is discussed in greater detail in the RI report for IR Site 22. The RI report's evaluation of arsenic from a human health risk assessment standpoint concludes that the risk to human health from arsenic is within the acceptable risk range for industrial exposure assumptions. There is no indication that the surface soil containing arsenic is related to the septic tank or leach field system. Consequently, further investigation of the SWMU site because of the occurrence of arsenic is not recommended. Review of the occurrence of arsenic at the site should be based upon the findings of the forthcoming Site 22 RI report.

The septic tank sewer water sample contained concentrations of two VOCs, three SVOCs, and several metals. However, none of these constituents are present in the soil at detectable concentrations (except for phenol, O&G, and metals, typically at low concentrations). Chemicals are present in the septic tank at low concentrations and have not caused a detectable impact on soils (or significant impact in the case of phenol, metals, and O&G). Because of the low concentration of the constituents present in the septic tank sewer water, the potential for future impacts to soil is low, provided that additional hazardous materials are not released to the septic tank. WPNSTA Concord's operating permit under RCRA prohibits such releases. Because of the low environmental risk associated with the continued operation of the septic tank and leach field system, SWMU 52 is recommended for no further action under the RCRA corrective action program.

5.22 SWMU 53 - BUILDING 7SH14

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 53.

5.22.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 53. Figure 33 shows the locations of building 7SH14 and other features.

Site Description

Building 7SH14 was constructed during the 1940s and is located on Seventeenth Street approximately 0.75 miles south of the intersection of Kinne Boulevard and Wilden Road. The building was historically used to store munitions. The building is now used for inert storage, environmental testing, and training.

A 5,000-gallon UST is located near the southeastern corner of building 7SH14. The UST contained diesel fuel to serve oil-fired heaters inside the building. The UST is scheduled to be removed and replaced under a separate program.

Building 7SH14 has a sink and sanitary sewer system that drains through a 4-inch pipe to the inlet manhole of a septic tank. The tank connects to a splitter box through a 4-inch pipe. The splitter box divides effluent from the septic tank flow into nine 4-inch pipes which run parallel to the drain field and are about 7 feet apart.

Previous Investigations

SWMU 53 was not identified in the RFA. The SWMU was designated as a management unit by the Navy because of the presence of a septic tank that may have released hazardous constituents to the environment. Liquid samples from the septic tank were collected on October 9, 1990, and August 17, 1993. TOG was detected in the samples analyzed.

5.22.2 RFA Confirmation Study Sampling

Soils and the septic tank were sampled at SWMU 53. These investigations are discussed below.

Soil

The objective of soil sampling at SWMU 53 was to investigate potential leakage of hazardous wastes from the septic tank and from the leach field system to nearby subsurface soils. Two soil borings were advanced to depths of 15.5 feet bgs (53-01 and 53-02). The soil samples were analyzed for VOCs, SVOCs, metals, and O&G.

Septic Tank

The objective of the septic tank sampling was to determine whether hazardous constituents were present within the tank. The septic tank sewer water was analyzed for VOCs, SVOCs, metals, and O&G.

5.22.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 26A and on Figure 33.

Soil

VOCs and SVOCs were not detected except for the SVOC phenol, which was detected at concentrations up to 4 mg/kg in all of the six soil samples analyzed for SVOC at SWMU 53. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg. Metals were not detected at concentrations above both the estimated ambient limit concentrations and residential PRGs. O&G was detected at concentrations up to 110 mg/kg in five of the six soil samples analyzed.

Septic Tank

A sample of the septic tank sewer water was also collected. A complete list of analytical results from the septic tank sewer water sample is presented in Table 29.

The sewer water sample from the septic tank did not contain detectable VOCs or SVOCs except for the SVOC 4-methylphenol, which was present at a concentration of 74 μg/L (estimated). A number of metals were detected; however, there are no screening criteria for metals in septic tank water.

5.22.4 Conclusions and Recommendations

O&G was detected in some of the soil samples, but at relatively low concentrations (110 mg/kg and less). The source of the O&G has not been determined. Because the soil samples were not analyzed for petroleum hydrocarbons, the analyses are insufficient to determine whether the O&G is derived from naturally occurring oils from plant organic matter or from petroleum hydrocarbons. However, in either case, the concentrations are low and do not suggest a potential for constituent mobility or a threat to receptors of any type.

Phenol was detected at concentrations of up to 4.0 mg/kg in soil samples, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

No inorganic soil constituents were detected exceeding both the estimated ambient limit concentrations and PRGs. The septic tank sewer water sample contained an elevated concentration of one SVOC and several metals. However, neither of these constituents is present in the soil at concentrations of significance. COPCs are present in the septic tank at low concentrations but have not caused a detectable impact on soils. Because of the low concentration of the constituents present in the septic tank sewer water, the potential for future impacts to soil is low, provided that hazardous materials are not released to the septic tank. WPNSTA Concord's operating permit under RCRA prohibits such releases. Because of the low environmental risk associated with the continued operation of the septic tank and leach field system, the site is recommended for no further action under the RCRA corrective action program.

5.23 SWMU 54 - BUILDING 79

This section presents the site background, RFA confirmation study sampling, investigation results, and conclusions and recommendations for SWMU 54.

5.23.1 Site Background

This subsection provides the site description and summary of previous investigations for SWMU 54. Figure 34 shows the locations of building 79 and other features.

Site Description

Building 79 was constructed during the 1950s and is located at the intersection of Kula Gulf Street and Coral Sea Road approximately 0.25 miles north of Kinne Boulevard. Building 79 housed the Reaction Fast Force, a group of 20 to 30 Marines. The facility maintained a kitchen and restrooms for the Marines. After being abandoned in the mid-1980s, plans were drawn up to convert the building into an x-ray facility. Construction began but was never completed. The building is no longer used.

Building 79 has an old septic tank and drain field system that was abandoned in 1978. The old septic tank was located about 60 feet east of the building. The old drain field, which is about 60 feet by 120 feet, is located just north of the Alpha area and about 80 feet east of building 79. The 6-inch vitrified clay pipe connected to the old septic tank was plugged with concrete.

A new sink and sanitary sewer system drains into a 2,175-gallon septic tank through a 4-inch vitrified clay pipe. The new septic tank is located about 80 feet west of building 79 and is completely covered with dirt. The outlet of the septic tank sends the effluent into a distribution box through a 4-inch vitrified clay pipe. The distribution box splits the effluent into 10 4-inch open-joint leach field pipes. The leach field drain trenches are about 2 feet wide and 2.5 feet deep.

Previous Investigations

SWMU 54 was not identified in the RFA. The SWMU was designated as a management unit by the Navy because of the presence of a septic tank that may have released hazardous constituents to the environment.

TOG was detected in a liquid sample collected from the septic tank on August 17, 1993. SVOCs including 1,3-dichlorobenzene and 2,4-dichlorophenol were also detected.

5.23.2 RFA Confirmation Study Sampling

Soils and the septic tank were sampled at SWMU 54. These investigations are discussed below.

Soil

The objective of soil sampling at SWMU 54 was to investigate potential leakage of hazardous wastes from the septic tank and leach field system to nearby subsurface soils. Four soil borings were advanced to depths of 15 to 15.5 feet bgs (54-01, 54-02, 54-03, and 54-04) in the area of the drain fields and septic tanks. All soil samples collected were analyzed for metals, O&G, VOCs, and SVOCs.

Septic Tank

The objective of the septic tank sampling was to determine whether hazardous constituents were present within the tank. A septic tank sewer water sample was collected and analyzed for VOCs, SVOCs, metals, and O&G.

5.23.3 Investigation Results

This subsection presents the investigation results. Analytical results are presented in Table 27Aand on Figure 34.

Soil

No VOCs or SVOCs were detected except for the SVOC phenol, which was detected at concentrations of up to 2.0 mg/kg in nine of the 12 soil samples analyzed for SVOCs at SWMU 54. For comparison, the EPA residential PRG for phenol is 39,000 mg/kg. No metals were detected at concentrations exceeding both the estimated ambient limit concentrations and residential PRGs. O&G was detected at concentrations of up to 160 mg/kg in 10 of the 12 soil samples analyzed.

Septic Tank

A sample of the septic tank sewer water was collected from each septic tank and a complete list of analytical results is presented in Table 29.

The new septic tank sewer water sample did not contain detectable VOCs except for bromodichloromethane, at a concentration of 1 μg/L (estimated). The sample also did not contain

detectable SVOCs except for fluoranthene (estimated 0.6 μg/L) and pyrene (estimated 0.5 μg/L). A number of metals were detected; however, there are no screening criteria for metals in septic tank water. O&G was not detected in the sewer water sample.

The old septic tank sewer water sample did not contain VOCs except for total xylenes at a concentration of 5 μg/L (estimated). SVOC were generally not detected in the sewer water sample except for the following four constituents: 1,2-dichlorobenzene (34 μg/L [estimated]), 1,3-dichlorobenzene (71 μg/L [estimated]), 1,4-dichlorobenzene (1,100 μg/L [estimated]), and naphthalene (1,100 μg/L [estimated]). Metals were detected in the sewer water sample; however there is no screening criteria for metals in septic tank water. O&G was detected in the sewer water sample at a concentration of 43.9 μg/L.

5.23.4 Conclusions and Recommendations

O&G was detected in most of the soil samples, but at relatively low concentrations (160 mg/kg and below). The source of the O&G has not been determined. Because the soil samples were not analyzed for petroleum hydrocarbons, the analyses are inadequate to determine whether the O&G is derived from naturally occurring oils from plant organic matter or from petroleum hydrocarbons. However, in either case, the concentrations are low and do not suggest a potential for constituent mobility or a threat to receptors of any type.

Phenol was detected at concentrations of up to 2.0 mg/kg in soil samples, which is substantially lower than the EPA residential PRG of 39,000 mg/kg. Because phenol detected at the site does not pose a threat to human health or the environment, no further investigation of phenol is recommended.

No inorganic soil constituents exceeded both the estimated ambient limit concentrations and PRGs. The old and new septic tank sewer water samples contained elevated concentrations of various VOCs, SVOCs, and metals. However, none of these constituents are present in the soil at concentrations of significance. Constituents of potential concern are present in the septic tanks at low concentrations but have not caused a detectable impact on soils. Because of the low concentration of these constituents present in the sewer water in each septic tank, the potential for future impacts to soil is low, provided that hazardous materials are not released to the septic tank. WPNSTA Concord's operating permit under RCRA prohibits such releases. Because of the low environmental risk associated with the continued

operation of the septic tank and leach field system, the site is recommended for no further action under the RCRA corrective action program.

6.0 CONCLUSIONS

The RFA confirmation study included performing the activities outlined in the field sampling and analysis plan as appropriate at each SWMU site and included collection of soil, surface water, groundwater, and septic tank samples; laboratory analysis of the samples; and evaluation of the analytical results.

Based on the RFA confirmation study results, 22 of the 24 SWMU sites will be appropriate for no further action under the RCRA corrective action program. As described below, 15 sites are appropriate for no further action because hazardous soil and/or groundwater conditions were not discovered. Four sites will require cleanup first before they are transferred to no further action status, and three sites are appropriate for removal from the RCRA corrective action program and transfer to the Navy's underground storage tank (UST) program because USTs containing petroleum hydrocarbons are or were present. The remaining two sites are recommended for further action as installation restoration sites under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

The recommended status of groups of sites is summarized below and a detailed summary for each site is presented in Table 32.

- Fifteen sites are recommended for no further action. Soil and/or groundwater samples collected from 14 of the 15 sites recommended for no further action did not contain concentrations of constituents that pose a threat to human health or the environment.

  One of the 15 sites (SWMU 2) is recommended for no further action under RCRA because laboratory analysis did not detect soil contamination that poses a threat to human health or the environment. Although groundwater contamination has been detected at SWMU 2, the source of constituents in groundwater does not appear related to the former site activities at SWMU 2. The source of groundwater contamination at SWMU 2 should be determined under the authority of a CERCLA remedial investigation (RI) associated with SWMUs 5 and 18 as described below.

- Four SWMU sites are recommended for cleanup activities. Following the completion of the cleanup, these sites are recommended for no further action under RCRA. Three of these SWMU sites are recommended for interim RCRA corrective actions in 1996 (SWMUs 13, 16, and 40). The interim RCRA corrective actions were recently completed at SWMUs 16 and 40. A summary of the interim RCRA corrective actions completed is being prepared by the Navy's Public Works Center, which conducted the cleanup.

At one SWMU site (SWMU 13), the septic tank contents should be removed because of the hazardous waste concentration of constituents detected. Although hazardous waste was detected in the sewer water samples, no constituents were detected in soil at concentrations that pose a threat to human health or the environment. Following removal of the septic tank contents under an interim RCRA corrective action, no further action will be appropriate. The removal of the septic tank contents at this site is scheduled for 1996.

At one SWMU site (SWMU 14), the septic tank contents should be removed as a precaution against future releases because of an elevated concentration of nickel in the septic tank water. The septic tank water is not hazardous waste and therefore does not require removal under an interim RCRA corrective action. The removal of the septic tank contents at this site is scheduled for 1996.

- Hydrocarbon-contaminated soils at three SWMU sites (SWMUs 1, 7, and 50) should be addressed under the Navy's UST program. These three sites are appropriate for no further action under the RCRA program.

- Two SWMU sites (SWMUs 5 and 18) are recommended for further investigation under the authority of a CERCLA process RI to evaluate the groundwater contamination in the Inland Area industrial area.

Three sites (SWMUs 1, 2, and 7) have hydrocarbon- or VOC-contaminated groundwater at low concentrations (up to 6 µg/L for VOCs at SWMU 1 and up to approximately 800 µg/L for hydrocarbons at SWMU 2 and 7). Although the petroleum hydrocarbons were stored storage in USTs at SWMUs 1 and 7, the soil conditions at these sites do not suggest that on-site SWMU activities are responsible for the detected constituents in groundwater. The site conditions in the immediate vicinity of these SWMUs are not recommended for further investigation under the RCRA corrective action program, and SWMUs 1 and 7 are appropriate for transfer to the Navy's UST program. SWMU 2 is recommended for no further action because soils at the site do not pose a threat to human health or the environment. Although none of the sites is recommended for further action under the RCRA corrective action program, the groundwater conditions at these sites should be investigated to evaluate the source(s) of VOCs and hydrocarbons. The investigation in the vicinity of these SWMUs should be conducted upgradient (and possibly downgradient) of each SWMU site under the authority of a CERCLA process RI that also includes SWMUs 5 and 18. A site plan illustrating the location of groundwater samples collected from SWMUs 1, 2, 5, 7, and 18 and a summary of all the analytical results is presented on Figure 35.

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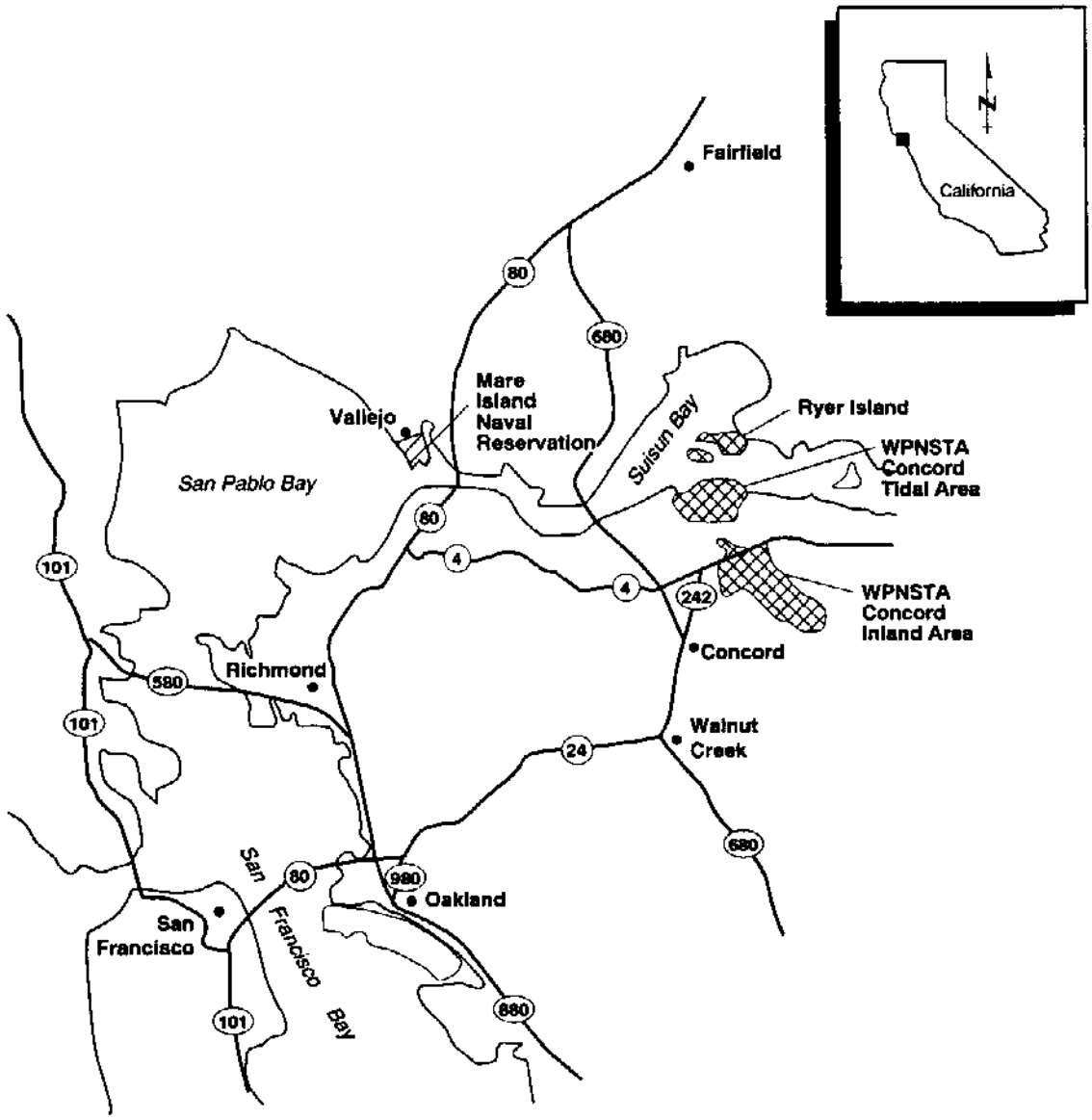


LEGEND:

WPNSTA Concord Property

N

0 5 10

SCALE IN MILES

7/93 CO

FIGURE 1
NAVAL WEAPONS STATION CONCORD

REGIONAL LOCATION MAP

Figures 2 and 3

These detailed station maps have been deleted from the Internet-accessible version of this document as per Department of the Navy Internet security regulations.

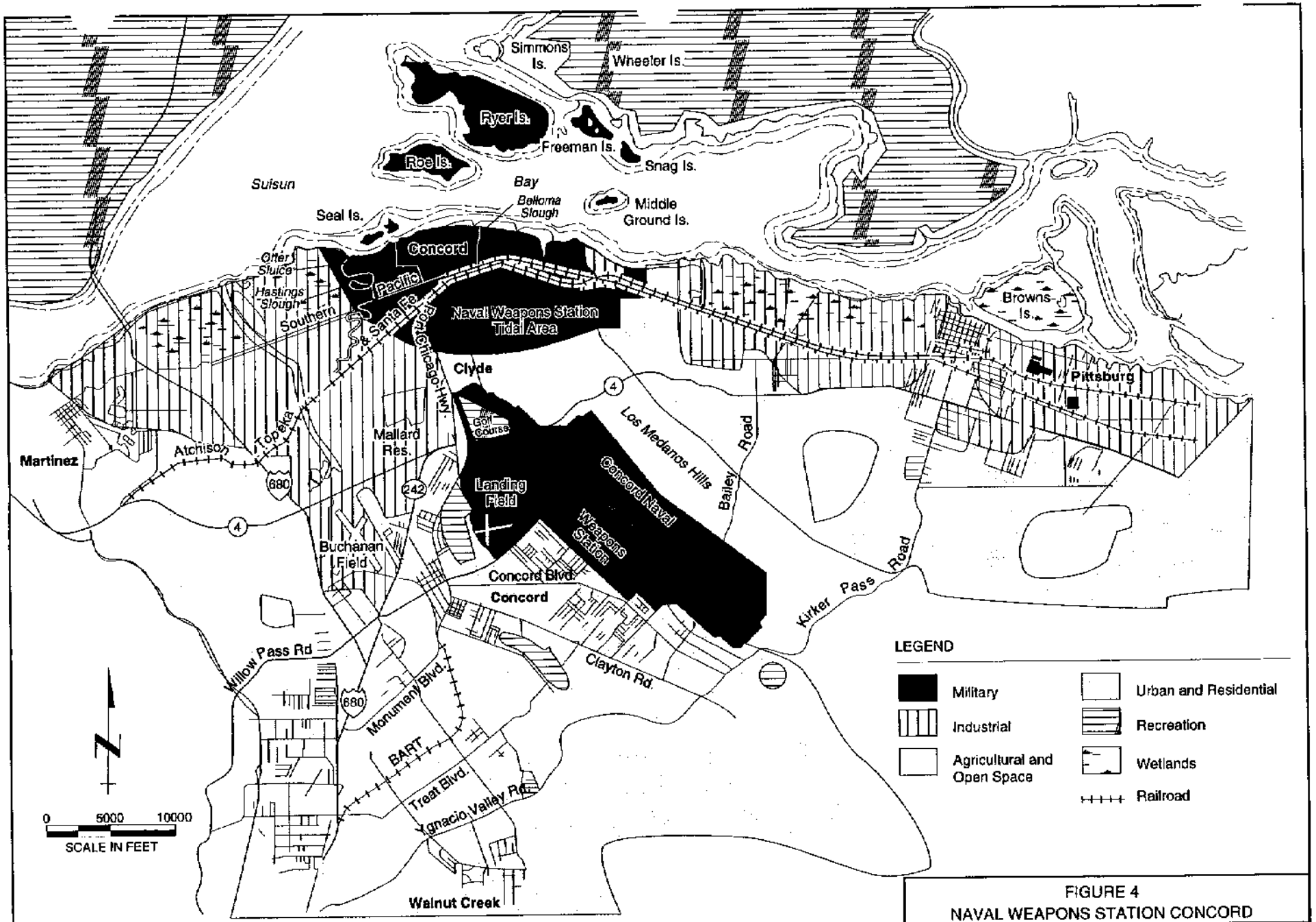
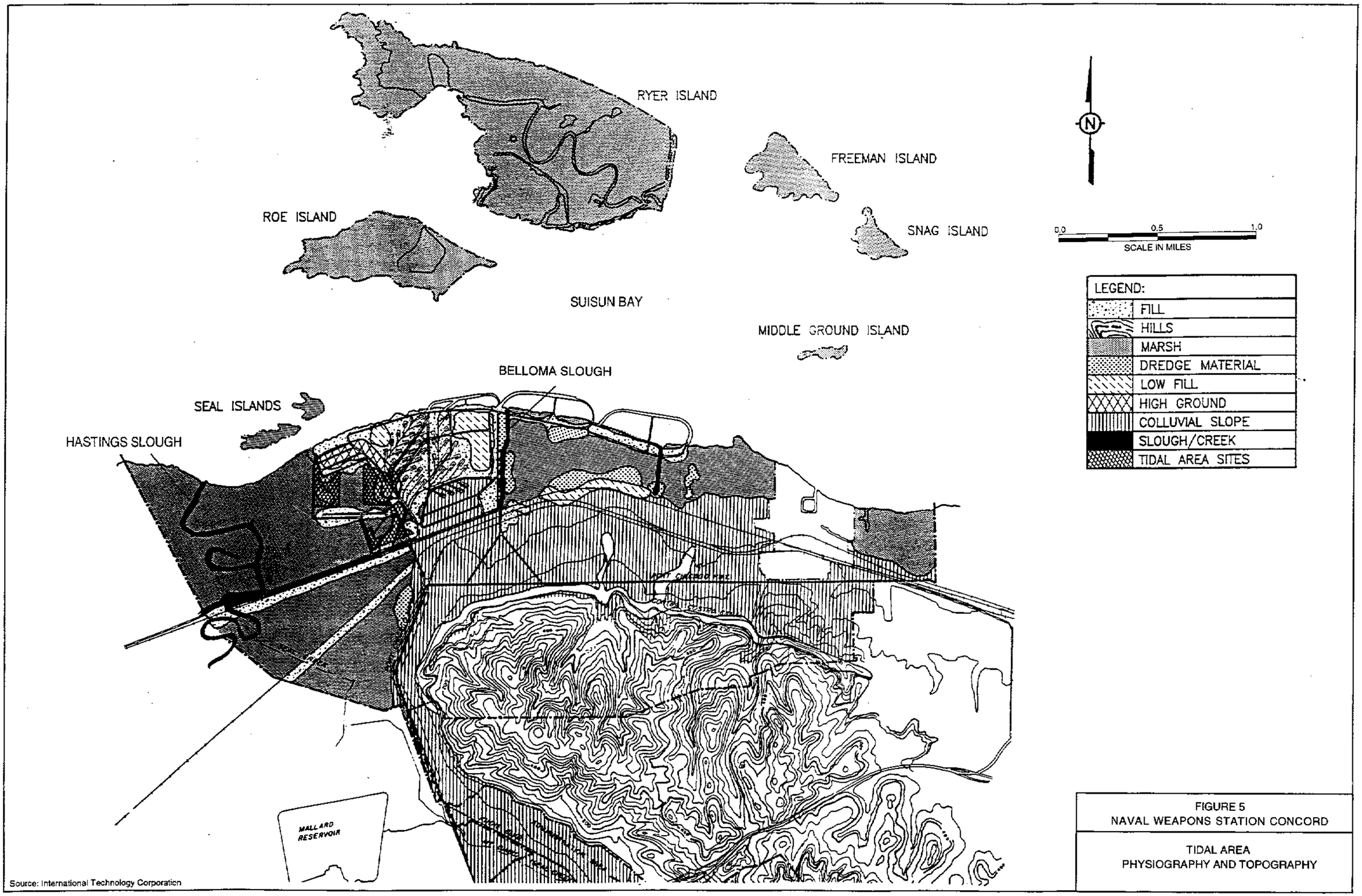


FIGURE 4
NAVAL WEAPONS STATION CONCORD

LAND USE AND TRANSPORTATION

SOURCE DRAWING: FIGURE 2-4, IT VOLUME I, DRAFT WORK PLAN, JUNE 1989

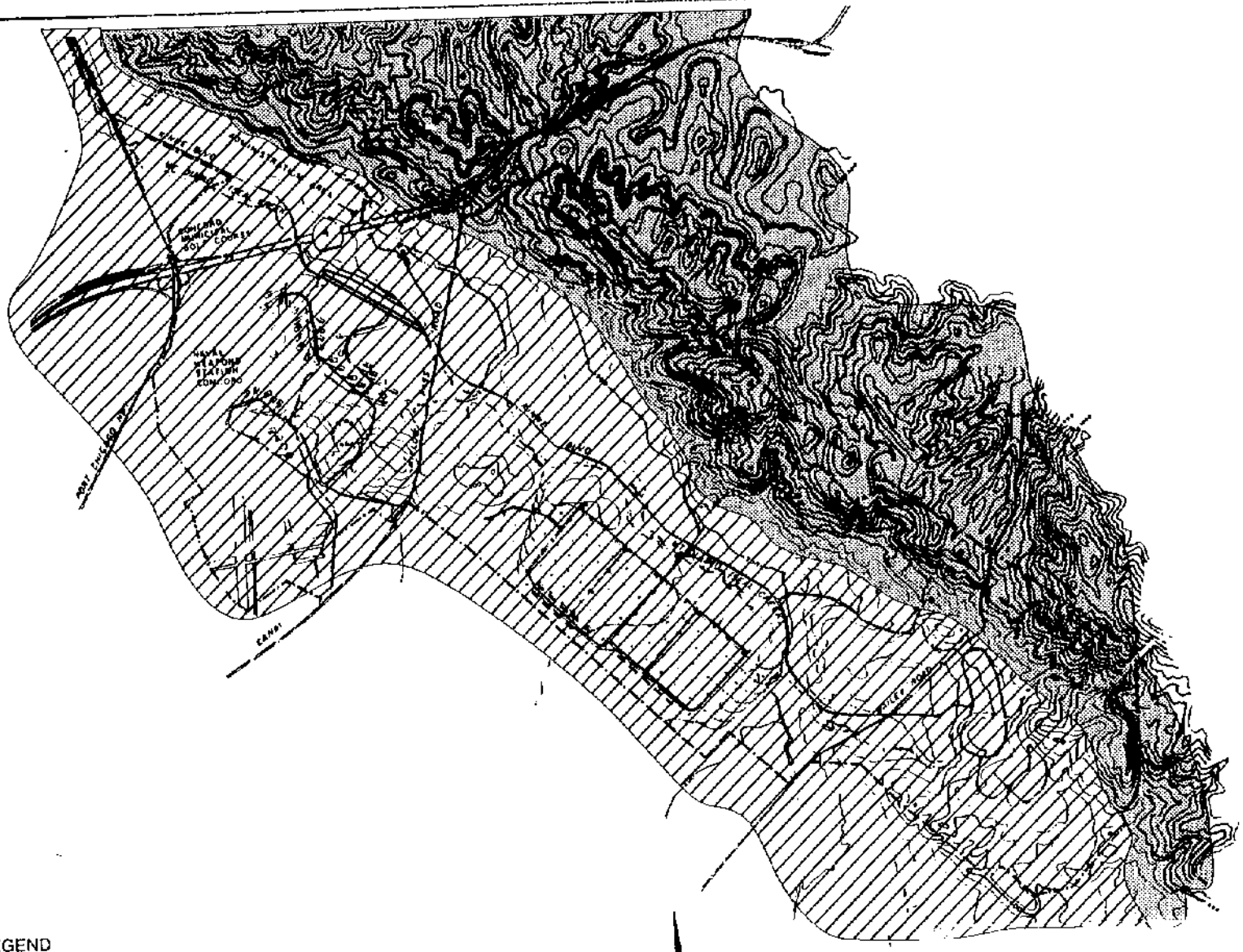
06/96.CO



Source: International Technology Corporation

FIGURE 5
NAVAL WEAPONS STATION CONCORD

TIDAL AREA
PHYSIOGRAPHY AND TOPOGRAPHY



LEGEND

Colluvial Slope

Hills

Site Boundary

N

0 1000 2000

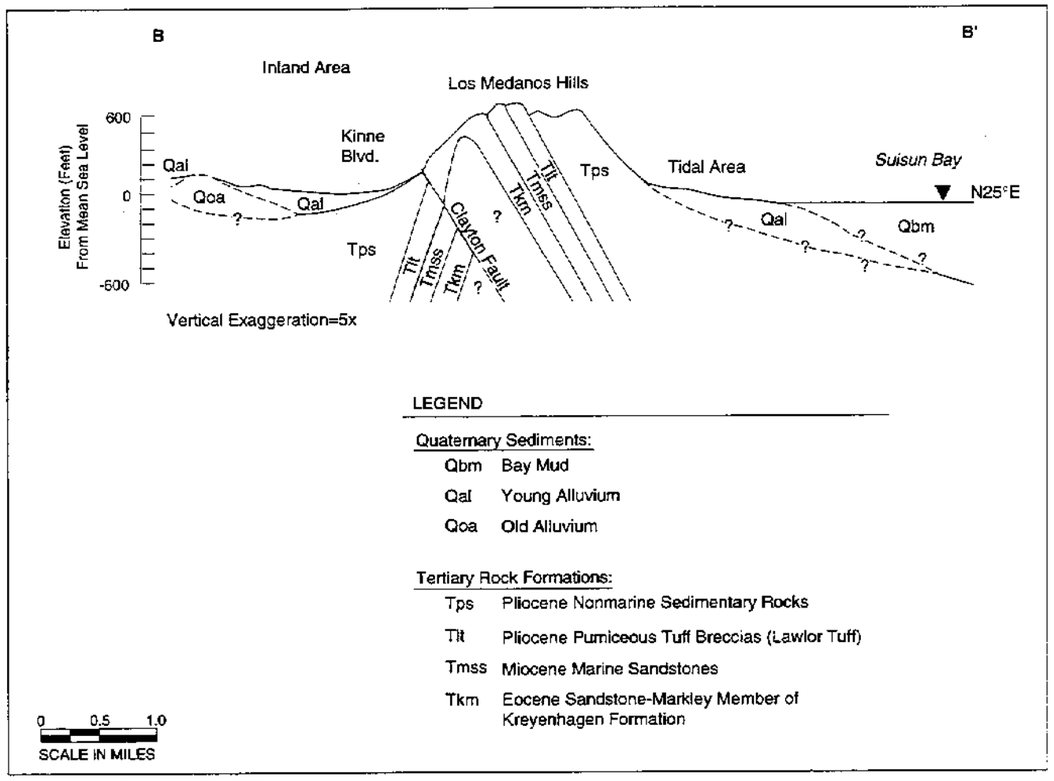
SCALE IN FEET

06/96.CO

FIGURE 6
NAVAL WEAPONS STATION CONCORD

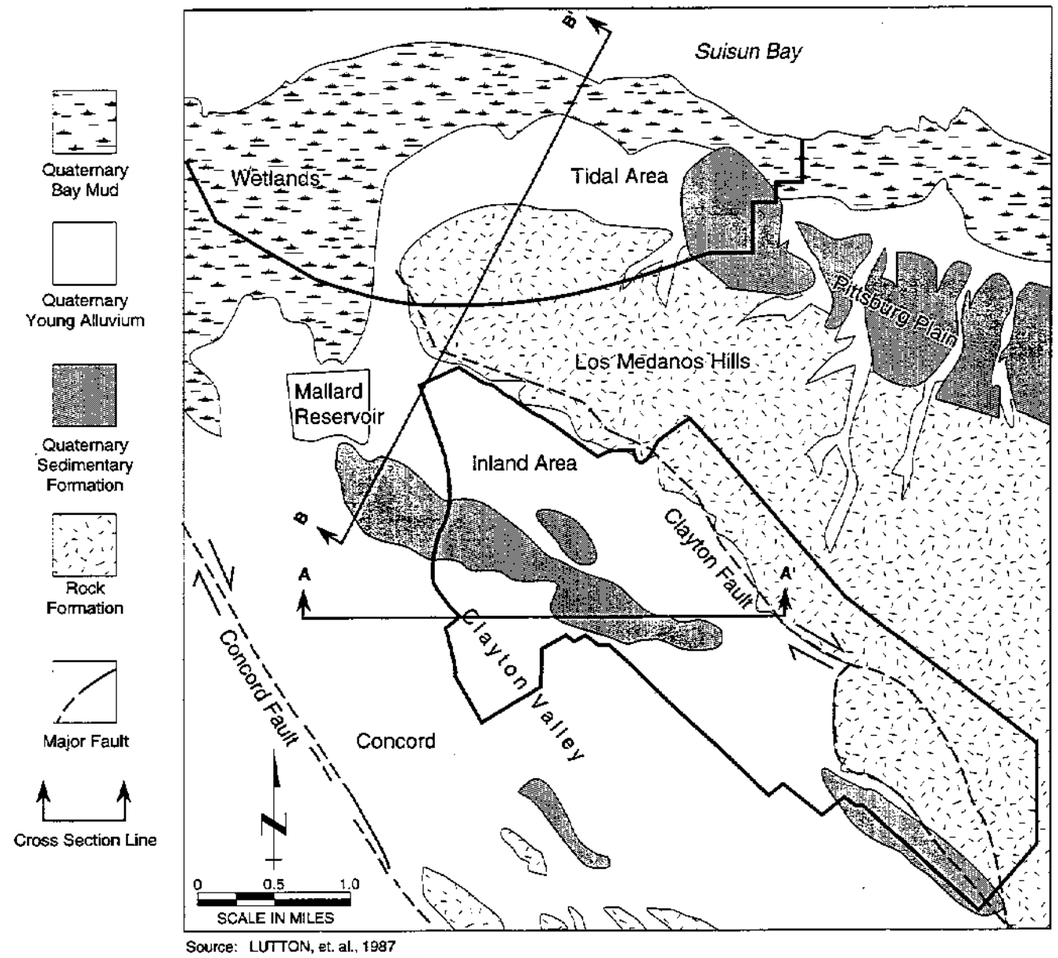
INLAND AREA
PHYSIOGRAPHY AND TOPOGRAPHY

Source Drawing: Figure 3-1, IT Volume II, Draft Sampling Plan, June 1989



Source: Adapted from DIBBLEE, 1981

Cross-Section A-A' is Figure 2-5.



Source: LUTTON, et. al., 1987
DIBBLEE, 1980a,b,c, 1981

FIGURE 7
NAVAL WEAPONS STATION CONCORD

REGIONAL GEOLOGY

06/96.CO

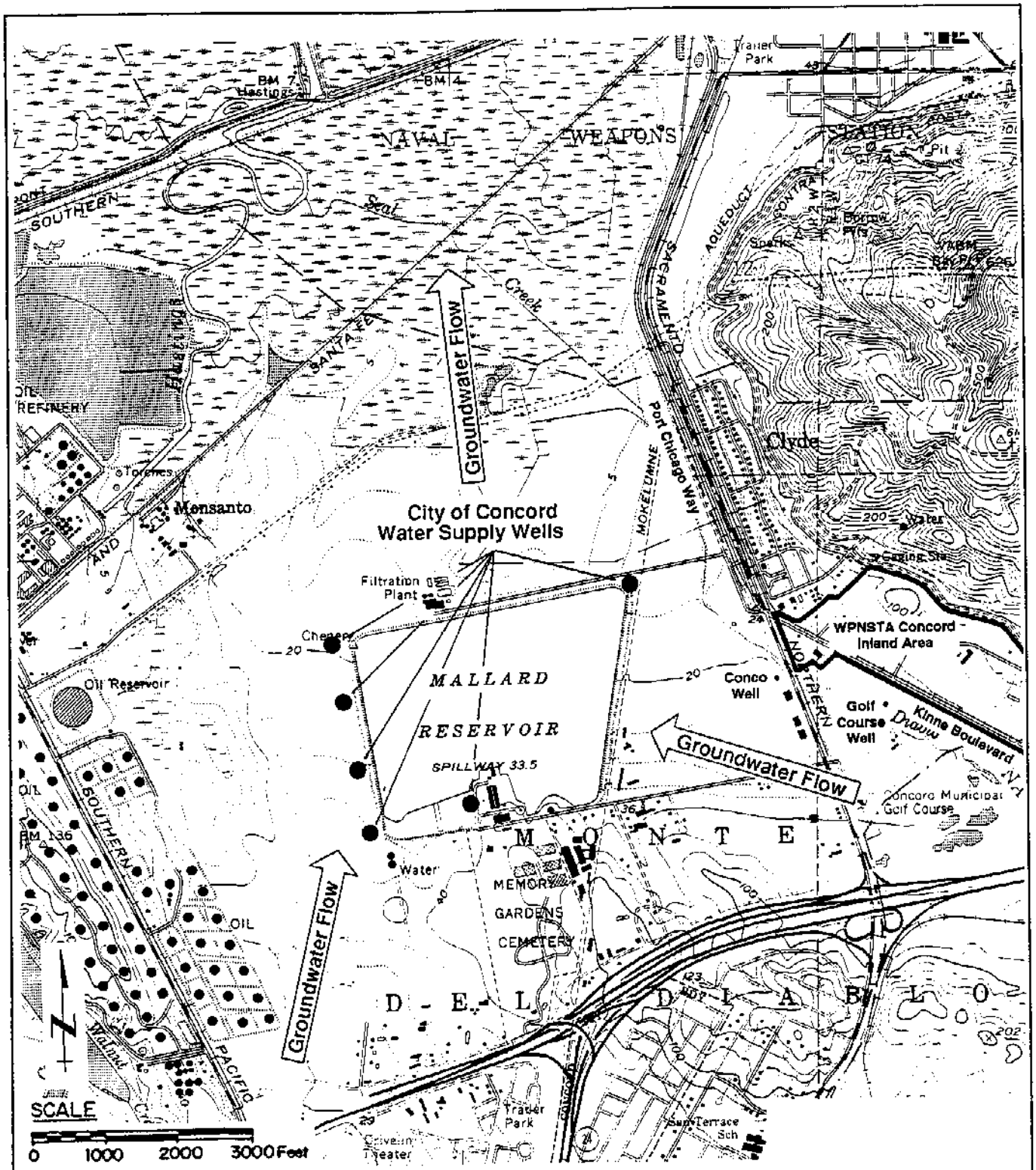


FIGURE 8
NAVAL WEAPONS STATION CONCORD

LOCATION OF WATER WELLS
IN THE VICINITY OF
WPNSTA CONCORD

Source Drawing: Figure 3-5, IT Volume II, Draft Sampling Plan, June 1989

WP.6/90.CO

LEGEND

—x—x—x— FENCE

20 TOPOGRAPHIC CONTOURS

FIRE HYDRANT

CATCH BASIN

TREES

CULVERT

01-02 SOIL BORING LOCATIONS

MW-04 MONITORING WELL LOCATIONS

02-09 TRENCH EXCAVATION LOCATIONS

NOTE: SOIL AND GROUNDWATER SAMPLE DEPTHS (FEET) ARE INDICATED BELOW

TPHg = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
TPHd = TOTAL PETROLEUM HYDROCARBONS AS DIESEL
TPHmo = TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
BTEX = TOTAL BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
O&G = TOTAL OIL AND GREASE
VOC = TOTAL OF VOLATILE ORGANIC COMPOUNDS (SEE FOOTNOTE TO IDENTIFY CONSTITUENTS)
SVOC = TOTAL OF SEMIVOLATILE ORGANIC COMPOUNDS (SEE FOOTNOTE TO IDENTIFY CONSTITUENTS)
PCBs = TOTAL OF POLYCHLORINATED BIPHENYLS
Pest = TOTAL OF PESTICIDES
Expl = EXPLOSIVES
ANIONS = ANIONS (SEE LABORATORY SUMMARY SHEET TO IDENTIFY CONSTITUENTS)

SOIL ANALYSES, RESULTS REPORTED IN mg/kg

GROUNDWATER ANALYSES, RESULTS REPORTED IN ug/L

DEPTH	METALS	TPHg	TPHd	TPHmo	BTEX	O&G	VOC	SVOC	PCBs	Pest	Expl	ANIONS /TDS
6	--	ND	ND	7	ND	--	--	--	--	--	--	--
11	--	ND	ND	7	ND	--	--	--	--	--	--	--
16	--	ND	ND	7	ND	--	--	--	--	--	--	--
21	--	ND	ND	ND	ND	--	--	--	--	--	--	--
26	--	ND	ND	7	ND	--	--	--	--	--	--	--
GW=25	*Y*	*ND*	*470*	*140*	--	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*	*ND*

INDICATES IF CLP METALS ANALYSIS WAS PERFORMED
Y = YES

SEE FOOTNOTE FOR A DESCRIPTION OF METAL CONSTITUENTS WHICH EXCEED PRELIMINARY REMEDIATION GOALS AND EXCEED BACKGROUND SOIL CONCENTRATIONS

-- = NOT ANALYZED

ND = NOT DETECTED

FIGURE 9
NAVAL WEAPONS STATION CONCORD

STANDARD LEGEND DETAILS
FOR SITE PLANS

KCH:(SP)(044-0283)TTLSHEET.DWG - 06/26/98 - PLOT 1:1

Figures 10 - 35

These detailed station maps have been deleted from the Internet-accessible version of this document as per Department of the Navy Internet security regulations.

APPENDIX A

BORING LOGS

APPENDIX A

TABLE OF CONTENTS

SWMU Site	Number of Borings
1	6
2	14
5	8
7	13
12/20	3
13	3
14	2
15	3
16	13
17	2
18	12
22	5
23	2
24	3
25	3
37	13
40	3
44	2
50	8
51	2
52	4
53	2
54	4

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
01-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 01
PROJECT NO.: 044-0283	SURFACE ELEVATION: 45.34 ft. MSL
DATE DRILLED: 21-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS009	0.0	PUSH		ML	FILL (af) SILT (ML), very dark gray (2.5Y 3/1), low plasticity, damp, medium stiff, trace very fine-grained sand and root material Color change to light olive brown (2.5Y 5/3), wet @ 3 ft. bgs Moist @ 4.5 ft. bgs
		SS010	0.0	PUSH			Damp @ 5.5 ft. bgs COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/4), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff Water measured @ 8.4 ft. bgs
10		SS011	0.0	PUSH			
							Wet @ 14.5 ft. bgs
		SS012	0.0	PUSH			
							T.D. of boring @ 16.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

mm(rr)(rrr-rrrr) rrrrrrrr.DWG rr/rr/rr PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
01-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 01
PROJECT NO.: 044-0283	SURFACE ELEVATION: 46.15 ft. MSL
DATE DRILLED: 21-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	FILL (af) SILT (ML), very dark grayish brown (10YR 3/2) and yellowish brown (10YR 5/4), mottled, low plasticity, moist, medium stiff, trace pockets of very fine-grained sand and root material Trace strong brown (7.5YR 6/4) iron-oxide spotting @ 3.5 ft. bgs
		SS006	0.0	PUSH			COLLUVIUM (Qco) SILTY SAND (SM), dark yellowish brown (10YR 4/4), very fine-grained sand, poorly graded, moist, medium dense Water measured @ 5.9 ft. bgs
						SM	
10		SS007	0.0	PUSH			
						ML	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff
		SS008	0.0	PUSH			Wet @ 15.5 ft. bgs
							T.D. of boring @ 16.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

111(??)(???-???) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
01-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 01
PROJECT NO.: 044-0283	SURFACE ELEVATION: 46.25 ft. MSL
DATE DRILLED: 20-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	FILL (af) CLAYEY SILT (ML), very dark brown (7.5YR 2.5/2), medium plasticity, moist, medium stiff, with trace root material Water measured @ 3 ft. bgs Color change to dark brown (10YR 3/3) and dark yellowish brown (10YR 4/6), mottled, with trace very fine-grained sand @ 3 ft. bgs COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/6) and light olive brown (2.5Y 5/3), mottled, low plasticity, very fine-grained sand, poorly graded, moist, medium stiff Color change to yellowish brown (10YR 5/6) @ 8.5 ft. bgs, with pockets of medium-grained sand Minus pockets of medium-grained sand @ 10.5 ft. bgs
	■	SS001		PUSH			
10	■	SS002		PUSH			
						SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained sand, poorly graded, wet, medium dense, with trace clay
	■	SS003		PUSH			
							T.D. of boring @ 16.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

R001 PLOT 1=1 ft/ft/ft ???(??)(???-???)???????.DWG

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
01-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 01
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 16-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS013	2.0	PUSH		ML	COLLUVIUM (Qco) SANDY SILT (ML), very dark dray (10YR 3/1), low plasticity, very fine-grained sand, damp, stiff Color grades to yellowish brown (10YR 5/4), trace calcite nodules Color change to strong brown (1.5YR 5/6), minus nodules
		SS014	3.0	PUSH			
10							
		SS015	4.4	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), strong brown (7.5YR 5/6), very fine-grained sand, poorly graded, moist, dense
							T.D. of boring @ 15.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???)???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
01-05

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 01
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 16-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R.Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS016	11.3	//		ML	COLLUVIUM (Qco) SILT (ML), very dark grayish brown (10YR 3/2), low plasticity, damp, stiff, with trace very fine-grained sand
10		SS017	28.1	//			COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6) and dark gray (5Y 4/1), mottled, low plasticity, very fine-grained sand, damp, stiff Moderate petroleum odor Trace medium-grained sand Moist, minus petroleum odor
		SS018	5.7	//			
							T.D. of boring @ 15.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
01-06

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 01
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 16-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							GRAVEL SURFACE
		SS019	59.6	//		ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, dry, stiff, with little subangular and subrounded gravel
						GW	FILL (af) GRAVEL (GW), light brownish gray (10YR 6/2), angular to subangular, well graded, dry, loose, with trace silt and very fine-grained sand
10		SS020	89.0	//		ML	FILL (af) GRAVELLY SILT (ML), yellowish brown (10YR 5/6), low plasticity, subangular well-graded gravel, dry, stiff, with trace very fine-grained sand
							T.D. of boring @ 13.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: 41.05 ft. MSL
DATE DRILLED: 11-APR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: J. GOULD	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	☒	SS017		//		CL	FILL (af) SANDY CLAY (CL), brown (5YR 3/4), trace very fine-grained sand, medium to high plasticity, slightly moist Cables and battery @ .3 to 1.5 ft bgs, with some staining.
	☒	SS018		//			FILL (af) CLAY (CL), yellowish brown (10YR 5/4) with light gray (5Y 8/1) and olive (5Y 4/1) mottling, dry to slightly moist. Saturated @ 2.5 ft.
							T.D. of boring @ 3.5 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

R001 PLOT 1=1 ft/ft/ft

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: 42.61 ft. MSL
DATE DRILLED: 21-FEB-95	DRILLING METHOD: HAND AUGER
LOGGED BY: K. BOWEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	☒	SS004		//		CL	ALLUVIUM (Qal) CLAY (CL) with trace gravel, (5YR 2.5/1), medium stiff, high plasticity, moist. ALLUVIUM (Qal) CLAY (CL) with trace sand and silt, (10YR 4/4), stiff, medium plasticity, damp.
	☒	SS005		//			Becoming saturated @ 4.5 ft.
							T.D. of boring @ 5.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

??(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: 43.77 ft. MSL
DATE DRILLED: 21-FEB-95	DRILLING METHOD: HAND AUGER
LOGGED BY: K. BOWEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	☒ ■	SS001		//		CL	ALLUVIUM (Qal) CLAY (CL), (5YR 2.5/1), medium stiff, high plasticity, moist. ALLUVIUM (Qal) CLAY (CL) with trace sand, (10YR 4/4), stiff, medium plasticity, damp.
	☒ ■	SS006		//			T.D. of boring @ 5.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

??(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: 44.08 ft. MSL
DATE DRILLED: 21-FEB-95	DRILLING METHOD: HAND AUGER
LOGGED BY: K. BOWEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	☒	SS002		//		CL	ALLUVIUM (Qal) CLAY (CL), black (5YR 2.5/1), high plasticity, moist, medium stiff with trace gravel Color change to dark yellowish brown (10YR4/4), medium plasticity, damp, stiff, with trace sand @ 2 ft. bgs
	☒	SS003		//			
							T.D. of boring @ 4.5 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG 11/??/?? PLOT 1=1 R0?1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-05

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: 47.75 ft. MSL
DATE DRILLED: 22-FEB-95	DRILLING METHOD: HAND AUGER
LOGGED BY: K. BOWEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	☒	SS007		//		CL	ALLUVIUM (Qal) CLAY (CL), with a few pebbles, (10YR 3/3), spotting, medium stiff, high plasticity, moist. ALLUVIUM (Qal) CLAY (CL) with trace pebbles and rootlets, (10YR 3/1), stiff, high plasticity, moist.
	☒	SS008		//			T.D. of boring @ 5.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

mm(dd)(yy-mm)mmmmmm.DWG mm/mm/mm PLOT 1=1 8001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-06

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: 48.44 ft. MSL
DATE DRILLED: 22-FEB-95	DRILLING METHOD: HAND AUGER
LOGGED BY: K. BOWEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	☒	SS009		//		CL	ALLUVIUM (Qal) CLAY (CL) with a few pebbles and rootlets, (10YR 3/3), spotting, medium stiff, high plasticity, damp. ALLUVIUM (Qal) CLAY (CL) with some rootlets, (10YR 3/1), medium stiff, high plasticity, moist.
	☒	SS010		//			
							T.D. of boring @ 5.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-07

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: 52.86 ft. MSL
DATE DRILLED: 23-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS014	0.0	PUSH		ML	ASPHALT and BASEROCK (0.25 ft. thick) COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/4), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff
		SS015	0.0 0.0	//			Very dark grayish brown (10YR 3/2) spotting @ 4.5 ft.
							T.D. of boring @ 6.0 feet
10							
20							
30							

(**)(**-)*******.DWG **/**/** PLOT 1=1 R001

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-08

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: 52.73 ft. MSL
DATE DRILLED: 23-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS012	0.0	PUSH		ML	ASPHALT (3 in. thick)
			0.0				COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/6), low plasticity, fine to very fine-grained sand, poorly graded, moist, medium stiff with trace pebbly gravel
							Wet @ 5 ft.
		SS013	0.0	PUSH			
							T.D. of boring @ 6.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

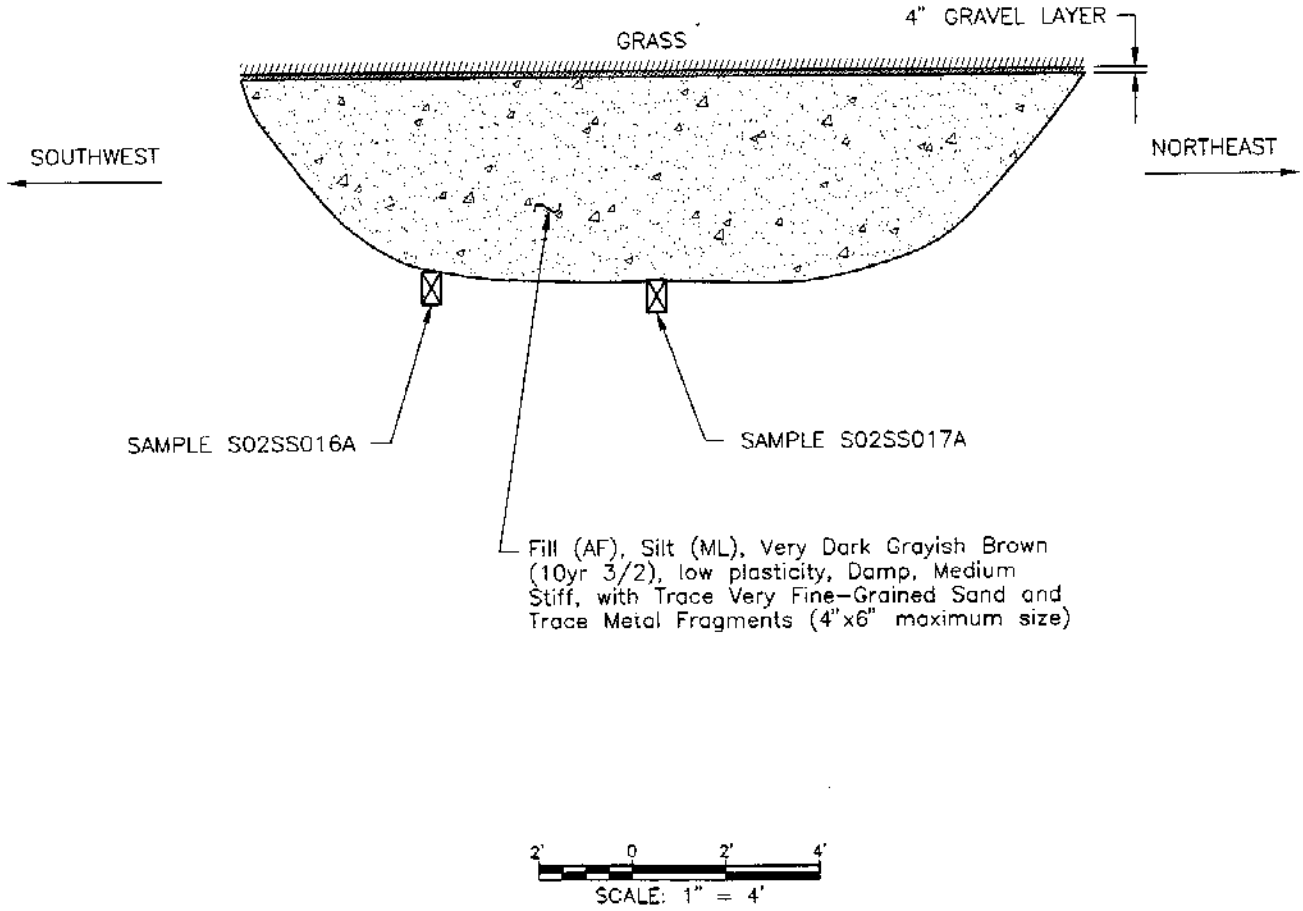
ENVIRONMENTAL MANAGEMENT, INC.

LOG OF TRENCH EXCAVATION

02-09

PROJECT: WPNSTA CONCORD RFI Confirmation Study	LOCATION: SWMU-2
PROJECT NO.: 044-0283	EXCAVATION METHOD: BACKHOE
DATE EXCAVATED: 27-APR-95	
LOGGED BY: R. VERNIMEN	

TEST TRENCH 02-09



KGH (SF) (044-0283) TRCH0209- 07/01/96 - PLOT 1=4 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-10

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 12-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS019	0.0	PUSH		ML	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, dry, stiff, with trace root material
		SS020	0.0	PUSH			Trace fine- and medium-grained sand
		SS021	0.0				COLLUVIUM (Qco) SILT(ML), very dark brown (10YR 2/2), low plasticity, damp, stiff, with little very fine-grained sand
10							Rod driven from 8 to 26 ft. bgs to encounter water
20							
							T.D. of boring @ 26.0 feet
30							

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-11

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 12-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS022	0.0	//		ML	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, low plasticity, dry, stiff, with trace calcite nodules
		SS023	0.0	//			Change to damp @ 4.0 ft. bgs
		SS024	0.0				COLLUVIUM (Qco) SILT (ML), dark brown (7.5YR 3/2), low plasticity, damp, stiff, with trace very fine-grained sand
10							T.D. of boring @ 8.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???)???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-12

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 12-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	■	SS025	0.0	//		ML	COLLUVIUM (Qco) SANDY SILT (ML), very dark grayish brown (10YR 3/2), low plasticity, very fine-grained sand, dry, stiff, with trace root material
	■	SS026	0.0	//			COLLUVIUM (Qco) SILT (ML), very dark brown (10YR 2/2), low plasticity, damp, very stiff
							COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/4), low plasticity, very fine-grained sand, damp, stiff
	■	SS027	0.0	//		SM	COLLUVIUM (Qco) SILTY SAND (SM), dark yellowish brown (10YR 4/6) with gray (10YR 5/1) spotting, very fine-grained sand, poorly graded, damp, dense
10							T.D. of boring @ 8.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-13

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 12-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	■	SS028	0.0	//		ML	COLLUVIUM (Qco) SILT (ML), brown (10YR 4/3), low plasticity, dry, medium stiff, trace organic material
	■	SS029	0.0	//			COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/4) with strong brown (7.5YR 5/6) mottling, low plasticity, very fine-grained sand, damp, stiff, with trace organic matter Color grades to very dark grayish brown (10YR 3/2)
	■	SS030	0.0				COLLUVIUM (Qco) SILT (ML), very dark gray (10YR 3/1), low plasticity, damp, very stiff, with trace very fine-grained sand
10							T.D. of boring @ 8.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
02-14

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 02
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 12-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS031	0.0	//		ML	COLLUVIUM (Qco) SILT (ML), olive gray (5Y 4/2) with light brown (2.5Y 5/3) spotting, low plasticity, dry, stiff with trace organic matter
		SS032	0.0	//			COLLUVIUM (Qco) SANDY SILT (ML), very dark gray (7.5YR 3/1), low plasticity, very fine-grained sand, dry, stiff
							COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6) with light gray (10YR 7/2) mottling, very fine-grained sand, poorly graded, damp, dense
		SS033	0.0	//			
							T.D. of boring @ 17.0 feet
10							
20							
30							

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
05-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 05
PROJECT NO.: 044-0283	SURFACE ELEVATION: 60.12 ft. MSL
DATE DRILLED: 10-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	ASPHALT (3 in. thick) FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff
		SS027		5/7/9			
10		SS028		4/10/13			Color change to dark yellowish brown (10YR 4/6) @ 10 ft. bgs, stiff COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/6) with minor black (2.5Y 2.5/1) speckling, low plasticity, very fine-grained sand, poorly graded, moist, stiff Water level @ 14.75 ft. bgs Hydropunch sample from 25 to 29 ft. bgs
		SS029		6/13/20			
20		SS030		6/12/16			
30							T.D. of boring @ 29.0 feet

* Field screening Analytical Results

SHEET: 1 of 1

R001 PLOT 1=1 11/11/11 ???(??)(???-???) ????????.DWG

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
05-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 05
PROJECT NO.: 044-0283	SURFACE ELEVATION: 60.5 ft. MSL
DATE DRILLED: 02-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: K. Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT
		SS007		4/10/14		ML	CLAYEY SILT (ML), (2.5Y 4/2), low plasticity, damp, stiff Color change to gray (2.5Y 5/1) and olive brown (2.5Y 5/3), mottled SILT (ML), brown (7.5YR 5/4), low to medium plasticity, dry, stiff, very uniform
10		SS008		5/13/18			
		SS009		6/9/17			Minor very fine-grained sand, low plasticity, dry, hard, with linear white (5YR 8/1) mottles @ 15.5 ft. bgs Water level measured @ 24.5 ft. bgs Color change to (10YR 6/4) with linear white mottles @ 25 ft. bgs, low plasticity, dry, hard Hydropunch sample @ 30.5 ft. bgs
20		SS010		6/10/24			
		SS011					
30							T.D. of boring @ 30.5 feet

* Field screening Analytical Results

SHEET: 1 of 1

ttt(tt)(ttt-ttttt) ttttttttt.DWG tt/tt/tt PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
05-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 05
PROJECT NO.: 044-0283	SURFACE ELEVATION: 59.74 ft. MSL
DATE DRILLED: 08-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (~9 in.)
							FILL (af)
						SM	SILTY SAND (SM), dark yellowish brown (10YR 4/6), very fine-grained sand, poorly graded, moist, medium dense
							Steel bar (rebar) @ 3 ft. bgs, no concrete
							COLLUVIUM (Qco)
							SANDY SILT (ML), olive brown (2.5Y 4/3), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff with moderate petroleum odor
		SS020	0.0 0.0	2 4 3		ML	No petroleum odor
							Color change to dark yellowish brown (10YR 4/6) @ 10 ft. bgs, damp, stiff
							Water level measured @ 18.2 ft. bgs
							COLLUVIUM (Qco)
							SANDY SILT (ML), yellowish brown (10YR 5/6), medium plasticity, very fine-grained sand, poorly graded, wet, medium stiff, with little clay
10		SS021	0.0 0.0	6 13 16			Color change to yellowish brown (10YR 5/6) @ ft. bgs
		SS022	0.0 0.0	5 11 17			
20		SS024	0.0 0.0	8 15 24			
							Hydropunch sample @ 27 to 29.5 ft. bgs
30							T.D. of boring @ 29.5 feet

* Field screening Analytical Results

SHEET: 1 of 1

PLOT 1=1 R001 ??/??/?? ????????????.DWG

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
05-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 05
PROJECT NO.: 044-0283	SURFACE ELEVATION: 58.75 ft. MSL
DATE DRILLED: 06-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: K. BOWEN	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						GP	GRAVEL (GP)
						CL	SILTY CLAY (CL), dark gray (10YR 3/1), high plasticity, medium stiff, moist, uniform, slight hydrocarbon odor
						ML	Color change to dark brown (10YR 3/3) @ 5.5 ft. bgs, low plasticity, damp to moist, trace subrounded fine-grained sand and gravel with black staining
							SANDY SILT (ML), yellowish brown (10YR 4/6), low plasticity, dry, uniform, very fine-grained sand, no odor
		SS013		4/5/10			CLAYEY SILT (ML), yellowish brown (10YR 4/4), dry, low plasticity, medium stiff, trace rounded gravel, no odor
							Water level measured @ 23.4 ft. bgs
							Becomes saturated @ 24.0 feet bgs and Hydropunch sample from 24.0 to 29.0 feet bgs
10							
		SS014		5/13/19			
		SS016		6/11/15			
20							
		SS017					
							T.D. of boring @ 29.0 feet
30							

* Field screening Analytical Results

SHEET: 1 of 1

mm(rr)(rrr-rrrr) rrrrrrrr.DWG rr/rr/rr PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
05-05

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 05
PROJECT NO.: 044-0283	SURFACE ELEVATION: 58.84 ft. MSL
DATE DRILLED: 28-FEB-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: K. Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS003	0.0	14		CL	ASPHALT (2 in. thick) FILL (af) SILTY CLAY (CL), yellowish brown (10YR 5/4), moist, medium plasticity, medium stiff, trace fine-grained gravel with olive brown mottling
		SS004	0.0				FILL (af) GRAVELLY CLAY (CL), very dark gray (2.5Y 3/1), high plasticity, medium stiff, moist, with trace subangular gravel
							T.D. of boring @ 6.5 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
05-06

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 05
PROJECT NO.: 044-0283	SURFACE ELEVATION: 58.66 ft. MSL
DATE DRILLED: 28-FEB-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: K. Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS005		16		CL	ASPHALT (2 in. thick) FILL (af) SILTY CLAY (CL), yellowish brown (10YR 4/4) and dark gray (10YR 4/1), mottled, medium plasticity, medium stiff, moist to damp, trace subrounded, fine-grained gravel and coarse-grained sand
		SS006		2			FILL (af) GRAVELLY CLAY (CL), dark grayish brown (10YR 4/2) to brownish yellow (10YR 6/6), mottled, high plasticity, soft, trace subangular to subrounded, coarse-grained gravel
10							T.D. of boring @ 6.5 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

mm(11)(dd-mm) mmmmm.DWG 11/mm/mm PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
05-07

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 05
PROJECT NO.: 044-0283	SURFACE ELEVATION: 60.71 ft. MSL
DATE DRILLED: 28-FEB-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT
	■	SS001	0.0	//		SM	COLLUVIUM (Qco) SILTY SAND (SM), light olive brown (2.5Y 5/4), very fine-grained sand, poorly graded, damp, medium dense Trace yellowish brown (10YR 5/6) spotting @ 4.0 ft. bgs
	■	SS002	0.0				
							T.D. of boring @ 5.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

mm(yy)(mm-mm) mmmmm.DWG mm/mm/mm PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
05-08

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 05
PROJECT NO.: 044-0283	SURFACE ELEVATION: 59.91 ft. MSL
DATE DRILLED: 17-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS034	0.0	PUSH		SM	ASPHALT (ac) approximately 6-inches thick. COLLUVIUM (Qco) SILTY SAND (SM), light olive brown (2.5Y 5/4), sand is very fine-grained, poorly graded, medium dense, damp. Color change to trace yellowish brown (10YR 5/6) spotting.
		SS035		PUSH			
							T.D. of boring @ 5.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

??(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: 61.9 ft. MSL
DATE DRILLED: 17-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	■	SS028	0.0	//		SM	ASPHALT COLLUVIUM (Qco) SILTY SAND (SM), light olive brown (2.5Y 5/4), very fine-grained sand, poorly graded, damp, medium dense
						ML	COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/6), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff
	■	SS029	0.0	//			
							T.D. of boring @ 6.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

??(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: 62.46 ft. MSL
DATE DRILLED: 03-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: K. Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT
		SS019	0.0	5 4 4 4		ML	SANDY SILT (ML), yellow brown (10YR 5/4), low plasticity, dry, soft, very fine-grained sand, poorly graded, loose, very uniform, unconsolidated
						CL	SILTY CLAY (CL), very dark gray (5YR 3/1), medium plasticity, moist, stiff, very uniform
		SS020	1.5	5 7 10		ML	SANDY SILT (ML), pink (5YR 7/4) and yellowish brown (10YR 5/4), mottled, low plasticity, damp, stiff, very fine-grained sand, poorly graded, mottles show linear patterns
							T.D. of boring @ 6.5 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: 62.51 ft. MSL
DATE DRILLED: 03-MAR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: K. Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS027		PUSH		SM	ASPHALT (6 in.) FILL (af) SILTY SAND (SM), yellowish brown (10YR 6/6), very fine-grained, poorly graded, dry, medium dense, loose, very uniform
						GW	FILL (af) GRAVEL (GW), reddish brown clay matrix, subangular to subrounded, well graded Refusal @ 2.5 ft., hit plastic
							T.D. of boring @ 2.5 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: 62.38 ft. MSL
DATE DRILLED: 03-MAR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: K. Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT
		SS026	0.0	7 5 4		SM ML	SILTY SAND/SANDY SILT (SM/ML), yellowish brown (10YR 5/6), low plasticity, hard, very fine-grained, poorly graded, dry, dense
							Water level measured @ 4 ft. bgs
						GW	GRAVEL
							T.D. of boring @ 4.5 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-05

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: 62.19 ft. MSL
DATE DRILLED: 03-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: K. Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS025	0.0			ML SM	ASPHALT SANDY SILT/SILTY SAND (ML/SM), yellowish brown (10YR 5/8), low plasticity, dry, hard, very fine-grained sand, poorly graded, dense, dry Refusal @ 3.5 ft., hit pipe or metal surface
10							
20							
30							

T.D. of boring @ 3.5 feet

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???)???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-06

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: 62.21 ft. MSL
DATE DRILLED: 03-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: K. Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT
						ML	SANDY SILT (ML), strong brown (7.5YR 5/6), with linear white mottles, low plasticity, dry, hard, very fine-grained sand, poorly graded, very uniform Changes to damp, stiff, loose @ 10 ft. bgs
		SS021	4.9	4/10/13			
10		SS022	5.4	4/5/12			
							Water level measured @ 13.64 ft. bgs
						SM	SILTY SAND (SM), strong brown (7.5YR 4/6), very fine-grained sand, poorly graded, wet, loose to medium dense, unconsolidated
		SS023	3.2	6/6/4/4			
							T.D. of boring @ 16.5 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG 11/11/?? PLOT 1=1 RD01

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-07

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: 61.15 ft. MSL
DATE DRILLED: 02-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: Kay Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (12 in.) over BASEROCK (6 in.)
						ML/SM	SANDY SILT (ML/SM), (2.5Y 5/4), low plasticity, dry, loose, very fine-grained sand, poorly graded, slight petroleum odor
		SS013	0.0	2/4/6		CL/ML	SILTY CLAY/CLAYEY SILT (CL/ML), (2.5Y 2.5/1), high plasticity, medium stiff, dry to damp, very uniform, petroleum odor
10		SS014	0.0	4/13/17		ML	SANDY SILT (ML), (5Y 4/1), medium plasticity, dry, stiff, very fine-grained sand, poorly graded, very uniform, petroleum odor CLAYEY SILT (ML), (5Y 4/2) and (5Y 5/1), mottled, medium plasticity, damp, stiff to hard, strong petroleum odor, minor very fine-grained sand, very uniform Color change to olive (5Y 4/3) and gray (5Y 4/1) @ 20 ft. bgs, low plasticity, dry, medium stiff, loose, with very strong petroleum odor
		SS015		4/13/17			
20		SS016		7/13/20			Static water level measured @ 22.7 ft. bgs SILTY CLAY (CL), olive (5Y 4/3) and gray (5Y 4/1), mottled, medium plasticity, dry to damp, medium stiff, loose, very uniform, very strong petroleum odor
		SS017		6/10/12		CL	Hydropunch sample @ 30.5 ft. bgs
30							T.D. of boring @ 30.5 feet

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-08

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: 61.38 ft. MSL
DATE DRILLED: 01-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: Kay Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						CL	ASPHALT SILTY CLAY (CL), very dark gray (10YR 3/1), medium plasticity, damp to moist, hard, slight petroleum odor, trace fine-grained angular gravel
		SS006	0.0	PUSH			
10		SS007	0.0	PUSH		ML	CLAYEY SILT (ML), dark yellowish brown (10YR 4/6), low plasticity, dry, stiff to hard, very uniform, slight petroleum odor Color change to olive brown (2.5Y 4/4), mottled, dry to damp, hard, slight petroleum odor, few fine-grained sand Water level measured @ 18.3 ft. bgs
		SS008		PUSH			
20		SS009		7/13/18		SM	SANDY SILT (ML), olive brown (2.5Y 4/3) and dark gray (2.5Y 4/1), mottled, low plasticity, dry to damp, hard, very fine-grained sand, medium petroleum odor SILTY SAND (SM), dark yellowish brown (10YR 4/4), low plasticity, poorly graded, very fine-grained sand, very uniform, loose, moist, no odor Wet @ 26 ft. bgs Hydropunch sample taken at 29 ft. bgs. Water level 29.2 measured @ time of drilling.
		SS010		4/4/6			
30							T.D. of boring @ 30.5 feet

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-09

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: 61.78 ft. MSL
DATE DRILLED: 28-FEB-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: Kay Pannell	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT
						SM	SAND (SM)
						ML	CLAYEY SILT (ML), dark grayish brown (2.5Y 4/2), low plasticity, stiff, damp
		SS001	0.0	6/12/41		SC	CLAYEY SAND (SC), dark yellowish brown (10YR 4/6), well graded, angular gravel, hard, dry to damp, compacted, mostly fine-grained sand
10		SS002	0.0	8/11/18		SP	SAND (SP), strong brown (7.5YR 5/6), poorly graded, fine-grained sand, trace clay and fine-grained gravel, loose, dry to damp, low plasticity
		SS003	0.0	7/14/17		SC	CLAYEY SAND (SC), yellowish brown (10YR 5/4) with gray (5Y 5/1) mottling, poorly graded, fine-grained sand, low plasticity, dense, dry to damp, trace fine-grained subrounded gravel
20		SS004	0.0	8/19/24		ML	CLAYEY SILT (ML), (10YR 5/4), low plasticity, dry to damp Color change to strong brown (7.5YR 5/6) @ 21 ft. bgs, hard very uniform, slight layering/stratification Color change to yellowish brown (10YR 5/4), medium to low plasticity, medium stiff, moist Water level measured @ 27.5 ft. bgs Hydropunch sample @ 30 ft. bgs
		SS005	0.0	catpkin			
30							T.D. of boring @ 31.5 feet

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG ft/m/in PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-10

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: ~9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS030	0.0	//		SM	ASPHALT (~2 in.) over BASEROCK (~3 in.) COLLUVIUM (Qco) SILTY SAND (SM), dark yellowish brown (10YR 4/4), fine- to very fine-grained sand, poorly graded, damp, dense
		SS031	0.0	//		ML	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, damp, stiff Trace clay @ 13 ft. bgs
		SS032	0.0	//			
10							
		SS033	0.0	//			T.D. of boring @ 15.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

??(??)(???-???)???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-11

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (~2 in.) over BASEROCK (~3 in.)
	■	SS034	0.0	//		SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained sand, poorly graded, damp, dense
						ML	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, damp, stiff, with trace clay Changes to moist Rod driven to 30 ft. bgs to encounter water
10							
	■	SS035	1.3	//			
20							
30							T.D. of boring @ 30.0 feet

(**)(-****) ********.DWG 11/11/97 PLOT 1=1 R001

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-12

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 12-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (~3 in.) over BASEROCK (~3 in.)
						SM	COLLUVIUM (Qco) SILTY SAND (SM), dark yellowish brown (10YR 4/6), very fine-grained sand, poorly graded, damp, dense
						ML	COLLUVIUM (Qco) SILT (ML), very dark grayish brown (10YR 3/2), low plasticity, damp, medium stiff, with little very fine-grained sand
							COLLUVIUM (Qco) SILTY SAND (ML), brown (7.5YR 4/4), low plasticity, damp, very fine-grained sand, stiff
10		SS037	1.6	//			Color change to dark gray (5Y 4/1) and brown (7.5YR 4/4), mottled @ 18.0 ft. bgs, with moderate petroleum odor
							Probe rod driven to 30.0 ft. bgs in an attempt to collect water
20		SS036	85.0	//			
							T.D. of boring @ 30.0 feet
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???)???????.DWG 11/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
07-13

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 07
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 12-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R.Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						SM	ASPHALT (~3 in.) over BASEROCK (~4 in.) COLLUVIUM (Qco) SILTY SAND (SM), dark yellowish brown (10YR 4/6), fine- to very fine-grained sand, poorly graded, damp, dense
						ML	COLLUVIUM (Qco) SILT (ML), very dark brown (10YR 2/2), low plasticity, damp, stiff, with trace very fine-grained sand
							COLLUVIUM (Qco) SANDY SILT (ML), brown (7.5YR 4/4), low plasticity, damp, very fine-grained sand, stiff Changes to very stiff, with trace calcitic sand stringers Color changes to dark olive gray (5Y 3/2) and brown (7.5YR 4/4), mottled, moist, with moderate petroleum odor, minus calcite stringers
10		SS038	2.9	//			
		SS039	3.2	//			
20							
		SS040	4.5	//			
							T.D. of boring @ 30.0 feet
30							

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
12-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 12
PROJECT NO.: 044-0283	SURFACE ELEVATION: 149.94 ft. MSL
DATE DRILLED: 16-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS003	0.0 0.0	PUSH		ML	FILL (af) SILT (ML), very dark grayish brown (10YR 3/2), low plasticity, moist, medium stiff, with trace clay and root material Trace gravel @ 2 ft. COLLUVIUM (Qco) GRAVELLY SILT (ML), strong brown (7.5YR 4/6) and gray (2.5Y 5/1), mottled, low plasticity, angular to subangular gravel, well graded, damp, medium stiff, with trace fine-grained sand Moist @ 11 ft. bgs Damp @ 14 ft. bgs
10		SS004	0.0 0.0	PUSH			
		SS005	0.0	PUSH			T.D. of boring @ 15.5 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ??????.DWG ??/??/?? PLOT 1=1 B001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
12-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 12
PROJECT NO.: 044-0283	SURFACE ELEVATION: 150.41 ft. MSL
DATE DRILLED: 02-MAR-95	DRILLING METHOD: GEOPROBE/GEOSTAR
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	FILL (af) SANDY SILT (ML), very dark grayish brown (10YR 3/2) and dark yellowish brown (10YR 4/4), mottled, low plasticity, very fine-grained sand, poorly graded, moist, medium stiff with trace roots Color change to very dark brown @ 3 ft.
		SS001	0.0 0.0	PUSH			FILL (af) CLAYEY SILT (ML), dark yellowish brown (10YR 4/4), medium plasticity, moist, stiff with little very fine-grained sand
							FILL (af) SANDY SILT (ML), dark yellowish brown (10YR 3/4) and yellowish brown (10YR 5/6), mottled, low plasticity, fine to very fine-grained sand, poorly graded, moist, medium stiff with little subangular gravel & few siltstone fragments
10		SS002	0.0 0.0	PUSH			No gravel and little clay @ 9.5 ft., wet Little siltstone fragments @ 11 ft.
							T.D. of boring @ 12.0 feet
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* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????).DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
12-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 12
PROJECT NO.: 044-0283	SURFACE ELEVATION: 149.87 ft. MSL
DATE DRILLED: 16-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS006	0.0 0.0	PUSH		ML	COLLUVIUM (Qco) GRAVELLY SILT (ML), very dark grayish brown (10YR 3/2) and dark yellowish brown (10YR 4/6), mottled, low plasticity, angular to subrounded gravels, well graded, moist, medium stiff, with trace fine-grained sand Color change to dark gray (2.5Y 4/1) gravel
10		SS007	0.0 0.0	PUSH			COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/6) and olive brown (2.5Y 4/3), mottled, low plasticity, fine to very fine-grained sand, poorly graded, moist, medium stiff, with little gravel
		SS008		PUSH			COLLUVIUM (Qco) GRAVELLY SILT (ML), dark yellowish brown (10YR 4/6) with dark gray (2.5Y 4/1) gravels, low plasticity, angular to subangular gravel, well graded, moist, medium stiff with trace fine-grained sand
							T.D. of boring @ 16.5 feet
20							
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* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT (=) RG01

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
13-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 13
PROJECT NO.: 044-0283	SURFACE ELEVATION: 141.01 ft. MSL
DATE DRILLED: 04-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS001	0.0	PUSH		ML	COLLUVIUM (Qco) SILT (ML), very dark grayish brown (10YR 3/2), low plasticity, moist, medium stiff, with trace root material and very fine-grained sand Trace siltstone fragments @ 2.5 ft. bgs COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff Damp @ 5 ft. bgs Stiff @ 6 ft. bgs
10		SS002	0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), light olive brown (2.5Y 5/4), very fine-grained sand, poorly graded, damp, dense Little medium-grained sand @ 11.5 ft. bgs
		SS003	0.0	PUSH		SP	COLLUVIUM (Qco) GRAVELLY SAND (SP), yellowish brown (10YR 5/6), with gray (10YR 5/1) gravel, fine-grained sand, poorly graded, angular to subrounded gravel, well graded, damp, dense
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
13-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 13
PROJECT NO.: 044-0283	SURFACE ELEVATION: 143.14 ft. MSL
DATE DRILLED: 04-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS006	0.0	PUSH		ML	COLLUVIUM (Qco) SANDY SILT (ML), very dark grayish brown (10YR 3/2), low plasticity, fine- to medium-grained sand, well graded, moist, medium stiff, with trace subrounded gravel Wet @ 3.5 ft. bgs COLLUVIUM (Qco) SANDY SILT (ML), strong brown (7.5YR 5/6), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff, with trace clay
10		SS007	0.0	PUSH		SW	COLLUVIUM (Qco) GRAVELLY SAND (SW), pale brown (10YR 6/3), medium- to very fine-grained sand, well graded, angular to subrounded gravel, well graded, damp, dense
		SS008	0.0 0.0	PUSH			Color change to yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) mottled @ 15.5 ft. bgs
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
13-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 13
PROJECT NO.: 044-0283	SURFACE ELEVATION: 144.35 ft. MSL
DATE DRILLED: 04-APR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	■	SS004	0.0			GW	COLLUVIUM (Qco) SILTY GRAVEL (GW), gray (10YR 5/1), gravels with dark grayish brown (10YR 4/2) silt, angular to subrounded, poorly graded, damp, loose to medium stiff
	■	SS005	0.0			ML	COLLUVIUM (Qco) SILT (ML), dark grayish brown (10YR 4/2), medium plasticity, moist, medium stiff, with trace clay
							T.D. of boring @ 3.5 feet
10							
20							
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* Field screening Analytical Results

SHEET: 1 of 1

mm(yy)(mm-mm) ??????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
14-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 14
PROJECT NO.: 044-0283	SURFACE ELEVATION: 119.76 ft. MSL
DATE DRILLED: 28-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS001	0.0 0.0	PUSH		ML	COLLUVIUM (Qco) SILT (ML), very dark grayish brown (10YR 3/2), medium plasticity, wet, medium stiff, with trace root material and very fine-grained sand Moist @ 2.5 ft. bgs COLLUVIUM (Qco) SANDY SILT (ML), strong brown (7.5YR 5/6), low plasticity, very fine-grained sand, poorly graded, moist, stiff
10		SS002	0.0 0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), strong brown (7.5YR 5/6), very fine-grained sand, poorly graded, damp, medium dense
		SS003	0.0	PUSH		GW SP	COLLUVIUM (Qco) SANDY GRAVEL (GW), brown (7.5YR 4/4) and gray (7.4YR 5/1), mottled, angular to subangular gravel, well graded, fine-grained sand, damp, dense COLLUVIUM (Qco) SAND (SP), strong brown (7.5YR 5/6), fine-grained sand, poorly graded, damp, dense
20							T.D. of boring @ 16.5 feet
30							

* Field screening Analytical Results

SHEET: 1 of 1

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PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
14-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 14
PROJECT NO.: 044-0283	SURFACE ELEVATION: 120.61 ft. MSL
DATE DRILLED: 28-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS004	0.0 0.0	PUSH		ML	COLLUVIUM (Qco) SANDY SILT (ML) with trace clay and root material, mottled dark brown (7.5YR 3/2) and strong brown (7.5YR 5/6), sand is very fine-grained in pockets, poorly-graded, low plasticity, medium stiff, moist 4-inch layer of angular to subangular gravel @ 4.5 ft. bgs Color change to strong brown (7.5YR 5/6) @ 5 ft. bgs, no gravel Decrease moisture content to damp
10		SS005	0.0	PUSH		SP	COLLUVIUM (Qco) Poorly-graded SAND (SP), strong brown (7.5YR 4/6), sand is fine-grained, dense, moist
		SS006	0.0	PUSH			COLLUVIUM (Qco) Poorly-graded GRAVELLY SAND (SP) with trace silt, strong brown (7.5YR 4/6) with gray (7.5YR 5/1) gravel, sand is very fine-grained, dense, damp
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
15-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 15
PROJECT NO.: 044-0283	SURFACE ELEVATION: 95.36 ft. MSL
DATE DRILLED: 07-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS003	0.0	PUSH		SP ML	COW MANURE and VEGETATION 3-inches thick GRAVELLY SAND (SP) 3-inches thick COLLUVIUM (Qco) CLAYEY SILT (ML), black (5Y 2.5/1), low plasticity, medium stiff, moist
		SS004	0.0	PUSH			COLLUVIUM (Qco) SILT (ML), olive gray (5Y 4/2) with light olive brown (2.5Y 5/4) spotting, low plasticity, medium stiff, moist
							T.D. of boring @ 7.0 feet
10							
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* Field screening Analytical Results

SHEET: 1 of 1

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PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
15-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 15
PROJECT NO.: 044-0283	SURFACE ELEVATION: 96.44 ft. MSL
DATE DRILLED: 07-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS001	0.0	PUSH		SP	COW MANURE and VEGETATION 3-inches thick FILL (af) Poorly-graded GRAVELLY SAND (SP), yellowish brown (10YR 5/6) with dark gray (10YR 4/1) gravel, sand is fine-grained, gravel is sub-angular to sub-rounded and well-graded, medium dense, wet
		SS002	0.0			ML	COLLUVIUM (Qco) CLAYEY SILT (ML) with trace calcite fragments, black (5Y 2.5/1), low plasticity, medium stiff, moist Color change to very dark gray (5Y 3/1) and dark olive gray (5Y 3/2) mottled with no calcite fragments
10							T.D. of boring @ 6.5 feet
20							
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* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???) ??????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
15-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 15
PROJECT NO.: 044-0283	SURFACE ELEVATION: 96.4 ft. MSL
DATE DRILLED: 11-APR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: J. GOULD	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							6-Inches CONCRETE (CO)
	☒	SS006		PUSH		CH	High plasticity CLAY (CH), black (N2), very sticky, saturated
	■	SS007		PUSH			Same as above
							T.D. of boring @ 5.0 feet
10							
20							
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: 63.92 ft. MSL
DATE DRILLED: 14-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS005	0.0	PUSH		GW	ASPHALT FILL (af) SILTY GRAVEL (GW), dark grayish brown (2.5Y 4/2) and gray (2.5Y 5/1), mottled, angular to subangular, well graded, wet with trace medium-grained sand
		SS006	0.0	PUSH		ML	FILL (af) SANDY SILT (ML), dark yellowish brown (10YR 4/6) and dark grayish brown (10YR 3/2), mottled, low plasticity, very fine-grained sand, poorly graded, moist, medium stiff COLLUVIUM (Qco) CLAYEY SILT (ML), dark gray (2.5Y 4/1) and very dark gray (2.5Y 3/1), mottled, medium plasticity, moist, medium stiff, with trace very fine-grained sand
10							T.D. of boring @ 6.0 feet
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(**)-****)*******.DWG **/**/** PLOT 1=1 R001

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: 63.8 ft. MSL
DATE DRILLED: 14-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS003	0.0	PUSH		GW	ASPHALT FILL (af), SILTY GRAVEL (GW), dark yellowish brown (10YR 4/6) and brown (10YR 4/3), mottled, angular to subangular, well graded, moist, loose, with trace fine-grained sand
						ML	COLLUVIUM (Qco) CLAYEY SILT (ML), very dark gray (2.5Y 3/1) with strong brown (7.5YR 4/6) iron-oxide spotting, low plasticity, moist, medium stiff Color change to black (2.5Y 2.5/1) with trace decayed organic material
		SS004	0.0	PUSH			
10							T.D. of boring @ 6.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG 11/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: 64.06 ft. MSL
DATE DRILLED: 14-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS001	0.0	PUSH		GW	ASPHALT FILL (af) SILTY GRAVEL (GW), dark brown (10YR 3/3) and gray (10YR 5/1), mottled, angular to subangular, well graded, wet, loose
						ML	FILL (af) SANDY SILT (ML), dark yellowish brown (10YR 4/6), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff
		SS002	0.0	PUSH			COLLUVIUM (Qco) SILT (ML), very dark grayish brown (10YR 3/2), medium plasticity, moist, medium stiff Trace peat-like organic material @ 4 to 5 ft. bgs, trace clay
10							T.D. of boring @ 5.0 feet
20							
30							

(**)X(**-*) *******.DWG 11/11/11 PLOT 1=1 R001

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 15
PROJECT NO.: 044-0283	SURFACE ELEVATION: 65.26 ft. MSL
DATE DRILLED: 15-MAR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (~3 in.) over BASEROCK (~6 in.)
		SS010	0.0 0.0	PUSH		ML	FILL (af) SILT (ML), very dark grayish brown (10YR 3/2), with brown (7.5YR 4/3) iron-oxide mottling, low plasticity, damp stiff Minus brown iron-oxide mottling, moist, very stiff Color change to dark brown (10YR 3/3) @ 5 ft. bgs, trace very fine-grained sand
		SS011	0.0 0.0	PUSH			
							T.D. of boring @ 6.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-05

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: 65.43 ft. MSL
DATE DRILLED: 15-MAR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS013	0.0	PUSH		ML	FILL (af) GRAVELLY SILT (ML), dark olive brown (2.5Y 3/3) and dark gray (2.5Y 4/1), mottled, low plasticity, damp, angular to subangular well graded gravel, medium stiff, with trace root material and fine-grained sand
		SS014	0.0	PUSH			FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/8), low plasticity, very fine-grained sand, poorly graded, moist, stiff
							T.D. of boring @ 6.0 feet
10							
20							
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* Field screening Analytical Results

SHEET: 1 of 1

??X(??-???)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-06

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: 65.34 ft. MSL
DATE DRILLED: 15-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS007	0.0 0.0	PUSH		GW ML	FILL (af) SILTY GRAVEL (GW), olive brown (2.5YR 4/3) and very dark grayish brown (2.5Y 3/2), mottled, subangular to subrounded, well graded, moist, loose FILL (af) CLAYEY SILT (ML), dark olive brown (2.5YR 3/3), medium plasticity, moist, medium stiff
		SS008	0.0 0.0	PUSH			FILL (af) SANDY SILT (ML), dark yellowish brown (10YR 4/4), low plasticity, moist, medium stiff, very fine-grained sand, poorly graded Color change to dark yellowish brown (10YR 3/6) @ 6.5 ft. bgs, stiff FILL (af) CLAYEY SILT (ML), dark yellowish brown (10YR 3/6), medium plasticity, moist, medium stiff, with trace chrome and copper colored metal filings
10		SS009	0.0 0.0	PUSH		SM ML	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained sand, poorly graded, moist, medium dense
		SS012	0.0	PUSH			COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/6) with minor black (10YR 2/1) speckling, low plasticity, very fine-grained sand, poorly graded, moist, very stiff
20							T.D. of boring @ 17.5 feet
30							

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-07

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS015	0.6	//		ML	COLLUVIUM (Qco) SANDY SILT (ML), strong brown (7.5YR 4/6), low plasticity, very fine-grained sand, damp, dense
		SS016	0.4	//			
							T.D. of boring @ 6.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-08

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS017	0.3	//		SM	TOPSOIL (~2 in.) COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained sand, poorly graded, dry, dense
		SS018	0.9	//		ML	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, damp, stiff
							T.D. of boring @ 6.0 feet
10							
20							
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* Field screening Analytical Results

SHEET: 1 of 1

R001 PLOT 1=1 11/11/11 ???(??)(??-????)????????.DWG

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-09

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS019	0.7	PUSH		ML	ASPHALT (~2 in.) over BASEROCK (~3 in.) COLLUVIUM (Qco) SANDY SILT (ML), reddish brown (5YR 4/4), low plasticity, very fine-grained sand, dry, stiff Trace calcite stringers @ 4.0 feet bgs
		SS020	1.1	PUSH			T.D. of boring @ 6.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

R001 PLOT 1=1 ??/??/?? ????????.DWG ????(???-????)

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-10

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	■	SS021	0.0	//		ML	FILL (af) SILT (ML), very dark grayish brown (10YR 3/2), low plasticity, moist, medium stiff, with trace clay and very fine-grained sand
	■	SS022	0.0	//			
	■	SS023	0.9				COLLUVIUM (Qco) SANDY SILT (ML), very dark grayish brown (10YR 3/2), low plasticity, very fine-grained sand, poorly graded, moist, stiff
							T.D. of boring @ 6.0 feet
10							
20							
30							

* Field screening Analytical Results

mm(dd)(yyyy-yyyy) mmmmmm.DWG tt/mm/tt PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-11

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS024	1.2	//		SM	ASPHALT (~2 in.) over BASEROCK (3 in.)
						ML	FILL (af)
		SS025	1.3	//			SILTY SAND (SM), yellowish brown (10YR 5/6) and gray (10YR 5/1), mottled, fine to very fine-grained sand, dry, dense, with trace gravel
							COLLUVIUM (Qco)
		SS026	0.8				SILT (ML), very dark gray (2.5Y 3/1), low plasticity, damp, stiff, with little very fine-grained sand
							COLLUVIUM (Qco)
							SANDY SILT (ML), dark brown (7.5YR 3/4), low plasticity, very fine-grained sand, damp, stiff
							T.D. of boring @ 6.0 feet
10							
20							
30							

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-12

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS027	0.5	//		ML	ASPHALT (~2 in.) over BASEROCK (~3 in.) FILL (af) SILT (ML), very dark gray (2.5Y 3/1), low plasticity, damp, stiff, with trace very fine-grained sand
		SS028	0.9	//			Changes to little very fine-grained sand
							T.D. of boring @ 6.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
16-13

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 16
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	■	SS029	0.0	//		SM	BASEGRAVEL and TOPSOIL (~2 in.) COLLUVIUM (Qco) SILTY SAND (SM), dark yellowish brown (10YR 4/4), fine- to very fine-grained sand, dry, medium dense
							T.D. of boring @ 2.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
17-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 17
PROJECT NO.: 044-0283	SURFACE ELEVATION: 137.41 ft. MSL
DATE DRILLED: 27-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	FILL (af) SILT (ML), with trace very fine-grained sand and trace root material, very dark grayish brown (10YR 3/2), low plasticity, medium stiff, moist FILL (af) SANDY SILT (ML) with trace root material and angular to sub-angular gravel, dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) mottled, sand is very fine-grained, poorly-graded, low plasticity, medium stiff, damp Increase gravel to little, average size 1/2-inch Increase moisture content to moist with trace siltstone fragments Color change to dark greenish gray (5BG 4/1) with dark yellowish brown (10YR 4/4) spotting with trace fine-grained sand
		SS001	0.0 0.0	PUSH			
10		SS002	0.0 0.0	PUSH			
		SS003	0.0	PUSH			
							T.D. of boring @ 16.5 feet
20							
30							

***(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
17-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 17
PROJECT NO.: 044-0283	SURFACE ELEVATION: 137.74 ft. MSL
DATE DRILLED: 27-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS004	0.0 0.0	PUSH		ML	FILL (af) SANDY SILT (ML) with little angular to sub-angular gravel, dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) mottled, sand is very fine-grained, poorly-graded, low plasticity, medium stiff, moist Color change to yellowish brown (10YR 5/6), decrease gravel content to trace and moisture content to damp Color change to bluish gray (5B 5/1) Color change to light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6) mottled, with no gravel and trace siltstone fragments
10		SS005	0.0	PUSH			
		SS006	0.0	PUSH			Color change to bluish gray (5B 5/1)
							T.D. of boring @ 15.5 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: 61.05 ft. MSL
DATE DRILLED: 08-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	CONCRETE (CO) approximately 9-inches thick FILL (af) CLAYEY SILT (ML) with trace sand and pebbly gravel, olive gray (5Y 4/2), low plasticity, medium stiff, damp Color change to dark gray (5Y 4/1) in pockets and fine-grained sand Color change to dark olive gray (5Y 3/2) with trace very fine-grained sand and no pebbly gravel Color change to dark yellowish brown (10YR 4/6) mottled COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/6), sand is very fine-grained, poorly-graded, low plasticity, stiff, damp Increase in moisture content to moist Increase to very stiff COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/6), sand is very fine-grained, poorly-graded, low plasticity, very stiff, moist
		SS013	0.0	unpkd			
10		SS014	0.0	5 pkd 16			
		SS015		5 10 15			
20			0.0				
			5.0			SM	COLLUVIUM (Qco) SILTY SAND (SM), dark yellowish brown (10YR 4/6), sand is very fine-grained, poorly-graded, medium dense, wet
30							T.D. of boring @ 30.0 feet

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG 11/??/?? PLOT (=1 R001

ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: 60.99 ft. MSL
DATE DRILLED: 07-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	ASPHALT (AS) approximately 3-inches thick BASEROCK approximately 4-inches thick FILL (af) GRAVELLY SILT (ML) with little coarse-grained sandm, very dark grayish brown (2.5Y 3/2), gravel is sub-angular to sub-rounded and medium stiff to loose, low plasticity, damp
	☒	SS007	0.0	3			FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/6) and very dark grayish brown (10YR 3/2) mottled, sand is very fine-grained, poorly-graded, low plasticity, medium stiff, damp
	☒	SS008	0.0	6/12/17		ML	CONCRETE (CO) rubble layer approximately 10-inches thick COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/4), sand is very fine-grained, poorly-graded, low plasticity, stiff, damp Increase in moisture content to moist Increase to very stiff
10	☒	SS009	0.0	5/9/13			COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/4), sand is very fine-grained, poorly-graded, low plasticity, very stiff, moist
	☒	SS010	0.0	7/15/24			
20							HYDROPUNCH FROM 21.0 TO 24.0 FEET BGS Did not yield water, consequently the boring was drilled to 26.0 feet bgs and hydro punched to 19.0 feet as a second attempt to obtain water
30							T.D. of boring @ 29.0 feet

(**)(-****) ********.DWG ft/in/ft PLOT 1=1 R001

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: 47.1 ft. MSL
DATE DRILLED: 24-FEB-95	DRILLING METHOD: HAND AUGER
LOGGED BY: K. BOWEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	☒	SS013		PUSH		SM	ALLUVIUM (Qal) SILTY SAND (SM), sand is rounded and very fine-grained, loose, damp
						CL	ALLUVIUM (Qal) High plasticity CLAY (CL), yellowish brown (10YR 4/4), stiff, moist
	☒	SS014		PUSH			
							T.D. of boring @ 4.5 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

R001 PLOT 1=1 ft/ft/ft DWG (ft-ft) ft/ft/ft

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: 48.67 ft. MSL
DATE DRILLED: 24-FEB-95	DRILLING METHOD: HAND AUGER
LOGGED BY: K. BOWEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	
	☒■	SS011		PUSH		SM	ALLUVIUM (Qal) SILTY SAND (SM) with trace gravel, sand is rounded and very fine-grained, loose, damp	
						CL	ALLUVIUM (Qal) High plasticity CLAY (CL) yellowish brown (10YR 4/4), stiff, moist	
	☒■	SS012		PUSH			ALLUVIUM (Qal) High plasticity CLAY (CL), (10YR 3/3) mottling, stiff, damp	
							T.D. of boring @ 4.5 feet	
10								
20								
30								

??(??)(??-????) ????????.DWG ??/??/?? PLOT 1=1 R001

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-05

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: 45.15 ft. MSL
DATE DRILLED: 24-FEB-95	DRILLING METHOD: HAND AUGER
LOGGED BY: Ken Bowen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	☒	SS015		PUSH		SM	ALLUVIUM (Qal) SILTY SAND (SM), brown (7.5YR 4/4), sand is rounded and very fine-grained, loose, damp
	☒	SS016		PUSH		CL	ALLUVIUM (Qal) High plasticity CLAY (CL), yellowish brown (10YR 4/4), stiff, moist
							T.D. of boring @ 4.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-06

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 16-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (AS)
		SS017	2.0	PUSH		GW	FILL (af) Well-graded GRAVEL (GW) with little silt and red brick fragments, gray (7.5YR 5/1), gravel is angular to sub-rounded, loose to medium dense, dry
						ML	COLLUVIUM (Qco) SANDY SILT (ML), strong brown (7.5YR 4/6), sand is very fine-grained, low plasticity, stiff, damp
		SS018	1.9			SM	COLLUVIUM (Qco) SILTY SAND (SM), strong brown (7.5YR 4/6), sand is fine to very fine-grained, dense, moist
10							T.D. of boring @ 10.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-07

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 16-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS019	1.0	PUSH		SM	ASPHALT (AS) approximately 2-inches COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6), sand is fine- to very fine-grained, poorly-graded, dense, dry
						ML	COLLUVIUM (Qco) SANDY SILT (ML) with trace clay, strong brown (7.5YR 4/6), sand is very fine-grained, low plasticity, stiff, moist
10		SS020	1.5	PUSH			T.D. of boring @ 10.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

??(??)(??-???) ???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-08

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 16-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							CONCRETE (CO) approximately 4-inches thick
						ML	BASEROCK approximately 6-inches thick
		SS021	1.3	PUSH			COLLUVIUM (Qco) SANDY SILT (ML) with trace clay, very dark grayish brown (2.5Y 3/2) and yellowish brown (10YR 5/6) mottled, sand is very fine-grained, low plasticity, stiff, damp
							Color change to yellowish brown (10YR 5/6) and very dark grayish brown (10YR 3/2) mottled
							COLLUVIUM (Qco) SANDY SILT (ML), strong brown (7.5YR 4/6), sand is very fine-grained, low plasticity, stiff, damp
10		SS022	1.4	PUSH			T.D. of boring @ 10.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-09

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED:	DRILLING METHOD:
LOGGED BY: R. Vernimen	DRILLING COMPANY:

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (AS)
	X	SS023	1.4	PUSH		ML	FILL (af) SANDY SILT (ML) with trace gravel and piece of wire, strong brown (7.5YR 4/6), sand is very fine-grained, low plasticity, stiff, dry
							Refusal at 2.0 feet bgs
							T.D. of boring @ 2.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(???)(???-????) ??????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-10

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 16-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS025	1.5	PUSH		ML	ASPHALT (AS), approximately 2-inches thick over BASEROCK, approximately 8-inches thick FILL (af) SANDY SILT (ML) with little gravel, dark brown (7.5YR 3/2) and strong brown (7.5YR 4/6) mottled, sand is very fine-grained, low plasticity, stiff, damp Color change to very dark gray (10YR 3/1), with trace clay and no gravel T.D. of boring @ 5.5 feet
10							
20							
30							

mm(m)(mm-mm)mmmmm.DWG tt/mm/tt PLOT 1=1 R001

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-11

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 16-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (~12 in.)
		SS026	1.2	PUSH		ML	FILL (af) SANDY SILT (ML), very dark grayish brown (10YR 3/2) and dark yellowish brown (10YR 4/6), mottled, low plasticity, damp, stiff with trace gravel COLLUVIUM (Qco) SANDY SILT (ML), strong brown (7.5YR 4/6), low plasticity, very fine-grained sand, damp, stiff
10		SS027	1.9	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), strong brown (7.5YR 4/6), fine- to very fine-grained sand, poorly graded, moist, dense
							T.D. of boring @ 10.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????).???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
18-12

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 18
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 16-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (12 in.)
		SS028	1.0	//		ML	FILL (af) SANDY SILT (ML), dark brown (10YR 3/3) and dark yellowish brown (10YR 4/6), mottled, low plasticity, very fine-grained sand, damp, stiff, with little gravel Asphaltic gravel layer @ 2.75 ft. bgs Sampler refusal @ 5 ft. bgs.
							T.D. of boring @ 5.0 feet
10							
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???)???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
22-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 22
PROJECT NO.: 044-0283	SURFACE ELEVATION: 282.04 ft. MSL
DATE DRILLED: 10-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SANDY SILT (ML), brown (10YR 4/3), low plasticity, very fine-grained sand, poorly graded, damp, medium stiff, with trace root material Color change to strong brown (7.5YR 4/6) @ 3 ft. bgs, minus root material
		SS006		PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), strong brown (7.5Y 4/6), very fine-grained sand, poorly graded, damp, dense
10		SS007	0.0	PUSH			
						SP	COLLUVIUM (Qco) SAND (SP), yellowish brown (10YR 5/6), very fine-grained sand, poorly graded, damp, dense
		SS008	0.0	PUSH			
							T.D. of boring @ 16.5 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 RO01

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
22-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 22
PROJECT NO.: 044-0283	SURFACE ELEVATION: 291.93 ft. MSL
DATE DRILLED: 10-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS003	0.0	PUSH		ML	COLLUVIUM (Qco) SANDY SILT (ML), brown (10YR 4/3) and yellowish brown (10YR 5/4), mottled, low plasticity, very fine-grained sand, poorly graded, damp, medium stiff Color change to brown (7.5YR 4/3) @ 3.5 ft., moist Color change to strong brown (7.5YR 4/6) @ 11 ft., damp, stiff
10		SS004	0.0	PUSH			
		SS005	0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained sand, poorly graded, damp, dense
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
22-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 22
PROJECT NO.: 044-0283	SURFACE ELEVATION: 299.36 ft. MSL
DATE DRILLED: 10-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/4), low plasticity, very fine-grained sand, poorly graded, damp, medium stiff
		SS011	0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/4), very fine-grained sand, poorly graded, damp, medium dense, with trace silt Dense @ 5.5 ft. bgs
10		SS012	0.0	PUSH			Medium dense @ 10.5 ft. bgs, with little silt
		SS013	0.0	PUSH			
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

ttt(tt)(ttt-tttt) tttttttt.DWG tt/tt/tt PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
22-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 22
PROJECT NO.: 044-0283	SURFACE ELEVATION: 278.95 ft. MSL
DATE DRILLED: 10-APR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: Jon Gould	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	X	SS009		PUSH		SC	SANDY CLAY (CL) with rootlets to 5.0 feet bgs, brown (5YR 3/2), 10% sand, 90% clay, sand is very fine-grained, clay is sticky, medium plasticity, slightly moist to moist SANDY CLAY (SC) with orange veins, brown (10YR 3/2), 10% sand, 90% clay, sand is very fine-grained, clay is sticky, medium plasticity, slightly moist to moist
	X	SS010		PUSH			
							T.D. of boring @ 5.0 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
22-05

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 22
PROJECT NO.: 044-0283	SURFACE ELEVATION: 269.47 ft. MSL
DATE DRILLED: 10-APR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: Jon Gould	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	X	SS001		PUSH		CL	SANDY CLAY (CL), 10% sand and 90% clay, dark brown (5YR 3/2), sand is very fine-grained, clay is sticky, medium plasticity, no odor or staining, slightly moist to moist Same as above, no water in hole
	X	SS002		PUSH			
							T.D. of boring @ 5.0 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
23-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 23
PROJECT NO.: 044-0283	SURFACE ELEVATION: 449.83 ft. MSL
DATE DRILLED: 07-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						SM	FILL (af) SILTY SAND (SM), light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6), mottled, very fine-grained sand, poorly graded, damp, medium dense, with trace root material
						SP	COLLUVIUM (Qco) SAND (SP), light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6), mottled, very fine-grained sand, poorly graded, moist, medium dense
		SS005	0.0 0.0	PUSH			
						ML	Little fine-grained sand @ 5.5 ft. bgs COLLUVIUM (Qco) SANDY SILT (ML), light brownish gray (2.5Y 6/2) with brownish yellow (10YR 6/6) banding, low plasticity, damp, very dense
10		SS006	0.0 0.0	PUSH			
						SP	COLLUVIUM (Qco) SAND (SP), light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6), mottled, very fine-grained sand, poorly graded, damp, very dense
		SS007	0.0	PUSH			
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
23-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 23
PROJECT NO.: 044-0283	SURFACE ELEVATION: 448.09 ft. MSL
DATE DRILLED: 06-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS001	0.0 0.0	PUSH		SM	FILL (af) SILTY SAND (SM), light olive brown (2.5Y 5/4), very fine-grained sand, poorly graded, damp, dense, with trace subrounded gravel Minus trace gravel
						SP ML SP	FILL (af) SAND (SP), light yellowish brown (2.5Y 6/4), very fine-grained sand, poorly graded, damp, dense COLLUVIUM (Qco) SANDY SILT (ML), light brownish gray (2.5Y 6/2) with brownish yellow (10YR 6/6) banding, low plasticity, dry, very dense (siltstonelike layer) COLLUVIUM (Qco) SAND (SP), light yellowish brown (2.5Y 6/3), fine- to very fine-grained sand, poorly graded, damp, very dense
10		SS002	0.0 0.0	PUSH			
		SS003	0.0	PUSH			
							T.D. of boring @ 16.5 feet
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(**)(-****)********.DWG **/**/** PLOT 1=1 R001

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
24-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 24
PROJECT NO.: 044-0283	SURFACE ELEVATION: 212.48 ft. MSL
DATE DRILLED: 31-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SILT (ML), brown (7.5YR 4/4), low plasticity, moist, medium stiff, with trace very fine-grained sand and root material Trace clay @ 3 ft. bgs, yellowish brown (10YR 5/4) Minus clay @ 4 ft. bgs COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, damp, medium stiff
		SS004	0.0 0.0	PUSH			
							COLLUVIUM (Qco) GRAVELLY SILT (ML), strong brown (7.5YR 4/6) with gray (7.5YR 5/1) gravel, low plasticity, angular to subrounded gravel, well graded, damp, medium stiff, with trace very fine-grained sand
						SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/4), very fine-grained sand, poorly graded, moist, medium dense
10		SS005	0.0	PUSH			
						ML	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, damp, medium stiff
		SS006	0.0	PUSH			
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
24-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 24
PROJECT NO.: 044-0283	SURFACE ELEVATION: 215.29 ft. MSL
DATE DRILLED: 31-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SILT (ML), dark brown (7.5YR 3/4), low plasticity, moist, medium stiff, trace clay, root material and very fine grained-sand COLLUVIUM (Qco) CLAYEY SILT (ML), brown (7.5YR 4/4), medium plasticity, moist, stiff, with trace very fine-grained sand
		SS001	0.0 0.0	PUSH			COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6) with gray (10YR 5/1) gravel, low plasticity, very fine-grained sand, poorly graded, damp, medium stiff, with some subangular gravel
10		SS002	0.0 0.0	PUSH			COLLUVIUM (Qco) GRAVELLY SILT (ML), yellowish brown (10YR 5/6) with gray (10YR 5/1) gravel, low plasticity, angular to subrounded gravel and gravel fragments, well graded, damp, medium stiff
		SS003	0.0	PUSH			COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, damp, stiff
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
24-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 24
PROJECT NO.: 044-0283	SURFACE ELEVATION: 212.22 ft. MSL
DATE DRILLED: 04-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS008	0.0	PUSH		ML	COLLUVIUM (Qco) SILT (ML), very dark grayish brown (10YR 3/2), low plasticity, damp, medium stiff, with trace root material and very fine-grained sand
							COLLUVIUM (Qco) SANDY SILT(ML), strong brown (7.5YR 5/6), low plasticity, very fine grained-sand, poorly graded, damp, stiff
						SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained sand, poorly graded, damp, dense
10		SS009	0.0	PUSH		SW	COLLUVIUM (Qco) GRAVELLY SAND (SW), light brownish gray (10YR 6/2), medium- to very fine-grained sand, well graded, angular to subrounded gravel, well graded, damp, dense, with trace silt
							T.D. of boring @ 11.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
25-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 25
PROJECT NO.: 044-0283	SURFACE ELEVATION: 394.3 ft. MSL
DATE DRILLED: 03-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SILT (ML), dark brown (7.5YR 3/2), low plasticity, dry, stiff, some fine-grained sand, clay, and root materials Silty with trace sand @ 2.5 ft, bgs, dark grayish brown (10YR 3/2), dry
		SS001	0.0	PUSH		CL	COLLUVIUM (Qco) SILTY CLAY (CL), brown (7.5YR 3/3), low plasticity, medium dense, trace very fine-grained sand
						SM	COLLUVIUM (Qco) SILTY SAND (SM), yellow brown (10YR 5/6)
						ML	COLLUVIUM (Qco) SANDY SILT (ML), brown (10YR 4/6), low plasticity, medium dense, trace clay Refusal @ 8.2 ft.
10							T.D. of boring @ 8.2 feet
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(**)(-****)********.DWG **/**/** PLOT 1=1 R001

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
25-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 25
PROJECT NO.: 044-0283	SURFACE ELEVATION: 399.03 ft. MSL
DATE DRILLED: 03-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: K. Bowen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
			0.0			ML	COLLUVIUM (Qco) CLAYEY SILT (ML), brown (10YR 3/2), low plasticity, dry, medium stiff, trace very fine-grained sand and root material COLLUVIUM (Qco) SANDY SILT (ML), brown (10YR 3/2), low plasticity, moist, medium stiff, very fine- to medium-grained sand and trace roots
		SS002	0.0	PUSH		SP	COLLUVIUM (Qco) SAND (SP), brown (10YR 5/6), very fine- to medium-grained sand, poorly graded, low density, dry, very friable Change to very fine-grained sand, friable @ 10.0 ft. bgs
10		SS003	0.0	PUSH			
		SS004	0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), brown (10YR 4/6), very fine-grained sand, moist
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
25-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 25
PROJECT NO.: 044-0283	SURFACE ELEVATION: 394.3 ft. MSL
DATE DRILLED: 03-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: K. Bowen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SILT (ML), dark brown (7.5YR 3/2), low plasticity, dry, some fine-grained sand, clay, and root materials Changes to trace sand @ 2.5 ft. bgs, dark grayish brown (10YR 3/2), dry
						CL	COLLUVIUM (Qco) SILTY CLAY (CL), brown (7.5YR 3/3), low plasticity, medium density, trace very fine-grained sand
						SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6)
						ML	COLLUVIUM (Qco) SANDY SILT (ML), brown (10YR 4/6), low plasticity, medium dense, trace clay
10		SS005	0.0 0.0	PUSH			COLLUVIUM (Qco) SILTY SAND (SM), light brown (10YR 4/6), very fine-grained sand, low density, dry, friable
							Refusal @ 14 ft. bgs
							T.D. of boring @ 14.0 feet
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* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 1.51 ft. MSL
DATE DRILLED: 11-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS005	0.0	PUSH		ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, damp to moist, with trace angular to subrounded gravel Concrete fragments in shoe Refusal @ 3 ft. T.D. of boring @ 3.0 feet
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* Field screening Analytical Results

SHEET: 1 of 1

??\??\(???-???)\????????.DWG 11/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 3.16 ft. MSL
DATE DRILLED: 13-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS007	0.0	PUSH		GW	FILL (af)
						SM	SILTY GRAVEL (GW), gray (2.5Y 5/1), subangular to subrounded, well graded, damp, loose
							COLLUVIUM (Qco)
							SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained, poorly graded, dense, damp
		SS008	0.0	PUSH			Water level @ 1.0 ft. bgs
							Saturated @ 4.5 ft.
							Refusal @ 5 ft.
							T.D. of boring @ 5.0 feet
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* Field screening Analytical Results

SHEET: 1 of 1

???(???)(???-???) ???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 2.44 ft. MSL
DATE DRILLED: 13-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS009	0.0	PUSH		GW	FILL (af) SILTY GRAVEL (GW), gray (5Y 5/1), subangular to subrounded, well graded, damp, loose to medium dense, with trace fine-grained sand Moist @ 2.5 ft. Water level @ 3.3 ft. bgs
		SS010	0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/8) and dark grayish brown (2.5Y 4/2), mottled, very fine-grained, poorly graded, damp, medium dense
							T.D. of boring @ 7.0 feet
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* Field screening Analytical Results

SHEET: 1 of 1

mm(mm-mm) mmmmm.DWG ft/ft/ft PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 2.46 ft. MSL
DATE DRILLED: 13-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS011	0.0	PUSH		GW	FILL (af) SILTY GRAVEL (GW), gray (5Y 5/1), angular to subrounded, well graded, damp, medium dense, with little fine-grained sand
						ML	FILL (af) SANDY SILT (ML), light olive brown (2.5Y 5/4) and yellowish brown (10YR 5/6), mottled, low plasticity, very fine-grained sand, poorly graded, damp, medium stiff
		SS012	0.0	PUSH		GW	FILL (af) SILTY GRAVEL (GW), very dark gray (2.5Y 3/1), angular to subrounded, well graded, moist, dense, with little fine-grained sand
						ML	FILL (af) GRAVELLY SILT (GW), yellowish brown (10YR 5/6), with dark gray (10YR 4/1) gravel, low plasticity, damp, stiff, with little sand
10							Refusal @ 6 ft.
							T.D. of boring @ 6.0 feet
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* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-???)???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-05

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 4.5 ft. MSL
DATE DRILLED: 17-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS021	0.0	PUSH		GW ML	ASPHALT (~1 in.) FILL (af) SANDY GRAVEL (GW), gray (2.5Y 5/1) gravels with yellowish brown (10YR 5/6) fine-grained sand, well graded, angular to subangular, damp, loose COLLUVIUM (Qco) SANDY SILT (ML), dark grayish brown (2.5Y 4/2) and olive gray (5Y 4/2), mottled, low plasticity, very fine-grained sand, poorly graded, damp, medium stiff
		SS022	0.0	PUSH			
							T.D. of boring @ 7.0 feet
10							
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* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-06

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 5.92 ft. MSL
DATE DRILLED: 17-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS023	0.0	PUSH		SM	ASPHALT (~1 in.) over BASEROCK (~4 in.) COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained, poorly graded, damp, medium dense Color changes to olive brown (2.5Y 4/4)
		SS024	0.0	PUSH		SP	COLLUVIUM (Qco) SAND (SP), olive brown (2.5Y 4/4), fine-grained, poorly graded, wet, medium dense, with trace silt
							T.D. of boring @ 7.0 feet
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(**)(**-*)*******.DWG **/**/** PLOT 1=1 R001

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-07

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 2.2 ft. MSL
DATE DRILLED: 13-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS013	0.0	PUSH		GW	FILL (af) SILTY GRAVEL (GW), gray (5Y 5/1), angular to subrounded, well graded, damp, medium dense
						ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, moist, medium stiff, with trace gravel
		SS014	0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), light brown (2.5Y 5/4) and olive brown (2.5Y 4/3), mottled, very fine-grained, poorly graded, wet, medium dense, with trace clay
10							T.D. of boring @ 7.0 feet
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* Field screening Analytical Results

SHEET: 1 of 1

yyyy(mm-mm).yyyyyyyy.DWG mm/mm/yy PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-08

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 1.44 ft. MSL
DATE DRILLED: 11-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS001	0.0	PUSH		ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/8), low plasticity, fine-grained sand, poorly graded, damp, medium dense with trace gravel Change to moist
		SS002	0.0	PUSH			FILL (af) CLAYEY SILT (ML), yellow brown (10YR 5/8) with dark gray (N4) mottling, medium plasticity, moist, medium soft ASPHALT Refusal @ 6 ft.
10							T.D. of boring @ 6.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

??X(??)X(??-????).??????.DWG ??/??/?? PLOT 1=1 BG01

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-09

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 1.37 ft. MSL
DATE DRILLED: 11-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS003	0.0	PUSH		ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, damp, stiff with trace angular gravel
		SS004	0.0	PUSH		GW	FILL (af) SILTY GRAVEL (GW), gray (7.5YR 5/1), angular to subangular, well graded, damp, dense Asphalt @ 5.4 ft., refusal @ 5.5 ft.
							T.D. of boring @ 5.5 feet
10							
20							
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* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-10

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 0.77 ft. MSL
DATE DRILLED: 17-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS025	0.0	PUSH		ML	ASPHALT (~3 in.) over BASEROCK (~2 in.) FILL (af) SANDY SILT (ML), olive brown (2.5Y 4/3) and dark yellowish brown (10YR 4/4), mottled, low plasticity, very fine-grained sand, poorly graded, moist, medium stiff, with little subrounded gravel
		SS026	0.0				Color change to very dark gray (5Y 3/1) @ 3.5 ft. Refusal @ 4 ft.
							T.D. of boring @ 4.0 feet
10							
20							
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* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-11

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 3.93 ft. MSL
DATE DRILLED: 18-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS028	0.0	PUSH		GW	ASPHALT (~1 in.)
						SP	FILL (af)
						SM	SILTY GRAVEL (GW), very dark gray (5Y 3/1), subangular to subrounded, well graded, damp, loose
							FILL (af) SAND (SP), yellowish brown (10YR 5/6), very fine-grained, poorly graded, damp, medium dense
		SS029	0.0	PUSH		SP	COLLUVIUM (Qco) SILTY SAND (SM), very dark grayish brown (2.5Y 3/2), very fine-grained, poorly graded, moist, dense
						ML	Trace asphaltic gravel @ 2 ft. COLLUVIUM (Qco) SAND (SP), very dark grayish brown (2.5Y 3/2), medium-grained, poorly graded, saturated, medium dense
10						CL	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6) and dark gray (10YR 4/1), mottled, low plasticity, very fine-grained sand, poorly graded, moist, stiff, with trace siltstone fragments
							YOUNGER BAY MUD (Qyb) SILTY CLAY (CL), very dark gray (5Y 3/1), medium plasticity, wet, soft, with little decayed organic material
							T.D. of boring @ 11.0 feet
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30							

* Field screening Analytical Results

SHEET: 1 of 1

mm(yy)(mm-mm)mmmmm.DWG mm/mm/mm PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-12

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 1.88 ft. MSL
DATE DRILLED: 14-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. VERNIMEN	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS016	0.0	PUSH		ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/8) and olive brown (2.5Y 4/3), mottled, low plasticity, very fine-grained sand, poorly graded, damp, medium stiff, with trace gravel and wood pieces Color change to yellowish brown (10YR 5/8) @ 4 ft., moist, minus wood pieces
		SS017	0.0	PUSH			COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/8), medium plasticity, very fine-grained sand, poorly graded, moist, medium stiff, with trace clay Color grading to olive gray (5Y 4/2) and dark yellowish brown (10YR 4/4) @ 7.5 ft., mottled Wet @ 10 ft. Saturated @ 10.5 ft.
10							COLLUVIUM (Qco) CLAYEY SILT (ML), olive gray (5Y 4/2) and yellowish brown (10YR 5/6), mottled, medium plasticity, moist, medium stiff, with trace fine-grained sand
							T.D. of boring @ 13.0 feet
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* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
37-13

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 37
PROJECT NO.: 044-0283	SURFACE ELEVATION: 3.93 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						GW	SILTY GRAVEL (GW), very dark gray (5Y 3/1), subangular to subrounded, well graded, damp, loose
						SP	SAND (SP), yellowish brown (10YR 5/6), very fine-grained sand, poorly graded, damp, medium dense
						SM	SILTY SAND (SM), very dark grayish brown (2.5Y 3/2), very fine-grained sand, poorly graded, moist, dense
						SP	SAND (SP), very dark grayish brown (2.5Y 3/2), very fine-grained sand, poorly graded, moist, medium dense
						ML	SANDY SILT (ML), yellowish brown (10YR 5/6) and dark gray (10YR 4/1), mottled, low plasticity, very fine-grained sand, poorly graded, moist, stiff, with trace siltstone fragments
10						CL	SILTY CLAY (CL), very dark gray (5Y 3/1), medium plasticity, wet, soft, with little decayed organic material
							T.D. of boring @ 12.0 feet
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30							

mm(mm)(mm-mm)mmmmm.DWG mm/mm/mm PLOT 1=1 R001

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
40-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 40
PROJECT NO.: 044-0283	SURFACE ELEVATION: 9.21 ft. MSL
DATE DRILLED: 24-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS001	0.0 0.0	PUSH		GW	FILL (af) Well-graded SILTY GRAVEL (GW) with trace medium- and fine-grained sand, dark gray (5Y 4/1), gravel is sub-angular to sub-rounded, loose, wet Increase in moisture content to saturated
		SS002	0.0	PUSH			Increase in gravel size, angular
10							T.D. of boring @ 10.0 feet
20							
30							

* Field screening Analytical Results

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
40-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 40
PROJECT NO.: 044-0283	SURFACE ELEVATION: 8.99 ft. MSL
DATE DRILLED: 24-MAR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	■	SS003	0.0			GW	FILL (af) SILTY GRAVEL (GW), dark gray (5Y 4/1), subangular to subrounded, well graded, moist, loose, with trace fine-grained sand Refusal @ 1 ft. bgs. hand auger
							T.D. of boring @ 1.0 feet
10							
20							
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* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)???????.DWG ??/??/?? PLOT 1=1 8001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
40-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 40
PROJECT NO.: 044-0283	SURFACE ELEVATION: 9.42 ft. MSL
DATE DRILLED: 24-MAR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	■	SS004	0.0			GW	FILL (af)
	■	SS005	0.0				SILTY GRAVEL (GW), dark gray (5Y 4/1), subangular to subrounded, well graded, damp, loose, with trace fine-grained sand
							Refusal @ 2 ft. bgs. hand auger
							T.D. of boring @ 2.0 feet
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20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
44-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 44
PROJECT NO.: 044-0283	SURFACE ELEVATION: 28.86 ft. MSL
DATE DRILLED: 12-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS001	0.0	PUSH		ML	COLLUVIUM (Qco) SANDY SILT (ML), very dark grayish brown (10YR 3/2) and brown (10YR 4/3), mottled, low plasticity, very fine-grained sand, poorly graded, damp, with trace subangular gravel and root material, medium stiff Color change to strong brown (7.5YR 4/6) @ 3.0 ft. bgs, with very dark grayish brown (10YR 3/2) mottling, minus gravel Sand occurring in pockets within the silt @ 5.0 ft. bgs, stiff Sand uniformly mixed with silt @ 9.0 ft. bgs Color change to yellowish brown (10YR 5/6) @ 10.0 ft. bgs, very stiff
10		SS002	0.0	PUSH			
		SS003	0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6) with minor white (10YR 8/1) banding, very fine-grained sand, poorly graded, damp, very dense
							T.D. of boring @ 15.5 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

mm(yy)(mm-mm) mmmmm.DWG yy/mm/hh PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
44-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 44
PROJECT NO.: 044-0283	SURFACE ELEVATION: 28.67 ft. MSL
DATE DRILLED: 12-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SILT (ML), very dark gray (10YR 3/1), low plasticity, moist, medium stiff, with trace subrounded gravel, very coarse-grained sand, and root material from 0 to 1 ft. bgs Trace very fine-grained sand COLLUVIUM (Qco) SANDY SILT (ML), dark grayish brown (2.5Y 4/2) and yellowish brown (10YR 5/4), mottled, low plasticity, very fine-grained sand, poorly graded, damp, stiff Color change to brownish yellow (10YR 6/6) @ 10.0 ft. bgs, slightly damp, very stiff Color change to yellowish brown (10YR 5/6) @ 14.0 ft. bgs, damp Color change to dark yellowish brown (10YR 4/6) @ 15.0 ft. bgs
		SS004	0.0	PUSH			
10		SS005	0.0	PUSH			
		SS006	0.0	PUSH			
							T.D. of boring @ 18.0 feet
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* Field screening Analytical Results

SHEET: 1 of 1

mm(yy)(mm-mm) mmmmm.DWG yy/yy/yy PLOT 1=1 ROOI

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
50-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 50
PROJECT NO.: 044-0283	SURFACE ELEVATION: 8.79 ft. MSL
DATE DRILLED: 07-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	ASPHALT (AS), approximately 9-inches thick BASEROCK approximately 2-inches thick FILL (af) SILT (ML) with trace very fine-grained sand and pebbly gravel, yellowish brown (10YR 5/6), low plasticity, medium stiff, damp
	X	SS006	0.0	3/10/18			FILL(af) SILT (ML) with little clay and trace pebbly sub-angular gravel, dark gray (5Y 4/1) and black (5Y 2.5/1), low plasticity, stiff, damp
	X	SS007	0.0	17/11/3		GW ML	4-inch layer of sub-angular GRAVEL (GW), loose, saturated FILL (af) CLAYEY SILT (ML), dark gray (5Y 4/1), medium plasticity, medium stiff, wet
10							T.D. of boring @ 6.5 feet
20							
30							

(**)(-***) *******.DWG **/**/** PLOT 1=1 R001

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
50-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 50
PROJECT NO.: 044-0283	SURFACE ELEVATION: 8.95 ft. MSL
DATE DRILLED: 07-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (AS), approximately 12-inches thick
						ML	FILL (af) SANDY SILT (ML), yellowish brown (10YR 5/6), sand is very fine-grained, poorly-graded, low plasticity, medium stiff, damp
	X	SS008	0.0	7 / 10 / 11		SM	Color change to yellowish brown (10YR 5/6) with olive gray (5Y 4/2) mottled
	X	SS009	999.0	14 / 15 / 13		GW	FILL (af) SILTY SAND (SM) with moderate diesel odor, olive gray (5Y 4/2), sand is fine-grained, poorly-graded, medium dense, damp
10							FILL (af) GRAVEL (GW) with strong diesel odor, dark gray (2.5Y 4/1), gravel is angular to sub-rounded, average diameter 1/2-inch, loose, saturated
							T.D. of boring @ 6.5 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
50-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 50
PROJECT NO.: 044-0283	SURFACE ELEVATION: 8.4 ft. MSL
DATE DRILLED: 07-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (AS), approximately 10-inches thick over BASEROCK, approximately 2-inches thick
						ML	FILL (af) SANDY SILT (ML) with trace clay and little pebbly gravel, dark yellowish brown (10YR 4/6) and light olive brown (2.5Y 5/4) mottled, sand is very fine-grained, poorly-graded, low plasticity, medium stiff, moist
		SS003	0.0	4 3 4			FILL (af) GRAVELLY SILT (ML) with trace very fine-grained sand, very dark gray (10YR 3/1), gravel is pebbly and sub-angular, well-graded, low plasticity, medium stiff, wet
						CL	Increase to trace angular gravels with (inferred depth) average
10		SS004	0.0	1 1 4			YOUNGER BAY MUD (Qyb) SANDY CLAY (CL) with trace fine-grained rootlets, dark gray (5Y 4/1), sand is fine-grained, poorly-graded, medium plasticity, medium stiff, saturated
							T.D. of boring @ 11.5 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

??(??)X(???-????) ??????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
50-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 50
PROJECT NO.: 044-0283	SURFACE ELEVATION: 8 ft. MSL
DATE DRILLED: 06-MAR-95	DRILLING METHOD: HOLLOW STEM AUGER
LOGGED BY: K. Bowen	DRILLING COMPANY: HEW DRILLING

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (AS), approximately 12-inches thick
						GW	GRAVEL (GW), approximately 6-inches thick
						SM	SILTY SAND (SM) with trace clay, dark yellowish brown (10YR 4/4), sand is very fine-grained, poorly-graded, no odor, wet
							SILT (ML), olive brown (2.5Y 4/4), silt is uniform, low plasticity, no odor, moist
		SS001		2/5/11			
10		SS002		2/5/11			
							T.D. of boring @ 15.0 feet
20							
30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
50-05

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 50
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							ASPHALT (~3 in.) over BASEROCK (~4 in.)
		SS010	0.6	PUSH		ML	FILL (af) SANDY SILT (ML), strong brown (7.5YR 5/6) and very dark gray (7.5YR 3/1), mottled, low plasticity, very fine-grained sand, stiff, with little subrounded gravel throughout
		SS011	0.9	PUSH			Color changes to dark gray (2.5Y 3/1)
							T.D. of boring @ 4.0 feet
10							
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* Field screening Analytical Results

SHEET: 1 of 1

??(??)(??-???) ????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
50-06

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 50
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS012	1.2	PUSH		ML	ASPHALT (AS), approximately 3-inches thick, over BASEROCK, approximately 3-inches thick FILL (af) SANDY SILT (ML) with little sub-rounded gravel throughout interval, dark yellowish brown (10YR 4/4), sand is very fine-grained, low plasticity, stiff, damp
		SS013	1.8	PUSH			
							T.D. of boring @ 4.0 feet
10							
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* Field screening Analytical Results

SHEET: 1 of 1

mm(rr)(rrr-mm) rrrrrrrr.DWG rr/rr/rr PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
50-07

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 50
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 13-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS014	1.5	PUSH		ML	APHALT (AS), approximately 3-inches thick BASEROCK, approximately 3-inches thick FILL (af) SANDY SILT (ML) with trace gravel, dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottled, sand is very fine-grained, low plasticity, stiff, damp
		SS015	1.2	PUSH			Color change to dark yellowish brown (10YR 4/4) and dark olive brown (2.5Y 3/3) mottling Color change to black (2.5Y 2.5/1) with trace clay, moist
							T.D. of boring @ 5.0 feet
10							
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
50-08

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 50
PROJECT NO.: 044-0283	SURFACE ELEVATION: -9 ft. MSL
DATE DRILLED: 16-OCT-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: VIRONEX

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS016	0.4	PUSH		ML	ASPHALT (AS), approximately 3-inches thick BASEROCK, approximately 3-inches thick COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), sand is very fine-grained, low plasticity, stiff, dry
		SS017	1.5	PUSH			Color change to olive gray (5Y 4/2), damp
							T.D. of boring @ 5.0 feet
10							
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* Field screening Analytical Results

SHEET: 1 of 1

ttt(mm)(ttt-ttt) ttttttt.DWG tt/tt/tt PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
51-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 51
PROJECT NO.: 044-0283	SURFACE ELEVATION: 87.88 ft. MSL
DATE DRILLED: 06-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS001	0.0 0.0	PUSH		ML	COLLUVIUM (Qco) SILT (ML) with trace root material, black (2.5Y 2.5/1), low plasticity, medium stiff, moist COLLUVIUM (Qco) SANDY SILT (ML) with trace clacite pieces, dark grayish brown (2.5Y 4/2) with yellowish brown (10YR 5/4) spotting, sand is very fine-grained, poorly-graded, low plasticity, medium stiff, moist COLLUVIUM (Qco) CLAYEY SILT (ML) with trace calcite fragments, very dark gray (5Y 3/1) with white (5Y 8/1) spotting, low plasticity, medium stiff, moist COLLUVIUM (Qco) SILTY SAND (SM) with trace clay, light olive brown (2.5Y 5/3) with yellowish brown (10YR 5/4) spotting, sand is very fine-grained, poorly-graded, medium dense, wet Change grain size to fine- to very fine-grained, dense with trace clay
10		SS002	0.0 0.0	PUSH		SM	
		SS003	0.0	PUSH			
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
51-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 51
PROJECT NO.: 044-0283	SURFACE ELEVATION: 88.89 ft. MSL
DATE DRILLED: 06-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SILT (ML) with traces of very fine-grained sand, clay and root material, black (2.5Y 2.5/1), low plasticity, medium stiff, moist COLLUVIUM (Qco) SANDY SILT (ML) with trace clay, light olive brown (2.5Y 5/3), sand is very fine-grained, poorly-graded, low plasticity, medium stiff, moist COLLUVIUM (Qco) CLAYEY SILT (ML) with trace calcite pieces, dark gray (5Y 4/1) with light gray (5Y 7/1) spotting, low plasticity, medium stiff, moist Color change to very dark gray (2.5Y 3/1) Color change to dark gray (5Y 4/1), medium plasticity, increase in moisture content to saturated
		SS004	0.0 0.0	PUSH			
10		SS005	0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM) with trace clay, light olive brown (2.5Y 5/3) and yellowish brown (10YR 5/4) mottled, sand is very fine-grained, poorly-graded, dense, moist Increase to little clay
		SS006	0.0	PUSH		CL	COLLUVIUM (Qco) SANDY CLAY (CL) with trace silt, light olive brown (2.5Y 5/3) and yellowish brown (10YR 5/4), sand is very fine-grained, poorly-graded, medium plasticity, soft, moist
20							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
52-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 52
PROJECT NO.: 044-0283	SURFACE ELEVATION: 161.66 ft. MSL
DATE DRILLED: 29-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS001	0.0 0.0	PUSH		ML	COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 3/4) and yellowish brown (10YR 5/6), mottled, low plasticity, very fine-grained sand, poorly graded, damp, medium stiff with trace root material Color change to yellowish brown (10YR 5/6) @ 3.5 ft. bgs, trace angular to subrounded gravel COLLUVIUM (Qco) SILT (ML), dark brown (7.5YR 3/3), low plasticity, damp, very stiff, with trace very fine-grained sand COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, damp, very stiff, with trace subangular to subrounded gravel Color change to strong brown (7.5YR 4/6) @ 15 ft. bgs, medium stiff, minus gravel
10		SS002	0.0 0.0	PUSH			
		SS003	0.0	PUSH			
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

??(??)(??-???)??????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
52-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 52
PROJECT NO.: 044-0283	SURFACE ELEVATION: 162.44 ft. MSL
DATE DRILLED: 29-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/4), very fine-grained sand, poorly graded, moist, medium dense, with trace root material Woody root and trace angular to subrounded gravel @ 3 ft.
		SS004	0.0 0.0	PUSH		ML	COLLUVIUM (Qco) SILT (ML), very dark gray (2.5Y 3/1), low plasticity, damp, stiff, with trace subrounded gravel and root material
10		SS005	0.0 0.0	PUSH			COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, damp, stiff
		SS006		PUSH			
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

R001 PLOT 1=1 ??/??/?? ????????.DWG ???(??)(???-????)

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
52-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 52
PROJECT NO.: 044-0283	SURFACE ELEVATION: 152.1 ft. MSL
DATE DRILLED: 30-MAR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	■	SS008	0.0			ML	COLLUVIUM (Qco) SILT (ML), very dark grayish brown (10YR 3/2), medium plasticity, moist, medium stiff, with little clay, trace very fine-grained sand, and pebbly, little rounded to subrounded gravel
			0.0				
	■	SS009					T.D. of boring @ 2.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

rrr(rr)(rrr-rrrr) rrrrrrrr.DWG rr/rr/rr PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
52-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 52
PROJECT NO.: 044-0283	SURFACE ELEVATION: 154.2 ft. MSL
DATE DRILLED: 30-MAR-95	DRILLING METHOD: HAND AUGER
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
	■	SS010	0.0			ML	COLLUVIUM (Qco) SILT (ML), very dark grayish brown (10YR 3/2) with reddish brown (5YR 4/4) spotting, low plasticity, damp, medium stiff, with little clay
	■	SS011	0.0				No reddish brown spotting from 2 ft. bgs, medium plasticity
							T.D. of boring @ 4.0 feet
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* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????)????????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
53-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 53
PROJECT NO.: 044-0283	SURFACE ELEVATION: 158.74 ft. MSL
DATE DRILLED: 30-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						SP	TOPSOIL (4 in.) with grass roots COLLUVIUM (Qco) SAND (SP), yellowish brown (10YR 5/6), very fine-grained sand, poorly graded, damp, medium dense, with trace silt
						ML	COLLUVIUM (Qco) SILT (ML), very dark gray (10YR 3/1), low plasticity, damp, medium stiff Color change to very dark brown (10YR 2/2) @ 4.0 ft. bgs Trace very fine-grained sand @ 5.0 ft. bgs Color change to dark grayish brown (2.5Y 4/2) @ 10.0 ft. bgs, stiff, little very fine-grained sand
		SS001	0.0 0.0	PUSH			
10		SS002	0.0	PUSH			
		SS003	0.0 0.0	PUSH			COLLUVIUM (Qco) SANDY SILT (ML), brown (10YR 4/3), low plasticity, very fine-grained sand, poorly graded, damp, stiff
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

mm(yy)(mm-mm) mmmmm.DWG mm/mm/mm PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
53-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 53
PROJECT NO.: 044-0283	SURFACE ELEVATION: 159.2 ft. MSL
DATE DRILLED: 30-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						SM	COLLUVIUM (Qco) SILTY SAND (SM), yellowish brown (10YR 5/6), very fine-grained sand, poorly graded, damp, medium dense with trace root material
						ML	COLLUVIUM (Qco) SILT (ML), very dark grayish brown (10YR 3/2), low plasticity, damp, medium stiff
		SS004	0.0 0.0	PUSH			Stiff @ 4.5 ft. bgs
10		SS005	0.0 0.0	PUSH			COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/6), low plasticity, very fine-grained sand, poorly graded, damp, stiff
		SS006	0.0	PUSH			Color change to dark yellowish brown (10YR 4/4) @ 14.5 ft. bgs, medium stiff
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
54-01

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 54
PROJECT NO.: 044-0283	SURFACE ELEVATION: 165.85 ft. MSL
DATE DRILLED: 05-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SANDY SILT (ML), brown (10YR 4/3), low plasticity, very fine-grained sand, poorly graded, damp, medium stiff, with trace root material Color changes to strong brown (7.5YR 5/6) @ 3.0 ft. bgs COLLUVIUM (Qco) SILTY SAND (SM), strong brown (7.5YR 5/6), very fine-grained sand, poorly graded, damp, medium dense
		SS011	0.0 0.0	PUSH			
						SM	Some fine-grained sand @ 10.0 ft. bgs, dense Very dense @ 15.0 ft. bgs
10		SS012	0.0 0.0	PUSH			
		SS013	0.0	PUSH			
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

???(???)(??-???)???????.DWG ??/??/?? PLOT 1=1 R001

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
54-02

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 54
PROJECT NO.: 044-0283	SURFACE ELEVATION: 166.98 ft. MSL
DATE DRILLED: 05-APR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SANDY SILT (ML), yellowish brown (10YR 5/4), low plasticity, very fine-grained sand, poorly graded, damp, medium stiff Color changes to dark yellowish brown (10YR 4/4) @ 2 ft. bgs
		SS008	0.0 0.0	PUSH		SM	COLLUVIUM (Qco) SILTY SAND (SM), strong brown (7.5YR 5/6), very fine-grained sand, poorly graded, damp, dense
10		SS009	0.0	PUSH			
		SS010		PUSH			
							T.D. of boring @ 16.5 feet
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* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
54-03

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 54
PROJECT NO.: 044-0283	SURFACE ELEVATION: 174.52 ft. MSL
DATE DRILLED: 23-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						ML	COLLUVIUM (Qco) SILT (ML), dark brown (7.5YR 3/3), low plasticity, wet, medium stiff, with trace very fine-grained sand and root material Moist @ 2.5 ft. COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/4), low plasticity, very fine-grained sand, poorly graded, moist, stiff
		SS001	0.0	PUSH			
10		SS002	0.0	PUSH			
		SS003	0.0	PUSH			
							T.D. of boring @ 16.0 feet
20							
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mm(rr)(rrr-rrrr) rrrrrrr.DWG rr/rr/rr PLOT 1=1 R001

* Field screening Analytical Results

SHEET: 1 of 1

PRC ENVIRONMENTAL MANAGEMENT, INC.

LOG OF BORING
54-04

PROJECT: RFA CONFIRMATION STUDY	LOCATION: SWMU 54
PROJECT NO.: 044-0283	SURFACE ELEVATION: 174.3 ft. MSL
DATE DRILLED: 22-MAR-95	DRILLING METHOD: GEOPROBE
LOGGED BY: R. Vernimen	DRILLING COMPANY: PRC EMI

ELEVATION (FEET) DEPTH	SAMPLE	SAMPLE NO.	PID (ppm)	BLOWS/FT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		SS004	0.0	PUSH		ML	COLLUVIUM (Qco) SILT (ML), dark yellowish brown (10YR 3/4), low plasticity, wet, medium stiff, with little very fine-grained sand COLLUVIUM (Qco) SANDY SILT (ML), dark yellowish brown (10YR 4/4), low plasticity, moist, very fine-grained sand, poorly graded, stiff Color change to yellowish brown (10YR 5/6) @ 5.5 ft. bgs Color change to strong brown (7.5YR 4/6) @ 10.0 ft. bgs Color change to yellowish red (5YR 4/6) @ 14.5 ft. bgs, damp, very stiff, with trace siltstone fragments
10		SS005	0.0	PUSH			
		SS006	0.0	PUSH			
							T.D. of boring @ 16.5 feet
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30							

* Field screening Analytical Results

SHEET: 1 of 1

???(??)(???-????) ????????.DWG ??/??/?? PLOT 1=1 R001