Record of Decision
Former Makalapa Pesticide Rinsate Pit
Pearl Harbor, Hawaii

September 2010

Department of the Navy
NAVFAC Hawaii
Pearl Harbor, HI 96860-3139

Contract Number: N62742-06-D-1882, CTO HC05

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Former Makalapa Pesticide Rinsate Pit
Pearl Harbor, Hawaii

September 2010

Prepared for:

Department of the Navy
NAVFAC Hawaii
400 Marshall Road
Pearl Harbor, HI 96860-3139

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ACRONYMS AND ABBREVIATIONS

ACRONYMS/ ABBREVIATIONS	DEFINITION/MEANING
°F	degrees Fahrenheit
amsl	above mean sea level
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CIP	Community Involvement Plan
COC	contaminant of concern
CSM	Conceptual Site Model
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DoN	U.S. Department of the Navy
ELCR	Excess Lifetime Cancer Risk
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
GSA	Geographic Study Area
HDOH	Department of Health, State of Hawaii
HI	Hazard Index
IAS	Initial Assessment Study
IRP	Installation Restoration Program
LUC	land use controls
mg/kg	milligrams per kilogram
NAVFAC	Naval Facilities Engineering Command
NEESA	Naval Energy and Environmental Support Activity
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
PCBs	polychlorinated biphenyls
PHNC	Pearl Harbor Naval Complex
PRE	Preliminary Risk Evaluation
PRG	Preliminary Remediation Goal
PWC	Public Works Center
RAB	Restoration Advisory Board
RI/FS	Remedial Investigation / Feasibility Study
ROD	Record of Decision
RSE	Removal Site Evaluation
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
SVOC	semi-volatile organic compound
TBC	To Be Considered
TSCA	Toxic Substances Control Act

ACRONYMS AND ABBREVIATIONS CONTINUED

ACRONYMS/ ABBREVIATIONS	DEFINITION/MEANING
VOC	volatile organic compound
WP	Work Plan
yd^3	cubic yards

1. DECLARATION

1.1 Site Name and Location

Pearl Harbor Naval Complex, now part of the Joint Base Pearl Harbor-Hickam, has been designated as a National Priority List (NPL) Site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). It has been assigned the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) identification of HI4170090076. To manage and facilitate the environmental investigation and cleanup activities at the Pearl Harbor Naval Complex (PHNC), it has been subdivided into discrete Geographic Study Areas (GSAs) by the PHNC Site Management Plan (U.S. Department of the Navy [DoN] 2004a). Individual sites within the various Geographic Study Areas (GSAs) are being investigated and remediated, if necessary, on an independent basis, followed by updates to the overall Site Management Plan. The Former Makalapa Pesticide Rinsate Pit Site, the subject of this Record of Decision (ROD), has been designated as an individual Site within the Public Works Center (PWC) Main Complex GSA.

The Former Makalapa Pesticide Rinsate Pit is a U.S. Navy facility, located near the intersection of Nanumea Road and an unnamed access road in the PWC Main Complex GSA on the island of Oahu in the State of Hawaii. The location of the Former Makalapa Pesticide Rinsate Pit Site (hereafter referred to as the "Site") is shown on Figure 1.

1.2 Statement of Basis and Purpose

This ROD presents the selected remedy for the Site, located in the PWC Main Complex GSA. The Site is in the PHNC, and is included on the NPL. The Navy, in conjunction with the U.S. Environmental Protection Agency (EPA), has chosen this remedy in accordance with CERCLA as amended by the Superfund Amendments and Reauthorization Act (SARA) and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This ROD satisfies EPA and Department of Health, State of Hawaii (HDOH) requirements. The information supporting the final remedy for this Site is contained in the Administrative Record file for the PHNC. The HDOH has indicated concurrence with the selected remedy by signature in Section 1.7.

1.3 Assessment of Site

The response action selected in this ROD is necessary to protect public health or welfare or the environment from actual or threatened releases of contaminants from this Site which may present a substantial endangerment to public health or welfare.

1.4 Description of Selected Remedy

The selected remedy involves the excavation and disposal of soil exceeding the Toxic Substances Control Act (TSCA) High Occupancy Cleanup Level for polychlorinated biphenyls (PCBs), the EPA Region IX Residential Preliminary Remediation Goal (PRG) for pesticides, and the natural background level of arsenic.

The following is a summary of the remedial actions:

- Excavation and offsite disposal of surface soil in the swale area and portion of the concrete pad which contain concentrations of PCBs above the TSCA High Occupancy Cleanup Level; and
- Excavation and offsite disposal of surface soil containing PCBs above the TSCA High Occupancy Cleanup Level (see Section 1.4 for description of High Occupancy Levels) in the swale area and portion of the concrete pad, surface and subsurface soil in the rinsate pit containing pesticides above Residential Soil PRGs, and shallow subsurface soil in the rinsate pit containing arsenic above the natural background level. In the pit area, the contaminated soil will be excavated to a depth of 5 feet. If soil is encountered at 5 feet, confirmation samples will be taken in the soil to confirm that clean-up objectives have been met. If tuff is encountered at five feet, soil samples will be collected at the deepest possible depth or from the sidewalls to confirm clean-up objectives are met. If the cleanup goals have not been met, excavation will continue beyond 5 feet. The final depth of the excavation will be limited to the surface of the tuff beyond 5 feet, or where confirmation samples in the soil indicate the cleanup goals have been met. Beyond 5 feet, no confirmation samples will be required in the tuff and no vertical excavation into the tuff is required.

The cleanup goals for each contaminant of concern (COC) at the Site are shown in Table 1-1. The EPA Region IX PRGs are further described in Section 2.13. Although Regional Screening Levels (RSLs) replaced the EPA Region IX 2004 PRGs, the PRGs were established as the cleanup goal in the Feasibility Study (FS) for this Site before the RSLs were published. However, the PRGs are still protective, and as a result, are considered appropriate cleanup goals for the Site. Following the removal action, the Site will be suitable for unrestricted access, and no land use controls (LUCs) will be necessary.

Table 1-1. Cleanup Goals for Each COC

Analyte	EPA Region IX Residential Soil PRG[1]	Natural Background Level (DoN 2006a)	TSCA PCB Cleanup Level[2] (High Occupancy)	Cleanup Goals for the Site
Organochlorine Pesticides (mg/kg)				
Alpha-HCH	0.090	Not Applicable	Not Applicable	0.090
Gamma-HCH	0.440	Not Applicable	Not Applicable	0.440
Heptachlor	0.110	Not Applicable	Not Applicable	0.110
Aldrin	0.029	Not Applicable	Not Applicable	0.029
Beta-HCH	0.320	Not Applicable	Not Applicable	0.320
Heptachlor-epoxide	0.053	Not Applicable	Not Applicable	0.053
Chlordane	1.6	Not Applicable	Not Applicable	1.6
4-4'-DDE	1.7	Not Applicable	Not Applicable	1.7
Dieldrin	0.030	Not Applicable	Not Applicable	0.030
Endrin	18.0	Not Applicable	Not Applicable	18.0
4-4'-DDD	2.4	Not Applicable	Not Applicable	2.4
4-4'-DDT	1.7	Not Applicable	Not Applicable	1.7
Endrin Aldehyde	—	Not Applicable	Not Applicable	—
Methoxychlor	310	Not Applicable	Not Applicable	310
Endosulfan Sulfate	—	Not Applicable	Not Applicable	—
Endrin Ketone	—	Not Applicable	Not Applicable	—
Toxaphene	0.440	Not Applicable	Not Applicable	0.440
Polychlorinated Biphenyls (mg/kg)				
Aroclor 1260	0.22	Not Applicable	≤1.0*	≤1.0*
Arsenic (mg/kg)				
Arsenic	0.39	16	Not Applicable	16

Notes:

1 Source for PRG values: EPA Region IX PRG Tables. October 2004.
2 TSCA levels apply to soil and concrete
— = not established
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
PRG = Preliminary Remediation Goal
TSCA = Toxic Substances Control Act
mg/kg = milligrams per kilogram
* = total PCBs

1.5 Statutory Determinations

Executive Order 12580 authorizes the U.S. Navy to conduct environmental cleanup and remedial activities at Navy sites. The Navy is the lead agency for environmental investigation and Site cleanup actions conducted under CERCLA at PHNC facilities. Environmental investigation and cleanup activities have been funded through the PWC initially, and most recently by Naval Facilities Engineering Command (NAVFAC), Hawaii. Environmental investigation and cleanup activities for the Site will be funded entirely through the NAVFAC, Hawaii Installation Restoration Program (IRP).

Future 5 year reviews or regular Site inspections will not be required for the Site because the selected remedy will ensure that concentrations of the site-specific contaminants of concern remaining at the Site are below levels that allow for unrestricted land use. The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to the remedial action, is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. The EPA is the lead oversight agency for the Site.

1.6 ROD Data Certification Checklist

The following information is included in the Decision Summary section of this ROD. Additional information can be found in the Administrative Record file for this Site.

Table 1-2. ROD Data Certification Checklist

Information	Section Number
Chemicals of concern and their respective concentrations.	2.5.8 and 2.7
Baseline risk represented by the chemicals of concern.	2.2.3 and 2.7
Cleanup levels established for chemicals of concern and the basis for these levels.	2.13
How source materials constituting principal threats are addressed.	2.11
Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of ground water used in the baseline risk assessment and ROD.	2.6
Potential land and ground-water use that will be available at the Site as a result of estimated capital, annual operation and maintenance, and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected.	2.12
Key factor(s) that led to selecting the remedy (i.e., describe how the Selected Remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision).	2.9, 2.10, and 2.12

1.7 Authorizing Signatures

The U.S. Navy and EPA jointly select the remedy described in Section 1.4 of this Record of Decision for the Makalapa Pesticide Rinsate Pit.

Aaron Y. Poentis
Regional Environmental Program Manager
By direction of:
Commander, Navy Region Hawaii

9/24/10
Date

Michael Montgomery
Assistant Director, Federal Facilities and Site Cleanup Branch
Superfund Division, US Environmental Protection Agency, Region 9

9/27/10
Date

The Hawaii Department of Health concurs with the remedy selected jointly by the Navy and the EPA as described in Section 1.4 of this Record of Decision for the Makalapa Pesticide Rinsate Pit.

Keith E. Kawaoka
Environmental Program Manager
Hazard Evaluation and Emergency Response Office
State of Hawaii, Department of Health

9-29-10
Date

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2. DECISION SUMMARY

This section summarizes Site location, description, history, and environmental investigations and response actions conducted at the Site.

2.1 Site Name, Location, and Description

The PHNC has been designated as a NPL Site under CERCLA. It has been assigned the CERCLIS identification of HI4170090076. To manage and facilitate the environmental investigation and cleanup activities at the PHNC, it has been subdivided into discrete GSAs by the PHNC Site Management Plan (DoN 2004a). Individual sites within the various GSAs are being investigated and remediated, if necessary, on an independent basis, followed by updates to the overall Site Management Plan. The Site, the subject of this ROD, has been designated as an individual Site within the PWC Main Complex GSA. The lead agencies for this ROD are the U.S. Navy and the EPA.

The Former Makalapa Pesticide Rinsate Pit is a U.S. Navy facility, located near the intersection of Nanumea Road and an unnamed access road in the PWC GSA on the island of Oahu in the state of Hawaii. The location of the Site is shown on Figure 1.

The Site is located to the east of NAVFAC, Hawaii Building X-1. It occupies less than half an acre and consists of the former pesticide rinsate pit area, concrete pad, and drainage swales. The Site represents the roughly square area bounded by raised earthen berm to the west, the drainage swales to the south, and the asphalt roadway to the north and east. This roughly square area covers the rinsate pit locations and is approximately 150 feet long by 100 feet wide.

The concrete pad is rectangular and approximately 100 feet long by 40 feet wide. This area occurs within the former rinsate pit area.

The drainage swale is a long, rectangular area oriented roughly east to west running to the north side and parallel to Nanumea Road. The swales measure approximately 160 feet long by 12 feet wide and 90 feet long by 15 feet wide, respectively. The layout of the Site is shown on Figure 2.

2.2 Site History and Enforcement Actions

2.2.1 Site History

The former rinsate pit was constructed in 1974 to dispose of waste solutions containing herbicides and pesticides, and for routine washing and rinsing of pesticide and herbicide application equipment. The unlined rinsate pit consisted of two cells located 3 to 4 feet below ground surface, occupying a space that measured 20 feet wide by 40 feet long. The pit was used from 1974 to 1978, when it was backfilled. When the pit was in use, equipment was washed two to three times daily, with each washing generating an estimated 25 to 50 gallons of wash water. These practices led to the contamination of nearby soil.

The concrete pad east of the rinsate pit was formerly used as a wash area. PCB contamination in the soil is possibly a result of stored equipment in this area.

A shallow and unlined drainage swale runs parallel to Nanumea Road along the southern margin of the Pit Site and slopes steadily towards the southwest. The portion of the unlined swale directly adjacent to the former pit area is separated from another portion of unlined swale farther from the pit area by the asphalt-paved entrance to Building X-1. No subsurface pipe connecting the two swale areas was found during fieldwork.

2.2.2 Previous Investigations

An Initial Assessment Study (IAS) conducted in 1983 (Naval Energy and Environmental Support Activity [NEESA] 1983) for PHNC identified the Site as having potential environmental impacts related to previous activities at the former pesticide rinsate pit. Based on the IAS conclusions, a Site Inspection (SI) was conducted at the Site. Five soil borings were advanced to depths ranging from 10.2 to 10.7 feet below ground surface (bgs) both within and near the approximate pit boundaries. Soil and volcanic tuff samples were collected at 5 and 10 feet bgs in each boring and analyzed for chlorinated pesticides and herbicides, volatile organic compounds (VOCs) and metals. Chlordane, dieldrin, bromacil, dichlorodiphenyldichloroethylene (DDE), dichlorodiphenyltrichloroethane (DDT), and arsenic were detected. The SI report concluded that the bottom of the pit was most likely 3 feet deep, based on the encountered depth of tuff. The report also concluded that the most commonly detected constituents were the chlorinated pesticide compounds DDE, DDT, chlordane, and dieldrin, and that the majority of detections and the highest detected concentrations were found within the pit.

An extensive Remedial Investigation (RI) was subsequently conducted at the Site in October 1995. This RI is identified as the “Initial RI” for the Site to differentiate it from subsequent RI work performed at the Site in 2005. The RI consisted of 13 trenches dug into and around the former rinsate pits. The trenches were excavated to expose the underlying bedrock tuff residing at depths ranging from 3 to 7 feet bgs. Soil samples were collected from the trenches and analyzed for VOCs, semi-volatile organic compounds (SVOCs), organochlorine pesticides and herbicides, organophosphorous pesticides, triazine pesticides, carbamates, PCBs, and metals. Extensive sampling of the shallow subsurface within the boundaries of the former rinsate pit and the surrounding area was conducted. Concentrations of chlorinated, organophosphorus, and carbamate pesticides; PCBs as Aroclor 1260; chlorinated and triazine herbicides; VOCs; cyanide; and metals (mercury, copper, and arsenic) were detected in Initial RI soil samples. The following is a summary of the conclusions of the 1995 RI:

- The majority of detected constituents were found in shallow subsurface soil samples collected from trenches dug in the immediate vicinity of the former rinsate pit at depths ranging from 2 to 6 feet bgs.
- Based on the observed distribution, the Initial RI report concluded that minimal transport appeared to have occurred away from the original location of equipment rinsate activity within the pit.
- Elevated concentrations of arsenic were detected within the pit area. Results for samples collected from outside the pit area demonstrate a much narrower

range of detected concentrations for arsenic, at concentrations below natural arsenic background levels determined for Navy sites.

- PCBs and pesticides were detected in several surface soil samples collected from the drainage swale adjacent to the Site.
- All but one of the elevated pesticide detections were within the former rinsate pits.
- The highest concentration of PCB at the Pit Site was detected in a near-surface soil sample collected from a depth of less than a foot bgs adjoining the concrete pad.
- The potential for significant drinking water impact was evaluated to be minimal based on a Pesticide Root Zone Model.

2.2.3 Removal Site Evaluation and Remedial Investigation/Feasibility Study

In 2004, the Navy initiated a Removal Site Evaluation (RSE) to complete the lateral and vertical delineation of Site COCs and to evaluate the potential risk to human health and the environment. PCBs, chlorinated pesticides, and arsenic were identified as COCs for the Site. Plans that documented proper procedures for RSE sample collection, contaminant analysis, data quality control, and personnel health and safety procedures were prepared in accordance with CERCLA guidance. In particular, locations and distribution of surface and near-surface soil samples were developed using EPA statistical sampling software to ensure adequate coverage of the Site.

In June 2004, draft versions of the RSE planning documents were made available to stakeholders for review. The planning documents were finalized in December 2004 (DoN 2004b). In an agreement with the EPA in March 2007, the RSE was converted to a Remedial Investigation/Feasibility Study (RI/FS).

The field investigation for the RI/FS (former RSE) (DoN 2008b) was conducted in May 2005. Surface soil samples were collected from 0 to 6 inches bgs at 54 locations to characterize the nature and lateral extent of the Site COCs in the surface area around the former pit area and in the adjoining drainage swale. Soil and rock core samples were collected in the subsurface at two locations directly beneath and adjoining the former rinsate pit locations from approximately 4 to 32 feet bgs to characterize the vertical extent of the Site COCs in the subsurface soil. Soil samples were also collected from ten locations over the concrete pad to a maximum depth of approximately 3 inches. The soil analysis results were compared to both Residential and Industrial Soil PRGs and the TSCA High Occupancy Cleanup Level. The investigation results indicate the following:

- Based on regional studies in the area, small pockets of higher-level groundwater perched above lenses of clay or other low permeability strata may be encountered above both caprock water and the basal aquifer. These occurrences of perched groundwater tend to be limited and do not represent potential drinking water sources. Perched groundwater was encountered at approximately 29 and 31 feet bgs in two of the boring locations. Groundwater samples from these boreholes were analyzed for chlorinated pesticide compounds, PCBs, and arsenic. No detectable concentrations of any

chlorinated pesticide compounds, PCBs, or arsenic were identified in the groundwater samples.

- Surface soil concentrations of PCBs show a decrease with distance around the pit and an overall decrease in concentration with distance downgradient (south and east) from the pit area. Although PCBs were detected in the surface soil samples, detections were limited to the surface area immediately surrounding the concrete pad and just north of the former pit area.
- Analysis of the distribution of elevated pesticide concentrations, as represented by sample results from both the surface soil sampling and the initial trench sampling, confirm that elevated pesticide concentrations in the surface soil and shallow subsurface soil are limited to the immediate vicinity of the former rinsate pit and confirm that the pits are the source of pesticides for the Site.
- Arsenic was uniformly detected in all areas of the Site and the concentrations are similar for all areas in the surface soil. Only four of samples exceeded the conservative background level of arsenic of 16 milligrams per kilogram (mg/kg), and all four exceedances were located in the middle of the former pesticide rinsate pit.
- Analysis of the data from both the 2005 RI subsurface soil samples and the 1995 RI soil samples, indicates that elevated pesticide concentrations decrease distinctly and rapidly with depth beyond the bottom depth of the former rinsate pit (approximately 3 to 4 feet bgs). Concentrations of residual pesticides are not detected below 20 feet bgs, therefore, pesticides have not migrated below 20 feet bgs beneath the bottom of the former rinsate pit.
- A Human Health Preliminary Risk Evaluation (PRE) was performed as part of the RI/FS based on the soil data from previous Site investigations and the 2005 RI. To determine what the potential risk to human health would be if no removal action were performed, the PRE was performed based on the assumption that no removal action would be implemented at the Site. The initial PRE results indicated that the carcinogenic properties of the COCs which contributed the greatest potential for adverse effects to human health and the highest estimated risk at the Site are concentrated in three main areas:
    - Surface soil near the former rinsate pit and concrete pad. Primary sources of risk are PCBs around the concrete pad, dieldrin (pesticide) immediately around the former pit, and background arsenic.
    - Shallow subsurface soil within the former rinsate pit. Risk is represented by elevated concentrations of various pesticides (which include dieldrin, alpha- and gamma- chlordane, and heptachlor), and arsenic.
    - Shallow subsurface soil. Potential risk is posed by one elevated concentration of DDE (pesticide) near the former rinsate pit and one elevated concentration of PCBs adjoining the concrete pad.

2.2.4 CERCLA Enforcement Activities

No enforcement actions have been directed at the Site.

2.3 Community Participation

The Navy has developed a Community Involvement Plan (CIP) to encourage and facilitate two-way communication between the Navy and local communities concerning environmental investigation and cleanup activities being conducted as part of the Navy Installation Restoration Program.

In an effort to involve the public in decision-making for the Site, and in accordance with the CIP, the Navy has established a Restoration Advisory Board (RAB) composed of community representatives and Pearl Harbor Installation Restoration Program personnel. The Navy has held public meetings, given presentations, and issued fact sheets summarizing the Site investigation and cleanup activities, including the following:

- A RAB meeting was held on 08 March 2005, during which the plans for performing sampling of the Site were presented to the community. Fact sheets and presentation notes were distributed. No comments were received from the community to the planning information.
- A RAB meeting was held on 10 June 2008, during which the results from the RI/FS were presented to the community. Fact sheets and presentation notes were distributed. No comments were received from the community to the RI/FS presentation.
- A public meeting was held on 23 September 2008, during which the findings and conclusions of the RI/FS investigation and the Proposed Plan (DoN 2008a) were made available to the community, however there was no community attendance. Fact Sheets and presentation notes summarizing RI/FS results, findings, or conclusions were distributed. No comments were received from the community to the RI/FS information or the Proposed Plan.

No public comments were received to any of the site work or documents as a result of the two RAB meetings or the public meeting held on 23 September 2008.

Project documents, including the Work Plan/Sampling and Analysis Plans (WP/SAPs), technical reports, fact sheets, and other materials relating to the investigation and cleanups, and other materials relating to the Site have been archived in the information repositories at the following locations:

Pearl City Public Library
1138 Waimano Home Road
Pearl City, Hawaii 96782
Telephone: (808) 453-6566

University of Hawaii-Manoa
Hamilton Library – Hawaiian and Pacific Collection
2550 McCarthy Mall
Honolulu, Hawaii 96822
Telephone: (800) 956-8264

Additional project information about the Site is located in the Administrative Record File at NAVFAC Pacific. The address for the Administrative Record File is as follows:

Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Code EV4CO
Pearl Harbor, Hawaii 96860-3134
Telephone: (808) 473-1428

2.4 Scope and Role of Response Actions

To manage and facilitate the environmental investigation and cleanup activities at the PHNC, the PHNC has been subdivided into discrete GSAs by the PHNC Site Management Plan (DoN 2004a). Individual sites within the various GSAs within the PHNC are being investigated and remediated, if necessary, on an independent basis, followed by updates to the overall Site Management Plan. Other sites within the PHNC will be documented separately.

The Former Makalapa Pesticide Rinsate Pit Site, the subject of this ROD, has been designated as an individual Site within the PWC Main Complex GSA. The Site Management Plan will be updated based on the results of this ROD and the following recommendations which will allow for the remediation of the Site such that unrestricted use is acceptable: the removal of surface soil containing PCBs above the TSCA High Occupancy Cleanup Level (see Section 1.4 for description of High Occupancy Levels) in the swale area and portion of the concrete pad, surface and subsurface soil in the rinsate pit containing pesticides above Residential Soil PRGs, and shallow subsurface soil in the rinsate pit containing arsenic above the natural background level. In the pit area, the contaminated soil will be excavated to a depth of 5 feet. If soil is encountered at 5 feet, confirmation samples will be taken in the soil to confirm that clean-up objectives have been met. If tuff is encountered at five feet, soil samples will be collected at the deepest possible depth or from the sidewalls to confirm clean-up objectives are met.

If the cleanup goals have not been met, excavation will continue beyond 5 feet. The final depth of the excavation will be limited to the surface of the tuff beyond 5 feet, or where confirmation samples in the soil indicate the cleanup goals have been met. Beyond 5 feet, no confirmation samples will be required in the tuff and no vertical excavation into the tuff is required.

2.5 Site Characteristics

The Site is part of a controlled access facility, the PWC Main Compound. The Site is located to the east of NAVFAC, Hawaii Building X-1. It occupies less than half an acre and consists of the former pesticide rinsate pit area, concrete pad, and drainage swale. The physical characteristics of the Site are described in the subsequent sections.

2.5.1 Climate

The Pearl Harbor area experiences northeast tradewinds that blow approximately nine months of the year. During the balance of the year, south to southeast winds and mild offshore breezes prevail. Winds up to 40 miles per hour occasionally occur from the north or northwest. The median rainfall for the region lies between 20 and 30 inches, depending on the incidence of the occasional heavy rains. These heavy rains occur principally from November to April. Temperatures typically range from 72 to 89 degrees Fahrenheit (°F) during the summer and 60 to 78°F during the winter season.

2.5.2 Topography and Elevation

The ground surface elevation of the former pit location and concrete pad is approximately 75 feet above mean sea level (amsl). The overall Site surface slopes to the southwest with a roughly flat surface at the concrete pad and rinsate pit location. Building 76 is located just slightly higher than the concrete pad and former rinsate pit locations. The Site has a steeper slope between the rinsate pit area and Building X-1, interrupted by the raised earthen berm, which has a maximum height of approximately 2 feet at its southern tip decreasing to approximately 6 inches at its northern end. Due to the grade of Nanumea Road and the berm, the former rinsate pit is terraced approximately 8 to 10 feet higher in elevation than the foundation of Building X-1.

A shallow and unlined drainage swale runs parallel to Nanumea Road along the southern margin of the Site. The swale is discontinuous and apparently terminates in a deeper depression approximately 1 to 2 feet deep at the entrance to the Building X-1 parking lot. No drainage outlet or pipe drains to or exits from this swale area. The Site layout is shown on Figure 2.

2.5.3 Geology

The Site is located upon fill material ranging from crushed coral to silty clay that is 2 to 6 feet thick. The fill is underlain by semi-consolidated to consolidated welded tuff with varying degrees of fracturing observed at several locations. Outcrops of tuff are visible in several locations, primarily in the drainage swale area and near the base of the berm. The observed outcrops comprise welded tuff that is moderately weathered, friable, and fractured, and is primarily found in layers resulting from airborne deposition. Pieces of tuff found in outcrop at the Site can be broken off by hand due to the high degree of weathering.

2.5.4 Groundwater Hydrogeology

Information on groundwater beneath the Site comes from surrounding areas and indicates that the Site overlies a complex series of strata making up overlying confining caprock and the underlying basal aquifer. Information from historical records of well drilling in the area indicate that regional basal groundwater in Hawaii is contained within basalt that forms the basis of all the Hawaiian Islands.

In the region surrounding the Site, the basal aquifer is typically confined by overlying layers of clay and reef limestone deposits interbedded with layers of relatively low permeability volcanic tuff, collectively termed caprock. The caprock progressively thins with distance inland and generally extends about a mile inland from shore in the Pearl Harbor area. Based on the historical record, the basal groundwater may be confined to considerable depth, and the depth to the basal aquifer groundwater in the vicinity of the Site may be in excess of several hundred feet bgs (Stearns and Vaksvik 1935, Ogden 1995).

Based on regional studies in the area, smaller pockets of higher-level groundwater perched above lenses of clay or other low permeability strata may be encountered above both caprock water and the basal aquifer. These

occurrences of perched groundwater tend to be limited and do not represent potential drinking water sources.

2.5.5 Surface Water

No long-term surface water exists onsite or in the general vicinity of the Site. The closest permanent surface water bodies to the Site are the Quarry Loch of Pearl Harbor or Halawa Stream approximately 0.9 and 1 mile from the Site, respectively.

Surface water at the Site is expected to occur only during periods of heavy rainfall. Site surface runoff, based on Site topography, is generally to the south and west. From the upgradient portion of the Site, near Building 76, surface runoff will generally trend away from the building to the west and then divert into two directions, southwest towards the concrete pad and former rinsate pit area, and south along the asphalt access road. Both surface water pathways potentially intersect with the drainage swale running along the edge of Nanumea Road. From the area south and adjoining Building 76, surface runoff is estimated to be towards the southwest, also towards the drainage swale. Surface runoff from the concrete pad and the former rinsate pit cells is estimated to be towards the southwest, meeting the base of the raised earthen berm and potentially being channeled south by the berm towards the drainage swale. The drainage swale terminates at the entrance to the Building X-1 parking lot. Surface drainage may collect within the drainage swale and disperse to sheet flow when the drainage swale overflows.

2.5.6 Vegetation and Wildlife

The area around the Site is a completely developed area, no endangered species or sensitive environments were identified in or around the Site.

2.5.7 Conceptual Site Model

The Conceptual Site Model (CSM) provides a framework for assessing the condition of the Site based on the relationship between sources of contamination and receptors that may be exposed to the contamination. The CSM describes contaminant transport mechanisms and exposure pathways for current and potential future human and ecological receptors and is utilized to assess risk on the Site.

The physical, demographic, ecological, and chemical information from previous investigations was evaluated to develop the CSM for the Site. The CSM is a dynamic model that was revised to include or exclude sources, receptors, or exposure pathways as additional data from the Site investigation became available. The following is a summary of the CSM utilized for the Site. Additional information is included in the Work Plan/Sampling Analysis Plan (WP/SAP) and the RI/FS for the project.

- Media of concern at the location include onsite surface soil, subsurface soil, and swale surface soil. Groundwater is not considered to be a medium of concern.

- The Site is within a secured facility, occupies a relatively small area, is mostly covered by pavement, is covered by a maintained grass layer in non-paved areas, and is surrounded by asphalt parking lots, industrial buildings, and roads. There are no trees or shrubs at the Site. The location is not a viable habitat for ecological receptors. Since there are no discernible pathways for ecological receptors such as birds and mammals to come into contact with potential contaminants at the Site an Ecological Risk Assessment is not required.
- Current commercial workers may come into contact with onsite surface soil. Future onsite workers and residents (in an unrestricted use scenario) could contact onsite surface soil. Potential exposure pathways for these receptors include incidental ingestion of, and dermal contact with soil, as well as inhalation of airborne soil particles.
- Based on regional studies in the area, smaller pockets of higher-level groundwater perched above lenses of clay or other low permeability strata may be encountered above both caprock water and the basal aquifer. These occurrences of perched groundwater tend to be limited and do not represent potential drinking water sources. There are no complete groundwater pathways.
- There is no surface water at the location; therefore, there are no complete exposure pathways to surface water.
- Current onsite commercial workers and future onsite residents or construction workers could potentially come into contact with onsite swale surface soil. Potential exposure pathways include incidental ingestion of and dermal exposure to surface soil, as well as inhalation of airborne surface soil particles.
- Current and future commercial workers, construction workers, and residents could have exposure to COCs which become airborne from soil and subsurface soil.
- After a chemical is released to the environment, it may be retained in one or more media, including the receiving medium, or be transported to other media. The COCs identified during previous investigations at the Site were pesticides, PCBs, and arsenic due to previous use of pesticide rinsate pits. Chemicals which were previously released as a result of these activities may have sorbed to surface or subsurface soil, or may have migrated into the drainage swale by means of surface soil runoff.
    - Sampling at the Site indicated that minimal migration of the contaminants had occurred. Elevated concentrations of COCs were concentrated around and in the former pit.
    - The deeper subsurface was evaluated for potential for transport of subsurface COCs to deeper groundwater. The evaluations of Hydrogeologic Conditions and Nature and Extent of Contamination demonstrated, respectively, that the potential for vertical migration is low, that there is no evidence of vertical migration (below 20 feet bgs), and that COCs in the subsurface decrease below the bottom depth of the former rinsate pit.

2.5.8 Summary of Current Nature and Extent of Contamination

The following is a summary of the nature and extent of contamination in each medium at the Site. Additional information is contained in the 2005 RI/FS. The current location of contamination at the Site is shown on Figures 5-1 through 5-11 of the RI/FS, included as Appendix B of this ROD for reference.

- Surface soil samples from the 2005 RI/FS collected at the Site were taken from two areas: the pit area and the swale area.
    - PCBs were detected in soil samples, with the highest levels around the concrete pad and north of the former pit area. The results indicated that the concentration of PCBs in surface soils in the pit area ranged from 0.0215 mg/kg to 10.20 mg/kg; concentrations of PCBs in the swale area ranged from 0.02 mg/kg to 2.070 mg/kg.
    - The pesticide compounds that were most commonly detected were DDE, DDT, dieldrin, and chlordane. The highest detected levels of detected pesticide compounds are concentrated around the former rinsate pit. Exceedances of the screening criteria in this area were observed for dieldrin (concentrations ranging from non-detect to 1.260 mg/kg), gamma-chlordane (concentrations ranging from non-detect to 5.27 mg/kg), and alpha-chlordane (concentrations ranging from non-detect to 7.99 mg/kg).
    - Arsenic was detected uniformly in surface soil samples. The detections occur in a narrow range of concentrations from 0.691 mg/kg to 12.4 mg/kg. This range is indicative of background levels.
- Subsurface samples from the 2005 RI/FS were analyzed for chlorinated pesticide compounds and arsenic. Analysis results indicate that elevated pesticide compound concentrations are limited to the former pit and strongly suggested a steady decrease in concentration with depth.
    - Subsurface samples contained detectable concentrations of dieldrin, DDE, DDT, gamma-chlordane and alpha-chlordane. The elevated pesticide was dieldrin, which was detected in three subsurface samples at concentrations of 0.00932 mg/kg, 0.620 mg/kg, and 0.0309 mg/kg, for depths of 4.5 feet (two locations), and 9 feet, respectively. The deepest detected occurrence of any pesticide compounds were alpha- and gamma-chlordane at a depth of 20 feet bgs at concentrations of 0.0047 mg/kg and 0.0021 mg/kg, respectively.
    - Detected concentrations of arsenic ranged from 0.74 mg/kg to 1.90 mg/kg.
- Perched groundwater was encountered and sampled for the 2005 RI/FS for PCBs, chlorinated pesticide compounds, and arsenic in two locations. Analyses of grab groundwater samples revealed no detectable concentrations of any chlorinated pesticide compounds, PCBs, or arsenic in either grab groundwater sample or the associated duplicate sample.

- Samples of the concrete pad were collected, fragmented and pulverized prior to analysis, and analyzed for PCBs, pesticides, and arsenic for the 2005 RI/FS.
    - The highest detected PCB concentrations were found in the concrete sample collected from a location on the western edge of the pad closest to the former rinsate pit. Analysis of the sample and duplicate indicated concentrations of 352 and 161 mg/kg, respectively.
    - A single pesticide compound, DDE, was detected in eight of the ten concrete samples collected, at concentrations ranging from 0.0013 mg/kg to 0.0289 mg/kg.
    - Arsenic was detected in all concrete samples at concentrations ranging from 0.39 mg/kg to 10.8 mg/kg.

2.6 Current and Potential Future Land Use

The Site is no longer actively used as a rinsate pit; however roll-off containers, concrete traffic barriers, and other large equipment are staged in the area. The general area is partially covered by patches of broken asphalt and scattered grass. The anticipated future use of the Site is similar to the current use, and will remain industrial in nature.

Based on available information, groundwater directly beneath the Site is not currently used, nor would future development as a drinking water source be likely. The near-term future use of the Site is anticipated to remain industrial. However, this Site is surrounded by residential use and thus it is not certain what the long-term future use will be.

2.7 Summary of Site Risks

An ecological risk assessment was not required for this Site because there were no potentially complete exposure pathways; therefore Site risks are limited to human health concerns. The collective soil data from previous investigations and those collected for the RI/FS were initially evaluated in the following (initial) groupings to represent a conservative scenario for current Site conditions. The Site is currently used for industrial activities and was analyzed for an industrial use scenario and future Site conditions if no remedial action is implemented. The future use of the Site is unknown; therefore, to be conservative, it was analyzed based on a residential use scenario. The groupings are as follows:

- Grouping A: The Total Collective Data for surface and subsurface samples from all depths,
- Grouping B: Surface soil samples (collected from 0 to 0.5 feet bgs), and
- Grouping C: Subsurface soil and rock samples (collected from depths greater than 0.5 feet bgs),

After the initial groupings were evaluated, Grouping C: subsurface soil and rock sample data were further segregated into:

- Shallow Pit Content subsurface soil and rock sample data collected from 0.5 to 5 feet bgs within the former rinsate pit.

- Outside Shallow Pit subsurface soil and rock sample data collected from 0.5 to 5 feet bgs from locations outside of the former rinsate pit.

Data from the shallow soil within the pit outlines was separated from data collected outside to estimate the relative risks represented by the different nature, extent, and relative detected COC concentrations observed in the two zones.

The PRE results indicate that the carcinogenic properties of the COCs contribute the greatest potential for adverse effects to human health and that the highest estimated risk at the Site is concentrated in three main areas.

- Shallow Pit Area surface soil – Highest risk is posed by PCBs around the concrete pad, dieldrin around the former pit, and overall background arsenic concentrations.
- Shallow Pit Contents shallow subsurface soil – Highest risk is posed by elevated pesticides dieldrin, alpha- and gamma- chlordane, heptachlor, and both background and elevated arsenic.
- Shallow Outside Pit soil – Highest risk is posed by two single elevated concentrations for DDE and PCB.

Based on the RI/FS findings, response action is recommended for the Site. A summary of the COCs and the medium specific exposure point concentrations (EPCs), based on sampling results from both the “Initial RI” and the 2005 RI, is shown in Table 2-1.

Table 2-1. Summary of COCs and EPCs from the "Initial RI" and 2005 RI/FS

Exposure Point	Chemical	Number of Detects	Sample Size [a]	Frequency of Detection	Max EPC[b]
Surface Soil (All Max EPCs from Pit Area)	**Pesticides (mg/kg)**				
	a-Chlordane	24	59	41%	7.99E+00
	g-Chlordane	24	59	41%	5.27E+00
	Dieldrin	6	59	10%	1.26E+00
	DDT	31	59	53%	5.55E-01
	DDE	41	59	69%	1.02E+00
	Metals (mg/kg)				
	Arsenic	58	59	98%	1.24E+01
	PCBs (mg/kg)				
	Aroclor-1260	59	59	100%	1.02E+01
Subsurface Soil	**Pesticides (mg/kg)**				
	a-Chlordane	29	76	38%	4.70E-03
	g-Chlordane	23	76	30%	2.10E-03
	Dieldrin	19	76	25%	6.20E-01
	DDT	6	76	8%	5.38E-03
	DDE	11	76	14%	6.00E+01
	Metals (mg/kg)				
	Arsenic	58	77	75%	1.90E+00

% = percent mg/kg = milligrams per kilogram

a Sample size does not include field or laboratory quality control samples; field duplicate result is averaged with original sample result.

b Maximum exposure point concentration (EPC) is the maximum detected concentration of an analyte.

The risks posed by contaminants in the surface soil and shallow subsurface soil, based on sampling results from both the "Initial RI" and the 2005 RI, for prior to and after the proposed soil remedial action and disposal are presented in Table 2-2. The estimated risk after the recommended response action is toward the low end of the EPA target risk range for Long-term cancer risk and below the EPA target risk Hazard Index (HI) level for non-cancer risks. Based on low estimated existing risk and evidence that no significant vertical migration of COCs has occurred, no further action is recommended for deeper subsurface tuff bedrock, beyond 5 feet, beneath the Site and shallow subsurface soil outside the former rinsate pit.

Table 2-2. Summary of Risk Calculations

Media and Area	Maximum EPC Cumulative Risk[1]				RME EPC Cumulative Risk[1]			
	Cumulative ELCR	**Background Arsenic ELCR**	**Cumulative ELCR – Background Arsenic**	***Estimated Non-cancer HI***	**Cumulative ELCR**	**Background Arsenic ELCR**	**Cumulative ELCR – Background Arsenic**	***Estimated Non-cancer HI***
Total Collective Soil Risk (Surface and Subsurface)	**1E-03**	**2E-04**	**1E-03**	***27***	**2E-04**	3E-05	**2E-04**	***3.5***
All Surface Soil Risk	**1E-04**	3E-05	**1E-04**	***11***	3E-05	1E-05	2E-05	***2.3***
Residual Surface Soil Risk After Removal/Exposure Prevention	2E-05	1E-05	5E-06	***1.1***	1E-05	8E-06	2E-06	*0.6*
All Subsurface Soil Risk	**1E-03**	2E-04	**1E-03**	***24***	**3E-04**	2E-05	**3E-04**	***6.1***
Shallow Pit Content Risk	**1E-03**	2E-04	**1E-03**	***22***	**5E-04**	6E-05	**4E-04**	***7.9***
Shallow Outside Pit Risk	**1E-04**	4E-05	8E-05	***7.0***	5E-05	2E-05	3E-05	***3.1***
Residual Shallow Subsurface Soil Risk After Removal/ Exposure Prevention	6E-05	4E-05	2E-05	***2.5***	2E-05	2E-05	5E-06	*0.9*

Notes:

1 Risk calculations are based on the more conservative Residential Use scenario.

Concentrations in **Bold** indicate cumulative ELCR values exceeding cited EPA target risk ranges.

Concentrations in **Bold Italics** indicate HI values exceeding cited EPA risk target threshold.

ELCR = Excess Lifetime Cancer Risk

HI = Non-cancer Hazard Index

RME = Reasonable Maximum Exposure

2.8 Remedial Action Objectives

The remedial action objectives for this Site are to perform the remedial actions necessary to excavate contaminated soil with the objective to achieve TSCA High Occupancy Cleanup Level goals for PCBs, residential soil PRGs for pesticides, and background levels for subsurface soil with arsenic in order to consider the Site safe for unrestricted use.

2.9 Description of Alternatives

The RI/FS evaluated five response alternatives for the Site. These alternatives were evaluated against the nine criteria listed for remedy selection under the NCP. These criteria included the following:

- Protection of human health and the environment
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)
- Long-term effectiveness and permanence
- Reduction of Toxicity, Mobility, or Volume through Treatment
- Short-term effectiveness
- Implementability
- Cost. *Cost estimates for evaluated alternatives were developed utilizing specifications and requirements obtained from DoN (2006b). Estimated costs for the evaluated alternatives were initially developed using online remedial cost estimation software (Northwest Builders Network 2006). Individual portions of the derived cost estimates were ground-truthed and adjusted with direct cost estimates from local contractors for individual tasks under each alternative (e.g., cost per unit volume for excavated soil transport). The overall respective cost estimates by individual Alternative tasks are summarized in Table 2-3.*
- State agency acceptance
- Community acceptance

2.9.1 Alternative A - No Action

Alternative A consists of no remedial/removal action around the former pit. This “no action” alternative is required to be evaluated under the NCP. Under this alternative, contaminated soil would be left in place and no response actions to minimize or mitigate COCs at the Site, control potential offsite migration of COCs, reduce potential exposure, or monitor Site conditions would be undertaken.

2.9.2 Alternative B - Capping/Partial Soil Removal

Alternative B is a two-part response consisting of a combination of covering the impacted surface and subsurface soil in the former pit area and excavation and offsite disposal of impacted surface soil from the swale area. Alternative B would involve sealing the soil in the former pit area and the concrete pad by installation of a cap. This cap would be intended to prevent direct surface exposure to COCs and minimize the potential for vertical migration of contaminants resulting from

accumulated rainwater. In addition, surface soil from the swale containing PCBs above the TSCA High Occupancy Cleanup Level would be excavated and disposed of offsite because installation of a cap over the slope in the swale would be impractical. An estimated total of 6 cubic yards (yd^3) of contaminated soil would be excavated. This alternative also requires implementation of LUCs and periodic 5 year reviews of the Site status and condition, as required under CERCLA.

2.9.3 Alternative C - Removal of Soil Exceeding the TSCA Cleanup Level and Industrial PRGs

Alternative C consists of the excavation and offsite disposal of surface soil containing PCBs above the TSCA High Occupancy Cleanup Level in the swale area and portion of the concrete pad, surface and subsurface soil to the depth of the welded tuff bedrock in the rinsate pit containing pesticides above Industrial Soil PRGs, and shallow subsurface soil to the depth of the welded tuff bedrock in the rinsate pit containing arsenic above the natural background level. An estimated total of 235.5 yd^3 of contaminated soil would be excavated. This alternative also requires implementation of LUCs and periodic 5 year reviews of the Site status and condition, as required under CERCLA.

2.9.4 Alternative D - Removal of Soil Exceeding the TSCA Cleanup Level and Residential PRGs to 5 feet Deep

Alternative D consists of the excavation and offsite disposal of surface soil containing PCBs above the TSCA High Occupancy Cleanup Level (see Section 1.4 for description of High Occupancy Levels) in the swale area and portion of the concrete pad, surface and subsurface soil in the rinsate pit containing pesticides above Residential Soil PRGs, and shallow subsurface soil in the rinsate pit containing arsenic above the natural background level. In the pit area, the contaminated soil will be excavated to a depth of 5 feet. If soil is encountered at 5 feet, confirmation samples will be taken in the soil to confirm that clean-up objectives have been met. If tuff is encountered at five feet, soil samples will be collected at the deepest possible depth or from the sidewalls to confirm clean-up objectives are met.

If the cleanup goals have not been met, excavation will continue beyond 5 feet. The final depth of the excavation will be limited to the surface of the tuff beyond 5 feet, or where confirmation samples in the soil indicate the cleanup goals have been met. Beyond 5 feet, no confirmation samples will be required in the tuff and no vertical excavation into the tuff is required. An estimated total, based on the depth of excavation, of 258.5 yd^3 of contaminated soil will be excavated. Following the removal action, the Site will be suitable for unrestricted access, and the estimated outcome would conclude that no land use controls will be necessary.

2.9.5 Alternative E - Removal of Soil Exceeding the TSCA Cleanup Level and Residential PRGs to 10 feet Deep

Alternative E consists of the excavation and offsite disposal of surface soil containing PCBs above the TSCA High Occupancy Cleanup Level in the swale area and portion of the concrete pad, surface and subsurface bedrock tuff to 10

feet deep in the rinsate pit containing pesticides above Residential Soil PRGs, and shallow subsurface soil to 10 feet deep in the rinsate pit containing arsenic above the natural background level. The justification for analysis of a deeper excavation alternative relates to concerns raised by EPA regarding a sample result from the center of the former rinsate pit at a depth of approximately 10 feet bgs which contained pesticide concentrations which were slightly elevated (approximately at the residential PRG).

An estimated total of 411.5 yd^3 of contaminated soil would be excavated. This alternative would allow unrestricted use of the Site and no LUCs or 5 year reviews would be required. Significant logistical and technical complications, including hammering, chipping, and excavating hard rock at depth (which would require specialized machinery and safety precautions), would have to be overcome in order to remove the tuff bedrock to this depth.

Table 2-3. Comparative Analysis of Remedial Action Alternatives, Estimated Cost in Dollars ($)

Task	Alternative A No Action	Alternative B Capping + Partial Soil Removal	Alternative C Removal of Soil Exceeding TSCA/Industrial PRGs	Alternative D Removal of Soil Exceeding TSCA/ Residential PRGs (5 ft)	Alternative E Removal of Soil Exceeding TSCA/ Residential PRGs (10 ft)
Project Planning/Management (includes Performance Design Work Plan)	n/a	$46,633	$46,633	$33,624	$34,735
Excavation/ Confirmation Sampling/ Disposal	n/a	$61,431	$1,141,047	$1,156,617	$2,242,831
Surface Cap Installation	n/a	$300,346	n/a	n/a	n/a
Site Restoration	n/a	$25,357	$138,239	$138,842	$186,367
Removal Verification Report	n/a	$51,178	$51,178	$51,178	$51,178
5 Year Review Reports	n/a	$132,647	$132,631	n/a	n/a
Annual Cap Inspection/ Reporting	n/a	$100,055	n/a	n/a	n/a
Land Use Control Plan	n/a	$23,988	$23,988	n/a	n/a
Proposed Plan/ Record of Decision Documents	n/a	$13,773	$13,773	$13,773	$13,773
Totals	**n/a**	**$755,392**	**$1,547,489**	**$1,394,034**	**$2,528,884**

Notes:
[1]Criteria according to National Contingency Plan, 40 CFR 300.415(b)(3)
TSCA = Toxic Substances Control Act
PRG = EPA Region IX Soil Preliminary Remediation Goal
n/a = Not Applicable

2.10 Comparative Analysis of Alternatives

General information and comparison information about each of the remedial action alternatives is provided in the previous section. The five alternatives were assigned qualitative values for a comparison against each of the NCP criteria. The five alternatives were compared against each other according to how they fulfilled the NCP criteria. The comparative evaluation is noted by the following:

- "-" The alternative satisfies no aspects of the criteria or is clearly deficient in comparison to other alternatives.
- "+/-" The alternative satisfies or fulfills few aspects of the criteria, and it is unclear that it fulfills the criteria better than other alternatives or provides a relative advantage.
- "+" The alternative satisfies or fulfills most of the criteria or shows a slight advantage over other alternatives.
- "++" The alternative satisfies or fulfills all of the criteria or shows a clear advantage over other alternatives.

Scores against the nine NCP evaluation criteria for all five alternatives are summarized in Table 2-4.

Table 2-4. Comparative Analysis of Remedial Action Alternatives

NCP Criteria[1]	Alternative A No Action	Alternative B Capping + Partial Soil Removal	Alternative C Removal of Soil Exceeding TSCA/Industrial PRGs	Alternative D Removal of Soil Exceeding TSCA/Residential PRGs (5 ft.)	Alternative E Removal of Soil Exceeding TSCA/ Residential PRGs (10 ft.)
NCP Criteria	**Alternative A**	**Alternative B**	**Alternative C**	**Alternative D**	**Alternative E**
Threshold Criteria					
Overall Protection of Human Health	”-“	”+/-”	”+/-”	”++”	”++”
Compliance with ARARs	”-“	”++”	”++”	”++”	”++”
Balancing Criteria					
Long-term Effectiveness / Permanence	”-“	”-“	”+/-“	”++”	”++”
Reduction of Toxicity, Mobility, or Volume through Treatment	”-“	”+/-”	”+/-”	”++”	”++”
Short-term Effectiveness	”-“	”++”	”+/-”	”+“	”+“
Implementability	”++”	”+/-”	”+/-”	”++“	”+“
Cost	”++”	”+”	”+/-”	”+”	”-”
Evaluation Based on Threshold and Balancing Criteria	”+/-“	”+“	”+/-“	”++”	”+”
Modifying Criteria					
Regulatory Agency Acceptance	”-“	”+”	”+”	“++“	“++“
Community Acceptance	”-“	”+/-”	”+/-”	”++”	”++”
Overall Evaluation	**”-“**	**”+”**	**”+/-”**	**”++”**	**”+”**

The following is a discussion of the evaluation criteria for each alternative:

- Alternative A provides no protection of human health and the environment, does not address ARARs or To Be Considered (TBC) criteria, provides no protection to potential receptors in the short term, provides no long-term effectiveness, and provides no reduction of the toxicity, mobility, or volume of contaminants. There are no implementation issues or monetary costs associated with Alternative A. Alternative A represents no monetary cost and was assigned a value of "++", but the overall evaluation is "-".
- Alternative B would be protective of human health and the environment by minimizing the direct exposure, ingestion, and inhalation of COCs at the Site. The alternative is compliant with pertinent ARARs and TBCs, however the capping under Alternative B would leave soil contaminated by COCs in place, requiring institutional Land Use Controls for the life of the Site; the Site would not qualify for a status of "unlimited use and unrestricted exposure." Capping under Alternative B will provide long-term effectiveness; however it will require LUCs to ensure the long-term effectiveness and may require eventual maintenance and replacement of the cap. The intrinsic toxicity of the COCs and the volume of contaminated soil would not be reduced; however the potential for mobility by vertical migration of contaminants would be minimized by capping and partial removal under Alternative B. Alternative B would provide short-term effectiveness in minimizing or removing the potential for exposure, and would also present a lower risk to Site workers during excavation, transport, and disposal of the materials than other alternatives. Alternative B is readily implementable; with monetary cost estimates of **$755,392 to $769,411**. However, Alternative B also includes several long term costs. The costs, which are anticipated to occur over an estimated 30 year period, were estimated with an assumed rate of inflation:
    - Annual Cap Inspections: The estimate assumes annual inspections of the proposed cap over an estimated 30-year operational life for the cap. The annual inspection costs also assume preparation of a short checklist and letter report. Costs for the annual report assume an annual escalation rate for cost of 0.06% over 30 years.
    - 5 Year Reviews: The estimate assumes inspections and evaluation of the overall Site conditions every 5 years over an estimated 30 year span. The 5 year review costs also assume preparation of a report documenting the Site conditions recorded during each 5 year review and any changes from the previous review. Costs for these reviews and reports assume an escalation rate for cost of approximately 3% for every 5 year review. This 5 year escalation figure is equivalent to the annual rate assumed for the annual cap inspections.

  Alternative B cost estimate does not include the cost of unexpected damages that may occur to the cap over the 30 year period. The cost estimate for this alternative also does not include the cost of cap replacement after its estimated 30 year effective life-span.
- Alternatives C and D would be protective by removing the COCs from the Site and therefore minimizing or eliminating the potential for exposure. Both

alternatives are compliant with pertinent ARARs and TBCs; however, Alternative C requires the implementation of LUCs because pesticides are excavated the levels of Industrial PRGs. Both alternatives offer short and long-term effectiveness by eliminating exposure potential through the removal of contaminated materials. The intrinsic toxicity of the COCs and the volume of contaminated soil would not be reduced; however the potential for mobility by vertical migration of contaminants would be minimized by the removal of soil. Alternative C is readily implementable; with monetary cost estimates of **$1,547,489 to $1,851,794** (however these costs do not include long term costs). Although similar in concept to Alternative D, and requiring less initial volume for excavation and correspondingly less cost for excavation, confirmation sampling, and transport and disposal, the savings over Alternative D are offset by the additional cost for LUC development and implementation, and the cost of 5 year reviews. For the purposes of this estimate, 5 year reviews were assumed for a period of 30 years, similar to the duration assumption for Alternative B.

- The estimated cost for Alternative D is approximately **$1,394,034 to $1,709,598** and includes the costs for excavation, transport, and disposal of contaminated soil, and for Site restoration. No long-term tasks are anticipated for Alternative D, therefore all costs are assumed to be current costs.
- Alternative E would provide short and long-term effectiveness for the Site by completely removing the potential threat and would allow "unlimited use and unrestricted exposure." It is compliant with pertinent ARARs and TBCs. The intrinsic toxicity of the COCs and the volume of contaminated soil would not be reduced; however the potential for mobility by vertical migration of contaminants would be minimized by the removal of soil. Equipment, materials, and qualified subcontracting services for soil and hard rock removal and shoring to 10 feet under Alternative E are not as readily available on Oahu, resulting in difficulty in implementation and increased monetary cost. The estimated cost for Alternative E is **$2,528,884 to $3,187,562**. The estimated cost for Alternative E includes the costs of excavation, engineered shoring of the excavation, transport, and disposal of contaminated media, and for Site restoration. No long-term tasks are anticipated for Alternative E, therefore all costs are assumed to be current costs.

The estimates for contaminated soil excavation, transport, and disposal for Alternatives B, C, D, and E assume that all operations will be performed as anticipated and do not include any emergency costs.

Based on the overall evaluation, the RI/FS evaluation indicates that Alternative B, C, D, and E fulfill the evaluation requirements under the nine NCP criteria and would be acceptable as response actions for the Site.

2.11 Principal Threat Waste

Principal threat wastes are typically associated with contaminant source materials. There are no known sources of principal threat wastes on the Site, therefore there are no principal threat wastes associated with the Site.

2.12 Selected Remedy

The RI/FS evaluation resulted in a higher overall score for Alternative D than any of the other alternatives based on better meeting the criteria for protection of human health, long-

term effectiveness, reduction of toxicity, mobility, or volume through treatment, cost, and regulatory and community acceptance. Alternative D consists of the excavation and offsite disposal of surface soil containing PCBs above the TSCA High Occupancy Cleanup Level (see Section 1.4 for description of High Occupancy Levels) in the swale area and portion of the concrete pad, surface and subsurface soil in the rinsate pit containing pesticides above Residential Soil PRGs, and shallow subsurface soil in the rinsate pit containing arsenic above the natural background level. In the pit area, the contaminated soil will be excavated to a depth of 5 feet. If soil is encountered at 5 feet, confirmation samples will be taken in the soil to confirm that clean-up objectives have been met. If tuff is encountered at 5 feet, soil samples will be collected at the deepest possible depth or from the sidewalls to confirm clean-up objectives are met.

If the cleanup goals have not been met, excavation will continue beyond 5 feet. The final depth of the excavation will be limited to the surface of the tuff beyond 5 feet, or where confirmation samples in the soil indicate the cleanup goals have been met. Beyond 5 feet, no confirmation samples will be required in the tuff and no vertical excavation into the tuff is required. An estimated total, based on the depth of excavation, of 258.5 yd^3 of contaminated soil will be excavated. Following the removal action, the Site will be suitable for unrestricted access, and the estimated outcome would conclude that no land use controls will be necessary.

Screening level analyses of pesticides and arsenic in perched groundwater samples resulted in no detected concentrations of pesticides or arsenic. The combined evidence indicates the following:

- Concentrations of residual pesticides show a rapid and consistent decrease with depth.
- Concentrations of residual pesticides are not detected below 20 feet bgs.
- There is no evidence for significant vertical migration of pesticides or arsenic below the bottom of the former rinsate pit.

Based on available information, regional groundwater directly beneath the Site is not currently used. Further, the Site-specific hydrologic and hydrogeologic conditions, along with pertinent federal, state, and local regulations and guidance, indicate that groundwater directly beneath the Site does not represent a potential drinking water source (DoN 2008b). From the RI/FS, the Navy has no plans or funding directed toward water well drilling or exploration (DoN 2008b). For these reasons it can be concluded that groundwater will not be used as a drinking water source in the future.

2.13 Statutory Determinations

Two Applicable or Relevant and Appropriate Requirements (ARARs) were identified for the surface and subsurface soil at the Site; one chemical specific and applicable, and the other action specific and applicable. Two TBC criteria were also identified.

The selected remedy satisfies the two ARARs and each of the TBC criteria as follows:

ARARs

- TSCA High Occupancy Cleanup Level – The TSCA High Occupancy Cleanup Level is considered a chemical specific and applicable ARAR for the Site. PCBs are subject to regulation under TSCA; high occupancy is defined under 40 CFR §761.3 as an area occupied for more than 335 hours per year or greater than an average of 6.7 hours per week. The TSCA cleanup level for high occupancy sites with no further restriction of use is ≤ 1.0 part per million, or ≤ 1.0 mg/kg for soil, as defined in 40 CFR, §761.61 (a)(4) for bulk PCB remediation waste, including soil. Use of the "High Occupancy" designation for this Site is considered conservative; however it is appropriate for consideration should the intended future use of the Site change. Following the remedial action, the concentrations of Aroclor 1260 at the Site will be below the TSCA High Occupancy Cleanup Level, based on the sampling design in Alternative D.
- 40 CFR 300.440 Procedures for Planning and Implementing Off-site Response Actions – This section is considered an action specific and applicable ARAR for the Site and applies to any remedial or removal action involving the off-site transfer of any hazardous substance, pollutant, or contaminant, as defined under CERCLA sections 101 (14) and (33) (''CERCLA waste''), that is conducted by EPA, States, private parties, or other Federal agencies, that is Fund-financed and/or is taken pursuant to any CERCLA authority, including cleanups at Federal facilities under section 120 of CERCLA, and cleanups under section 311 of the Clean Water Act (except for cleanup of petroleum exempt under CERCLA).

TBCs

- EPA Region IX PRGs (Industrial and Residential) – The PRGs are TBC criteria for the Site. The PRGs are conservative estimates for the risk associated with exposure to contaminant compounds under specific scenarios. PRGs are based on carcinogenic or non-carcinogenic or toxicity of compounds subject to ingestion, inhalation, or dermal contact. Exposure to contaminant compounds at or below PRG-listed concentrations represents a minimal risk to human health below which even additive risks are estimated to be insignificant. The EPA Region IX PRGs are specifically intended to evaluate risk to human health and are typically updated annually. Following the removal action, the concentrations of the COCs at the Site will be below the respective PRG action levels.
- HDOH Environmental Action Levels – The EALs are TBC criteria for the Site. The State of Hawaii chemical-specific criteria which were identified for the Site are the HDOH Environmental Action Levels (EALs) for soil. The HDOH has adopted the EPA Region IX Soil PRGs for the COCs for the Site. Therefore, since the action levels for the PRGs will be met by the selected remedy, the requirements of this TBC will also be achieved.

The cleanup goals for each COC at the Site are shown in Table1-1.

2.14 Documentation of Significant Changes

No significant changes have been documented for the Site.

3. RESPONSIVENESS SUMMARY

The 30 day comment period for the Proposed Plan (DoN 2008a) was held from 23 September through 23 October 2008, as announced in a Notice of Availability that was published in the 21 September 2008 (Sunday) edition of the Honolulu Advertiser and the Star Bulletin, the largest daily edition newspapers in the State of Hawaii. The public meeting to present the Proposed Plan was held at the Oahu Veterans Center on 23 September 2008. The Oahu Veterans Center is located less than 5 miles from the Site within the nearby Foster Village residential neighborhood. No comments were received from the community to the results of the RI/FS or the Proposed Plan.

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4. REFERENCES

Department of Navy (DoN) 2004a. *Site Management Plan Update for the Pearl Harbor Naval Complex, Pearl Harbor, Hawaii.* Pearl Harbor, Hawaii: NAVFAC Pacific. October.

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_____ 2008b. *Remedial Investigation / Feasibility Study, Former Makalapa Pesticide Rinsate Pit, Pearl Harbor, Hawaii*. Prepared by Environmental Science International, Inc. April.

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Ogden 1995. *Remedial Investigation Report, Makalapa Pesticide Rinsate Pit, PWC Pearl Harbor, Pearl Harbor, Hawaii.* Vol. I. Pearl Harbor, Hawaii: NAVFAC Pacific. October.

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FIGURES

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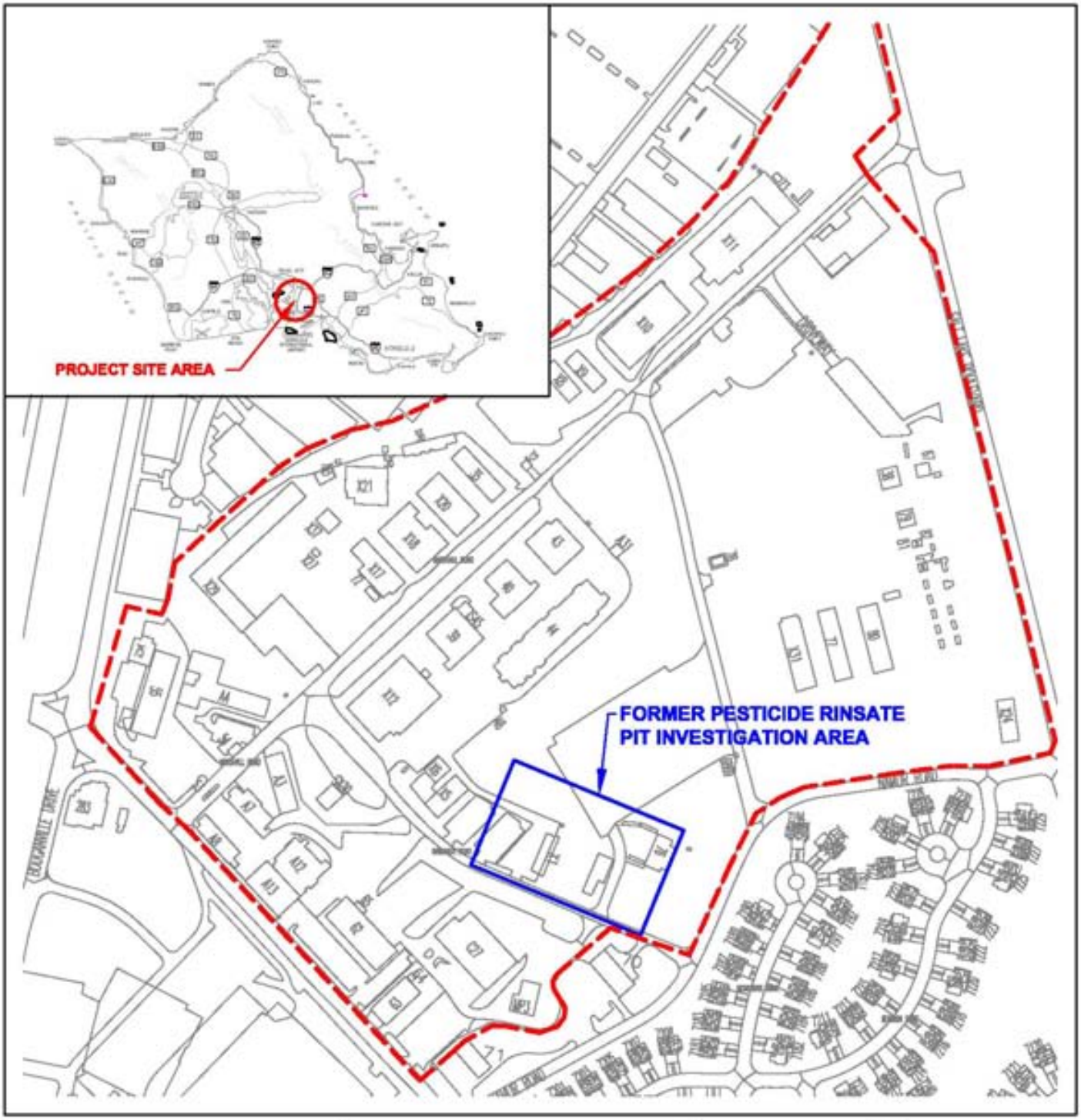

LEGEND

PWC MAIN COMPLEX PROPERTY LIMIT

NOTES

The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.

SOURCES

Pearl Harbor Base Map

NORTH

350 0 350

1 inch = 350 feet

FIGURE 1

SITE LOCATION

MAKALAPA RINSATE PIT ROD
PWC MAIN COMPLEX GEOGRAPHIC STUDY AREA
PEARL HARBOR, HAWAII

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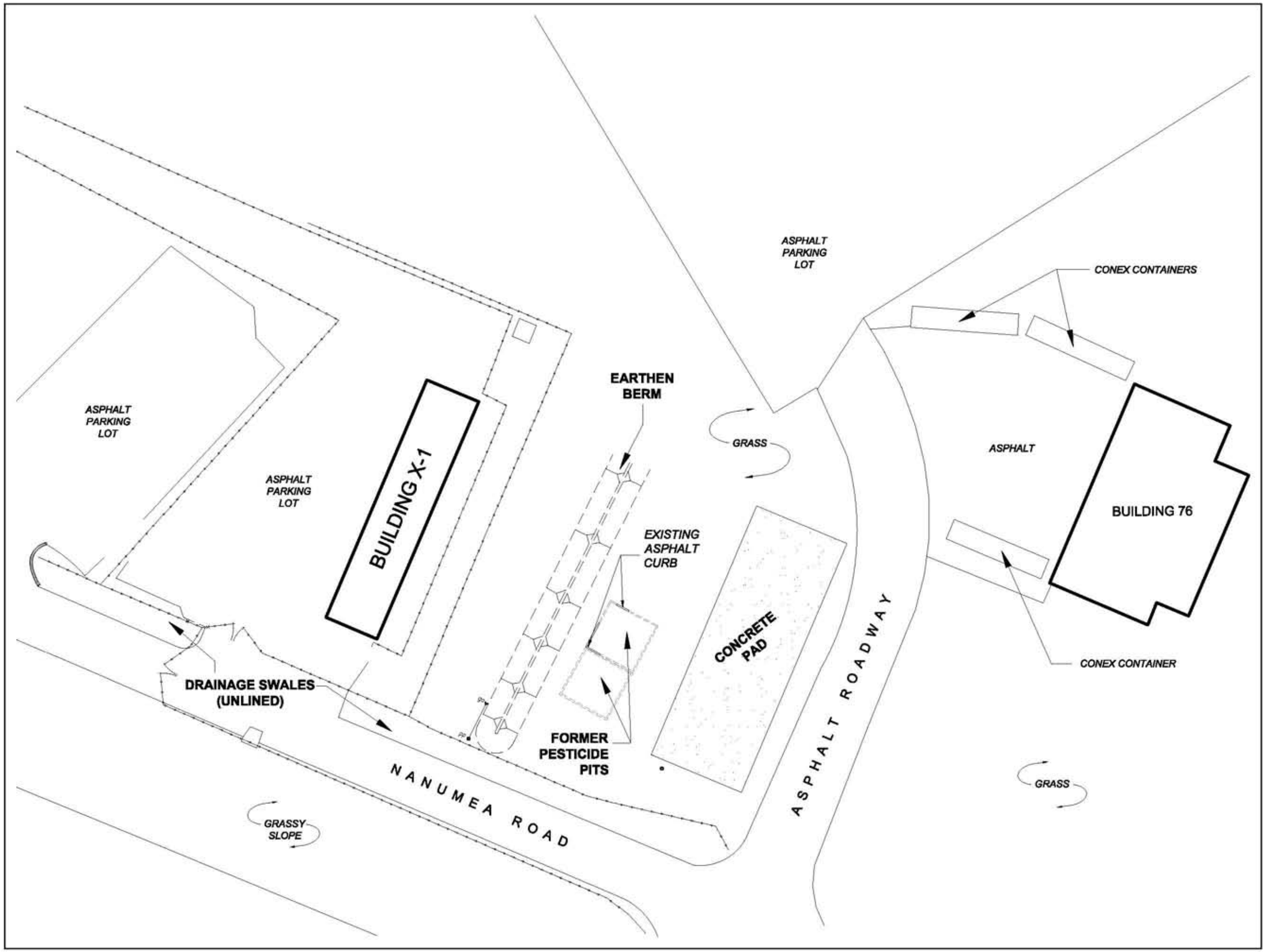

LEGEND

- INFERRED LIMITS OF FORMER PESTICIDE PITS
- BUILDING
- CHAINLINK FENCE

NOTES

The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.

SOURCES

Pearl Harbor Base Map
Austin, Tsutsumi & Associates, Inc., 2005

NORTH

35 0 35

1 inch = 35 feet

FIGURE 2

SITE LAYOUT

MAKALAPA RINSATE PIT ROD
PWC MAIN COMPLEX GEOGRAPHIC STUDY AREA
PEARL HARBOR, HAWAII

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APPENDIX A
Response to Comments

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Sarah Kloss, U.S. Environmental Protection Agency
Record of Decision, Former Makalapa Pesticide Rinsate Pit
Pearl Harbor, Hawaii
Contract No. N62742-06-D-1882, Contract Task Order HC05

Date Received (Comments 1-8): 23 December 2009
Date Received (Comments 9-15): 17 February 2010
Date Received (Comments 16-18): 15 April 2010
Date Received (Comments 19-23): 26 July 2010
Date Received (Comments 24-26): 11 August 2010

Comment No.	Page/ Section No.	Comment
1	Section 1.4, 1-1 and 1-2	For consistency with the discussion of Alternative D later in the text, the selected remedy should either mention that the excavation is bounded by the tuff rather than 5 feet, or delete the references to five feet.

Response: The section has been revised as follows.

The selected remedy involves the excavation and disposal of soil exceeding the Toxic Substances Control Act (TSCA) High Occupancy Cleanup Level for polychlorinated biphenyls (PCBs), the EPA Region IX Residential Preliminary Remediation Goal (PRG) for pesticides, and the natural background level of arsenic.

The following is a summary of the removal actions:

- excavation and offsite disposal of surface soil in the swale area and portion of the concrete pad which contain concentrations of PCBs above the TSCA High Occupancy Cleanup Level; and
- excavation and offsite disposal of surface soil containing PCBs above the TSCA High Occupancy Cleanup Level (see Section 1.4 for description of High Occupancy Levels) in the swale area and portion of the concrete pad, surface and subsurface soil in the rinsate pit containing pesticides above Residential Soil PRGs, and shallow subsurface soil in the rinsate pit containing arsenic above the natural background level. In the pit area, the contaminated soil will be excavated to a depth of 5 feet. If soil is encountered at 5 feet, confirmation samples will be taken in the soil to confirm that clean-up objectives have been met. If tuff is encountered at five feet, soil samples will be collected at the lowest possible depth or from the sidewalls to confirm clean-up objectives are met. If the cleanup goals have not been met, excavation will continue beyond 5 feet. The final depth of the excavation will be limited to the surface of the tuff beyond 5 feet, or where confirmation samples in the soil indicate the cleanup goals have been met. Beyond 5 feet, no confirmation samples will be required in the tuff and no vertical excavation into the tuff is required.

2	Section 1.4, 1-2	Table 1-1 lists cleanup goals based on the EPA Region 9 PRGs. This section should briefly explain what the PRGs are, or reference a section later in the ROD that describes the PRGs. The ROD should also discuss that although EPA Region 9 now uses the RSLs, the 2004 PRGs were established as the cleanup goal in the FS before the RSLs were published. Also, since the PRGs are still protective, we chose to keep those numbers.

Response: The following text has been added to the section.

The cleanup goals for each contaminant of potential concern (COPC) at the Site are shown in Table 1-1. The EPA Region IX PRGs are further described in Section 2.13. Although Regional Screening Levels (RSLs) replaced the EPA Region IX 2004 PRGs, the PRGs were established as the cleanup goal in the Feasibility Study (FS) for this Site before the RSLs were published. However, the PRGs are still protective, and as a result, are considered appropriate cleanup goals for the Site. Following the removal action, the Site will be suitable for unrestricted access, and no land use controls (LUCs) will be necessary.

3	Table 1-1, Page 1-2	Please check the PRG for Methoxychlor; it should be 310 mg/kg.

Response: According to the EPA Region IX PRGs (2004) for residential soil, Table 1-1 has been changed for Methoxychlor to 310 mg/kg.

4	Section 1.5, Page 1-3	Please delete cite to E.O. 12080 as it has no relevance to Navy authority to conduct cleanups.

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Comment No.	Page/ Section No.	Comment

Response: The EO 12080 citation has been removed.

5	Section 2.4, Page 2-6	Please remove the last sentence, or state that the SMP will be updated based on this Record of Decision instead of the RSE.

Response: The section has been revised (*in italics*) as follows.

The Site Management Plan will be updated based on the results of this ROD and the following recommendations which will allow for the remediation of the Site such that unrestricted use is acceptable: the removal of soil exceeding the TSCA High Occupancy Cleanup Level for PCBs, the Residential PRGs for pesticides, and the natural background level of arsenic to the *depth of the welded tuff bedrock, to a depth of 5 feet. In the pit area, the contaminated soil will be excavated to a depth of 5 feet. If soil is encountered at 5 feet, confirmation samples will be taken in the soil to confirm that clean-up objectives have been met. If tuff is encountered at five feet, soil samples will be collected at the lowest possible depth or from the sidewalls to confirm clean-up objectives are met. No confirmation sampling beyond 5 feet is required in the tuff.*

6	Section 2.5.2, Page 2-6	Please check to make sure that the last sentence of the first paragraph in this sentence is correct. As written, the rinsate pit surface seems to be at an elevation 8-10 feet higher than the foundation of Building X-1.

Response: The former rinsate pit, at ground level, is approximately 8 to 10 feet higher than the foundation of Building X-1 due to the grade of the Nanumea Road, approximately 10%. The difference is further exaggerated by the earthern berm. The text has been changed to, "Due to the grade of Nanumea Road and the berm, the former rinsate pit is terraced approximately 8 to 10 feet higher in elevation than the foundation of Building X-1."

7	Section 2.8, Page 2-14	Please elaborate more on the remedial action objectives: describe the media, treatment/removal, etc. For example the RAO for soil could be "to excavate contaminated soil with the cleanup objectives of the TSCA high occupancy level for PCBs, PRGs for pesticides and background levels for arsenic so that the site is safe for unrestricted use".

Response: The following text has been added in this section.

The remedial action objectives for this Site are to perform the remedial actions necessary to excavate contaminated soil with the objective to achieve TSCA High Occupancy Cleanup Level goals for PCBs, residential soil PRGs for pesticides, and background levels for subsurface soil with arsenic in order to consider the Site safe for unrestricted use.

8	Section 2.12, Page 2-18	Please elaborate more on the remedy based on the description in Section 2.9.4. Also, provide a detailed cost estimate for Alternative D. Finally, this section should discuss estimated outcome, i.e., available land use and groundwater use.

Response: The following text (*in italics*) has been added to the section.

The RI/FS evaluation resulted in a higher overall score for Alternative D than any of the other alternatives based on better meeting the criteria for protection of human health, long-term effectiveness, reduction of toxicity, mobility, or volume through treatment, cost, and regulatory and community acceptance. *Alternative D consists of the excavation and offsite disposal of surface soil containing PCBs above the TSCA High Occupancy Cleanup Level (see Section 1.4 for description of High Occupancy Levels) in the swale area and portion of the concrete pad, surface and subsurface soil in the rinsate pit containing pesticides above Residential Soil PRGs, and shallow subsurface soil in the rinsate pit containing arsenic above the natural background level. In the pit area, the contaminated soil will be excavated to a depth of 5 feet. If soil is encountered at 5 feet, confirmation samples will be taken in the soil to confirm that clean-up objectives have been met. If tuff is encountered at five feet, soil samples will be collected at the deepest possible depth or from the sidewalls to confirm clean-up objectives are met.*

If the cleanup goals have not been met, excavation will continue beyond 5 feet. The final depth of the excavation will be limited to the surface of the tuff beyond 5 feet, or where confirmation samples in the soil

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Comment No.	Page/ Section No.	Comment
		indicate the cleanup goals have been met. Beyond 5 feet, no confirmation samples will be required in the tuff and no vertical excavation into the tuff is required. An estimated total, based on the depth of excavation, of 258.5 yd^3 of contaminated soil will be excavated. Following the removal action, the Site will be suitable for unrestricted access, and the estimated outcome would conclude that no land use controls will be necessary. *Based on available information, regional groundwater directly beneath the Site is not currently used. Further, the Site-specific hydrologic and hydrogeologic conditions, along with pertinent federal, state, and local regulations and guidance, indicate that groundwater directly beneath the Site does not represent a potential drinking water source (DoN 2008b). From the RI/FS, the Navy has no plans or funding directed toward water well drilling or exploration (DoN 2008b). For these reasons it can be concluded that groundwater will not be used as a drinking water source in the future.* The cost estimate discussion was revised in Section 2.9 and Table 2.3 *Comparative Analysis of Remedial Action Alternatives*. Cost. Cost estimates for evaluated alternatives were developed utilizing specifications and requirements obtained from DON (2006b). Estimated costs for the evaluated alternatives were initially developed using online remedial cost estimation software (Northwest Builders Network 2006). Individual portions of the derived cost estimates were ground-truthed and adjusted with direct cost estimates from local contractors for individual tasks under each alternative (e.g., cost per unit volume for excavated soil transport). The overall respective cost estimates by individual Alternative tasks are summarized in Table 2.3.
9	TOC	Naming convention for tables in the ROD is not consistent with the captions for the tables in the ROD. See "." vs. "-" separating the table numbers.
Response: The List of Tables in the TOC has been amended per the comment.		
10	Tables 1-1 and 2-4	Although the value for Methoxychlor was changed per our comments to 310 ppm in Table 1-1, it was not changed in Table 2-4. Since Tables 1-1 and 2-4 are identical, the Navy can eliminate Table 2-4 and just refer back to Table 1-1.
Response: Table 2-5 (mislabeled Table 2-4) *Cleanup Goals for Each COPC* has been removed per the comment and the text changed to reference Table 1-1 *Cleanup Goals for Each COPC*.		
11	Table 2-4, Pages 2-19 and 2-24	There are two different Tables marked Table 2-4 -- see pp. 2-19, 2-24.
Response: See comment No. 10.		
12	Page 2-14, Section 2.9, 1st para.	The nine criteria are used for remedy selection, not for "site closure" -- substitute "remedy selection" for "site closure".
Response: The change has been made per the comment.		
13	Sections 1.4, 2.12	Please remove the note about PCB remediation waste in italics that was added.
Response: The text, "*Note, bulk PCB remediation waste (e.g., soil, sediment, sludge) and porous surfaces (e.g., concrete) for High Occupancy Areas is 1 part per million (ppm) without restriction, or 10 ppm with a 10 inch cap,"* has been removed per the comment.		
14	Section 2.1, 3rd para., sentence 4	Insert "roughly square" into the phrase "this area" in sentence four, paragraph 3 or use some other language to define that the area with dimensions of 150 by 40 ft does not include the whole site, it's a smaller area within the larger site.

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Comment No.	Page/ Section No.	Comment
		Otherwise it's confusing.
Response: The text has been changed per the comment to, "This roughly square area covers the rinsate pit locations and is approximately 150 feet long by 100 feet wide."		
15	Section 2.7, Page 2-12	For the first sentence on this page, change "removal" action to "remedial" action.
Response: The text has been revised based on the comment.		
16	General	Please change all the instances where the ROD says COPC to COC. Now that we know the contaminants mentioned pose an unacceptable risk, they are no longer "potentially" of concern.
Response: The document has been revised as requested.		
17	Table 1-1	Table 1-1 should list the PRGs for Arsenic and Aroclor 1260 since they do exist (comment from my attorney). To make the table clearer since there will be multiple concentrations for Arsenic and PCBs, please add a column that specifies which concentration is the cleanup goal.
Response: A column "Cleanup Goals for the Site" has been added to Table 1-1.		
18	Section 1.1	The first sentence states that the Joint Base Pearl Harbor- Hickam has been designated an NPL site; however, the NPL designation does not include Hickam. You could say that "Pearl Harbor Naval Complex, now part of the Joint Base Pearl Harbor-Hickam... " or something like that.
Response: The text has been changed to, "Pearl Harbor Naval Complex, now part of the Joint Base Pearl Harbor-Hickam, has been designated as a National Priority List (NPL)..."		
19	Section 2.13	The Offsite Rule (40 CFR 300.440) is an action specific ARAR for the alternatives where waste will be disposed of off-site. The ROD should include this action specific ARAR.
Response: The following paragraph has been added to the section: 40 CFR 300.440 Procedures for Planning and Implementing Off-site Response Actions – This section is considered an ARAR for the Site and applies to any remedial or removal action involving the off-site transfer of any hazardous substance, pollutant, or contaminant, as defined under CERCLA sections 101 (14) and (33) (''CERCLA waste''), that is conducted by EPA, States, private parties, or other Federal agencies, that is Fund-financed and/or is taken pursuant to any CERCLA authority, including cleanups at Federal facilities under section 120 of CERCLA, and cleanups under section 311 of the Clean Water Act (except for cleanup of petroleum exempt under CERCLA).		
20	Section 2.13	The ROD should note that the TSCA ARAR is chemical specific and applicable (vs. relevant and appropriate).
Response: The text has been revised based on the comment.		
21	Page 1-2	First line: Change "removal actions" to "remedial actions".
Response: The text has been revised based on the comment.		
22	Section 2.9.4	The "yd3" in the second paragaph needs a superscript.
Response: A superscript has been added per the comment.		
23	Section 2.13	In the TSCA ARAR description on page 2-24, please add a "less than or equal" sign in front of the "1.0 parts per million." Also, please change the word

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Comment No.	Page/ Section No.	Comment
		"removal" to "remedial".
Response: The text has been revised based on the comment.		
24	Table 1-1	Table 1-1 -- PCB cleanup level and goal for Aroclor both should be less than or equal to 1.0 (not just 1.0) to be consistent with TSCA PCB high occupancy levels.
Response: The table has been revised based on the comment.		
25	Section 2.12	Section 2.12 (last paragraph) -- This paragraph should explain that no detectable concentrations of COCs were found in the perched groundwater was not addressed.

Response: The following text has been added to Section 2.12:

Screening level analyses of pesticides and arsenic in perched groundwater samples resulted in no detected concentrations of pesticides or arsenic. The combined evidence indicates the following:

- Concentrations of residual pesticides show a rapid and consistent decrease with depth.
- Concentrations of residual pesticides are not detected below 20 feet bgs.
- There is no evidence for significant vertical migration of pesticides or arsenic below the bottom of the former rinsate pit.

26	Section 2.13	Section 2.13 (last bullet) -- there needs to be a less than or equal to sign placed in front "1.0 part per million" and another in front of "1.0 mg/kg" The Navy added a symbol to only the front of the "1.0 part per million" and it was wrong. They put in a greater than or equal to sign, instead of less than or equal to sign.
Response: A less than or equal to sign has been added in front of "1.0 part per million" and "1.0 mg/kg."		

RESPONSE TO COMMENTS (via email) – CTO HC05
Former Makalapa Pesticide Rinsate Pit, Pearl Harbor, Hawaii
Draft Final Record of Decision Review Comments

Reviewer: Maria Eloisa Q. Reyes, Ph. D., HEER (HDOH) Date: 03 September 2009

#	Section	Page	Comment	Response
1		Table 2-1	Please make sure that the Max EPC values are the same as the maximum detected values given in Section 2.5.8. Some of the values were off.	Maximum EPC values were checked against the maximum detected values as well as the data tables from Appendix B and any discrepancies corrected.
2		Figures 5-1 thru 5-6	Clearly differentiate between Figures 5-1 and 5-2, between Figures 5-3 and 5-4, and between Figures 5-6 and 5-6. Each set of figures have the same title – clearly indicate what area of the site is being shown in the figure.	Each set of figures was accordingly renamed and the area clearly identified as Pit or Swale Area.

APPENDIX B
Current Contamination Location Figures

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