

# **Record of Decision**

## **Former Fire Fighting Training Facility**

### **Pearl Harbor, Hawaii**

September 2010

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



**Contract Number: N62742-06-D-1891, CTO HC11**

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## **Former Fire Fighting Training Facility**

### **Pearl Harbor, Hawaii**

**September 2010**

Prepared for:



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

Prepared by:

**Environmental Science International, Inc.**  
**354 Uluniu Street, Suite 304**  
**Kailua, HI 96734**

Prepared under:

**Contract Number: N62742-06-D-1891, CTO HC11**

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Contract Number N62742-06-D-1891  
Contract Task Order: HC11

# Record of Decision Former Fire Fighting Training Facility Pearl Harbor, Hawaii

September 2010

Prepared by:

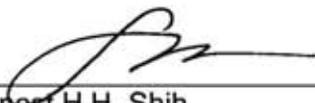
## **Environmental Science International**

354 Uluniu Street, Suite 304  
Kailua, Hawaii 96734



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Nicole Scheman  
Project Manager



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Ernest H.H. Shih  
Program Manager

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## TABLE OF CONTENTS

Cover Page.....	i
Title Page.....	iii
Signature Page.....	v
Table of Contents.....	vii
Acronyms and Abbreviations.....	ix
<b>1. DECLARATION.....</b>	<b>1-1</b>
1.1 Site Name and Location.....	1-1
1.2 Statement of Basis and Purpose.....	1-1
1.3 Assessment of Site.....	1-1
1.4 Description of Selected Remedy.....	1-2
1.5 Statutory Determinations.....	1-2
1.6 Data Certification Checklist.....	1-3
1.7 Authorizing Signatures.....	1-5
<b>2. DECISION SUMMARY.....</b>	<b>2-1</b>
2.1 Site Description, Location, and History.....	2-1
2.2 Previous Investigations.....	2-2
2.3 Community Participation.....	2-5
2.4 Site Characteristics.....	2-6
2.4.1 Climate.....	2-6
2.4.2 Topography and Elevation.....	2-6
2.4.3 Geology.....	2-7
2.4.4 Groundwater Hydrogeology.....	2-7
2.4.5 Groundwater Use Classification.....	2-8
2.4.6 Surface Water.....	2-9
2.4.7 Sensitive Populations and Habitats.....	2-9
2.5 Summary of Current Nature and Extent of Contamination.....	2-10
2.6 Current and Potential Future Site Uses.....	2-10
2.7 Summary of Site Risks.....	2-11
2.7.1 Conceptual Site Model.....	2-11
2.7.2 Human Health Risk Assessment.....	2-11
2.7.3 Screening Ecological Risk Assessment.....	2-12
2.8 Response Action Summary.....	2-13
2.8.1 Alternative A – No remedial/removal action.....	2-13
2.8.2 Alternative B – Subsurface free-phase petroleum product source removal and near-surface/shallow subsurface soil excavation.....	2-13
2.8.3 Alternative C – Subsurface free-phase petroleum product source removal/surface capping.....	2-13
2.8.4 Near-surface/Shallow Subsurface Soil Removal.....	2-14
2.8.5 Free-phase Petroleum Product Features Removal.....	2-14
2.8.6 Groundwater Monitoring.....	2-14
2.9 No Further Action Required.....	2-14
2.10 Principle Threat Wastes.....	2-15
2.11 Statutory Determinations.....	2-15
2.12 Documentation of Significant Changes.....	2-15
<b>3. RESPONSIVENESS SUMMARY.....</b>	<b>3-1</b>
3.1 Community Preferences.....	3-1

3.2 Integration of Comments.....3-1

**4. REFERENCES .....4-1**

**APPENDIX**

Response to Comments

**LIST OF TABLES**

Table 2-1 Summary of Final Cleanup Results

Table 2-2 Summary of Estimated Human Health Risks after Removal Action

**LIST OF FIGURES**

Figure 1 Site Location

Figure 2 RFI Results

Figure 3 Previous Site Configuration

Figure 4 RSE Screening Level Exceedances in Soil

Figure 5 RSE Screening Level Exceedances in Groundwater

Figure 6 Removal Action Results

Figure 7 Conceptual Site Model

## ACRONYMS AND ABBREVIATIONS

ACRONYMS/ ABBREVIATIONS	DEFINITION/MEANING
ARAR	Applicable or Relevant Appropriate Requirements
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	Chemical of Concern
COPC	Chemical of Potential Concern
CSM	Conceptual Site Model
DOH	Department of Health, State of Hawaii
DoN	U.S. Department of the Navy
EE/CA	Engineering Evaluation/Cost Assessment
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
GSA	Geographic Study Area
GWPS	EPA Groundwater Protection Strategy
HI	Hazard Index
HQ	Hazard Quotient
IRP	Installation Restoration Program
mg/L	milligrams per liter
MI	multi-increment
MRL	method reporting limit
NAVFAC	Naval Facilities Engineering Command
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OSWER	Office of Solid Waste and Emergency Response
PAH	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PHNC	Pearl Harbor Naval Complex
PWC	Public Works Center
RA	Removal Action
RBSC	Risk-based Screening Criteria
RCRA	Resource Conservation and Recovery Act
RFI	Resource Conservation and Recovery Act Facility Investigation
RME	Reasonable maximum exposure
ROD	Record of Decision
RSE	Removal Site Evaluation
RVR	Removal Verification Report
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SVOCs	Semi-volatile organic compounds
TEQ	Toxicity Equivalent Quotient
TFH	Total Fuel Hydrocarbons
TSCA	Toxic Substances Control Act

TPH-GRO total petroleum hydrocarbon as gasoline range organics  
TPH-DRO total petroleum hydrocarbon as diesel range organics  
TPH-LRO total petroleum hydrocarbon as lubricating oil range organics  
VOCs volatile organic compounds  
WP Work Plan

# 1. DECLARATION

## 1.1 Site Name and Location

This Record of Decision (ROD) has been prepared by the U.S. Navy for the Former Firefighting Training Facility (FFTF); herein referred to as the "Site," located in the Richardson Geographic Study Area (GSA). The Pearl Harbor Naval Complex (PHNC) was designated as a National Priority List (NPL) on 14 October 1992 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.

The Site is a U.S. Department of the Navy (Navy) facility, located along the shoreline area of the Pearl Harbor Naval Base, comprising the northern and eastern shoreline of East Loch and Arizona Memorial Drive on the island of Oahu in the State of Hawaii. The Site is in the PHNC, and is included on the NPL.

## 1.2 Statement of Basis and Purpose

The ROD presents a no further action (NFA) decision for the Site based on the implementation of the response alternative recommended in the **Engineering Evaluation/Cost Analysis (EE/CA)** (Ref. 01) and from the results of completion from the **Remedial Verification Report (RVR)** (Ref. 02). The final decision was chosen in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This ROD satisfies U.S. Environmental Protection Agency (EPA) and the State of Hawaii Department of Health (DOH) requirements.

Information supporting the decisions leading to the selected remedy is contained in the Administrative Record file for the Site. The DOH and the EPA concur with this NFA decision as indicated by signatures in Section 1.7. Information not specifically summarized in this ROD or its references but contained in the Administrative Record has been considered and is relevant to the selection of the remedy.

## 1.3 Assessment of Site

As part of the selected remedy, four hazardous substance management areas have been removed via excavation to eliminate exposure pathways of site-specific contaminants of concern (COCs) to human receptors. These areas have been excavated to site-specific COC concentrations below **Risk-based Screening Criteria (RBSC)** (Ref. 03) for the protection of human health, for unrestricted land use. As a result, CERCLA hazardous substances at the Site no longer pose a threat to public health, welfare, or the environment. 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. Future 5 year reviews or regular site inspections are therefore not required. The EPA is the lead oversight agency for the Site.

## 1.4 Description of Selected Remedy

Soil of the Site impacted with dioxins, lead, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs) were excavated and disposed of off-site. Dioxin contamination was not detected in samples from groundwater in six new monitoring wells installed during the removal action (RA). Following the removal action, the selected remedy for the FFTF is NFA.

A limited Non-time Critical Removal Action was conducted at FFTF in October 2007, when approximately thirty-five, loose cubic yards of soil were removed and shipped off-island at a facility approved to accept Toxic Substances Control Act (TSCA) and CERCLA wastes. The removal action was conducted to reduce potential risks to human and ecological receptors to acceptable levels. Pre-excavation characterization by discrete sampling defined the lateral extent of the COCs in soils exceeding the cleanup goals specified in Section 2, Table 2-1. Soil with COCs exceeding the respective cleanup goals was excavated and disposed of off-site. Analytical results for COC confirmation soil samples, by multi-increment (MI) sampling, from the excavation sidewalls were below the project cleanup goals.

Regarding the petroleum-related sites, geophysical anomalies including concrete debris, and free-phase petroleum product-impacted soil surrounding the anomalies were removed, except for the concrete debris.

The removal and disposal of these materials reduced the contaminant source and mobility, and eliminated potential exposure pathways at the FFTF. The removal action objective of protecting human health and the environment was achieved. Therefore, FFTF is in a protective state for human health and the environment, meets the criteria for unrestricted use and the cleanup goals; and the selected remedy is NFA. This decision is supported by the administrative record and other documents in the information repository. The Restoration Advisory Board (RAB) team—composed of representatives of the DOH, EPA, Navy, and the community—provided review and comment leading to selection of this NFA decision.

## 1.5 Statutory Determinations

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 Public Works Center (PWC) initially, and most recently by Naval Facilities Engineering Command (NAVFAC). Environmental investigation and cleanup activities for the Site are funded entirely through the NAVFAC Hawaii Installation Restoration Program (IRP). The EPA and DOH have provided oversight during environmental investigations and cleanup activities on Navy properties.

Under CERCLA, no further action is required for a site where release conditions do not pose a current or potential threat to human health or the environment. Accordingly, the Navy and EPA, with concurrence of DOH, have determined that no further action is required under CERCLA because the findings of the **Removal Site Evaluation (RSE)** (Ref. 04) and RVR indicate that the soil impacted with CERCLA regulated COCs above the cleanup goals has been removed from the Site and no longer poses a current or potential threat to human health or the environment.

Following removal actions to address dioxins in soil and groundwater, lead, PCBs, and PAHs in soils, the Navy, as the lead agency, has determined that site conditions at FFTF are protective of human health and the environment and meet criteria for unrestricted use and the cleanup goals; therefore, no further action is planned. This decision is based on the fact that the COCs in soils and groundwater present at FFTF are below the respective cleanup goals for the Site applicable at the time of cleanup, further described in Section 2.2 under the **Non-Time Critical Removal Action, 2008** (Ref. 05) and listed in Table 2-1.

A Dioxin Directive was issued by EPA Office of Solid Waste and Emergency Response (OSWER) setting nationwide policy for dioxin screening and CERCLA removal levels for residential exposure scenarios. For the purposes of this investigation, the dioxin level of 1.0 microgram per kilogram ( $\mu\text{g}/\text{kg}$ ), identified by the directive, was used as a conservative cleanup goal, but was not used to evaluate actual risk represented by dioxin at the Site. The EPA Residential Soil Regional Screening Level (RSL) (formerly 2004 EPA Region 9 Preliminary Remediation Goal) of 400 milligrams per kilogram ( $\text{mg}/\text{kg}$ ) for lead was used to evaluate risk for soil concentrations because RSLs are RBSC. Individual RSLs for PAHs were not used for compound-specific cleanup criteria and the recommended cleanup was directed on a sample by sample basis by EPA Region 9 comments. For the purposes of the investigation, the TSCA High Occupancy Level of  $\leq 1.0 \text{ mg}/\text{kg}$  for PCBs was used as a conservative Applicable or Relevant Appropriate Requirement (ARAR) and cleanup goal, and although an RBSC, it was not used to quantitatively evaluate actual risk represented by PCBs at the Site.

Free-phase petroleum (a non-CERCLA contaminant) on shallow groundwater at the Site indicates that a source of petroleum contamination is still present. Evaluation of the petroleum will determine the location of the source and associated contaminant migration towards Pearl Harbor; however, this was not included in the selected remedy or NFA decision; it will be conducted and documented as a separate action. Depending upon the findings and determination, the action to address the petroleum may implement a long-term monitoring program and evaluate the potential for migration of residual free-phase petroleum product and/or dissolved phase constituents resulting from the petroleum product in the groundwater migrating towards Pearl Harbor, in accordance with the State of Hawaii Contingency Plan.

## 1.6 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.

Information and section number for ROD data certification are:

- Chemicals of concern and their respective concentrations: 2.2
- Baseline risk represented by the chemicals of concern: 2.2 and 2.7
- Cleanup goals established for chemicals of concern and the basis for these levels: 2.2
- How source materials constituting principal threats are addressed: 2.2 and 2.10

- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater used in the baseline risk assessment and ROD: 2.6
- Potential land and groundwater use that will be available at the Site as a result of estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected: 2.4
- 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): 2.2 and 2.5

**1.7 Authorizing Signatures**

The U.S. Navy and EPA jointly select the remedy described in Section 1.4 *Description of Selected Remedy* for the Former Firefighting Training Facility (FFTF) Record of Decision.



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

9/23/10

\_\_\_\_\_  
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 this Record of Decision.



\_\_\_\_\_  
Keith E. Kawaoka, D. Ch.  
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 the Site location, description, history, environmental investigations and response actions conducted at the Site.

### 2.1 Site Description, Location, and History

PHNC has been designated as a NPL site under CERCLA. It has been assigned the CERCLIS identification number HI4170090076. To manage and facilitate the environmental investigation and cleanup activities at the PHNC, it has been subdivided into discrete Geographic Study Areas (GSAs) by the **PHNC Site Management Plan** (Ref. 06). 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 Richardson GSA.

The Site is located along the shoreline area of the PHNC and is bounded by the northern and eastern shoreline of East Loch and Arizona Memorial Drive. The Site is located in the Richardson GSA on the island of Oahu in the state of Hawaii. The location of the Site is shown on Figure 1. It is currently a Pearl Harbor Morale, Welfare, and Recreation Department recreational area. The Site occupies a flat area with very little relief or slope. The southern and central portion of the Site comprise a large grassy lawn area (Figure 2) surrounding a large open-air picnic pavilion. A canoe shed area occupies the northwestern third of the Site. Buildings 97 and 103, and an asphalt parking lot are located in the northeast portion of the Site. Building 97 is currently used as a store room/restroom. Building 103 is used by a commercial dive shop and as storeroom/classroom. Two small sheds to the west of Building 103 are used by the dive shop for equipment and supply storage.

The Site features were built in the 1940s, and were used to train Navy firefighting students by simulating fire situations likely to be encountered on a ship. Site features included structures built on concrete pads and lined with firebrick in order to create a simulated boiler room, aircraft carrier flight deck, aircraft carrier hangar compartment, ship forecastle area, and airplane (Figure 3). Other **former features** (Ref. 07) include an incinerator, an electrical transformer, fuel lines, fuel tanks, drainpipes, sumps, and oil-water separators that were associated with these structures. Reportedly, gasoline, diesel fuel, waste oil, and paints were used or handled from the early 1940s to 1976. The Resource Conservation and Recovery Act (**RCRA**) **Facility Investigation (RFI)** (Ref. 08) stated that water and ignited materials washed into drains during firefighting training operations. These practices, along with the storage of petroleum, led to contamination of the soil and groundwater at the Site.

In 1976, Site operations were transferred to another location within the Pearl Harbor Shipyard, and the majority of surface structures were removed. The approximate limits of the Site are marked by a chain stanchion surrounding the current Site. **Estimated locations** (Ref. 09) of former Site features representing potential sources of subsurface COCs, such as fuel underground storage tanks and oil-water separators are illustrated in Figure 3.

## 2.2 Previous Investigations

The following documents listed are available in the Administrative Record and provide detailed information used to support remedy selection at the Former Firefighting Training Facility.

### ***RCRA Facility Investigation, 1992 (Ref. 10)***

An RFI was conducted in 1992 to identify potential sites at PHNC that may require further investigation. The RFI included an assessment of the presence or absence of fuel or fuel related contamination at the Site based on the historical use of the Site. Geophysical surveying results indicated that sub-surface structures still existed and could be a source of any fuel based contamination. Free-phase petroleum product was observed in the lawn area (former oil-water separator locations), and between Buildings 97 and 103. A soil gas survey revealed detectable concentrations of toluene, methane and total volatile hydrocarbons in three areas (Figure 2). Limited subsurface soil and groundwater samples were collected at nine locations chosen to investigate potential source features like oil-water separators, sumps, and fuel storage tanks.

Groundwater samples were collected directly from each boring. Soil and groundwater samples were analyzed for PCBs, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), and total fuel hydrocarbons (TFHs). The VOC benzene was detected in one groundwater sample at 56 micrograms per liter ( $\mu\text{g/L}$ ). This concentration exceeded the EPA Risk-Based Screening Levels for Soil to Groundwater migration of 5 micrograms per liter ( $\mu\text{g/L}$ ) (EPA Region 9 RSLs 2008). Subsurface soil samples collected from two locations were found to have concentrations of TFH that exceeded the investigation screening levels. The investigation concluded that releases originated from a series of residual point sources irregularly distributed across the Site. Based on low permeability of the soil throughout the Site it was suggested that the rate of contaminant movement was low and that contaminants degrade slowly in place. Further Investigation was recommended to determine the extent of petroleum contamination.

### ***Removal Site Evaluation (RSE), 2005 (Ref. 11)***

An RSE was initiated in 2005 to further investigate the findings of the 1992 RFI, and to evaluate if any contaminated media at the Site was a result of previous Site activities. The RSE was conducted as the first phase of the EE/CA. The RSE results were also used to evaluate the need for further action at the Site. Several Site features were identified by the RSE:

- Potential subsurface features were identified by a geophysical survey of the Site. The features were located at suspected locations of historic fuel storage features where free-phase product was observed (Figure 3).
- Levels above initial screening criteria were found for PCBs (one sample), dioxins (31 samples), total petroleum hydrocarbon as diesel range organics (TPH-DRO) (one sample), PAHs (18 samples) and lead (one sample) in near-surface and surface soil (Figure 4). The highest PAH concentrations were found closest to the picnic pavilion.

- The concentrations for PAHs and lead exceeding EPAs RSLs (formerly 2004 EPA Region 9 Preliminary Remediation Goals) for soil were found in isolated locations at the Site.
- Concentrations above the TSCA level for PCBs (1 milligram per kilogram [mg/kg]) in soil were found at one location at the Site.
- Concentrations of dioxins over the OSWER toxicity equivalent quotient (TEQ) level (1 microgram per kilogram [ug/kg]) for Residential Soils was detected in one soil sample location (Figure 4).
- Levels above initial screening criteria were found for dioxins (six samples), total petroleum hydrocarbon as gasoline range organics (TPH-GRO) (two samples), TPH-DRO (19 samples), total petroleum hydrocarbon as lubricating oil range organics (TPH-LRO) (20 samples), PAHs (25 samples), cadmium (one sample), and lead (12 samples) in groundwater (Figure 5). Elevated concentrations for PAHs, dioxins, cadmium, and lead were likely due to adherence to suspended particulate matter.
- Free-phase petroleum product was observed in two general areas: the Canoe Shed/Building 97/103 area and the lawn area in the southern area of the Site in an inferred location of a previous oil/water separator (Figures 4 and 5). These were two of the three locations identified for the later removal of petroleum-impacted soil.

A Human Health and a Screening Ecological Risk Assessment were conducted as part of the RSE. The results of these assessments are discussed in further detail in section 2.5.2 and 2.5.3. Based on the risk assessment, a soil RA was recommended based on the results of high lead and dioxin concentrations at the Site.

#### ***Engineering Evaluation Cost Analysis, 2007 (Ref. 12)***

An EE/CA of the findings presented in the RSE was completed in 2007. The EE/CA evaluated three future response alternatives. The preferred alternative was to remove four hazardous substance management areas, and three petroleum-impacted areas. It was recommended that the Site undergo a RA, in order to address the COCs, risks and subsurface features discovered during the RSE.

#### ***Non-Time Critical Removal Action, 2008 (Ref. 13)***

Based on the findings of the EE/CA, a Non-Time Critical RA was performed at the Site. The purpose of the RA was to characterize, remove, transport, and dispose of soil from four hazardous substance management areas (Areas 1, 2, 6 and 7, shown on Figure 6), and three petroleum-impacted areas (Areas, 3, 4 and 5; shown on Figure 6). Samples collected/analyzed during the RA completed delineation of the impacted areas. Areas 1 and 2 were selected based on the risk posed by dioxin and lead concentrations. Areas 6 and 7 were selected as a measure of caution to remove PCBs (exceeding ARARs) and PAHs (at the request of EPA Region 9). The RA activities have been documented in the RVR.

The four COCs that drove the RA of the four hazardous substances management sites, described in the RVR, were: dioxins, lead, PAHs, and PCBs. Cleanup goals (Table 2-1), recommended in the EE/CA, were determined for: dioxins in soil, from the EPA OSWER

toxicity equivalent quotient (TEQ) for Residential Levels, and dioxin TEQs in groundwater from the dioxin congener (2,3,7,8-TCDD) DOH EAL cleanup goal for groundwater; lead, and PCBs, from the EPA Residential RSLs (formerly 2004 EPA Region 9 Preliminary Remediation Goals). The project cleanup goals for PAHs were raised from the Residential Soil RSLs (EPA 2004) recommended in the EE/CA; however, still result in acceptable risk that is within the EPA target risk range for PAHs.

Some PAHs can be related to combustion from barbecue activity. The raised cleanup goals were permissible because the areas sampled for PAHs were surrounding the Site barbecue pit, and are likely attributed to the current Site use (recreational barbecue activities), not to the former fire training activities.

Among the four sites excavated, two separate locations were specifically excavated to eliminate exposure pathways to elevated near-surface and shallow subsurface concentrations of dioxin and lead, and two additional locations were excavated as a measure of caution. One of these was excavated to remove PCBs exceeding ARAR cleanup goals. The other was excavated to remove two locations of PAHs, based on an EPA Region 9 request, even though PAH concentrations did not exceed ARARs, or represent any significant risk.

Subsurface soil samples were collected from each hazardous substance management and petroleum-impacted areas to delineate subsurface contamination. The four hazardous substances management sites were excavated to 0.5 feet below the deepest sample depth at each location. Only one sample, nearest MW-04, contained PAH concentrations above the site-specific cleanup goals (Table 2-1). Following the excavation, an outward, sidewall, MI soil sample was collected from the respective location between ground surface (0.0 feet) and 2.0 feet below ground surface (bgs), and analyzed for the Site PAHs. According to the laboratory results, the PAH concentrations were below the site-specific cleanup goals; therefore, the excavation extents had been delineated. None of the other COCs exceeded the site-specific cleanup goals (Table 2-1).

Thirty-five, loose cubic yards of soil were removed from the four hazardous substance management areas. The excavated soil was characterized for proper disposal and shipped to a U.S. Mainland CERCLA and RCRA approved landfill for disposal. Six hundred twelve, loose cubic yards of petroleum contaminated soil were removed from the three petroleum impacted areas. The petroleum-related soil was, after characterization, disposed off-site at an on-island RCRA Subtitle D landfill. Free phase petroleum product was observed floating on the groundwater indicating a petroleum contamination source is still present at the Site. The distribution of free phase petroleum should be evaluated to determine the potential for the residual petroleum and/or related dissolved-phased constituents in groundwater to migrate toward Pearl Harbor (Figure 6).

The results of the Site delineation were presented to representatives from the Navy, DOH, and EPA Region 9, and the excavation limits for hazardous substance management and petroleum-related areas were agreed upon.

**Table 2-1. Summary of Final Cleanup Results**

COC	Cleanup Goals	Depth (feet bgs)	Maximum Concentration	Were Cleanup Goals Met?
<b>Dioxins Total TEQ in soil</b> (EPA OSWER TEQ for Residential Levels)	1.0 µg/kg	0.0 – 0.5	0.225	Yes
<b>Dioxins Total TEQ in groundwater</b> (Dioxin congener (2,3,7,8-TCDD) DOH EAL cleanup goal, where groundwater is not current or potential source of drinking water and site is < or equal to 150 meters to surface water body)	5.0 pg/L	---	0.622	Yes
<b>Lead</b> (2004 EPA Preliminary Remediation Goal. Current EPA RSL remains unchanged.)	400 mg/kg	0.0-0.5	21.8	Yes
		2.0	30.2	Yes
		4.0	3.9	Yes
<b>PAHs</b> (Site specific per EPA, based on EPA Residential RSLs at 10 <sup>-5</sup> risk)				
Benz[a]anthracene	6.2 mg/kg	0.0-0.5	0.073	
		1.0	0.064	
		1.5	0.920	
Cleanup confirmation sample	6.2 mg/kg	0.0-2.0	0.330	Yes
Benzo[b]fluoranthene	6.2 mg/kg	0.0-0.5	0.190	
		1.0	0.074	
		1.5	0.900	
Cleanup confirmation sample	6.2 mg/kg	0.0-2.0	0.560	Yes
Benzo[a]pyrene	0.62 mg/kg	0.0-0.5	0.062	
		1.0	0.060	
		1.5	<b>0.750</b>	
Cleanup confirmation sample	0.62 mg/kg	0.0-2.0	0.300	Yes
Dibenz[a,h]anthracene	0.62 mg/kg	0.0-0.5	0.065	
		1.0	0.011	
		1.5	0.110	
Cleanup confirmation sample	0.62 mg/kg	0.0-2.0	0.060	Yes
<b>PCBs</b>	≤ 1.0 mg/kg	0.0-0.5	ND	Yes
		1.0	ND	Yes
		3.0	ND	Yes

## Notes:

**Bold** results exceed site-specific cleanup goals

µg/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

ND - not-detected above the method reporting limit (MRL)

pg/L - picograms per liter

**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 that are being conducted as part of the Navy IRP.

A Public meeting was held on 5 May 2009, during which the findings and conclusions of the RFI, RSE, RVR and **Proposed Plan** (Ref. 14) were made available to the community. Fact Sheets and presentation notes summarizing the previous investigation results, findings, or conclusions were distributed. No comments were received from the community to the previous investigation information or the Proposed Plan.

Project documents, including the Work Plan/Sampling and Analysis Plans (WP/SAPs), technical reports, fact sheets, materials relating to the investigation and RA, 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 Site Characteristics**

### **2.4.1 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** (Ref. 15) 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 during the summer and 60 to 78 degrees Fahrenheit during the winter season.

### **2.4.2 Topography and Elevation**

Based on U.S. Geological Survey topographical map N2115-W15754/7.5 (USGS 1983), the general ground surface elevation at the Site is approximately 5 feet above mean sea level. The land surface is predominantly flat with very little discernible relief over the entire Site and the first significant change in relief is cliffs consisting of tuff outcrops encountered approximately 150 to 200 feet east of the eastern boundary of the Site near the Richardson GSA Athletic Field. Land surface in the central and

southern portion of the Site consists primarily of a regularly mowed and maintained lawn area. The northeast quarter of the Site consists of an asphalt parking lot around the Canoe Shed/Building 97/103 area.

### **2.4.3 Geology**

Pearl Harbor is situated within the Coastal Plain geomorphic province. Regionally, the Honolulu Coastal Plain is composed primarily of fill that is underlain by bedrock consisting of coral-reef limestones and volcanically-derived alluvial sediments.

The Richardson GSA is located upon fill material underlain by layers of clay and reef limestone deposits interbedded with volcanic tuff layers of relatively low permeability, which are collectively termed **caprock** (Ref. 16). The caprock progressively thins with distance inland and generally extends about a mile inland from shore in the Pearl Harbor area. The coral-reef limestone is intercalated with calcareous beach sand deposits, finely laminated lagoonal muds, and volcanic material. Near Pearl Harbor, the caprock that overlies the volcanic bedrock forms a shelf approximately 6 miles wide at its widest point and more than 1,000 feet thick at the entrance to the main channel of Pearl Harbor.

**Boring logs** (Ref. 17) from the RSE investigation indicated that the subsurface consists of silty clay and clay, with occasional clayey sand overlain by a thin layer of fill soil. The Site soils are characterized in prior investigations as relatively heterogeneous. To the eastern boundary of the Site, outcrops of volcanic tuff are exposed in road cuts and the excavated hillside.

### **2.4.4 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 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 base 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 volcanic tuff layers of relatively low permeability, 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** (Ref. 18) may be confined to considerable depth.

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.

The **shallow groundwater** (Ref. 19) beneath the nearshore areas of Pearl Harbor is consistently considered non-potable, and is separated from the deeper confined Pearl Harbor aquifer by impermeable or poorly permeable sedimentary formations. Chloride data collected from prior investigations conducted at Shoreline Pearl Harbor sites and

the adjoining Ford Island area indicate brackish conditions for the shallow groundwater beneath nearshore locations in both areas.

The Richardson GSA is located over the Pearl Harbor Basal Groundwater Aquifer. In the region surrounding the Site, the basal aquifer is typically confined. Based on the historical record the **depth to the basal aquifer** (Ref. 20) in the vicinity of the Site may be in excess of several hundred feet bgs. The Mink and Lau (1990) report indicates that the shallower aquifer sampled beneath the Site is separated from the deeper confined Pearl Harbor aquifer; therefore, it is unlikely that the deeper groundwater in the Pearl Harbor Aquifer would be affected by any potential contamination from the overlying zone.

#### **2.4.5 Groundwater Use Classification**

The DOH has adopted the **regional groundwater classification system** (Ref. 21) of Mink and Lau (1990) to determine the permissible uses for groundwater in different areas of Hawaii. This classification is used to determine the set of DOH criteria used for evaluation of soil and groundwater contaminants detected at a site (DOH 2008). Mink and Lau identify the following **two types of groundwater** (Ref. 22) in the FTF: a shallow, predominantly caprock groundwater system and an underlying deep basal aquifer. They classify the groundwater in the two systems as follows:

- The uppermost member is characterized as an unconfined caprock aquifer contained in sediments. This caprock groundwater is given a Status Code of 12211, which indicates that the groundwater is brackish (i.e., with a low chloride content of 250 to 1,000 milligrams per liter [mg/L]). Under the Mink and Lau system, the code indicates that the shallow caprock groundwater is not suitable for drinking water, is ecologically important, is an irreplaceable resource, and is highly vulnerable to contamination.
- The deep, underlying aquifer is characterized as a confined basal aquifer contained in flank basalt. Under the Mink and Lau system, the groundwater contained in the deep aquifer is given a Status Code of 12212, indicating that the groundwater has a low chloride content is not used as a drinking-water source, is ecologically important, and has a moderate susceptibility to contamination because of confinement and the overlying caprock.

Because the State of Hawaii does not have an **EPA approved Comprehensive State Groundwater Protection Program** (Ref. 23), the EPA's Groundwater Protection Strategy (GWPS) is used additionally to classify groundwater. Under the EPA GWPS, the Guidelines for Groundwater Classification are used to classify groundwater into three classes.

- Class I groundwater sources are highly vulnerable to contamination and are an irreplaceable source of drinking water for a substantial population or are ecologically vital.
- Class II groundwater sources are current or potential sources of drinking water.
- Class III groundwater sources are not potential sources of drinking water and are of limited beneficial use.

Site-specific factors that indicate groundwater at the FFTF would not be used as a future potable water source include the following:

- Chloride data collected from prior investigations conducted at shoreline Pearl Harbor sites and the adjoining Ford Island area indicate brackish conditions for the shallow groundwater beneath near shore locations in both areas (DoN 2003).
- The DOH has adopted the regional groundwater classification system of Mink and Lau (1990) to determine the permissible uses for groundwater in different areas of Hawaii. According to this system, the status code for the lower unit is 12212, which indicates that the groundwater is currently used, is not suitable for drinking water but is ecologically important, has low salinity, is irreplaceable, and is moderately vulnerable to contamination (Mink and Lau 1990).
- Hydraulic conductivity values in fine-grained soils of the PHNC can range from 1E-04 centimeters/second (cm/sec) to 2E-08 cm/sec. The low conductivity values potentially indicate that groundwater migration velocity at the PHNC is very low and potential for groundwater transport is correspondingly low.

Based on the EPA GWPS Guidelines for Groundwater Classification, DOH groundwater classification system, and site specific factors the shallow groundwater directly beneath the FFTF does not represent a current or potential future drinking water source. The caprock groundwater beneath the Site is appropriately categorized as Federal Groundwater Classification Class III.

#### **2.4.6 Surface Water**

No long-term surface water exists at the Site itself. The closest permanent surface water body is Pearl Harbor, directly bordering the Site to the west. The Site is located on the east coast of the East Loch of Pearl Harbor. It is the southeast side of Aiea Bay, an embayment that is approximately 0.5 miles in diameter. Surface water from the FFTF drains into Pearl Harbor via storm water drainage systems and sheet flow.

#### **2.4.7 Sensitive Populations and Habitats**

A **biological reconnaissance** of the Site was conducted in January 2006 with observations of the terrestrial and shoreline environments. The Site is flat and primarily open, mowed grass along the shoreline of Pearl Harbor and no freshwater is present. It is a highly degraded ecological landscape. A small stand of mangrove is present just offshore immediately to the northwest of the Site. The water along the shoreline is shallow with a gradual slope and the substrate consists of gravel and cobble, and finer materials, with little observable marine life in the immediate vicinity of the shoreline.

Most plant species observed were weedy plants non-indigenous to Hawaii and none are State or Federal listed species or are considered rare. Due to the extensive grass and buildings on the Site, human use of the Site, and lack of any substantial wildlife habitat within 1000 feet of the Site, no significant terrestrial wildlife habitat exists for any native animal except the indigenous Pacific golden plover or *kolea* (*Pluvialis fulva*). The *kolea*'s winter habitat includes grassy areas in Hawaii. The *kolea* is considered a moderate conservation concern according to an update of the **2001 U.S. Shorebird Conservation Plan** (Ref. 24).

## 2.5 Summary of Current Nature and Extent of Contamination

The following is a summary of the current nature and extent of contamination in each medium at the Site. Additional information is contained in the RVR.

Soil data were initially screened against EPA RSLs for Residential Soil sites to evaluate nature and extent of contamination. Groundwater results were screened against DOH Environmental Action Levels for groundwater. The state levels are for sites located less than 150 meters from surface water bodies and not located over potential drinking water.

The comparisons to screening criteria indicated the following:

Based on analytical results, soil impacted with dioxins, lead, PAHs, and PCBs **have been removed** (Ref. 25) from the four hazardous substance management areas. Thirty-five, loose cubic yards were removed and shipped to a U.S. Mainland CERCLA and RCRA approved landfill for disposal. Based on the results of the RVR, no dioxins, lead, PAHs, and PCBs were detected above project clean up goals in the soil remaining at the Site. Six hundred twelve, loose cubic yards of petroleum contaminated soil were removed from the three petroleum impacted areas. However, free phase petroleum product floating on the groundwater indicates a possible source of petroleum contamination is still present at the Site. This situation should be evaluated to determine the potential for the residual free-phase petroleum product and/or dissolved-phased constituents in the groundwater to migrate toward Pearl Harbor.

Under CERCLA, no further action is required for a site where conditions do not pose a current or potential threat to human health or the environment. Accordingly, the Navy and EPA, with concurrence of DOH, have determined that no further action is required under CERCLA because the findings of the RSE and RVR indicate that the soil impacted with CERCLA regulated contaminants above the cleanup goals has been removed from the Site and no longer poses a current or potential threat to human health or the environment. Free phase petroleum (a non-CERCLA contaminant) on the groundwater at the Site indicates that a source of petroleum contamination is still present. Evaluation of the petroleum will determine the location of the source and associated contaminant migration towards Pearl Harbor; however, this was not included in this action; it will be conducted and documented as a separate action. Depending upon the findings and determination, the action to address the petroleum may implement a long-term monitoring program and evaluate the potential for migration of residual free-phase petroleum product and/or dissolved phase constituents resulting from the petroleum product in the groundwater migrating towards Pearl Harbor, in accordance with the State of Hawaii Contingency Plan.

## 2.6 Current and Potential Future Site Uses

The Site is no longer actively used as a firefighting training area. It is currently a Pearl Harbor MWR Department recreational area. The Site is comprised primarily of a large grassy lawn area surrounding an open-air picnic pavilion, canoe storage, and commercial structures. The anticipated future use of the Site is similar to the current use.

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 the same; however it is not certain what the long-term future use will be.

## 2.7 Summary of Site Risks

### 2.7.1 Conceptual Site Model

The **conceptual site model (CSM)** (Ref. 26) is a dynamic model that is used to include or exclude sources of COPCs, receptors, or exposure pathways, based on site history and current information (Figure 7). The human health CSM identifies the exposure pathways that are potentially complete, insignificant, or incomplete for selected current and future receptors.

Direct contact with soil is possible under the current Site conditions. However, the Site is predominantly covered by a maintained lawn, which limits the amount of direct contact exposure. In addition to limiting direct contact with soil, the surface vegetative cover also minimizes offsite transport of soil. Groundwater was not considered a viable source of potable water for current or future use. Further, it is not likely to be used for any other purpose, because of the observed groundwater characteristics. The Site subsurface is composed of fine-grained material, made up predominantly of clays and silty clays. Geotechnical analyses of the subsurface material resulted in very low values for hydraulic conductivity. This evidence indicates that potential for groundwater seepage or discharge to Pearl Harbor rate is low, and therefore the related potential for transport of contaminants or free-phase petroleum product through the subsurface is most likely correspondingly low.

### 2.7.2 Human Health Risk Assessment

Using the results of the RSE, a **Human Health Preliminary Risk Evaluation** (Ref. 27) was conducted. The results indicated the carcinogenic risk for the Site exceeded the upper limit of the EPA target cancer risk range. However, the majority of this cumulative cancer risk originated from dioxin concentrations detected in two soil samples collected from the area formerly occupied by an incinerator on the Site.

Two soil COPCs, lead and dioxin, demonstrated anomalous high concentrations, and also represent the highest contributions to overall risk to human health at the Site. Potential adjustments to overall risk represented by all soil and near-surface soil remaining after limited removal of these high concentrations are summarized in the following Table.

**Table 2-2. Summary of Estimated Human Health Risk after Removal Action**

Media	Max Exposure Point Concentration* Comparison		Reasonable Maximum Exposure, Exposure Point Concentration Comparison	
	ELCR	HI	ELCR	HI
All Soil (near-surface and subsurface)	<b>1E-04</b>	<b>2.0</b>	2E-05	0.4
Surface Soil (0 to 0.5 feet bgs)	<b>1E-04</b>	<b>2.0</b>	2E-05	0.4

Notes:

\* Exposure assumptions, factors, and parameters pertain to EPA standard default residential scenario.

Excess lifetime cancer risks (ELCR) in Bold Italics indicate values exceeding the upper margin of the EPA risk target range of 1E-04 to 1E-06.

Concentrations in Bold Italics indicate hazard index (HI) values exceeding EPA non-cancer risk target threshold of 1.0

The Hazard Index (HI) for the Site, based on the reasonable maximum exposure (RME) after limited removal of high concentration COPCs in the soil at the Site, is 0.4. This is below the EPA threshold HI of 1.0. Based on this reduction in risk, the Navy conducted a RA to address dioxin and lead risk to human health at the Site.

### **2.7.3 Screening Ecological Risk Assessment**

Using the results of the RSE, a **Screening Ecological Risk Assessment** (Ref. 28) was conducted. The only terrestrial receptor identified was a bird, the indigenous *kolea*.

The Site was assessed using several exposure scenarios. Exposure scenarios before and during/following construction were considered. Exposure concentrations that were used in the exposure estimation are the maximum concentrations and 95 percent upper confidence limit (UCLs) measured for all soil (near-surface and subsurface), near-surface soil, and groundwater samples. The measurements for near-surface soil (surface to 6 inches) represented the pre-construction exposure scenario for ecological receptors. The measurements for all soil samples represented the potential exposure scenario for ecological receptors during or after construction. The measurements for groundwater represented the potential scenario for groundwater discharging to Pearl Harbor before, during and after construction.

In the pre-construction exposure scenario, maximum soil concentrations exceeded the ecological screening criteria for dioxins/furans, cadmium, lead, benzo[a]pyrene, PCBs, acetone, and toluene. When using 95 percent UCLs as exposure concentrations, ecological screening criteria for benzo[a]pyrene and toluene were no longer exceeded. Dioxins/furans and lead resulted in the highest Hazard Quotients (HQs). For exposure calculations specifically for birds, dioxins/furan resulted in HQs that were several orders of magnitude lower for birds than for the general screening. Under the least conservative evaluation conducted for birds, the HQ was less than the EPA risk threshold. The lead HQs exceeded the threshold for birds, even under the most conservative evaluation.

An assessment of the Site using an exposure scenario during/following construction, where there could be exposure to subsurface soil (during or following construction) or

near-surface soil, showed that, if using maximum concentrations for the calculations, ecological screening criteria were exceeded for dioxins, cadmium, lead, petroleum hydrocarbons in the gasoline range, benzo[a]pyrene, PCBs, acetone, and toluene. If 95 percent UCL values were used as exposure concentrations, benzo[a]pyrene, acetone, and toluene risk quotients were below or at the EPA target level. However, the HQs for dioxins and lead still exceeded EPA target level.

For groundwater, under pre-construction and construction/post-construction remediation scenarios of discharge of the groundwater to Pearl Harbor, ecological screening criteria were exceeded. Dioxins and benzo[a]pyrene resulted in the highest HQs. A major uncertainty associated with the analysis for groundwater is whether these low mobility substances will actually discharge to Pearl Harbor.

Based on the exceedance of HQs, a soil RA was recommended to reduce the ecological risks to the environment. The evaluation of risk after removal of the highest soil sample concentrations showed that for the indigenous *kolea*, the pre-construction risks can be greatly reduced to an HQ at EPA threshold or lower by removal of relatively small amounts of soil containing the highest detected concentrations of lead and dioxin.

## **2.8 Response Action Summary**

The **EE/CA** (Ref. 29) evaluated three response alternatives. This ROD documents the response actions of the implemented alternative, Alternative B, as part of the NFA remedy.

### **2.8.1 Alternative A – No remedial/removal action**

### **2.8.2 Alternative B – Subsurface free-phase petroleum product source removal and near-surface/shallow subsurface soil excavation**

Alternative B is a three-part response that would: (1) excavate, transport, and dispose of near-surface/shallow subsurface soil, (2) excavate and remove three identified features that likely represent potential sources of free-phase petroleum product, and (3) monitor three potential free-phase petroleum product sources after removal to verify that residual free-phase petroleum product is not migrating offsite.

Monitoring of groundwater would be conducted post-removal to confirm that free-phase petroleum product is not being transported to Pearl Harbor.

### **2.8.3 Alternative C – Subsurface free-phase petroleum product source removal/surface capping**

Alternative C would involve the same areas of concern and the same removal action steps for potential free-phase petroleum product sources and subsequent monitoring as Alternative B. However, Alternative C would install asphalt/concrete caps over the area with dioxin exceedance, an area of two elevated concentrations of PAHs, and an area of one exceedance of lead in the subsurface soil. Subsurface free-phase petroleum product source removal would be the same as under Alternative B.

Evaluating Site conditions against the National Contingency Plan Threshold and Balancing criteria indicated that Alternative B better fulfilled the criteria than Alternative C, based on

higher individual scores for long-term effectiveness, reduction of toxicity/mobility/volume, and implementability. Alternative B was implemented and is summarized below.

#### ***2.8.4 Near-surface/Shallow Subsurface Soil Removal***

The removal action took place in October 2007. The preliminary excavation volume for the sites had been pre-determined based on the results of a previous Site investigation. The excavation volume was revised following pre-excavation sampling outward of the sites. The soil of the hazardous substance management sites soil excavated and containerized. Analytical results for excavation sidewall samples, collected from areas not previously delineated, confirmed that the hazardous substance management sites soil was removed from those areas.

#### ***2.8.5 Free-phase Petroleum Product Features Removal***

The soil from the three petroleum-related sites was excavated and placed into stockpiles. The geophysical anomalies of the petroleum-related sites, identified during a previous Site investigation, appeared to be concrete and/or metal drain line debris. Following disposal of the stockpiled soil, the Site was restored to pre-existing site conditions.

#### ***2.8.6 Groundwater Monitoring***

In October 2007, following the excavation activities, six monitoring wells (MW-01 through MW-06) were installed along the Pearl Harbor shoreline of the Site, and free-phase product was observed floating on the groundwater surface in several of the wells. Further, in order to determine if the dioxin concentration in groundwater was due to particulates rather than dissolved concentrations, the six new monitoring wells (MW-01 through MW-06) were developed, purged and sampled for dioxins.

### **2.9 No Further Action Required**

Free-phase petroleum product was observed floating on the groundwater during installation of three monitoring wells; residual product sheen observed in development or purge water in two monitoring wells; and isolated free-phase product globules were observed floating on groundwater at the floor of one excavation. Free-phase petroleum (a non-CERCLA contaminant) on the groundwater at the Site indicates that a source of petroleum contamination is still present. As a result, the Navy has implemented a groundwater monitoring program to evaluate the potential for migration of residual petroleum free-phase product and/or dissolved-phased constituents in the subsurface toward Pearl Harbor. Evaluation of the petroleum will determine the location of the source and associated contaminant migration towards Pearl Harbor; however, this was not included in the selected remedy or NFA decision; as it is conducted and documented as a separate action.

Based upon the analytical results, no further action is recommended with respect to dioxins in groundwater. All soil, impacted with hazardous substances above the cleanup goals, was removed from the hazardous substance management sites. No further action is recommended with respect to these areas.

## **2.10 Principle Threat Wastes**

The NCP establishes an expectation that treatment will be used to address the principal threats posed by a site wherever practicable. Materials constituting a principal threat waste are source materials with toxicity and mobility characteristics that combine to pose a potential risk several orders of magnitude greater than the risk level that is acceptable for the current or anticipated future land use, given realistic exposure scenarios (EPA 1997). No highly toxic and highly mobile source material remains at the Site; therefore, no principal threat wastes exist at the Site.

## **2.11 Statutory Determinations**

The Navy is the lead agency for environmental cleanup at Navy sites, such as the excavation activities at the four hazardous substance management areas of the Site. The EPA and DOH have provided oversight during environmental investigations and cleanup activities on Navy properties. The selected remedy described in Section 1.4 is protective of human health and the environment, complies with ARARs, is cost-effective, and uses, to the maximum extent practicable, permanent solutions and alternative treatment technologies.

The basis for the remedy selection was an evaluation of three response alternatives against the nine NCP criteria: overall protection of human health and the environment; compliance with ARARs; long-term effectiveness; reduction in toxicity, mobility or volume through treatment; short-term effectiveness; implementability; cost; and state acceptance and community acceptance. The alternative with the overall highest score under these criteria was the selected remedy.

The selected alternative is consistent with the requirements of Section 121 of CERCLA because the alternative:

- protects human health and the environment,
- is cost-effective, and
- utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; therefore, no further action is required.

Based on the removal actions to address dioxins in soil and groundwater, lead, PCBs, and PAHs in soils, and the fact that confirmation samples of soils were below the respective cleanup goals for the Site applicable at the time of cleanup (listed in Table 2-1), the Navy, as the lead agency, has determined that FFTF is in a protective state for human health and the environment and meets criteria for unrestricted use; therefore, no further action is planned.

## **2.12 Documentation of Significant Changes**

There have been no significant changes at the Site since the publication of the Final EE/CA document in 2007.

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### **3. RESPONSIVENESS SUMMARY**

The 30-day comment period for the **Proposed Plan** (Ref. 30) was held from 19 April through 19 May 2009, as announced in a Notice of Availability that was published in the 19 April 2009 (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 Aiea Public Library on 5 May 2009. The Aiea Public Library is located less than five miles from the Site within the nearby city of Aiea. No comments were received from the community regarding the results of the previous investigations or the Proposed Plan.

#### **3.1 Community Preferences**

No community preferences were requested or identified.

#### **3.2 Integration of Comments**

Comments received and corresponding comment responses are integrated in the Appendix. Corresponding verbal and written changes to this document incorporate these responses. No changes to the selected decision are indicated in these comments.

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## 4. REFERENCES

Reference No.	Reference Phrase in ROD	Location in ROD	Identification of Reference Document Available in Administrative Record
01	<b>Engineering Evaluation/Cost Analysis (EE/CA)</b>	Section 1.2	Environmental Science International 2007. Engineering Evaluation/Cost Analysis, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor, Hawaii. August. Section 8, 8-1pp.
02	<b>Remediation Verification Report (RVR)</b>	Section 1.2	Environmental Chemical Corporation, 2008. Remediation Verification Report Removal Action, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor Naval Complex, Oahu, Hawaii. June.
03	<b>Risk-Based Screening Criteria (RBSC)</b>	Section 1.3	Department of Health, State of Hawaii, 2008. Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater. Summer (Updated April 2009).
04	<b>Removal Site Evaluation (RSE)</b>	Section 1.5	Environmental Science International 2007. Engineering Evaluation/Cost Analysis, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor, Hawaii. August.
05	<b>Non-Time Critical Removal Action, 2008</b>	Section 1.5	Environmental Chemical Corporation, 2008. Remediation Verification Report Removal Action, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor Naval Complex, Oahu, Hawaii. June.
06	<b>PHNC Site Management Plan</b>	Section 2.1	Department of Navy, 2004. Site Management Plan Update for the Pearl Harbor Naval Complex, Pearl Harbor, Hawaii. NAVFAC Pacific. October
07	<b>former features</b>	Section 2.1	Ogden Environmental and Energy Services Company 1992. RCRA Facility Investigation, Pearl Harbor Naval Complex, Pearl Harbor, Hawaii. Vol. I. Technical Report. October. Section 5.1.1., Figures 5-2 and 5-3.
08	<b>The RCRA Facility Investigation (RFI)</b>	Section 2.1	Ogden Environmental and Energy Services Company 1992. RCRA Facility Investigation, Pearl Harbor Naval Complex, Pearl Harbor, Hawaii. Vol. I. Technical Report. October. Section 5.1.1., page 5-6.

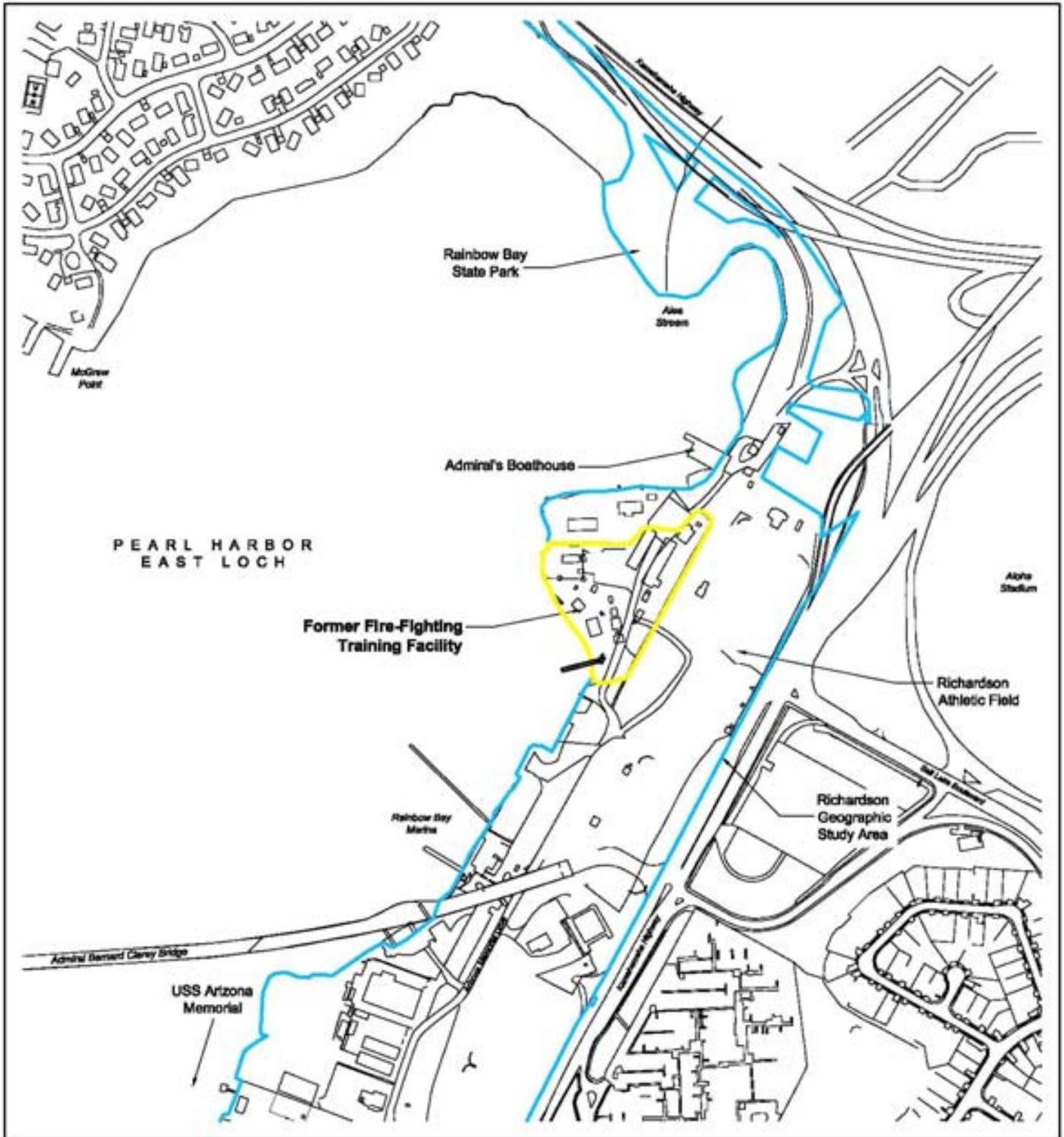
Reference No.	Reference Phrase in ROD	Location in ROD	Identification of Reference Document Available in Administrative Record
09	<b>estimated locations</b>	Section 2.1	Ogden Environmental and Energy Services Company 1992. RCRA Facility Investigation, Pearl Harbor Naval Complex, Pearl Harbor, Hawaii. Vol. I. Technical Report. October. Section 5.1.1., Figures 5-2 and 5-3.
10	<b>RCRA Facility Investigation, 1992</b>	Section 2.2	Ogden Environmental and Energy Services Company 1992. RCRA Facility Investigation, Pearl Harbor Naval Complex, Pearl Harbor, Hawaii. Vol. I. Technical Report. October. Section 5.23, 5-27 pp.
11	<b>Removal Site Evaluation (RSE)</b>	Section 2.2	Environmental Science International 2007. Engineering Evaluation/Cost Analysis, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor, Hawaii. August.
12	<b>Engineering Evaluation Cost Analysis (EE/CA)</b>	Section 2.2	Environmental Science International 2007. Engineering Evaluation/Cost Analysis, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor, Hawaii. August.
13	<b>Non-Time Critical Removal Action, 2008</b>	Section 2.2	Environmental Chemical Corporation, 2008. Remediation Verification Report Removal Action, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor Naval Complex, Oahu, Hawaii. June.
14	<b>Proposed Plan</b>	Section 2.2	Environmental Science International, 2009. Proposed Plan, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Oahu, Hawaii. April.
15	<b>median rainfall</b>	Section 2.3.1	Department of Land and Natural Resources, Division of Water and Land Development, State of Hawaii. 1986. Rainfall Atlas of Hawaii, Report R76, June. Appendix Figure A.40.
16	<b>caprock</b>	Section 2.3.3	Stearns, H. T. 1939. Geologic Map and Guide of the Island of Oahu, Hawaii: Bulletin 2. August. Plate 2.
17	<b>boring logs</b>	Section 2.3.3	Ogden Environmental and Energy Services Company 1992. RCRA Facility Investigation, Pearl Harbor Naval Complex, Pearl Harbor, Hawaii. Vol. I. Technical Report. October. Section 5.1.2.1., Figure 5-4.

Reference No.	Reference Phrase in ROD	Location in ROD	Identification of Reference Document Available in Administrative Record
18	<b>basal groundwater</b>	Section 2.3.4	Macdonald, G. A., Abbott, A.T. and Peterson, F. L. 1983. Volcanoes in the Sea, The Geology of Hawaii, Second Edition. Page 237.
19	<b>shallow groundwater</b>	Section 2.3.4	Mink, J. F., and L. S. Lau. 1990. Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii. Revised. Tech. Report No. 179. Honolulu: Univ. of Hawaii, Water Resources Research Center. February. Page 22.
20	<b>depth to the basal aquifer</b>	Section 2.3.4	Macdonald, G. A., Abbott, A.T. and Peterson, F. L. 1983. Volcanoes in the Sea, The Geology of Hawaii, Second Edition. Page 237.
21	<b>regional groundwater classification system</b>	Section 2.3.5	Mink, J. F., and L. S. Lau. 1990. Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii. Revised. Tech. Report No. 179. Honolulu: Univ. of Hawaii, Water Resources Research Center. February. Page 6.
22	<b>two types of groundwater</b>	Section 2.3.5	Mink, J. F., and L. S. Lau. 1990. Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii. Revised. Tech. Report No. 179. Honolulu: Univ. of Hawaii, Water Resources Research Center. February, page 3.
23	<b>EPA approved Comprehensive State Groundwater Protection Program</b>	Section 2.4.5	Environmental Protection Agency, U.S. 1988. Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy. EPA/440/6-86-007. Office of Water, Office of Groundwater Protection. June.
24	<b>2001 U.S. Shorebird Conservation Plan</b>	Section 2.4.7	U. S. Fish and Wildlife Service. 2004. U.S. Shorebird Conservation Plan. High Priority Shorebirds – 2004. Unpublished Report, 4401 N. Fairfax Dr., MBSP 4107, Arlington, VA, 22203 U.S.A. 5 pp, page 4.
25	<b>have been removed</b>	Section 2.4.8	Environmental Chemical Corporation, 2008. Remediation Verification Report Removal Action, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor Naval Complex, Oahu, Hawaii. June. Section 2.5, Page 14-15.
26	<b>conceptual site model (CSM)</b>	Section 2.7.1	Environmental Science International 2007. Engineering Evaluation/Cost Analysis, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor, Hawaii. August. Section 6.1, Figure 6-1.

Reference No.	Reference Phrase in ROD	Location in ROD	Identification of Reference Document Available in Administrative Record
27	<b>Human Health Preliminary Risk Evaluation</b>	Section 2.7.2	Environmental Science International 2007. Engineering Evaluation/Cost Analysis, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor, Hawaii. August. Section 6, page 6-1 pp.
28	<b>Screening Ecological Risk Assessment</b>	Section 2.7.3	Environmental Science International 2007. Engineering Evaluation/Cost Analysis, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor, Hawaii. August. Section 7, page 7-1 pp.
29	<b>Engineering Evaluation Cost Analysis (EE/CA)</b>	Section 2.8	Environmental Science International 2007. Engineering Evaluation/Cost Analysis, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor, Hawaii. August.
30	<b>Proposed Plan</b>	Section 3.0	Environmental Science International, 2009. Proposed Plan, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Oahu, Hawaii. April.

## **FIGURES**

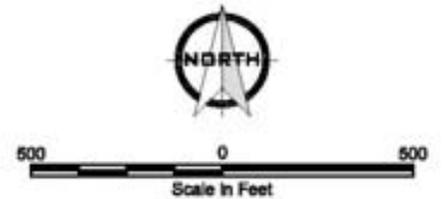
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LEGEND	
	PROJECT SITE BOUNDARY
	NAVY PROPERTY LINE

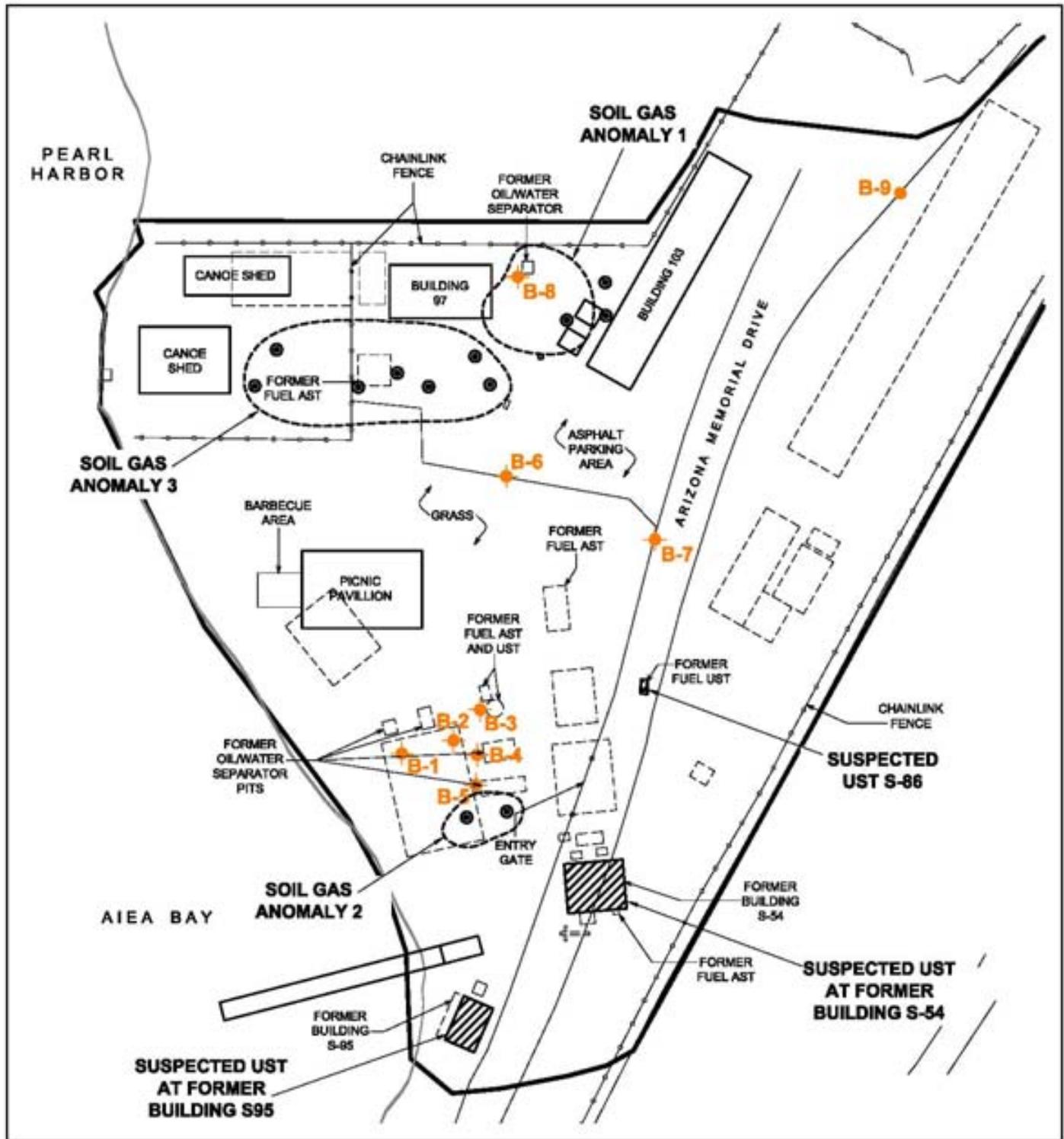
SOURCES
Aerial Photography June 2002, R.M. Towill NAVFAC Pacific GIS files

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.



**FIGURE 1**  
**SITE LOCATION**  
 FORMER FIRE FIGHTING TRAINING FACILITY  
 RICHARDSON GEOGRAPHIC STUDY AREA  
 PEARL HARBOR, HAWAII

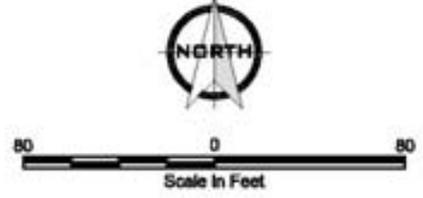
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LEGEND	
	ESTIMATED LOCATIONS OF FORMER STRUCTURES
	EXISTING STRUCTURE
	RFI BORING LOCATION
	ELEVATED SOIL GAS SAMPLING POINT
	SOIL GAS ANOMALY
	GENERAL AREA OF SUSPECTED UST LOCATION
	FORMER FIRE FIGHTING TRAINING FACILITY BOUNDARY

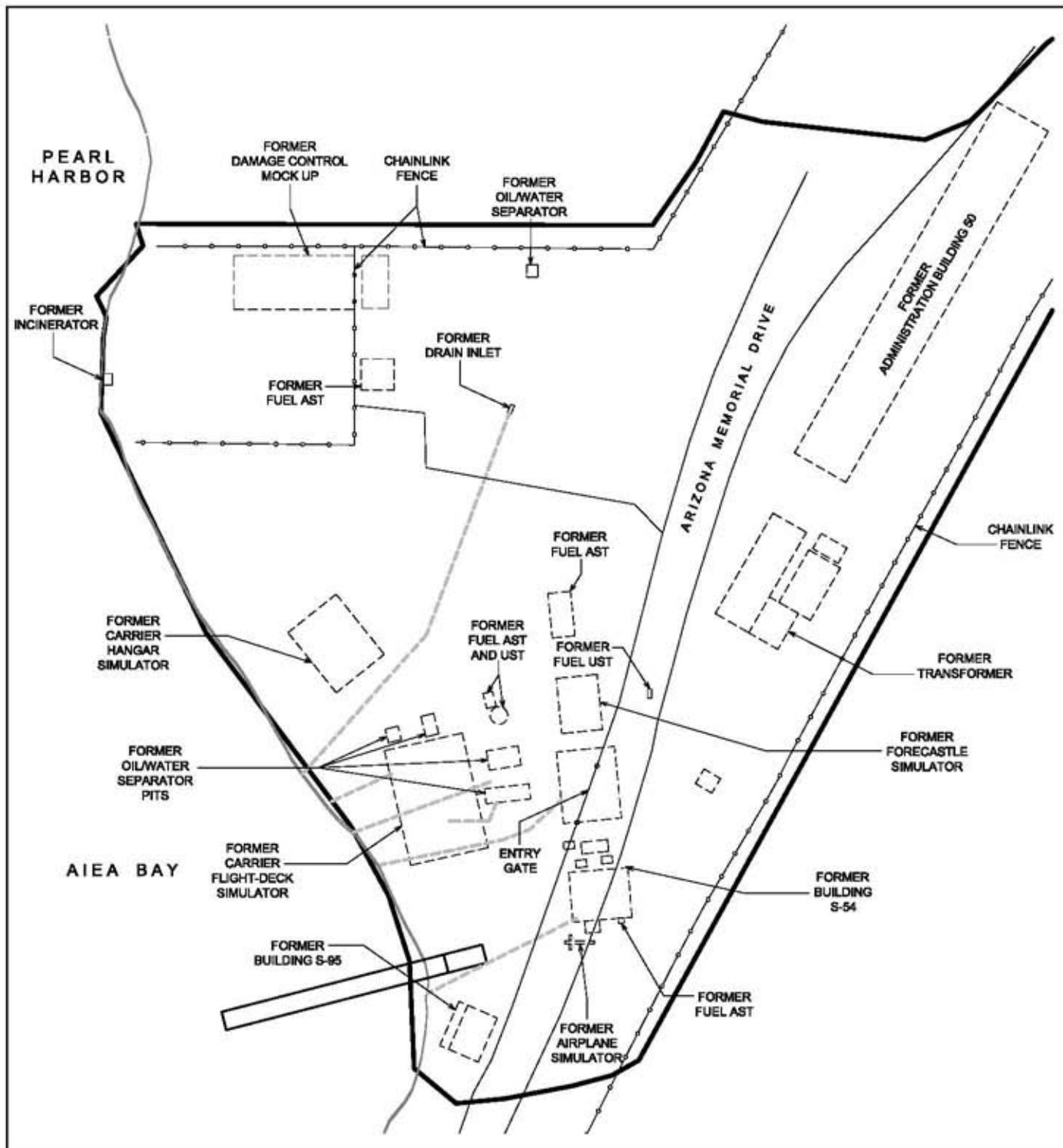
NOTES
1. The accuracy of this document is limited to the quality and scale of the source information. This document is not a legal representation of an engineered survey.
2. Relative locations of current and former structures are estimated based on the accuracy of listed sources.

SOURCES
Aerial Photography June 2002, R.M. Towill NAVFAC Pacific GIS files
Ogden RFI Report 1992
Earth Tech SSR Report 2002



**FIGURE 2**  
**RFI RESULTS**  
 FORMER FIRE FIGHTING TRAINING FACILITY  
 RICHARDSON GEOGRAPHIC STUDY AREA  
 PEARL HARBOR, HAWAII

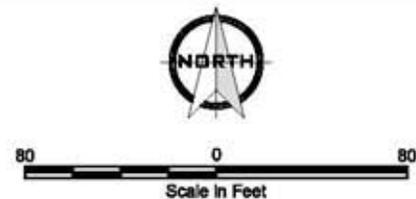
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LEGEND	
	ESTIMATED LOCATIONS OF FORMER STRUCTURES
	FORMER FIRE FIGHTING TRAINING FACILITY BOUNDARY

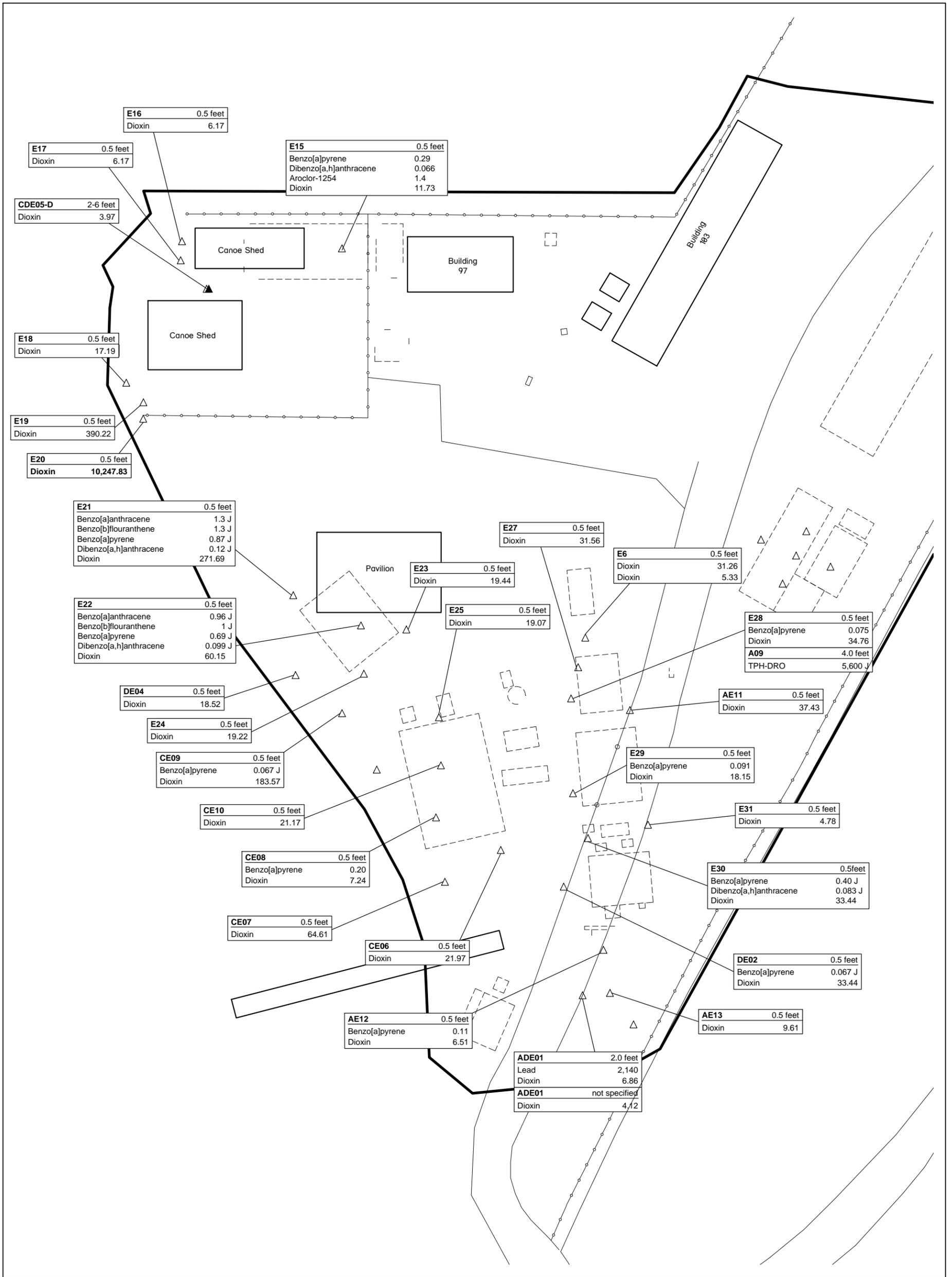
SOURCES
Aerial Photography June 2002, R.M. Towill NAVFAC Pacific GIS files

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.



**FIGURE 3**  
**PREVIOUS SITE CONFIGURATION**  
 FORMER FIRE FIGHTING TRAINING FACILITY  
 RICHARDSON GEOGRAPHIC STUDY AREA  
 PEARL HARBOR, HAWAII

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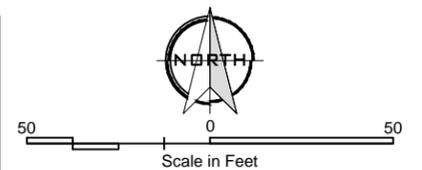


**NOTES**

1. 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.
2. All units in milligrams per kilogram unless otherwise noted.
3. Dioxins are expressed as TEQ in ng/kg.
4. Bold - OSWER TEQ exceeded.

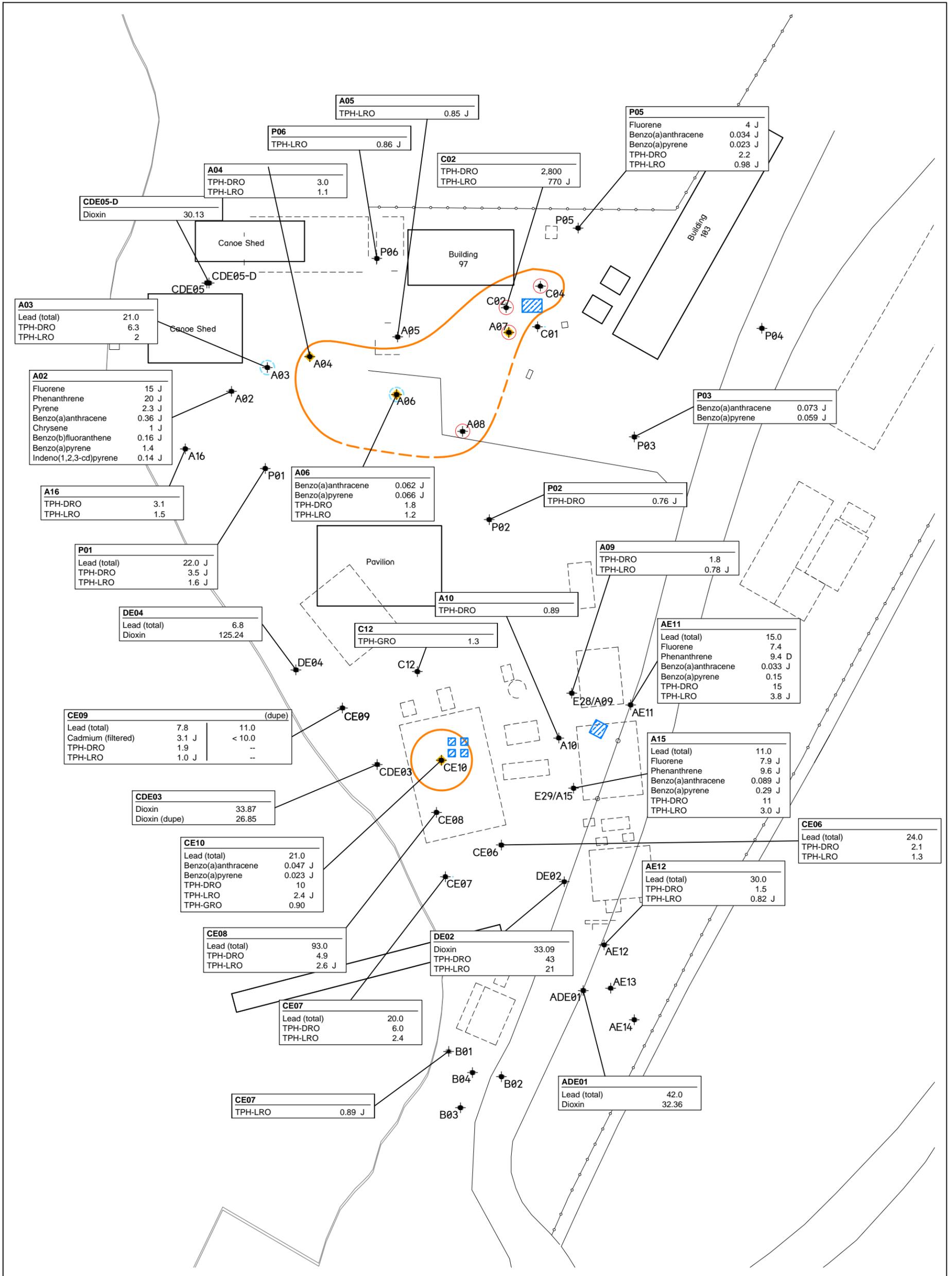
**SOURCES**

Pearl Harbor Base Map  
 Earth Tech SSR Report 2002  
 Gil Surveying, Survey Map, 2006



**FIGURE 4**  
**RSE SCREENING LEVEL**  
**EXCEEDANCES IN NEAR-**  
**SURFACE & SURFACE SOIL**  
 FORMER FIRE FIGHTING TRAINING FACILITY  
 RICHARDSON GEOGRAPHIC STUDY AREA  
 PEARL HARBOR, HAWAII

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**LEGEND**

- DEMOLISHED BUILDING OUTLINE
- ▭ EXISTING BUILDING
- BORING LOCATION
- ◆ FREE PRODUCT OBSERVED IN SOIL
- MEASUREABLE FREE PRODUCT OBSERVED IN TEMPORARY WELL
- ▨ LOCATED GEOPHYSICAL ANOMALIES
- SHEEN OBSERVED IN TEMPORARY WELL
- ESTIMATED EXTENT OF FREE-PHASE PRODUCT

**SOURCES**

- Pearl Harbor Base Map
- Earth Tech SSR Report 2002
- Gil Surveying, Survey Map, 2006

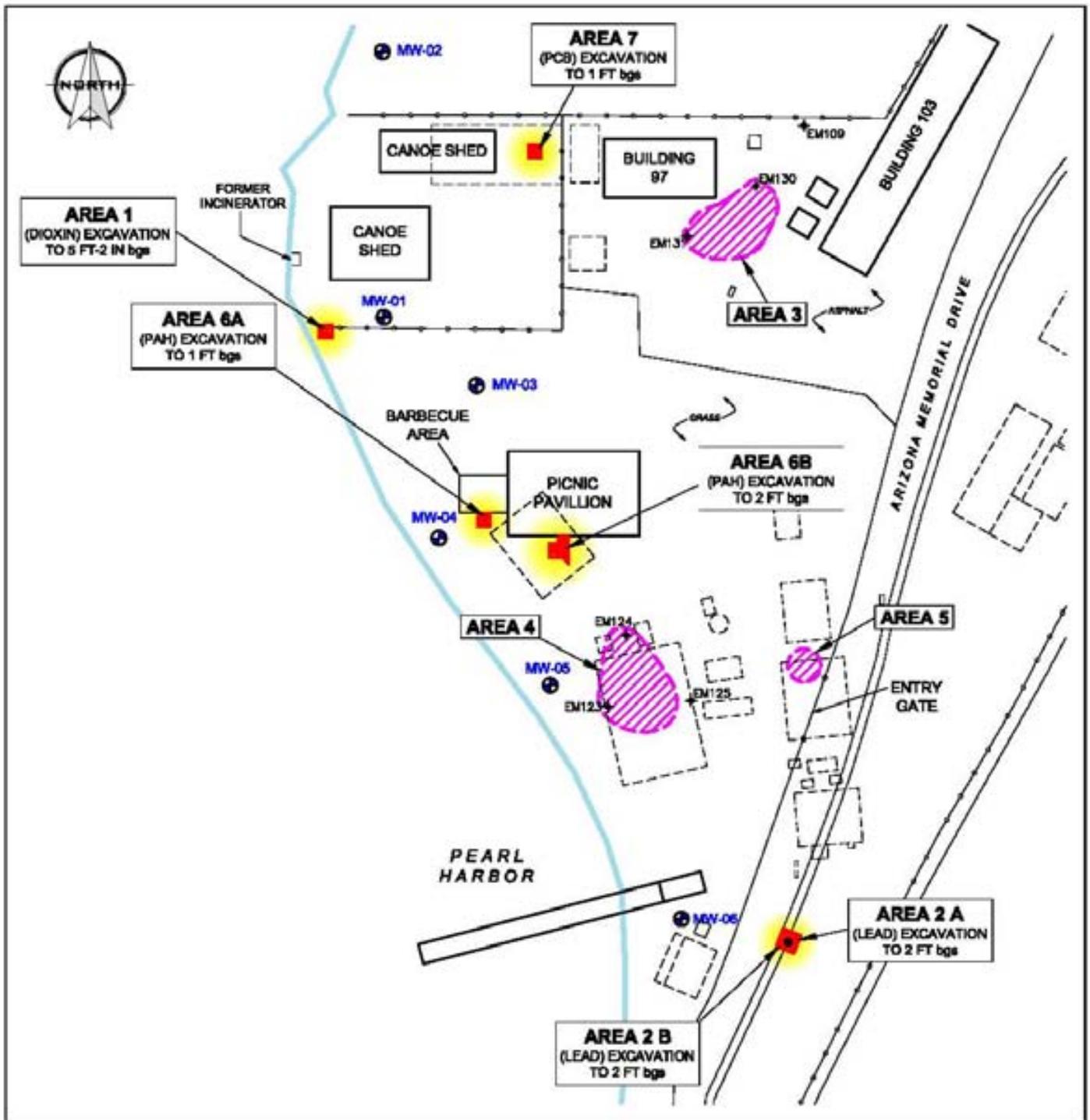
**NOTES**

- 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.
- Metal and PAH results expressed in micrograms per liter.
- TPH expressed in milligrams per liter.
- Dioxin expressed as Toxicity Equivalent Quotient (TEQ) of 2,3,7,8-TCDD in picograms per liter.

  
 50 0 50  
 Scale in Feet

**FIGURE 5**  
**RSE SCREENING LEVEL EXCEEDANCES IN GROUNDWATER**  
 FORMER FIRE FIGHTING TRAINING FACILITY  
 RICHARDSON GEOGRAPHIC STUDY AREA  
 PEARL HARBOR, HAWAII

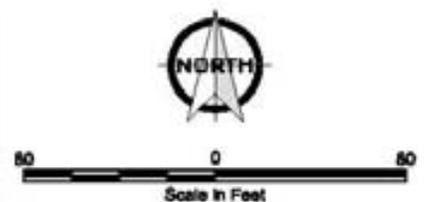
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LEGEND	
	ESTIMATED LOCATION OF DEMOLISHED BUILDING*
	EXISTING STRUCTURE*
	SITE BOUNDARY
	SUBSURFACE SOIL BORING & TEMPORARY MONITORING WELL SAMPLE LOCATION*
	MONITORING WELL
	EXCAVATION AREA
	PETROLEUM-RELATED SITE PRE-EXCAVATION DELINEATION SOIL SAMPLE LOCATION & IDENTIFICATION
	PRELIMINARY EXCAVATION AREA DETERMINED DURING PREVIOUS INVESTIGATION

NOTES
1. 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.
2. Relative locations of current and former structures are estimated based on the accuracy of listed sources.

SOURCES
Pearl Harbor Base Map
Earth Tech SSR Report, 2002
Survey Map, Oil Surveying - 2006
ATA Survey Map, 2007
ESI E2/CA, 2007*



**FIGURE 6**  
**REMOVAL ACTION RESULTS**  
 FORMER FIRE FIGHTING TRAINING FACILITY  
 RICHARDSON GEOGRAPHIC STUDY AREA  
 PEARL HARBOR, HAWAII

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Exposure Pathway			Receptors								Rationale		
			Current Land Use				Future Land Use						
Contributing Source	Transport Mechanism	Exposure Route	Industrial or Construction Worker	Recreational User	Trespasser (Adult/Child)	Offsite Resident (Adult/Child)	Industrial or Construction Worker	Recreational User	Trespasser (Adult/Child)	Offsite Resident (Adult/Child)			
Surface	Direct Contact	Incidental	Incomplete	Potentially Complete	Potentially Complete	Incomplete	Potentially Complete	Potentially Complete	Potentially Complete	Incomplete	Incomplete for Current I/C Worker. There are currently no industrial or construction activities in the source area. Potentially Complete for Current Recreational User and Trespasser. The facility serves as a gathering place for canoeists, and access is not strictly controlled. Incomplete for Current and Future Offsite Resident. Residential areas are not likely to be exposed to site soil in any significant concentration (>1,000 feet). Potentially Complete for Future I/C Worker, Recreational User, and Trespasser.		
		Dermal Contact	Incomplete	Potentially Complete	Incomplete	Incomplete	Potentially Complete	Potentially Complete	Potentially Complete	Insignificant		Same as above.	
	Air Transport	Inhalation of VOCs	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete for all Current and Future receptors. There are no buildings (i.e., enclosures) overlying potential source areas that are able to trap volatile COPCs from surface soil.		
		Inhalation of	Incomplete	Potentially Complete	Potentially Complete	Incomplete	Potentially Complete	Potentially Complete	Potentially Complete	Incomplete		Potentially Complete for Current Recreational User and Trespasser. Incomplete for Current I/C Worker and Offsite Resident. There are no construction activities in the potential source areas and the site is currently recreational. Potentially complete for Future I/C Worker if soil is left exposed after development as a commercial or industrial property.	
	Bio-uptake	Ingestion of Plants/Animals	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete for all Current and Future receptors. There are no gardens or subsistence activities at the site. Site conditions that would result in potentially complete exposure pathways for biouptake are not likely in the future..		
	Leaching to Subsurface Soil	Ingestion	Ingestion	Incomplete	Incomplete	Incomplete	Incomplete	Potentially Complete	Potentially Complete	Potentially Complete	Incomplete	Incomplete for all Current scenarios. There is currently no direct contact with subsurface soil. With the exception of Offsite Resident, exposure to all receptors is possible if Future Land Use includes excavation and construction activities without remediation.	
			Dermal Contact	Incomplete	Incomplete	Incomplete	Incomplete	Potentially Complete	Potentially Complete	Potentially Complete	Incomplete		Same as above.
			Inhalation of	Incomplete	Incomplete	Incomplete	Incomplete	Potentially Complete	Potentially Complete	Potentially Complete	Incomplete		Incomplete for Current receptors. There are no buildings (i.e., enclosures) overlying potential source areas that are able to trap volatile COPCs from subsurface soil. Exposure to Future I/C Worker, Recreational User, and Trespasser is possible if Future Land Use includes excavation and construction activities that disturb and expose soil. Incomplete for Future Offsite Resident.
	Leaching to Groundwater	Ingestion	Ingestion	Incomplete	Incomplete	Incomplete	Incomplete	Potentially Complete	Incomplete	Incomplete	Incomplete	Incomplete for all Current human receptors. Groundwater is not used for any purpose. There are currently no excavation activities in the potential source areas. Groundwater is not a potential future source of potable water. Future I/C Worker (specifically Construction Worker) could be exposed to groundwater if Future Land Use includes excavation and construction activities that extend below sea level..	
			Dermal Contact	Incomplete	Incomplete	Incomplete	Incomplete	Potentially Complete	Incomplete	Incomplete	Incomplete		Same as above.
			Inhalation of	Incomplete	Incomplete	Incomplete	Incomplete	Potentially Complete	Incomplete	Incomplete	Incomplete		Same as above.
	Discharge of Groundwater to Harbor	Ingestion	Ingestion	Incomplete	Potentially Complete	Incomplete	Incomplete	Incomplete	Potentially Complete	Incomplete	Incomplete	Potentially complete for current and future recreational users. The site serves as a gathering place for canoeists. Incidental ingestion, immersion, and inhalation of volatiles is possible for canoeists (e.g., switching paddlers positions). Incomplete for current and future residents.	
			Dermal Contact	Incomplete	Potentially Complete	Incomplete	Incomplete	Incomplete	Potentially Complete	Incomplete	Incomplete		Same as above.
			Inhalation of VOCs	Incomplete	Potentially Complete	Incomplete	Incomplete	Incomplete	Potentially Complete	Incomplete	Incomplete		Same as above.
	Bioconcentration Biomagnification	Ingestion of Fish/Shellfish	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete	Incomplete for all current and future human receptors (same as above). Fishing or harvesting of shellfish is prohibited in the harbor.		

**Figure 7**  
**Conceptual Site Model**  
**Former Fire Fighter Training Facility**  
**Richardson Geographic Study Area**  
**Pearl Harbor, Hawaii**

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## **APPENDIX**

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**Response to Comments**

**Project Title: Draft Record of Decision, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor Naval Complex, Oahu, Hawaii, June 2009**

**Chris Lichens, Remedial Project Manager, Superfund Federal Facility Branch  
US EPA, Region IX**

No.	Page	Section No.	Comment
1		General	The following sections should be added to the ROD: Description of Alternatives, Principal Threat Wastes, Selected Remedy, Statutory Determinations, and Documentation of Significant Changes. If certain sections are not applicable, please state that in the text of that section (e.g., there are no principal threat wastes).
<p><b>Response:</b> The sections <i>Site Name and Location, Statement and Basis of Purpose, Assessment of the Site, Description of Alternatives, Principle Threat Wastes, Statutory Determinations, and Documentation of Significant Changes</i> were added under Chapter 1. <i>Declaration</i>.</p>			
2		Declaration	Please add a section stating the Basis and Purpose for the selected remedy.
<p><b>Response:</b> The following text has been added (in italics) in Section 1.2 <i>Statement and Basis of Purpose</i>:</p> <p><i>This ROD documents, for the Administrative Record, the decision by the Navy and U.S. Environmental Protection Agency (EPA), and in concurrence with the State of Hawaii Department of Health (DOH), to undertake the remedy in Section 1.4 in accordance with CERCLA as amended by the Superfund Amendments and Reauthorization Act (SARA), to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and the Office of the President U.S. Executive Order 12580. The Navy is the lead agency and the EPA is the lead oversight agency.</i></p> <p><i>Information supporting the decisions leading to the selected remedy is contained in the Administrative Record file for the Site. The DOH concurs with this decision as indicated by signature in Section 1.7.</i></p> <p><i>This ROD presents the no further action (NFA) decision for the Site following completion of the selected remedy. The purpose of the selected remedy was to prevent, remediate, minimize or mitigate risks to human health or the environment under the most cost-effective circumstances. The basis for the remedy selection was an evaluation of three response alternatives against the nine NCP criteria: overall protection of human health and the environment; compliance with Applicable or Relevant Appropriate Requirements (ARARs); long-term effectiveness; reduction in toxicity, mobility or volume through treatment; short-term effectiveness; implementability; cost; and state acceptance and community acceptance. The alternative with the overall highest score under these criteria was the selected remedy.</i></p>			
3		Declaration	Include a section titled "Assessment of the Site", which certifies that the site does or no longer poses a threat to public health, welfare or the environment.

**Response to Comments**

**Project Title: Draft Record of Decision, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor Naval Complex, Oahu, Hawaii, June 2009**

**Chris Lichens, Remedial Project Manager, Superfund Federal Facility Branch  
US EPA, Region IX**

No.	Page	Section No.	Comment
<p><b>Response:</b> A Section 1.3 <i>Assessment of the Site</i> has been added (in italics):</p> <p><i>As part of the selected remedy, four hazardous substance management areas have been removed via excavation to eliminate exposure pathways of site-specific contaminants of concern (COCs) to human receptors. These areas have been excavated to site-specific COC concentrations below Risk-based Screening Criteria (RBSC) for the protection of human health, for unrestricted land use. As a result, CERCLA hazardous substances at the Site no longer pose a threat to public health, welfare, or the environment. 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. Future 5 year reviews or regular site inspections are therefore not required. The EPA is the lead oversight agency for the Site.</i></p>			
4		1.1	<p>Section 1.1 (selected remedy) should specify that the selected remedy is no further action, rather than the EE/CA. This section should also explain how and why no further action is the selected remedy. The citation to Executive Order 12080 should be removed as it is not relevant to the authorities for implementing the cleanup.</p>
<p><b>Response:</b> Section 1.4 <i>Selected Remedy</i> has been revised to include (in italics):</p> <p><i>Under CERCLA, no further action is required for a site where release conditions do not pose a current or potential threat to human health or the environment. Accordingly, the Navy and EPA, with concurrence of DOH, have determined that no further action is required under CERCLA because the findings of the Removal Site Evaluation (RSE) (Ref. 03) and RVR indicate that the soil impacted with CERCLA regulated contaminants above the cleanup goals has been removed from the site and no longer poses a current or potential threat to human health or the environment. Free-phase petroleum (a non-CERCLA contaminant) on the groundwater at the Site indicates that a source of petroleum contamination is still present. Evaluation of the petroleum will determine the location of the source and associated contaminant migration towards Pearl Harbor; however, this was not included in the selected remedy or NFA decision; it will be conducted and documented as a separate action. Depending upon the findings and determination, the action to address the petroleum may implement a long-term monitoring program and evaluate the potential for migration of residual free-phase petroleum product and/or dissolved phase constituents resulting from the petroleum product in the groundwater migrating towards Pearl Harbor, in accordance with the State of Hawaii Contingency Plan.</i></p> <p>Citation to Executive Order 12080 in Section 1.2 <i>Statement and Basis of Purpose</i> has been replaced with 12580.</p>			

**Response to Comments**

**Project Title: Draft Record of Decision, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor Naval Complex, Oahu, Hawaii, June 2009**

**Chris Lichens, Remedial Project Manager, Superfund Federal Facility Branch  
US EPA, Region IX**

No.	Page	Section No.	Comment
5			Include a section titled "Statutory Determinations", which describes how the selected remedy will satisfy statutory requirements under Section 121 of CERCLA.
<b>Response:</b> The section has been added under Section 1.5 <i>Description of Alternatives</i> .			
6		1.2	In Section 1.2 (Data Certification Checklist), please include the list as bullets in the text, rather than in table form.
<b>Response:</b> The table has been removed and the bullets removed and listed in the text.			
7		2.2	Section 2.2 (Previous Investigations): Please move the information in the table to read as text.
<b>Response:</b> The information has been removed from the table and included as text.			
8		2.2	Please explain how the RCRA Subpart S cited level of 5 ug/L for benzene is relevant. Please also provide the specific statutory or regulatory citation.
<b>Response:</b> The cited level of 5 ug/L for benzene is the EPA Risk-Based Screening Levels for Soil to Groundwater migration (EPA Region IX PRGs, 2008). The reference to RCRA Subpart S has been removed.			
9		2.2	Please explain how a no further action remedy is appropriate, given that there is unevaluated free-phase petroleum in the groundwater, which may contain CERCLA hazardous substance "dissolved phase constituents."

**Response to Comments**

**Project Title: Draft Record of Decision, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor Naval Complex, Oahu, Hawaii, June 2009**

**Chris Lichens, Remedial Project Manager, Superfund Federal Facility Branch  
US EPA, Region IX**

No.	Page	Section No.	Comment
<p><b>Response:</b> The text from Section 1.4 <i>Selected Remedy</i> has been copied to Section 2.3.8 <i>Summary of Current Nature and Extent of Contamination</i> to restate that the evaluation of the petroleum as a separate action as follows.</p> <p><i>Accordingly, the Navy and EPA, with concurrence of DOH, have determined that no further action is required under CERCLA because the findings of the Removal Site Evaluation (RSE) (Ref. 03) and RVR indicate that the soil impacted with CERCLA regulated contaminants above the cleanup goals has been removed from the Site and no longer poses a current or potential threat to human health or the environment. Free-phase petroleum (a non-CERCLA contaminant) on the groundwater at the Site indicates that a source of petroleum contamination is still present. Evaluation of the petroleum will determine the location of the source and associated contaminant migration towards Pearl Harbor; however, <b>this was not included in this action; it will be conducted and documented as a separate action.</b> Depending upon the findings and determination, the action to address the petroleum may implement a long-term monitoring program and evaluate the potential for migration of residual free-phase petroleum product and/or dissolved phase constituents in the groundwater migrating towards Pearl Harbor, in accordance with the State of Hawaii Contingency Plan.</i></p>			
10		2.3	<p>Please delete the word "source" at the end of the sentence on page 2-6 (bottom half of the page) and clarify whether the deep groundwater has been characterized. If the deep groundwater will not be sampled periodically to verify that free-phase petroleum will not contaminate this zone, please explain why not.</p>
<p><b>Response:</b> Changes made per the comment. Clarification has been added to indicate that the Mink and Lau (1990) Aquifer Identification and Classification for Oahu report indicates that the deeper shallower aquifer sampled beneath the Site is separated from the deeper confined Pearl Harbor aquifer by impermeable or poorly permeable sedimentary formations; therefore, it is unlikely that the deeper groundwater in the Pearl Harbor Aquifer would be effected by the contamination in this overlying zone.</p>			
11		2.4	<p>Please describe the uses of the current recreational facility.</p>
<p><b>Response:</b> "Recreational facility" has been replaced with "recreational area" and the canoe storage shed has been included in the description of this area which is primarily an open field.</p>			

**Response to Comments**

**Project Title: Draft Record of Decision, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor Naval Complex, Oahu, Hawaii, June 2009**

**Chris Lichens, Remedial Project Manager, Superfund Federal Facility Branch  
US EPA, Region IX**

<b>Comments 12-14 received 21 July 2010</b>			
12		1.4	It's difficult to determine the cleanup standards and how they were determined. It would be helpful to add a brief discussion of cleanup levels, including a table with final cleanup levels and corresponding concentrations remaining in soil for each contaminant, for both the shallow and deeper zones.
<b>Response:</b> <i>Table 1. Summary of Final Cleanup Results</i> has been added, including annotation of the sources. In addition, a description of how cleanup confirmation samples were collected has been added to the section.			
13		1.5	The discussion of EE/CA alternatives in the Declarations section is out of place and suggests that evaluation of alternatives is an objective of the ROD. The Description of Alternatives in Section 1.5 should be moved to the Decision Summary.
<b>Response:</b> Section 2.8 <i>Description of Alternatives</i> has been added to Chapter 2. <i>Decision Summary</i> .			
14		TOC	A different organization/structure might facilitate these changes and be easier to follow. An example NFA ROD prepared by the Navy is attached for your consideration. Please review and then Larry and I would be glad to discuss it with you."
<b>Response:</b> The organization of the document has been changed to reflect the example format. Section 2.8 <i>Description of Alternatives</i> with subheadings for each alternative, Section 2.9 <i>Response Action Summary</i> , and Section 2.10 <i>No Further Action Required</i> have been added. Likewise, the <i>Principle Threat Wastes</i> , <i>Statutory Determinations</i> , and <i>Documentation of Significant Changes</i> have been moved to Chapter 2. <i>Decision Summary</i> .			

**Response to Comments**

**Project Title: Draft Record of Decision, Former Fire Fighting Training Facility, Richardson Geographic Study Area, Pearl Harbor Naval Complex, Oahu, Hawaii, June 2009**

**Chris Lichens, Remedial Project Manager, Superfund Federal Facility Branch  
US EPA, Region IX**

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