Draft Final

Remedial Design

Waikane Valley Impact Area

Munitions Response Program
Kaneohe Marine Corps Base Hawaii

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Department of the Navy
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ACRONYMS AND ABBREVIATIONS

APP	Accident Prevention Plan
ARAR	Applicable or Relevant and Appropriate Requirements
CADD	computer-aided design and drafting
CD-R	Compact Disk Recordable
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CPR	Cardiopulmonary Resuscitation
COC	Contaminant of Concern
DD	Decision Document
DDESB	Department of Defense Explosives Safety Board
DoD	Department of Defense
DoN	Department of Navy
EOD	Explosive Ordnance Disposal
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ESS	Explosives Safety Submission
FS	Feasibility Study
ft.	Feet
GIS	Geographical Information System
GPS	Global Positioning System
GSA	General Services Administration
HAZWOPER	Hazardous Waste Operations and Emergency Response
HDOH	Hawaii Department of Health
IVS	Instrument Verification Strip
LUC	Land Use Controls
MEC	Munitions and Explosives of Concern
MEC HA	MEC Hazard Assessment
MC	Munitions Constituents
MCB	Marine Corps Base
MDAS	Material Documented as Safe
mm	millimeter
MPPEH	Material Potentially Presenting an Explosive Hazard
MRS	Munitions Response Site
NAVFAC	Naval Facilities Engineering Command

NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NIRIS	Navy Installation Restoration Information Solution
NTR	Navy Technical Representative
O&M	operation and maintenance
OSHA	Occupational Safety and Health Administration
PLS	Professional Land Survey
PP	Proposed Plan
QA	Quality Assurance
QC	Quality Control
QCP	Quality Control Plan
RA	Remedial Action
RAB	Restoration Advisory Board
RACR	Remedial Action Completion Report
RAO	Remedial Action Objective
RD	Remedial Design
RD/RA	Remedial Design /Remedial Action
RI	Remedial Investigation
RTS	Robotic Total Station
SDSFIE	Spatial Data Standards for Facilities Infrastructure and Environment
SI	Site Inspection
SOW	Scope of Work
SUXOS	Senior UXO Supervisor
TBC	To be considered
TMP	Technical Management Plan
USAE	USA Environmental, Inc.
UTM	Universal Transverse Mercator
UXO	Unexploded Ordnance
UXOQCS	UXO Quality Control Specialist
UXOSO	UXO Safety Officer
UXOTIII	UXO Technician Level III
UXOTII	UXO Technician Level II
UXOTI	UXO Technician Level I
WGS	World Geodetic System
WP	Work Plan
WVIA	Waikane Valley Impact Area

EXECUTIVE SUMMARY

This Remedial Design (RD) outlines the required actions necessary to implement a remedial action that meets the Remedial Action Objectives (RAOs) identified in the Final Decision Document (DD) (February 2013) for the Waikane Valley Impact Area (WVIA) Munitions Response Site (MRS) located in Waikane Valley, Kaneohe, Oahu, Hawaii. The selected remedy was selected in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This RD was developed as a series of phases (preliminary 30%, draft 60%, and final 100%) as recommended by the Environmental Protection Agency (EPA) Model CERCLA Remedial Design/ Remedial Action (RD/RA) Consent Decree, Section VI, subsection 11, paragraphs b, c, d, e, and f. Implementation of the selected remedial activities detailed in this RD will meet the requirements of the RAOs and are protective of human health and the environment, comply with federal and state regulations that are applicable or relevant and appropriate to the remedial action, will be cost-effective, will utilize permanent solutions to the maximum extent practicable, and satisfy the preference for treatment as a principle element of the remedy.

The RD and related appendices provide the maps and specifications that where developed as part of this overall RD process. The RD will be utilized during the procurement of RA Contractor(s) in order to provide the basis of scope for RA activities. The Land Use Control (LUC) Implementation Plan (Appendix B) provides guidelines for conducting long term maintenance and other related LUC activities.

This RD was developed by USA Environmental, Inc. (USAE) on the behalf of Naval Facilities Engineering Command (NAVFAC) Pacific under Contract No. N62470-11-D-8007; Task Order No. KB06, and included coordination with Stakeholders: Marine Corps Base (MCB) Hawaii, the Hawaii Department of Health (HDOH), and the Waikane Valley Restoration Advisory Board (RAB). RD coordination efforts included scoping and project meetings with NAVFAC and MCB Hawaii, site visits with community leaders (RAB) and technical personnel, and various design review meetings. Stakeholder involvement was actively sought throughout the design process in order to seek concurrence with the RD document.

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1.0 INTRODUCTION

This Remedial Design was prepared to detail the activities associated with the design and subsequent remedial action (RA) described in the Decision Document (DD) dated February 2013 for the WVIA located in Kaneohe, Oahu, Hawaii.

This RD was prepared in accordance with the Scope of Work (SOW), the CERCLA, and to the extent practicable, the NCP by USAE for NAVFAC Pacific and MCB Hawaii under Contract N62470-11-D-8007, CTO KB06.

The Navy is the lead agency and provides funding for site cleanups at WVIA. The technical design set forth in this RD has been selected by the NAVFAC, MCB Hawaii, and HDOH. HDOH, the lead regulatory agency, and the RAB actively participated throughout the development of the RD and, hence, have reviewed and concur with the intended approach.

1.1 PURPOSE AND SCOPE OF THE REMEDIAL DESIGN

The purpose of this RD is to provide a detailed technical design package necessary for implementing the selected remedial alternative solidified in the WVIA DD. This design package has been developed as a series of phases (preliminary 30%, draft 60%, and final 100%) as recommended by the *Environmental Protection Agency (EPA) Model CERCLA RD/RA Consent Decree, Section VI, subsection 11, paragraphs b, c, d, e, and f.* Implementation of the selected remedial activities detailed in the RD will meet the requirements of the WVIA DD and will be protective of human health and the environment, comply with federal and state regulations that are applicable or relevant and appropriate to the remedial action, will be cost-effective, will utilize permanent solutions to the maximum extent practicable, and satisfy the preference for treatment as a principle element of the remedy.

The RD package contains the design criteria necessary to provide a comprehensive procurement document to the Government for the RA Phase.

1.2 REMEDIAL ACTION OBJECTIVE AND SELECTED REMEDY IN DECISION DOCUMENT

The former WVIA has been investigated under the Munitions Response Program to determine what types of cleanup actions are needed to reduce risks from Munitions and Explosives of Concern (MEC) remaining from past training activities. The investigation activities included the development of Remedial Action Objectives (RAOs). The RAOs for the WVIA site were developed during the remedial investigation (RI) and DD stages. The RAO for the WVIA is as follows:

To prevent exposure to MEC through reduction of MEC hazards, and to support future agricultural, recreational, cultural, and forest reserve land use (unrestricted use/ unrestricted exposure).

MEC includes unexploded ordnance (UXO) and other munitions items that may pose an explosive hazard, and munitions constituents (MC) are chemical components of munitions which may pose human health or ecological risks if left on the site. Previous investigations have identified the presence of MEC in the Northern Target Area, a potential for MEC in the Northern Non-Target Area, and a low potential for MEC in the Southern Area (Figure 1-2).

Following the Feasibility Study, the Northern Target and Northern Non-Target Areas were combined into a single Northern Area based on the similarity of response actions for the two areas.

The response action selected in this Decision Document is necessary to satisfy the RAO by protecting public health, welfare, and the environment from residual explosive hazards at the site. The Selected Remedy for WVIA is:

- Surface clearance of accessible areas in the Southern Area and the Northern Area

- Subsurface clearance to a depth of 2 feet of a 10-foot wide buffer strip along the boundary separating the Southern and Northern Areas
- Removal of the existing fencing from the Southern Area and installation of new fencing along the north edge of the cleared buffer strip between the Southern and Northern Areas
- Subsurface clearance to a depth of 2 feet in the Southern Area in a 50-foot radius of any MEC found during the surface clearance
- Subsurface clearance to a depth of 2 feet of 50-foot wide corridors to and around the Kamaka Shrine and Waikane Spring, and the installation of fencing along and around these cleared areas, to allow free access to these sites from the Southern Area.
- Additional Land Use Controls, including notification letters to local landowners and an educational program to inform the community of risks and mitigation measures.

1.3 ROLES AND RESPONSIBILITIES

Listed below are the roles and responsibilities of the participating project team members and stakeholders for the development of the RD package.

1.3.1 LEAD AGENCY, NAVAL FACILITIES ENGINEERING COMMAND (NAVFAC), PACIFIC

NAVFAC Pacific is the lead agency implementing munitions response Activities at the WVIA. NAVFAC Pacific provides oversight and control of the overall project effort including oversight of the Remedial Design Contractor NAVFAC PAC assigns a Navy Technical Repetitive (NTR) to oversee the various project elements.

1.3.2 TECHNICAL SUPPORT AGENCY, MARINE CORPS BASE OF HAWAII, KANEOHE (MCBH)

MCBH manages the WVIA site. The MCBH Environmental Compliance and Protection Department provides technical guidance and direction for RD activities.

1.3.3 REMEDIAL DESIGN CONTRACTOR, USA ENVIRONMENTAL, INC. (USAE),

USAE is the contractor responsible for delivery of the RD package. USAE receives direction from the Lead Agency and coordinates with the Technical Support Agency and other Stakeholders during RD development.

1.3.4 STAKE HOLDERS, STATE OF HAWAII DEPARTMENT OF HEALTH (HDOH) AND WAIKANE VALLEY RESTORATION ADVISOR BOARD (RAB)

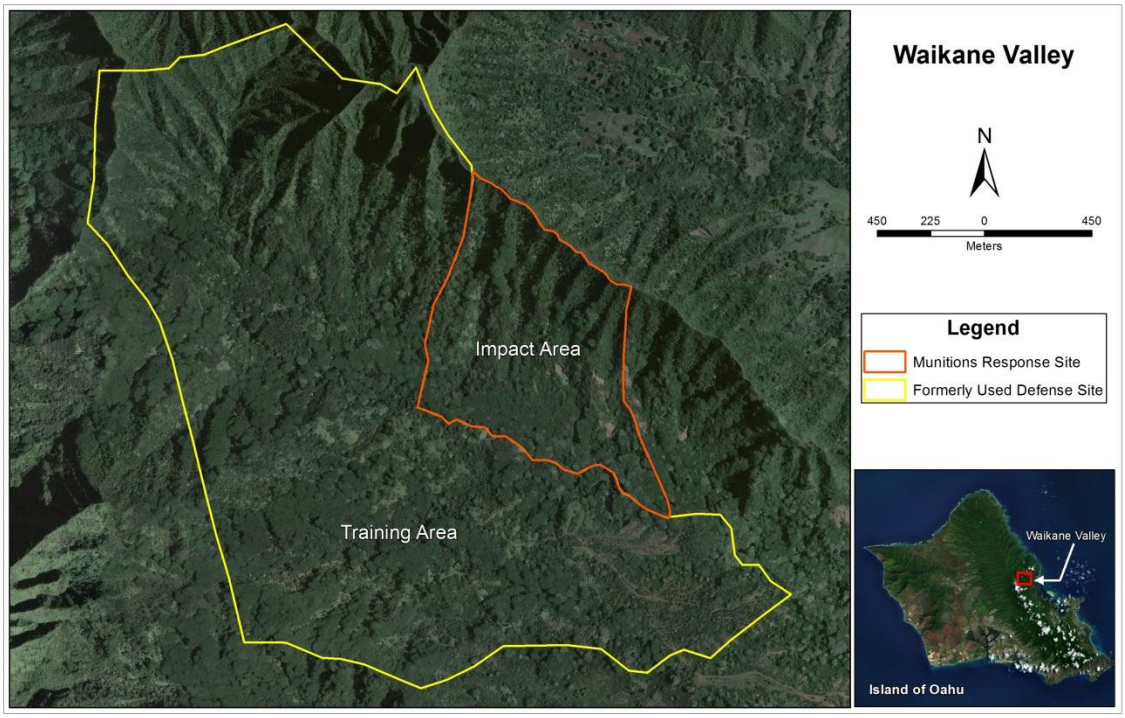
The RAB participated in the development of the Draft RD package. As an opportunity to receive initial public input/buy-in for the RD, the RAB participated in a pre-design site visit with the project team. HDOH was provided an opportunity to review the Draft Final RD.

1.4 SITE BACKGROUND

1.4.1 SITE DESCRIPTION AND HISTORY

WVIA is a 187-acre area located approximately 10 miles northwest of MCB Hawaii. It was once part of a 2,000-acre lease (see Figure 1-1) used for military jungle training and field maneuvers. The remaining acres fall under the Defense Environmental Restoration Program for Formerly Used Defense Sites and are not addressed in this Decision Document.

Figure 1-1: Map of Waikane Valley Impact Area



WVIA's military history dates back to the early 1940s, when the U.S. Army leased over 2,000 acres in the Waiahole and Waikane Valleys between 1943 and 1953 for jungle training, small arms, artillery, and mortar firing, field maneuvers and a bombing range for air to ground ordnance delivery practice. The area was known as the Waiahole Training Area and managed by the U.S. Army as property of Fort Hase.

In 1944, four people were injured, two fatally, when a 60-millimeter (mm) mortar discovered in Waikane Valley accidentally detonated. Three children were injured in 1963, when a souvenir rifle grenade reportedly discovered in Waikane Valley exploded after it was thrown against a wall. There are no other reports of fatalities or injuries attributable to MEC discovered at Waikane Valley.

In 1953, the USMC leased 1,061 acres of the training area. Training consisted of small arms fire, 3.5-inch rockets, and possibly medium artillery fire. Live fire apparently stopped in the early 1960s. Because of fire hazards, incendiaries were prohibited and all ammunition in excess of 0.50 caliber was to be fired into the designated impact area.

The USMC conducted ordnance clearance sweeps in 1976. The 1976 clearance effort resulted in the removal of over 24,000 pounds of practice ordnance and fragments, including 42 items of UXO. The after action report stated that 187 acres of the WVIA can never be certified free of UXO because of the ground cover and topography. The lease was terminated following the clearance effort in 1976 and the land was returned to the original owners who farmed and developed it.

In December 1983, heavy rain exposed ordnance on the property and Marine EOD removed a number of 3.5-inch rockets. In January 1984, Marines conducted a second clearance sweep and removed 480 3.5-inch rockets. In June 1984, an intensive ordnance clearance resulted in the removal of an additional 16,000 pounds of demilitarized practice ordnance and 190 items of UXO from the parcel. The after action report supported the conclusions of the 1976 report that the property could never be certified clear of ordnance.

In 1989, the government acquired title to the 187-acre ordnance contaminated area of the original WVIA because of safety concerns from the ordnance that was assumed to remain on the site after the previous clearance efforts. A perimeter chain-link fence was installed in 1992 and the area remains as government property. The area is currently controlled and maintained by MCB Hawaii. The project site is managed as an “other than operational range”, with access controlled with fencing and warning signs. Civilians may legally enter the property only if accompanied by EOD personnel. Land use restrictions and transfer out of Federal Government control is subject to Marine Corps Systems Command (MARCORSYSCOM) and Department of Defense Explosives Safety Board (DDESB) approval.

1.4.2 CONTAMINANTS OF CONCERN

The Contaminant of Concern (COC) for the WVIA site is MEC. Potential risks to human health and the environment were evaluated and documented in the RI Report. A MEC Hazard Assessment (MEC HA) was conducted to determine the human health and ecological risks associated with MEC at the site, and a Tier 2 Baseline Risk Assessment was conducted to determine the potential risks from MC. The Tier 2 Baseline Risk Assessment evaluated potential risks to animals and the environment from MC remaining on WVIA. Based on soil and sediment sample analysis, the potential risks were determined to be within acceptable levels. Therefore, no further action was recommended at the WVIA with respect to MC.

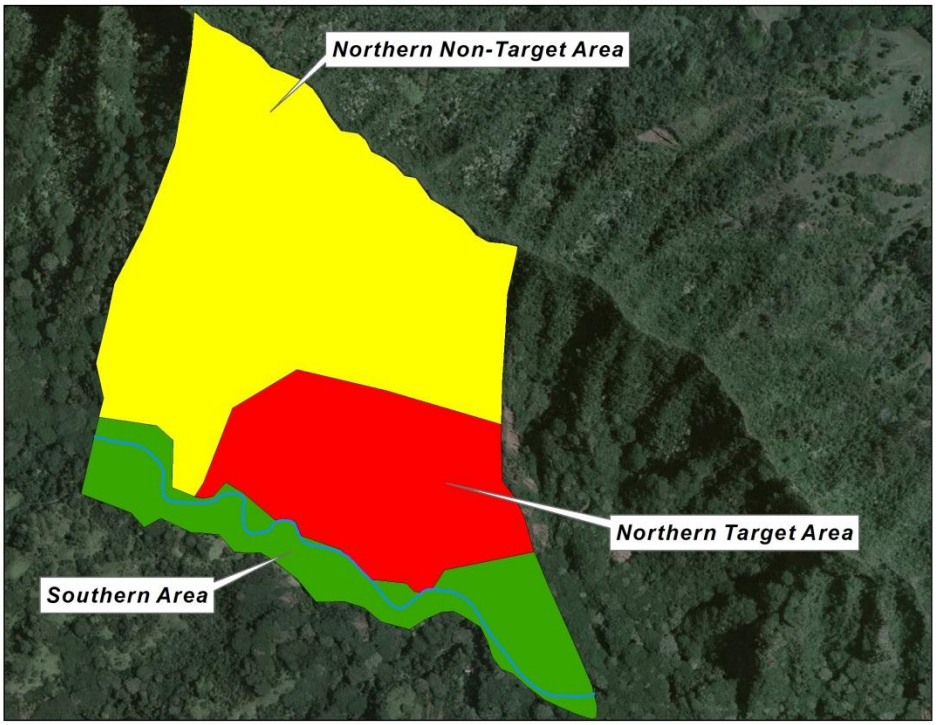
The MEC HA addressed the likelihood of exposure to MEC, the severity of the exposure, and the likelihood of detonation. It is important to note that exposure to MEC does not mean that an incident or injury will occur. A person would have to disturb the MEC item (e.g., apply heat, friction or shock to the item) to be exposed to actual explosive hazards.

The Northern Target Area, shown in red on Figure 1-2, has a high MEC risk. Almost all of the MEC was found in this area during previous investigations. Despite the surface clearance conducted during the RI, shoulder-fired grenades and rockets may still exist and may present an explosive hazard.

Northern Non-Target Area, shown in yellow on Figure 1-2, has a moderate MEC risk. Most of this area was inaccessible during the previous investigations, but a few material potentially presenting an explosive hazard (MPPEH) items have been found and therefore MEC items may exist in the inaccessible areas.

The Southern Area, shown in green on Figure 1-2, has minimal risk because no MEC was found in the area. However, three inert items were found which had obviously been carried out of the Northern Target Area.

Figure 1-2: WVIA MEC Risk Areas



1.4.3 PHYSICAL CHARACTERISTICS

Waikane Valley is located on windward Oahu approximately 10 miles (16 kilometers) northwest of MCB Hawaii. The project site is located in the interior of the forested Waikane Valley, which supports lush vegetation owing to an abundance of rainfall. Waikane Valley was carved into the basalt of the Koolau Range through stream erosion. Some of the gravel and clay formed by weathering and erosion of the volcanic shield were deposited on valley floors. In addition, alluvium of marine origin accumulated in the valleys as the sea level rose during interglacial periods and fell during glacial periods. The project site extends along a steep gradient from 100 feet above mean sea level at the southern boundary to 1,400 feet above mean seal level along the northern boundary. Much of the project area has slopes exceeding 45 percent, with some steep vertical cliffs.

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2.0 TECHNICAL APPROACH TO REMEDIAL DESIGN

2.1 DESIGN OBJECTIVES

The overall design objectives of the RD include the following activities:

- Describe the pre-design components required to be implemented to support the design of the remedy as described in the DD;
- Detail the design components for remediation, including the design criteria as described in the DD;
- Present the remedial design deliverables, including design drawings and specifications, supporting plans and operation and maintenance (O&M) details (Land Use Control Implementation Plan):
- Present the project organization, including the roles and responsibilities of the regulatory agencies, MCBH, their contractor and the quality assurance (QA) and quality control (QC) officers; and
- Summarize the RAOs and describe the action that will be performed to achieve the RAOs, including assessment of applicable or relevant and appropriate requirements (ARARs);

2.2 PHASED REMEDIAL DESIGN APPROACH

2.2.1 PHASE I- PRELIMINARY DRAFT REMEDIAL DESIGN (30%)

The Preliminary Draft Remedial Design constitutes the 30% design (preliminary) milestone that outlines the major elements and identifies the project deliverables for the WVIA site. Pursuant to the *EPA Model CERCLA RD/RA section VI, subsection 11, paragraphs b and d*; the Preliminary Draft Remedial Design contains the proposed basis of design contents based on the selected remedy in the WVIA Decision Document. Transitioning from the 30% design to the 60% design will involve iterative process that will require interaction from all project team members and may include project meetings to coordinate identified changes or additional requirements. Comments and input received from NAVFAC/MCBH's review of the 30% design will be integrated into the Draft Remedial Design (60% design deliverable). Design input received from RAB members during the RAB site visit and subsequent site assessment data will also be integrated into the 60% RD.

2.2.2 PHASE II- DRAFT REMEDIAL DESIGN (60%)

The Draft Remedial Design constitutes the 60% design (intermediate) milestone that details the major elements and the project deliverables for the WVIA site. Pursuant to the *EPA Model CERCLA RD/RA section VI, subsection 11, paragraphs b and e*; the Draft Remedial Design includes discussions of all the efforts necessary to prepare plans and specifications to approximately 60% completion. During this phase, changes to the 30% design package are incorporated; and input on constructability, bidability, and operability are addressed. The specific subsections fir the 60% drawings, specifications. The 60% design package is then submitted for review by NAVFAC, MCBH, and HDOH.

2.2.3 PHASE III- FINAL REMEDIAL DESIGN (100%)

The Final Remedial Design constitutes the 100% design (final) milestone that finalizes the major elements and the project deliverables for the WVIA site. Pursuant to the *EPA Model CERCLA RD/RA section VI, subsection 11, paragraphs b and f*; the Final Remedial Design incorporates a two-step process to finalize the RD package. During the initial step, changes resulting from comments on the 60% design package are incorporated in the RD, including detailed aspects of the final A&E design drawings

and specifications. A pre-final version of the design package is then reviewed by the project team to resolve any outstanding issues.

2.3 REGULATORY CONSIDERATIONS DURING REMEDIAL DESIGN

2.3.1 ALTERNATIVE SPECIFIC ARARS

Section 121(d) of CERCLA, as amended, specifies, in part, that remedial actions for cleanup of hazardous substances must comply with requirements and standards under federal or more stringent state environmental laws and regulations that are applicable or relevant and appropriate (i.e., ARARs) to the hazardous substances or particular circumstances at a site or obtain a waiver. See also 40 C.F.R. 300.430(f)(1)(ii)(B). ARARs include only federal and state environmental or facility citing laws/regulations and do not include occupational safety or worker protection requirements. Compliance with OSHA standards is required by 40 C.F.R. 300.150 and therefore the CERCLA requirement for compliance with or waiver of ARARs does not apply to OSHA standards. In addition to ARARs, the lead and support agencies may, as appropriate, identify other advisories, criteria, or guidance to be considered for a particular release. The "to-be-considered" (TBC) category consists of advisories, criteria, or guidance that were developed by EPA, other federal agencies, or states that may be useful in developing CERCLA remedies. In accordance with 40 C.F.R. 300.400(g), Navy, and Hawaii DOH have identified the ARARs and to be considered (TBCs) for the selected remedy. Appendix A lists respectively the Chemical-, Location-, and Action-Specific ARARs/TBCs for the Selected Remedy. The Selected Remedy will meet all identified ARARs.

2.3.2 MONITORING CONSIDERATIONS

The following subsections identify additional requirements integrated during the RD development process.

2.3.2.1 WVIA Archeological Resource Monitoring

Archeological resources have been previously identified. In order to avoid compromising any identified archeological resources, two field archeologists were provided to monitor the various filed activities associated with the RI field work. The activities included vegetation clearing, surface clearance sweeps, subsurface clearance, demolition operations, blow-in-place activities, soil sampling, Geophysical Mapping, and helicopter operations; i.e. transporting material documented as safe (MDAS) out of the MRS via helicopter). Similar monitoring requirements for archeological resources during implementation of the RA activities will be required in order to adhere to associated ARARs/TBCs identified in Appendix A. Specific archeological monitoring procedures will be required in the Contractor's RA work plan.

2.3.2.2 WVIA Biological Resource Monitoring

In 2010, A Natural Resource Survey was conducted by AECOS, Inc. in conjunction with the RI. This survey report is included in Appendix L of WVIA RI Report (2011). Appendix A of the AECOS report identifies specific endemic native plants and provides recommended procedures for addressing vegetation removal processes (or to preserve in place) in support of MEC removal action activities. Guidance provided in this report should be utilized by the RA Contractor to ensure all related ARARs/TBCs identified in Appendix A are adhered to. Specific biological monitoring procedures will need to be incorporated in the Contractors RA work plan. This may include the development and use of biological field guides for reference by RA field personnel.

3.0 REMEDIAL DESIGN PLANNING

3.1 KICKOFF MEETING

A project kickoff meeting was held on 11 July 2012 at the MCBH Environmental Compliance and Protection Department office. The purpose of the kickoff meeting was to bring together the participating project team members to introduce, discuss, and agree upon the scope of work, initial design criteria, and overall delivery schedule for the proposed RD effort, identification of deliverables, and establish the project channels of communication..

3.2 REMEDIAL DESIGN SCOPING MEETING

A project scoping teleconference was held on 1 August 2012 with NAVFAC Pacific, MCBH, and USAE project personnel for the purposes of reaching an agreement on the basis for the remedial design approach, design constraints, design tasks, and project delivery schedule.

3.3 SITE ASSEMENT AND RAB SITE VISIT

3.3.1 PRE-DESIGN SITE ASSESSMENT ACTIVITIES

Two site assessments were conducted by the project team on 30 August 2012 and 16 October 2012. The objective of these site assessments were to collect additional site information identified during the scoping meeting to support development of the RD. Activities included verification of site access and existing fence types, non-munitions related debris locations, location and marking (with GPS equipment) of proposed Kamaka Shrine and Waikane Spring corridors. The USAE field team also delineated a temporary (safe) access path along these corridors for RAB member access on the subsequent site visit. Data collected during these site assessments were used to define the RA maps shown in Figures 4-2 and 4-3.

3.3.2 RAB SITE VISIT

Previous concerns regarding fencing of the corridors were raised by the public during the Proposed Plan phase. The primary issue with implementing the fencing portion of the Land Use Controls was the concern that tight fencing surrounding corridors would affect the spiritual experience of those visiting the Waikane Spring and Kamaka Shrine sites. To address this concern as part of the Remedial Design phase, a site visit was conducted on September 1, 2012 to allow members of the public to advise on fence locations with respect to the Waikane Spring and Kamaka Shrine corridors. During this site visit, participants were able to provide input on where fencing should be located with respect to the pathways that lead to each of the cultural features. RAB members were able to traverse the suggested access paths previously established by the project team. Discussions between RAB and project team members regarding corridor locations where held at both the Kamaka Shrine and Waikane Spring locations. The RAB participants and project team were able to take into consideration various visual screening techniques that would in effect reduce the overall appearance of the fencing but still meet the LUC that fencing provides. These screening techniques included placement of the fence line behind elevated terrain (ridgelines or cliff faces) so that terrain hides or obscures the appearance the fence from the corridor pathway. Another screening technique employed was locating fencing further away from the corridor pathway in order to place more vegetation between the pathway and the fence. Using these techniques, design efforts were made to reduce the overall appearance of fencing surrounding the corridors. The project team recorded the recommended fencing locations during the site visit using survey grade GPS equipment. After discussion, participating RAB members agreed to provide feedback of the proposed corridor delineation to the project team.. The team was able to use the site visit field data to

evaluate the noted corridor features with respect to the fencing design. Figures 3-1 and 3-2 reflect the reconfigured corridor designs resulting from public input collected during the site visit. Input received from the public during this site visit was instrumental in finalizing each of the corridor layouts with respect to the overall fencing layout for the Remedial Design.

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Figure 3-1: Waikane Spring Corridor Design

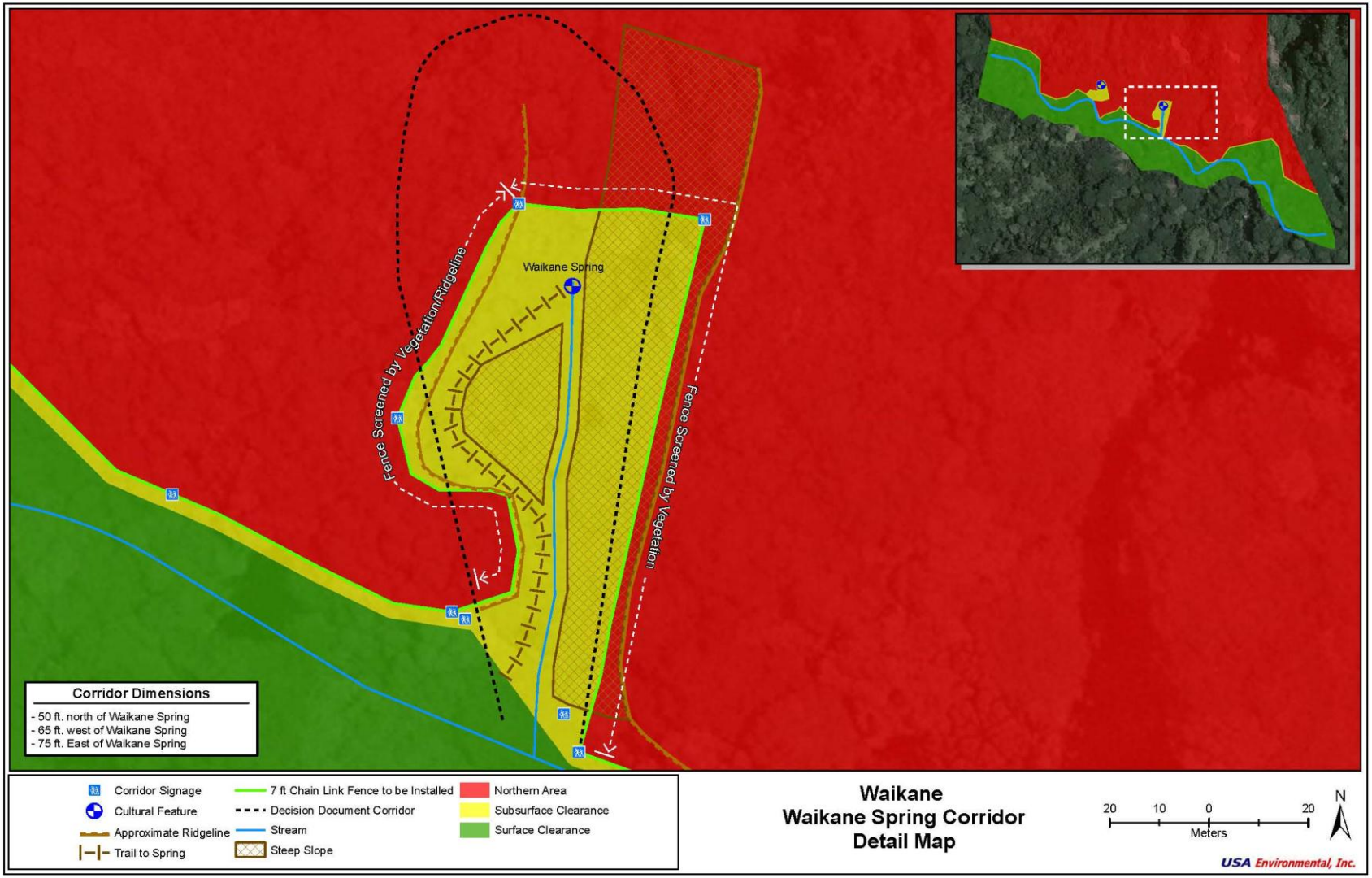
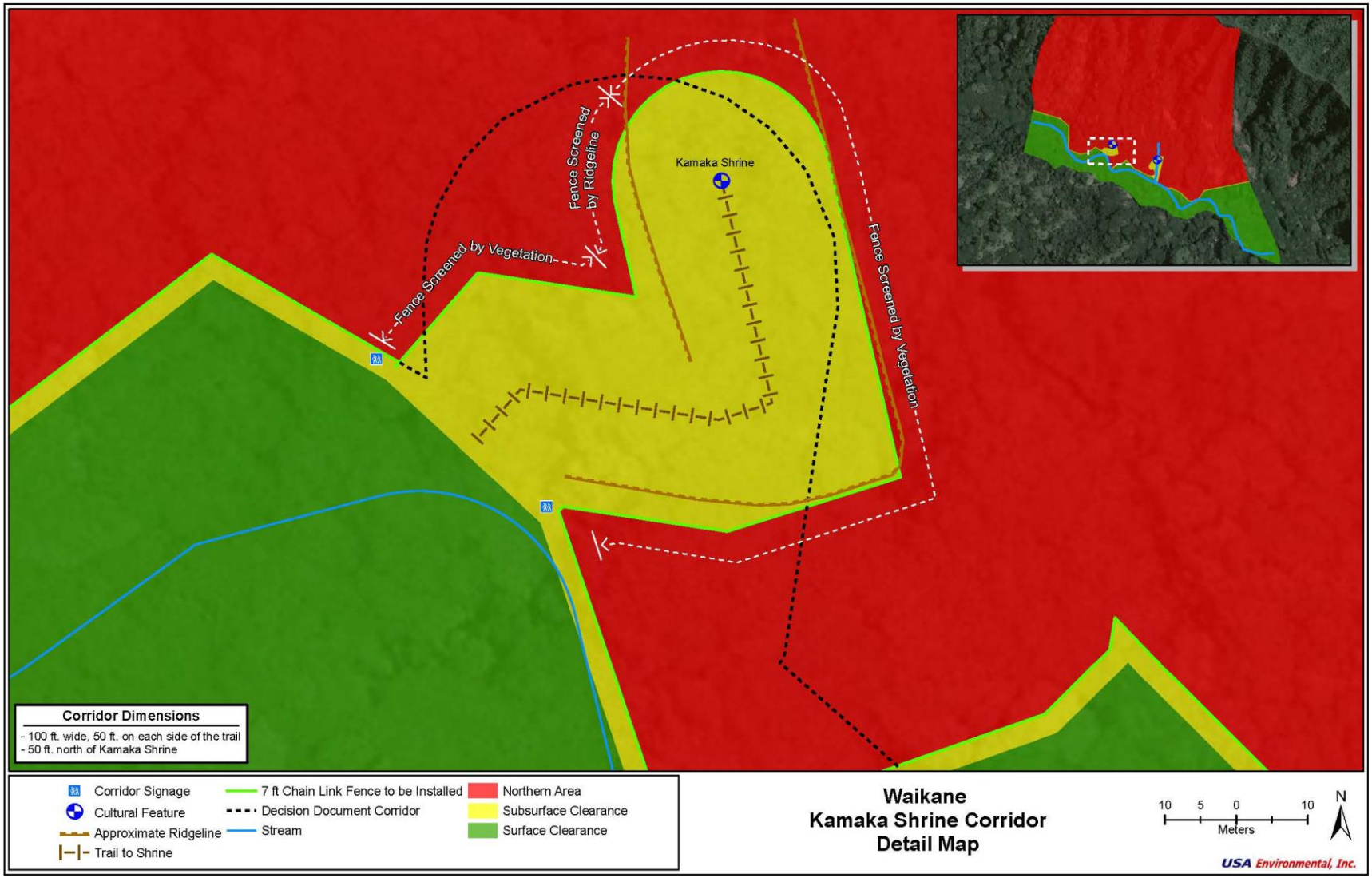


Figure 3-2: Kamaka Shrine Corridor Design



3.4 ACQUISITION AND EVALUATION OF EXISTING DATA

As the initial development effort of the Preliminary Draft Design, an evaluation of all of the available WVIA project information was conducted. Sources of existing data include the work plan and report documentation related to the Site inspection (SI), RI/FS, Proposed plan (PP), and DD phases. Other support information regarding the project was collected through discussions with various project team members or support agencies.

3.5 PREPARATION OF SECONDARY RD SUPPORT PLANS

3.5.1 LAND USE CONTROL (LUC) PLAN

Implementation of LUCs are included in the selected remedy outlined in the Final DD. These LUCs include fencing and signage requirements as well as creating a public education program. These LUCs are intended to limit the risk associated with MEC that may remain in the WVIA. Appendix B provides a Land Use Control Plan that outlines the LUC elements, i.e. engineering and institutional controls and the recommended operational and maintenance (long term maintenance) requirements.

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4.0 REMEDIAL DESIGN

4.1 PRELIMINARY DESIGN (30%)

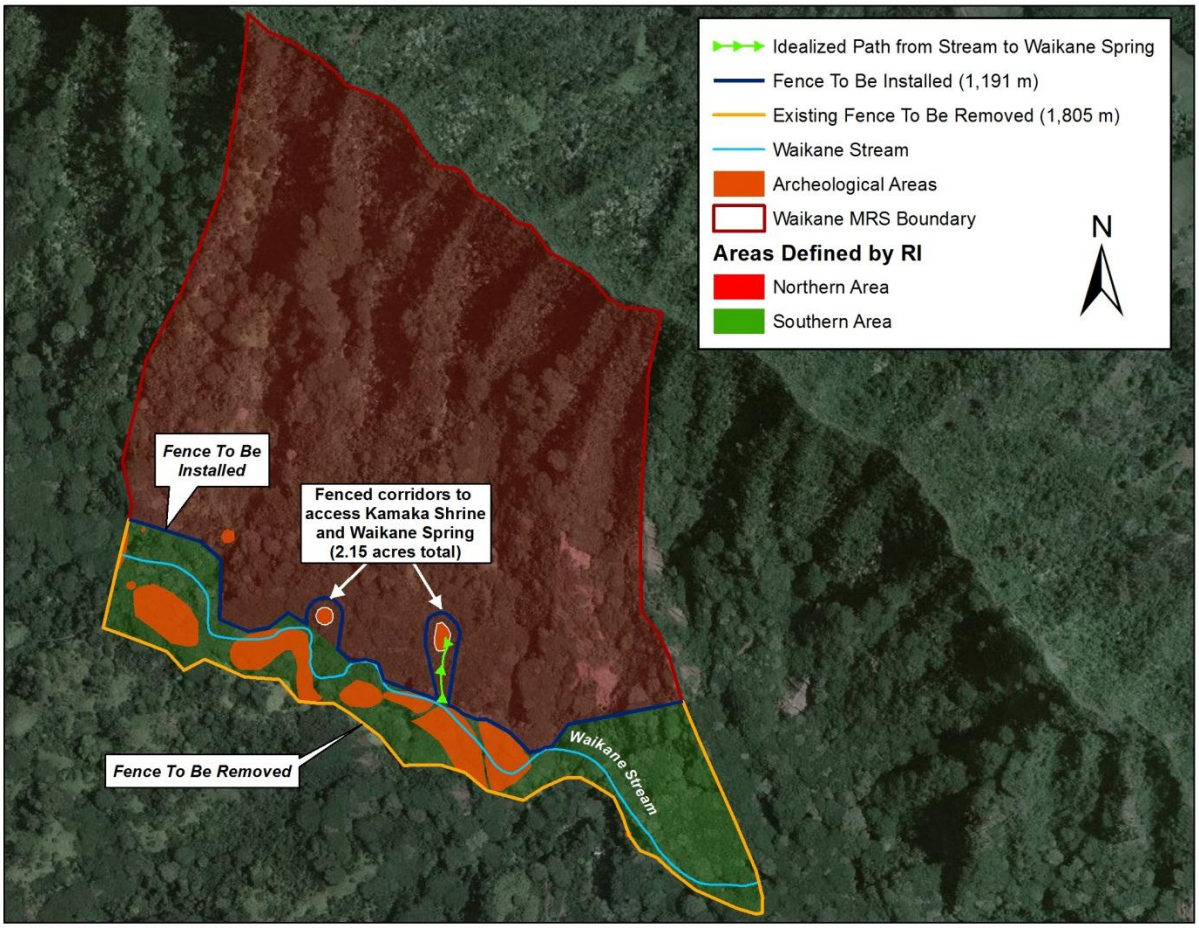
This section describes the Preliminary Draft elopements of the RD package.

4.1.1 PRELIMINARY DRAWINGS AND SPECIFICATIONS

4.1.1.1 Preliminary Drawing Development

For the 30% Design package, the conceptual site plan from the DD is presented (Figure 4-1). A refined version of the site plan is developed during the 60% draft phase. The 60% site plan will reflect any adjustments to the surface/subsurface clearance areas or fencing alignments resulting from the pre-design site assessment and RAB site visit activities. During the initial field activities, proposed corridor delineation, and proposed fencing alignment were marked with ribbon by the project team. RAB members who attended the subsequent site visit were able to provide input on corridor delineation markers around the Kamaka Shrine and Waikane Spring locations. Corridor markers were adjusted during the site visit and will be recorded on GPS upon concurrence from the project team.

Figure 4-1: Preliminary Site Plan



4.1.2 PRELIMINARY SPECIFICATION IDENTIFICATION

This section provides a list of the anticipated specifications for surface/subsurface clearance activities and chain-link fencing (material, equipment, and installation) requirements. Once all of the appropriate specifications have been identified and agreed upon by the project team during the 30% review, they further developed in the 60% design phase (Section 4.2.1) through discussions with the project team members and technical support personnel.

- MEC Clearance Requirements
- Chain Link Fencing Requirements
- Archeological Monitoring
- Biological Monitoring Requirements
- Storm Water Best Management Practices
- Quality Control Management Program

4.1.3 PRELIMINARY COST ESTIMATE

As a basis for the preliminary cost estimate, the cost estimate developed in the FS report was utilized to establish a baseline estimate for RA costs. The RA estimate is further developed during the 60% design phase as revised design elements are quantified and related costs captured. The Final RA Estimate is included for Government use only and will not be a part of the RA procurement package(s).

4.2 INTERMEDIATE DESIGN (60%)

This section details the RA Maps and Specification as developed as the 60% design phase.

4.2.1 RA MAPS

Maps depicting were surface and subsurface removal actions are to occur are shown in Figures 4-2 and 4-3, respectively. Each map includes the expected removal action acreage for each type of removal as well as lengths of new fence installation and the length of fence to be removed (southern areas). Figures 3-1 and 3-2 provide details on the revised Waikane Spring and Kamaka Shrine Corridor layouts.

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Figure 4-2: Surface Removal Plan

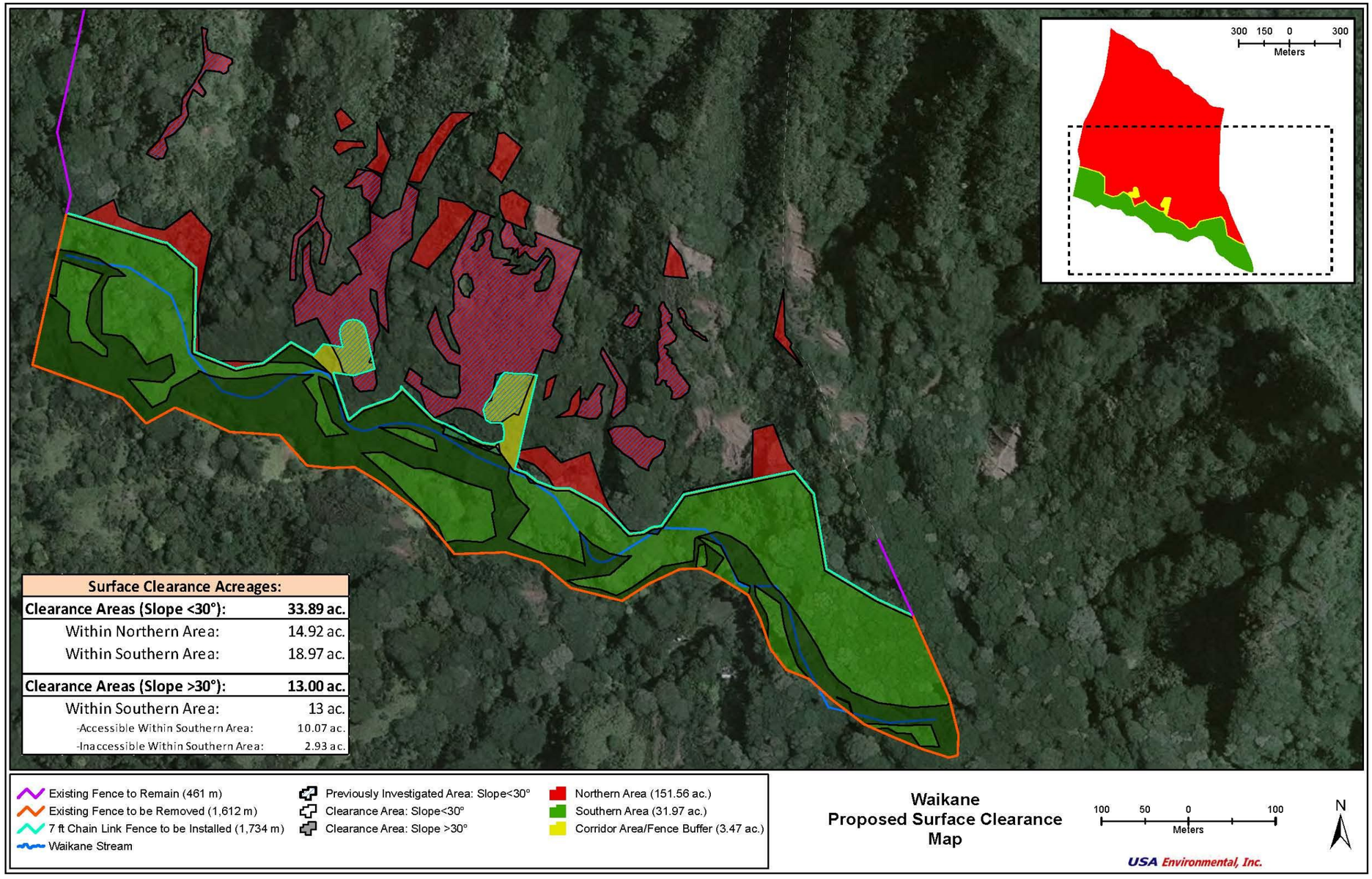
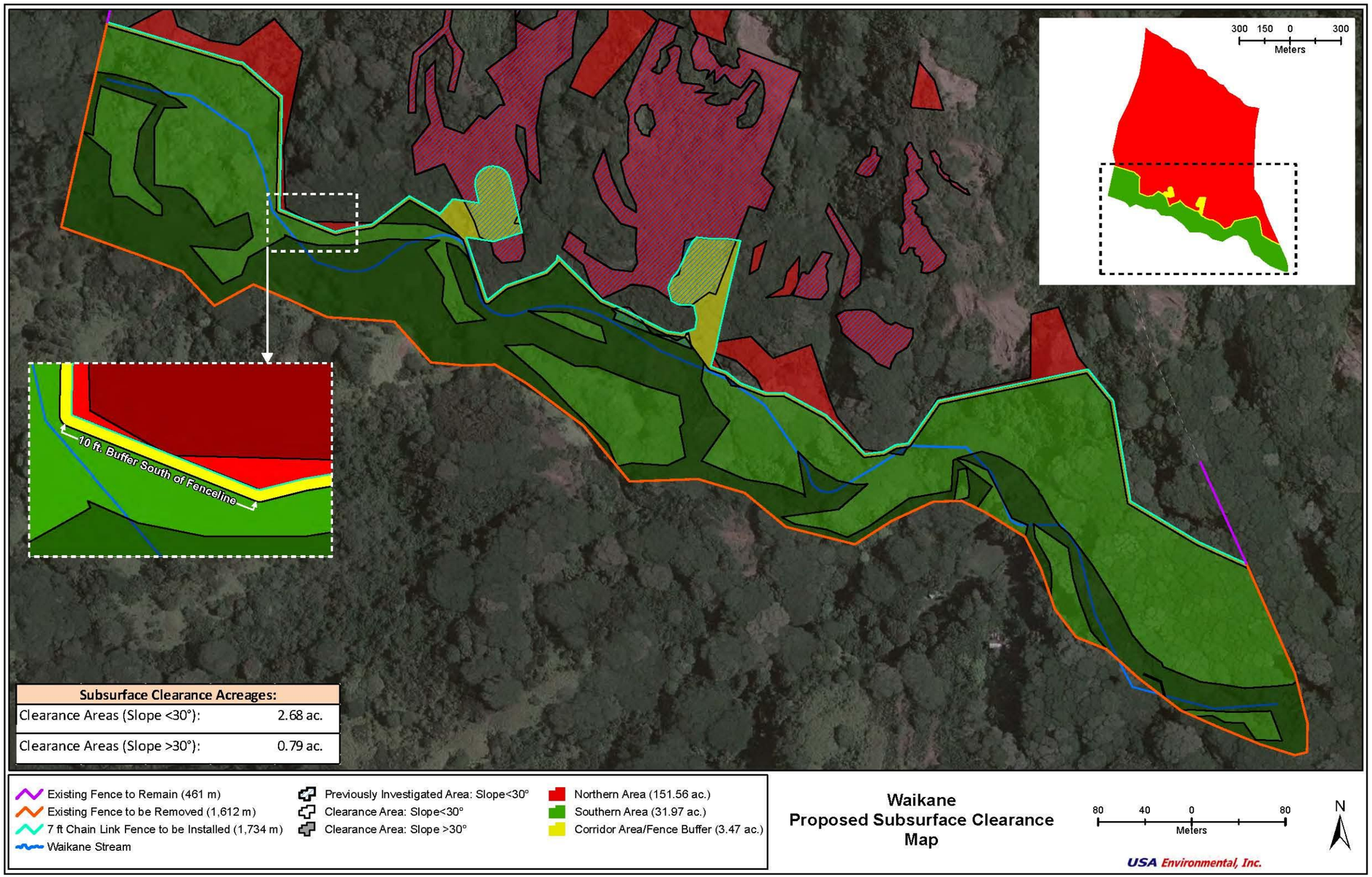


Figure 4-3: Subsurface Removal Plan



4.2.2 RA AND LUC SPECIFICATIONS

Below are the specifications for the required RA activities in accordance with the Selected Remedy.

4.2.2.1 RA Project Plans

The contractor shall provide all plans in draft and final versions. The plans shall reflect standards approved by Technical Coordinator and align with previous USMC accepted format and content. The Contractor shall prepare written response to all Government comments on the plans. All plans must be approved by the NTR before any fieldwork can commence. For this project the required plans include:

- RA Work Plan (WP) The RA Contractor shall prepare a work plan outlining the approach to be used to accomplish the work as outlined under this RD. The Work Plan shall summarize the planned work as well as issues related to unexploded ordnance (UXO) avoidance, clearance and disposal procedures to be used during field activities and including storage and disposal of ordnance scrap and target debris with a detailed description of all processes to be used to identify, handle, demilitarize and properly dispose of ordnance scrap and target debris. The RA Contractor is required to ensure that all equipment proposed to be utilized is properly permitted, this includes items such as generators, diesel powered equipment, etc. Evidence of proper permitting must be included in the work plan and available for review.
- Accident Prevention Plan (APP) with Site Specific Health and Safety Plan (SSHSP). The RA Contractor shall develop an APP and SSHP in accordance with the basic contract requirements and applicable directives and regulations. It will be submitted and finalized prior to work commencement. The AAP and SSHSP shall address health and safety requirements for all phases of work. The RA Contractor shall include in the plan a description of a systematic method of conducting daily safety inspections to evaluate operating areas and personnel performance with the goal of eliminating hazards. Copies of all safety inspection results shall be included on the periodic status report. The Contractor UXO Safety Officer shall accompany any Marine Corps, Federal, State, or installation regulatory official performing on-site evaluations of contractor operations.
- Quality Control Plan (QCP). The RA Contractor shall develop a QCP describing the approach, methods, and operational procedures to be employed during this project. It will be included within the project Work Plan.
- Environmental Management Plan (EMP). The Contractor shall develop an EMP in accordance with applicable ARARs and Marine Corps instructions and orders. It shall describe the approach, methods, and operational procedures to be employed to protect the natural environment during performance of this project. The EMP will be included within the project Work Plan.
- Technical Management Plan (TMP). The TMP will be used to describe the approach, methods, and operational procedures to be employed to perform Munitions and Explosives of Concern (MEC) operations for this project. The TMP will be included within the project Work Plan.
- Explosives Safety Submission (ESS). An ESS will be required.

4.2.2.2 Personnel Qualifications

All UXO personnel will meet the requirements set forth in the DDESB Technical Paper 18 (TP-18), Minimum Qualifications for Unexploded Ordnance (UXO) Technicians and Personnel, dated 20 December 2004. UXO personnel will have to complete the training requirements found in Table 4-1 as required for their specific responsibilities. Additional site-specific training IAW OSHA 29 CFR 1910.120 for Hazardous Waste Operations and Emergency Response (HAZWOPER) will be provided to all personnel prior to their mobilization. Additionally all RA Contractor, including their subcontractor's field personnel will

participate in a Medical Surveillance Program, with the latest exam occurring within 12 months of field operations.

Table 4-1: Training Requirements

Training Course	Personnel Attending
40-Hour HAZWOPER Training	All personnel who have not previously received this training or who do not qualify for certification through documented experience or training equivalent to that in paragraphs (e)(1) through (e)(4) of 29 CFR 1910.120.
8-Hour Supervisor Course	All USA management and supervisory personnel. This includes the SUXOS, UXOSO, UXOQCS, and UXO Technicians III (UXOTIIIs).
8-Hour Refresher Course	All site personnel, except those who have completed their initial 40-Hour HAZWOPER training within the past year.
First Aid and Cardiopulmonary Resuscitation (CPR) Training	At least two site personnel will have current first aid and CPR training.
30-Hour OSHA Construction Safety Course	Training Requirement for UXOSO IAW with USACE EM 385-1-1, Section 01.A.17

4.2.2.3 Mobilization & Demobilization

The RA Contractor shall mobilize the needed personnel, support materials and equipment, as addressed within the RA Work Plan. Mobilization of personnel will not proceed until the contractor receives government approval of the Draft or Final Site Work Plan. The contractor will present, within the Site Work Plan, a schedule outlining the milestones necessary to achieve both personnel and equipment mobilization at the site. The contractor shall demobilize and restore project sites.

General Assumptions:

- RA Contractor will perform Demolition Operations and have the responsibility for coordination with MCB Hawaii EOD unit.
- The Contractor will be required to blow in place UXO and/or MPPEH that is not safe to move. BIP and resulting munitions debris disposal will be a contractor responsibility. The effort must be coordinated with MCB Hawaii EOD unit.
- Assume that water will be no closer than 45 minutes' drive from work site.
- The Government will not provide water or electricity.
- Contractor will obtain all necessary environmental permits required to operate equipment and to perform operations.
- A minimum UXO Tech I will be required for all clearance work. The use of sweepers in not allowed.
- The Contractor will be required to blow in place UXO and/or MPPEH that is not safe to move. BIP and resulting munitions debris disposal will be a contractor responsibility. The effort must be coordinated with the MCB Hawaii EOD unit..

- Contractor shall containerize processed range debris materials for shipment to the recycling facility. Certification must include that materials do not contain MPPEH (i.e., DoD 1348-1 Certification forms). All processed and inspected materials must be stored and shipped via closed/locking/sealed containers.
- Inclement weather may result in flash floods that may impact site access. Contractor should anticipate contingency for site access if necessary (i.e. minor grading or all-terrain vehicle access).

4.2.2.4 Vegetation Removal Requirements

In order to facilitate subsequent field activities such as civil surveys and surface/subsurface clearances (areas with <30 degree slopes or ares with >30 degree slopes, as determined by the UXOSO). In addition, the RA contractor will need to ensure that vegetation is cleared within a 10-ft buffer along both sides of the all fence (existing and proposed) sections that are scheduled to remain to facilitate access for periodic fence maintenance. Given the anticipated duration of the field work, the RA Contractor should anticipate that the 10-ft vegetation buffers will need to be maintained though out the duration of the RA field work.

Vegetation will need to be removed to 6 inches above ground surface using mechanical equipment such as skid steers with de-foresting or mulching attachments or manually with hand held power tools such as weed eaters and chain saws. Cuttings may be mulched and spread across the site or hauled away to an approved yard waste facility. Vegetation cut from steep areas (with slopes greater than 30 degrees) can be cut to 1-2 foot length and spread out within the WVIA property to allow decomposition. The RA contractor will need to ensure that vegetation is cleared with 10-ft on both sides of the all fence (existing and proposed) sections that are scheduled to remain. The RA contactor will be required to reacquire and install survey stakes using a survey grade GPS (Trimble PRO XRT or equivalent) within 3 meters of the proposed fencing alignment (as depicted in Figures 4-2 and 4-3). The Navy will provide the RA Contractor with the GIS shapefiles of the proposed fencing alignment to utilize for marking vegetation removal work areas. Prior to commencing vegetation removal activities, preventative measures for biological resources will need to be in place to avoid cutting or removal of endangered, threatened, or endemic plant species under the ARARs listed in Appendix A. The RA Contractor should attempt to preserve native plants as much as possible. There is no restriction on cutting invasive plants. In addition to these protective measures, the RA contactor will also verify and implement any erosion control measures that may be required by action specific ARARs. All preventive measures for vegetation removal activities will be developed and approved by the NTR prior to by the RA Contractor during the RA Work Plan phase.

4.2.2.4.1 Natural Resource Monitoring

The RA Contractor shall provide a natural resource monitor to prevent damage to native plant, bird, and terrestrial invertebrate species present in the Waikane Valley Impact Area (Impact Area), Marine Corps Base Hawaii. The total area to be monitored will be the RA footprint (Figures 4-2 and 4-3).

The natural resources monitor shall provide the following information in a Draft and Final Report:

- Description of the training and natural resource monitoring used during the RA field work.
- Latitude/longitude coordinates and maps of locations of natural resource monitoring conducted.
- Latitude/longitude coordinates and maps of locations of observed native plant, bird, and terrestrial invertebrate species, and plant community types.

Electronic copies of the Draft and Final Reports shall be submitted on CD-R and shall include the source files (e.g. Microsoft Word) as well as a PDF copy of the entire Report with major sections bookmarked.

Maps shall be on paper and in digital format (submitted on CD-R) compatible with ArcGIS version 9.X with associated attribute tables of GPS depicting the locations and identification of 1) monitoring conducted, 2) native plant species, 3) native bird species, 4) native terrestrial invertebrate species, and 5) plant communities. Information may be compiled for the mapping effort from other existing documents and GIS data, and shall include data from the contracted surveys. GIS data shall comprise polygon, line, and point data and shall be in compliance with Spatial Data Standards for Facilities, Infrastructure and Environment (SDSFIE).

4.2.2.5 Civil Survey Requirements

4.2.2.5.1 Location Surveys and Mapping Plan

The RA Contractor will provide a professional land surveyor (PLS) licensed in Hawaii to provide one PLS crew to stake the boundaries of the surface and subsurface clearance areas and provide maps of the clearance areas. The PLS crew will identify or provide control monuments as necessary for the clearance. The survey data will be provided in the Universal Transverse Mercator (UTM) coordinate system.

All PLS survey work will be performed under the escort of a UXOTII or higher, who will ensure that MEC Avoidance procedures are followed. The UXO technician will provide a MEC safety briefing to the PLS crew at the beginning of each survey day. The UXO technician will lead the PLS crew into the work areas (where vegetation has been removed), mark and record all MEC/MPPEH, and use a handheld detector to clear all staking points.

4.2.2.5.2 Setting Control Monuments

The PLS team will provide control monuments necessary to sufficiently traverse the WVIA site as necessary for the RA. To the maximum extent practicable, USA will use existing monuments to control its survey work. However, if necessary, the PLS crew will install additional monuments. The PLS crew will install and record the locations of these monuments. The monuments will be brass- or aluminum-capped monuments set in concrete, and marked with witness posts. The PLS crew will determine the specific locations for these monuments, based on the distribution of existing monuments and control needs for surveying performed under this project.

4.2.2.5.3 Delineate Work Areas Boundaries

Based on the RA design (Figures 4-2 and 4-3), the RA Contractor will determine the range work area and will then use these coordinates and the Geographic Information System (GIS) to determine the grid/sector distribution for the work area. Following this determination, the RA Contractor will use the PLS to set, determine, and record the coordinates of each boundary point on the ground.

4.2.2.5.4 Subdivide Work Areas into Sectors

To provide positive control of the surface and subsurface removal and to ensure complete coverage, the work area will be subdivided into individual grids or sectors. The survey team will use Robotic Total Station (RTS) survey equipment to locate each boundary point and to mark these points with nails and survey stakes.

The survey team will survey and mark all grids/sectors with a nail at each point, along with a 4-ft lathe marked with a dedicated point ID, color-coded paint, and surveyor's tape.

4.2.2.5.5 Marking and Mapping of Cleared Areas

At the completion of field activities, the RA Contractor will ensure that the clearance area is visibly delineated on the ground by stakes and nails and will canvas over the clearance area and ensure the area is properly delineated. The RA Contractor will provide (at the time of the walk-over or before) maps and/or drawings to the NTR detailing the clearance areas. The maps will convey all corner coordinates or break points around the boundary of the cleared area and will be signed and sealed by a Hawaii PLS, and signed by the SUXOS and a principal of the RA Contractor.

4.2.2.5.6 Geographic Information System

The RA Contractor will produce ArcGIS Projects, and submit an electronic copy of the GIS project as part of the Remedial Action Completion Report (RACR). Updated status maps will be submitted to the NTR on a regular basis as part of the Project Status Reports. Acreage clearance estimates will be prepared and revised based on the latest design drawings provided to USA. The ArcGIS Project will be prepared in ArcGIS 9.x format and is compatible with ArcGIS 9.2 GeoDatabases. GIS datasets will identify the project features specified in the RA PWS. MEC items that are found and either moved or BIP will have the original coordinates documented within the GIS. The layers will be completely independent, and produce a concise, complete picture of all clearance activities accomplished during this contract. GIS data will be referenced to the UTM coordinate system, Zone 4 North. All supporting databases will be complete and contain single entities with no joins or related connections. All spatial data will conform to the CADD/GIS Technology Center Spatial Data Standards for Facilities Infrastructure and Environment (SDSFIE) and the OE-GIS data standard. Metadata will be created for the Navy Installation Restoration Information Solution (NIRIS) data layers, and prepared IAW Federal Geographic Data Committee metadata standards. The GIS data sets will identify the following information:

- Grid/sector identification number.
- Grid/sector coordinates.
- Full or partial grid.
- Date of mag-and-dig.
- Date of QC inspection
- Date of QA inspection.
- Grids/sectors containing MEC.
- Grids/sectors containing munitions debris.
- Number of digs in each grid/sector.
- Pounds of munitions debris and RRD.

The RA Contractor will coordinate with the NTR and MCB Hawaii to obtain copies of existing site data for WVIA and will upload this data into the project GIS. Throughout the project, the RA Contractor will build upon the existing data and integrate the field data into the system. Upon receipt of the field data, the GIS Manager will perform an accuracy inspection of the data and import the data into the project GIS.

4.2.2.6 Establishment of Instrument Verification Strip

The RA Contractor will use the Whites DFX 300 All-metals detector (or equivalent) for the surface and subsurface removal efforts at The RA Contractor will establish an Instrument Verification Strip (IVS) at the range to ensure the detection equipment and operators are working properly. The actual location of the IVS will be determined in the field during site setup. The RA Contractor will seed the IVS with appropriate ISOs. The UXO teams conduct an instrument test of all detection instruments prior to the start of the MEC

and MPPEH clearance. The objective of the IVS is to provide daily documentation that the sensor system (sensor and operator) are functioning as designed.

4.2.2.7 Surface Clearance (Areas < 30°)

Subsequent to the required amount of vegetation removal, surface clearance of MEC, MD within the accessible areas (areas with < 30 degree slopes) of the southern and northern portions of the WVIA will be conducted as shown on the RA Map (Figure 4-2). The RA contractor shall provide all UXO labor, equipment, and materials necessary to remove MEC and MD found within 0-6 inches below ground surface. UXO teams will utilize either the Whites DFX 300 All-metals detector, or equivalent to assist the UXO team members in detecting metallic surface items.

In the event that a MEC item is discovered on the surface, a 50-ft radius will be marked to establish a subsurface clearance area per the Selected Remedy. These areas will be cleared to a depth of 2 feet below ground surface in accordance.

Assumptions:

- Assume a total of about **33.89 acres** require surface clearance in areas with slopes less than 30 degrees (northern and southern areas),
- Assume that ordnance scrap is mostly concentrated in the immediate target areas with lighter amounts in the surrounding area
- Removal, demilitarization, and proper disposal of approximately **12,538 pounds surface items** will be required,
- Remove items 4" or larger surface clearance foot prints.
- Assume up to **526** MEC or MPPEH items may encountered (2% of total surface anomalies)

4.2.2.8 Surface Clearance (Southern Areas > 30°)

Detector aided surface clearance activities within areas containing slopes greater than 30 degrees (southern area only) will be at the discretion of the UXO Safety Officer. Approximately 10% of the >30 degree slope areas are considered to be inaccessible due to near vertical slopes. In these terrain conditions, UXO teams will conduct visual sweeps only; utilizing additional safety equipment such as ropes and climbing harnesses to traverse areas with steeper slopes.

In the event that a MEC item is discovered on the surface, a 50-ft radius will be marked to establish a subsurface clearance area per the Selected Remedy. These areas will be cleared to a depth of 2 feet below ground surface..

Assumptions:

- Assume a total of about **13.00 acres** require surface clearance in areas with slopes greater than 30 degrees (southern area only),
- Removal, demilitarization, and proper disposal of approximately **11,239 pounds surface items** will be required,
- Remove items 4" or larger surface clearance foot prints.
- Assume up to **238** MEC or MPPEH items may encountered (2% of total surface anomalies)

4.2.2.9 Subsurface Clearance (Areas < 30°)

Subsequent to the required amount of vegetation removal, The RA Contractor UXO Teams will utilize detect-and-dig procedures and manual excavation techniques to remove MEC and MPPEH to a depth of 2 feet below ground surface within the accessible areas (areas with < 30 degree slopes) of the WVIA will be conducted as shown on the RA Map (Figure 4-3). These areas include the 10-ft buffer area along the

new fence alignment separating the northern and southern portions of the site as well as the two cultural corridors (Kamaka Shire and Waikane Spring) as depicted on Figure 4-3.

In the event that a MEC item is discovered on the surface, a 50-ft radius will be marked to establish a subsurface clearance area per the Selected Remedy. These areas will be cleared to a depth of 2 feet below ground surface.

Assumptions:

- Assume a total of about **2.68 acres** require subsurface clearance in areas with slopes less than 30 degrees (northern area only),
- Assume that ordnance scrap is mostly concentrated in the immediate target areas with lighter amounts in the surrounding area
- Removal, demilitarization, and proper disposal of approximately **34 pounds** subsurface MD will be required,
- Remove items 4" or larger surface clearance foot prints.
- Assume up to **17** MEC or MPPEH items may encountered (2% of total surface anomalies)

4.2.2.10 Subsurface Clearance (Areas > 30°)

Where allowable by the UXO Safety Officer, the RA contractor will conduct MEC subsurface removal to a dep th of 2 feet below ground surface as shown on Figure 4-3.

In the event that a MEC item is discovered on the surface, a 50-ft radius will be marked to establish a subsurface clearance area per the Selected Remedy. These areas will be cleared to a depth of 2 feet below ground surface..

Assumptions:

- Assume a total of about **0.79 acres** require subsurface clearance in areas with slopes greater than 30 degrees (northern area only),
- Assume that ordnance scrap is mostly concentrated in the immediate target areas with lighter amounts in the surrounding area
- Removal, demilitarization, and proper disposal of approximately **17 pounds** subsurface MD will be required,
- Remove anything 4" or larger surface clearance foot prints.
- Assume up to **11** MEC or MPPEH items may encountered (2% of total surface anomalies)

4.2.2.11 Fencing and Sigage (Repair, Installation, and Removal)

Prior to conducting remedial activities, the existing fencing and signage along the southern area will need to be repaired back to the original state, as required, to ensure that the site is properly secured for the duration of the RA field activities. The RA Contractor will maintain the integrity of the existing fencing and signage during the course of the RA field activities by repairing breaches caused by trespassers or fallen trees. The southern fence shall remain in place until final MARCORSYSCOM/ DDESB approval of the Remedial Action Completion Report has been obtained. Once approval is obtained, the RA Contractor will be required to remove the designated portions of the southern fencing.

Subsequent to completion of the RA activities, the RA Contractor will be required to install new fencing along the proposed alignment that separates the northern and southern portions of the WVIA site (Figures 4-2 and 4-3).The proposed fencing layout is shown on Figure 4-4. In addition, fencing repairs will be required to the portions of existing fencing that will remain (western and eastern sides of the site (denoted on Figure 4-4).

The Final RD will provide include stamped civil design drawings and A&E construction specifications detailing the new fence installation. The following requirements are provided for estimating purposes:

4.2.2.11.1 Location Surveys

The RA contractor will be required to utilize a PLS to lay out the final fence locations for NTR approval prior to installing the new fencing. Assume that the same PLS control points established during the RA portion of the project will be utilized.

4.2.2.11.2 General Chain Link Fencing Specifications (GSA)

- 7-foot tall galvanized chain link fencing with 1-foot 3-strand barbed wire

U.S. General Services Administration (GSA) Specs:

- FS RR-F-191 (Rev K) Fencing, Wire and Post Metal (and Gates, Chain-Link Fence Fabric, and Accessories)
- FS RR-F-191/1 (Rev F) Fencing, Wire and Post, Metal (Chain-Link Fence Fabric)
- FS RR-F-191/2 (Rev E) Fencing, Wire and Post, Metal (Chain-Link Fence Gates)
- FS RR-F-191/3 (Rev E; Am 1) Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces)
- FS RR-F-191/4 (Rev F) Fencing, Wire and Post, Metal (Chain-Link Fence Accessories)

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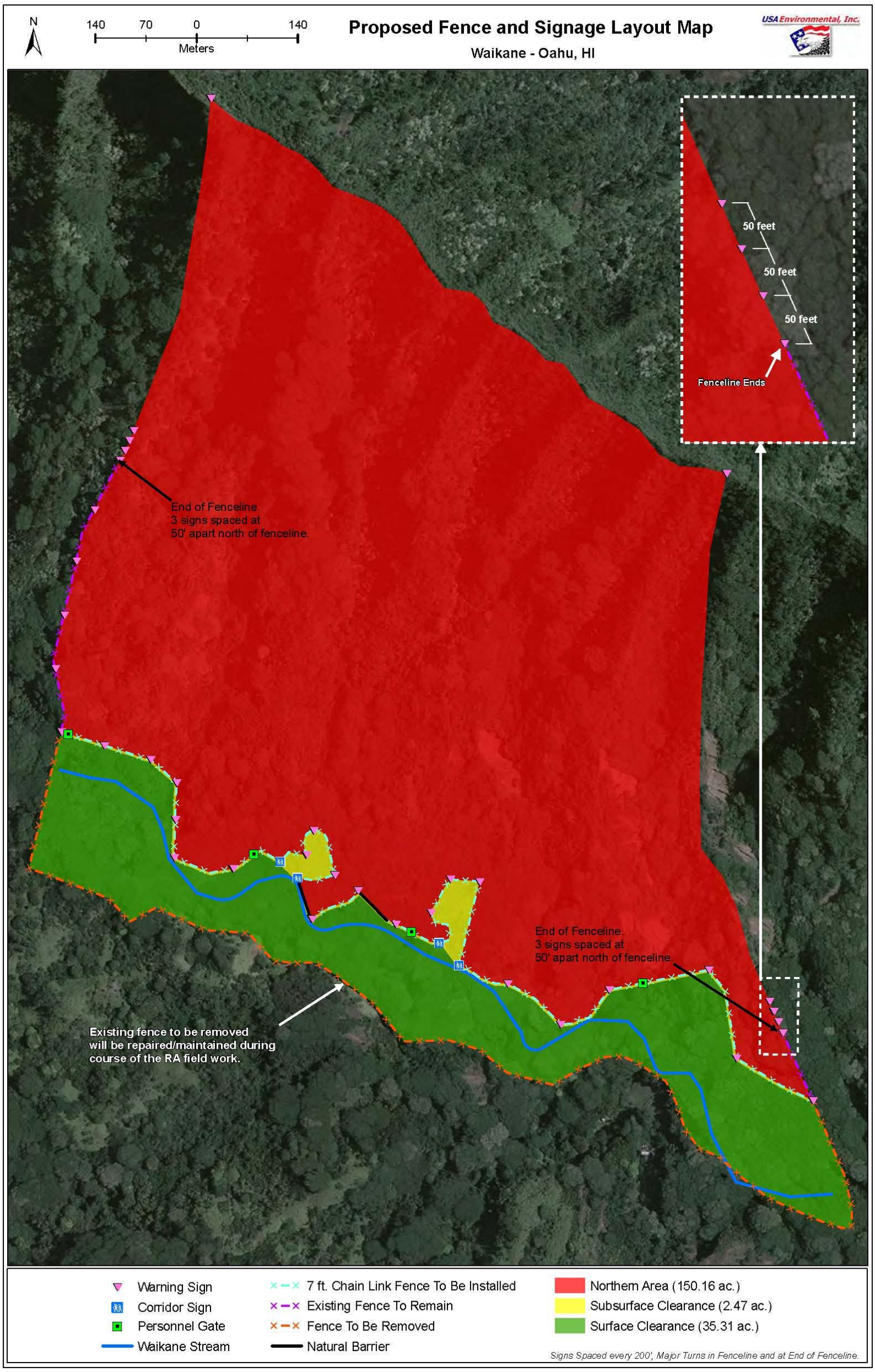
Figure 4-4: Fencing and Signage Plan

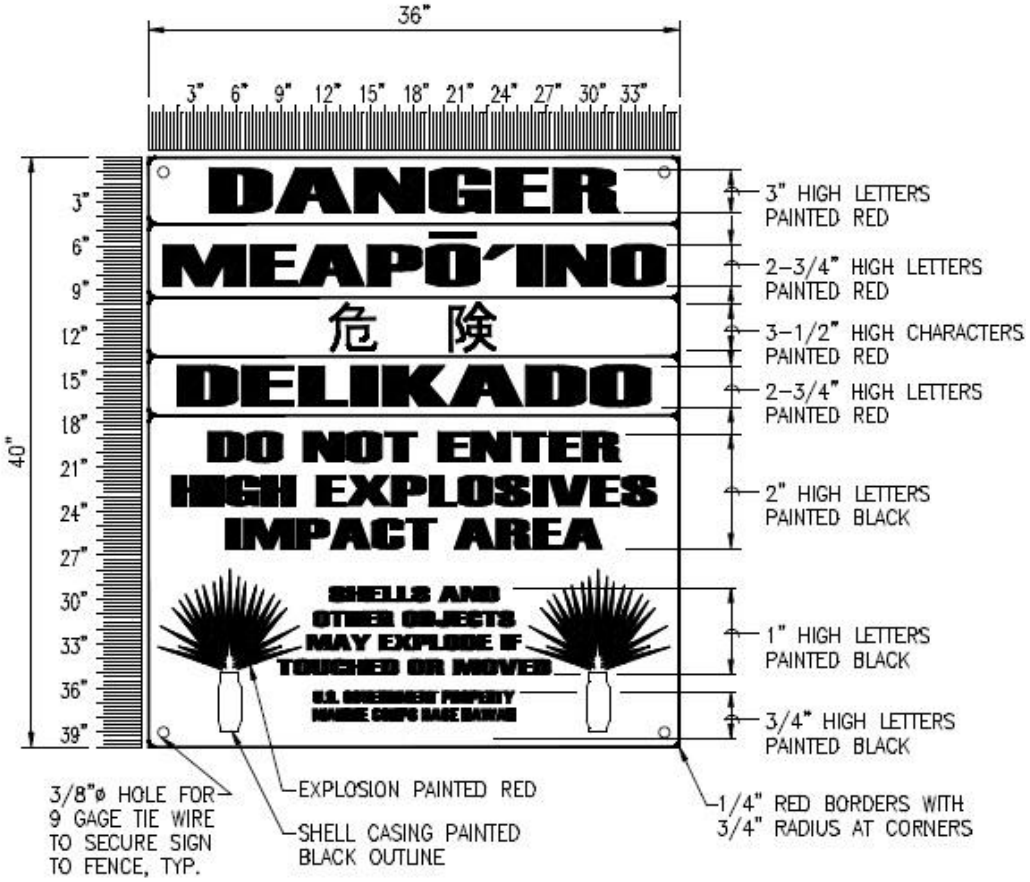


4.2.2.11.3 Signage

4.2.2.11.3.1 Warning Signs

Currently there are three styles of warning signs posted along the existing fencing the WVIA site. To be consistent with the existing signage at the site, the RA Contractor shall provide the same style signage and language. The two warning sign specifications and layouts are shown below in Figures 4-4 “Warning Sign A” and 4-5 “Warning Sign B” and are to be installed at 200-foot centers, 2-ft below the top of the fabric. In addition to the 200-ft spacing, warning signs “A” & “B” will alternate along the fence. A warning sign will be installed at inflection points over 45 degrees and at terminal points in the fence alignment... The third sign is for personnel gates and is shown in Figure 4-6 “Gate Sign”. Gate signs will be installed on each gate 1-ft below the top of fabric.

Figure 4-5: Warning Sign “A”

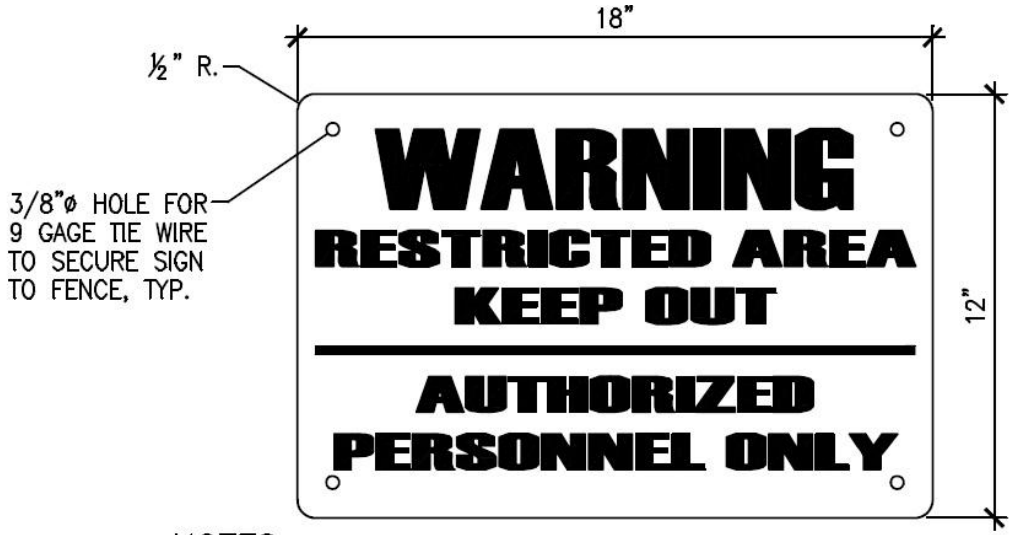


NOTES:

1. FENCE WARNING SIGNS SHALL BE POSTED AT 200 FEET MAXIMUM INTERVALS ALONG FENCE WITH THE TOP OF SIGN TWO FEET BELOW TOP OF FABRIC.
2. ALL SIGNS WILL BE MADE OF ALUMINUM WITH A MINIMUM THICKNESS OF 1/8" THICK.
3. THE SIGN BACKGROUND SHALL BE WHITE.

“A”

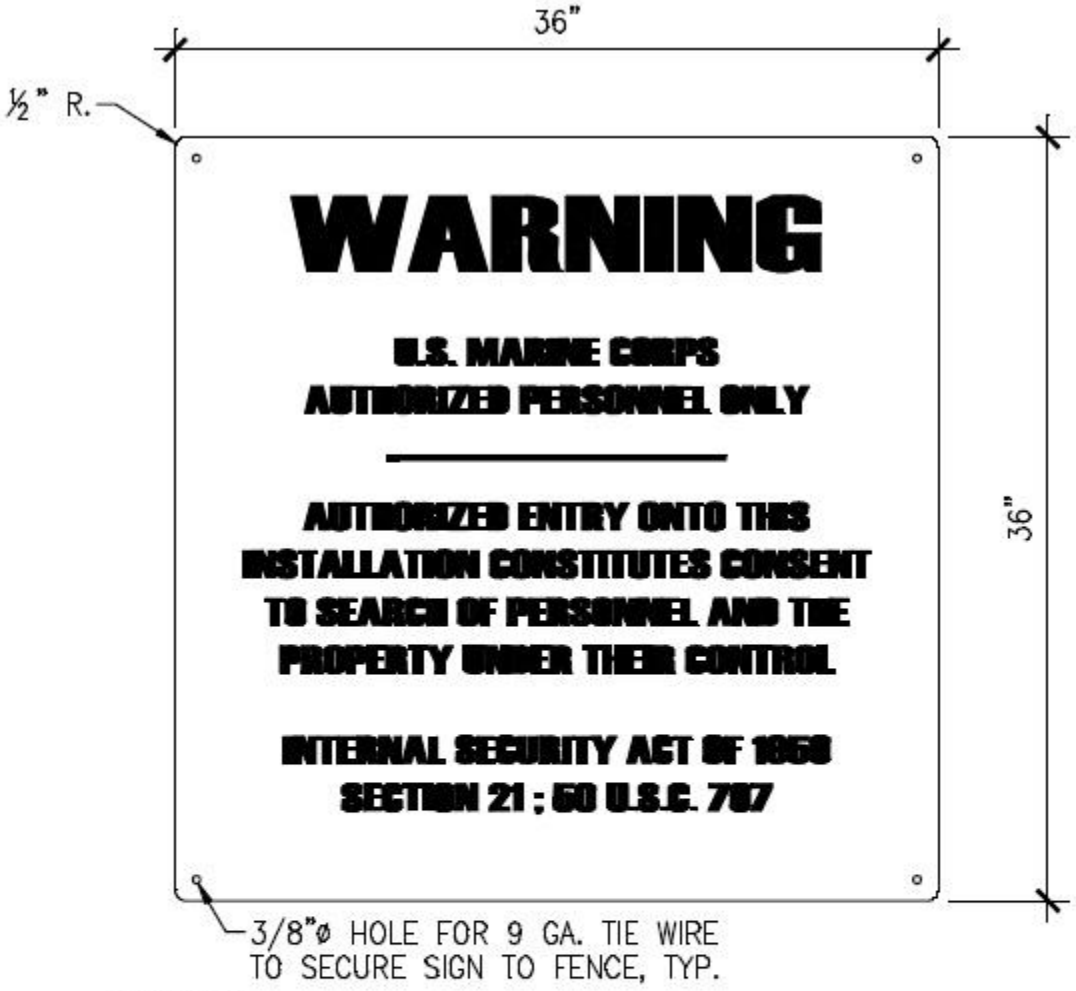
Figure 4-6: Warning Sign "B"



NOTES:

1. FENCE WARNING SIGNS SHALL BE POSTED AT 200 FEET MAXIMUM INTERVALS ALONG FENCE WITH THE TOP OF SIGN TWO FEET BELOW TOP OF FABRIC.
2. ALL WORDING EXCEPT "WARNING" SHALL BE BLACK AND 1" HIGH.
3. THE WORD "WARNING" SHALL BE RED AND 2 1/4" HIGH.
4. THE BACKGROUND SHALL BE WHITE.
5. SOLID BLACK LINE SHALL BE 1/4" THICK.
6. ALL SIGNS WILL BE MADE OF ALUMINUM WITH A MINIMUM THICKNESS OF 1/8" THICK.

Figure 4-7: Gate Signs



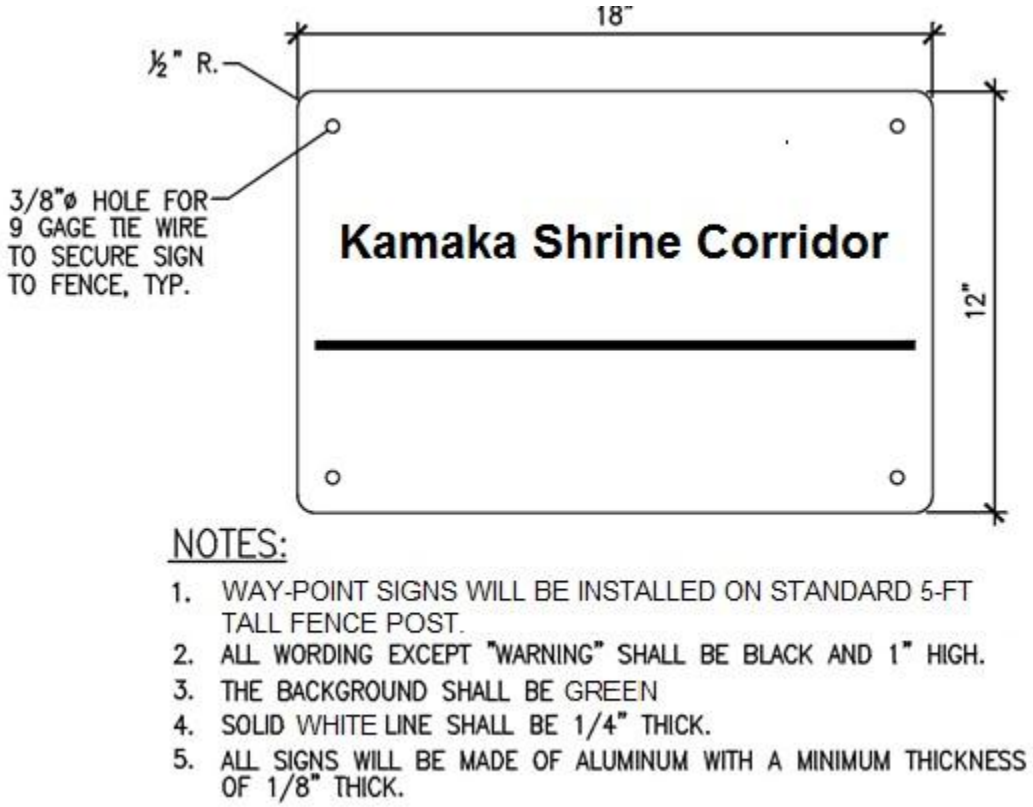
NOTES:

1. GATE WARNING SIGNS SHALL BE POSTED ON EACH GATE WITH THE TOP OF SIGN ONE FOOT BELOW TOP OF FABRIC.
2. ALL WORDING EXCEPT "WARNING" SHALL BE BLACK AND 1 1/4" HIGH
3. THE WORD "WARNING" SHALL BE RED AND 3 1/2" HIGH.
4. THE BACKGROUND SHALL BE WHITE.
5. SOLID BLACK LINE SHALL BE 1/4" THICK.
6. ALL SIGNS WILL BE MADE OF ALUMINUM WITH A MINIMUM THICKNESS OF 1/8" THICK.

4.2.2.11.3.2 Corridor Way-point Signs

Signage will be provided at both ends of the Waikane Spring and Kamaka Shrine Corridor openings in order to provide way-points for visitors. Each corridor will have, at a minimum, two signs installed on both sides of the respective corridor openings. Figure 4-7 shows the way-point sign specifications and layout. Note that the color and language on the corridor way-point signs are subject to change based on input that will be provided by the RAB..

Figure 4-8: Corridor Way-Point Sign



4.3 DRAFT FINAL DESIGN

The 60% RD was revised as “Draft Final” on 27 February 2013. The Draft Final RD revision is based on review comments received from NAVFAC, MCB Hawaii, and MARCORSYSCOM. Progress of the RD development will be briefed to the Public during the 6 March 2013 RAB Meeting. During this presentation the project team will describe the various elements of public input that was received during the deign phases and present how that input was utilized in the RD, specifically the Waikane Spring and Kamaka Shrine Corridors. The RAB members will be able to provided comments on the Draft Final RD documents. In addition to the RAB review, HDOH will be given an opportunity to review and comment of the Draft Final RD .Once all RAB and HDOH comments have been addressed, the project team will issue the Final RD.

5.0 REMEDIAL DESIGN SCHEDULE

The RD Schedule is included as Appendix C.

REFERENCES

1. EPA, Revised Model CERCLA RD/RA Consent Decree, Federal Register Volume 60, Issue 145 (July 28, 1995)
2. NAVFAC Pacific, Final Waikane Valley Decision Document, February 2013
3. NAVFAC Pacific, Final Waikane Valley RI/FS Report (2011)

APPENDICES

A. Project ARARs and TBCs
B. Land Use Control Plan
C. RD Schedule

Appendix A

Table A-1 Potential Chemical-Specific ARARs and TBCs

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Federal					
Clean Air Act National Ambient Air Quality Standards (NAAQS)	42 USC 7409 40 CFR 50	Establishes numerical ambient air quality standards for carbon monoxide, nitrogen dioxide, particulate matter, ozone, sulfur dioxide, lead, and hydrogen sulfide	As ambient standards, the contribution, if any of remedial activities to meeting or exceeding the standards' concentrations versus the contributions of area or regional sources cannot be determined. The standards themselves do not apply to individual sources	Not an ARAR	
Regional Screening Levels	EPA User's Guide and Background Technical Document for EPA Region 9 Preliminary Remediation Goals Table	Provides conservative, risk-based, chemical-specific screening action levels designed to protect human and ecological receptors	Document not promulgated, but is a user's guide and technical reference which can be considered a TBC.	TBC	Risk evaluation has determined that no chemical risks exist at the site.
Sediments	NOAA Sediment Quality Guidelines	Guidelines for interpreting chemical data from sediment analyses	Document not promulgated, but is a technical reference which can be considered a TBC	TBC	Risk evaluation has determined that no chemical risks exist at the site.
Sediments	EPA Region III Biological Technical Assistance Group (BTAG) Freshwater Sediment Screening Benchmarks	Developed to be used to evaluate Superfund sampling data. Provides chemical-specific benchmark values to protect ecological receptors in freshwater sediments	Document not promulgated, but is a technical reference which can be considered a TBC	TBC	Risk evaluation has determined that no chemical risks exist at the site.

Table A-1 Potential Chemical-Specific ARARs and TBCs

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
State					
Air Quality	Hawai'i Administrative Rules (HAR) Title 11, Chapter 59: Ambient Air Quality Standards	Establishes numerical ambient air quality standards for carbon monoxide, nitrogen dioxide, particulate matter, ozone, sulfur dioxide, lead, and hydrogen sulfide.	As ambient standards, the contribution, if any of remedial activities to meeting or exceeding the standards' concentrations versus the contributions of area or regional sources cannot be determined. The standards themselves do not apply to individual sources	Not an ARAR	
Water Quality	HAR Title 11, Chapter 54: Water Quality Standard	Establishes a series of classifications and water quality standards for surface water and groundwater used to protect the public health or welfare and enhance water quality.	Surface water bodies are present and the underlying aquifer is considered a potential drinking water source.	ARAR	Site activities will be conducted in a manner that is protective of surface water and groundwater.
Environmental Action Levels	HDOH Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Volume 1 and Volume 2: Background Documentation for the Development of Tier 1 Environmental Screening Levels, Appendix 1	Provides chemical-specific environmental screening criteria and action levels designed to protect human and ecological receptors	Document is not promulgated, but is a user's guide and technical reference which can be considered a TBC	TBC	

Table A-2 Potential Location-Specific ARARs and TBCs

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Federal					
Clean Water Act (CWA)	33 USC 1251 et seq. 40 CFR 100-149	Establishes standards governing all untreated waters including marine, coastal, estuarine, fresh surface water, and groundwater. Establishes the program, framework and federal water quality standards. Additional substantive and potentially more stringent requirements/criteria will be established via State statutes and regulations. Waters are present within the site.		ARAR	Any MEC response action at this site will minimize impacts on surface water and groundwater.
CWA (Section 404)	33 USC 1251 et seq. 40 CFR 230 33 CFR 323	Requires a permit from the Army for construction activities in wetlands and alternative analysis to ensure selection of the least damaging practical alternative.	Consists of non-substantive procedural requirements.	Not an ARAR	No wetlands have been identified at the site.
Protection of Wetlands	Executive Order 11990	Restricts federal activities when alterations of wetlands may occur.		Not an ARAR	No wetlands have been identified at the site.
Floodplain Management	Executive Order 11988	Restricts activities within the 100-year floodplain.	Floodplains associated with Waikane Stream are present at the site.	ARAR	MEC response alternatives do not involve alteration of Waikane Stream.

Table A-2 Potential Location-Specific ARARs and TBCs

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Native American Graves Protection and Repatriation Regulations	43 CFR 10.4 (c) and (d)	Requires consultation with Native Hawaiian organization to determine disposition of objects discovered.	Applicable if human remains are found during the remedial action.	ARAR	If human remains are found, proper disposition will be coordinated.
National Historic Preservation Act	16 USC 470 36 CFR 800	Provides for the recovery and preservation of historical and archaeological significant artifacts.	Various culturally significant sites exist within the MRS, including a site listed on the National Register of Historic Places.	ARAR	Archaeological monitoring would be conducted during remedial actions to prevent disturbance and possible discovery of significant archaeological artifacts.
Protection of Archaeological Resources	43 CFR 7.4 (a), 7.5 (b)(1)	Requires protection of archaeological resources if discovered.	Applicable if remedial activities uncover or disturb cultural resources. Various culturally significant sites are known to exist within the MRS.	ARAR	May not excavate, remove, damage, or otherwise alter or deface such resource unless by permit or exception.
Endangered Species Act	16 USC 1531-1543	Prohibits actions that jeopardize the continued existence of any listed species, results in the destruction or adverse modification of designated critical habitat of such species, or results in a “taking” of any listed species.	Applicable if listed species or critical habitat is identified. No federally listed threatened or endangered plant or animal species are known to exist on site. Though typical nesting habitat for the threatened Newell’s Shearwater was found on a portion of the site, there are no known nesting colonies of this species on Oahu	ARAR	If listed species are identified, appropriate mitigate measures will be implemented.

Table A-2 Potential Location-Specific ARARs and TBCs

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Migratory Bird Treaty Act	16 USC 703-712	Prohibits the taking, possessing, buying, selling, or bartering of any migratory bird, including feathers or other parts, nest eggs, or products, except as allowed by regulations.	Migratory birds are known to pass over the area, although no nesting habitats are believed to exist on site.	ARAR	
Fish & Wildlife Coordination Act	16 USC 661 et seq.	Provides that Federal agencies should consult with appropriate agency to develop protective measures for affected fish and wildlife.	The statute sections do not define a specific standard of control or a substantive requirement, criterion or limitation.	Not an ARAR	
Magnuson-Stevens Fishery Conservation and Management Act (1996)	16 USC 1851 et seq.	Requires project activities to minimize adverse effects on fish habitat.	Location-specific	ARAR	Activities will be managed to minimize adverse effects to fish, habitat, and water quality.
Bald and Golden Eagle Protection Act	16 USC 668-668(d)	Requires project activities to protect and preserve eagle habitat.	Bald and golden eagles are not found in Hawai'i.	Not an ARAR	

Table A-2 Potential Location-Specific ARARs and TBCs

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Coastal Zones	16 USC 1456(c) 15 CFR 930.30 - 33, 36(a), 39(b-d)	Requires federal actions or activities conducted within or affecting a coastal zone be consistent with the State's coastal program. Coastal zone management objectives include the protection of valuable coastal ecosystems from disruption and minimizing adverse impacts on all coastal ecosystems. Where national defense or other over-riding national interests are concerned, they must at least be consistent "to the maximum extent practicable."	The MRS is not located within the coastal zone.	Not an ARAR	
Marine Mammal Protection Act	16 USC 1361 50 CFR 12	Requires project activities to protect marine mammals.	The site is not in a coastal zone and does not encompass marine waters.	Not an ARAR	
State					
Burial Sites and Human Remains	HAR Title 13, Chapter 300: Rules of Practice and Procedure Relating to Burial Sites and Human Remains	Governs practice and procedure relating to the proper care and protection of burial sites/human skeletal remains fifty years or older	Applicable if human remains are found during the remedial action.	ARAR	
Historic Preservation	Hawaii Revised Statutes (HRS) Chapter 6E.	Requires action to be taken to locate, identify, evaluate, and protect cultural resources.	Several culturally significant sites were found within the MRS during previous investigations.	ARAR	Statute suspended until 30 June 2016 by Governor's Proclamation dated 14 June 2011.

Table A-2 Potential Location-Specific ARARs and TBCs

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Protection of Caves	HRS Chapter 6D	Protects caves and contents	Applicable if cave(s) discovered during site clearing activities. Caves are not expected within the areas where remedial actions would be conducted.	TBC	Statute suspended until 30 June 2016 by Governor's Proclamation dated 14 June 2011.
Endangered Species	HRS Title 12, Chapter 195D-4 HAR Title 13, Chapter 124	Prohibits any taking, transport or commerce in designated species. Further outlines conservation programs that mandate continued research on listed species.	Applicable if listed species or critical habitat is identified. No federally listed threatened or endangered plant or animal species are known to exist on site. Though typical nesting habitat for the threatened Newell's Shearwater was found on a portion of the site, there are no known nesting colonies of this species on Oahu	TBC	Statute suspended until 30 June 2016 by Governor's Proclamation dated 14 June 2011.
Forest Reservations, Water Development, Zoning	HRS Chapter 183.	Regulates activities in forested land and watersheds.	Forested lands and surface water (Waikane Stream) are found on site.	Not an ARAR	Statute suspended until 30 June 2016 by Governor's Proclamation dated 14 June 2011.
Coastal Zones	HRS Title 13, Chapter 205A: Coastal Zone Management.	Provides for the protection of coastal resources.	The MRS is not located within the coastal zone.	Not an ARAR	Statute suspended until 30 June 2016 by Governor's Proclamation dated 14 June 2011.

TABLE A-3 POTENTIAL ACTION-SPECIFIC ARARS AND TBCS

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Federal					
RCRA Subpart M (Military Munitions Rule)	62 Federal Register 6622 40 CFR 266 Subpart M	Identifies when military munitions become a solid waste, and, if these wastes are hazardous, the management standards that apply.	This is a procedural requirement, and does not provide site-specific criteria.	TBC	Substantive requirements for managing recovered munitions will be implemented during remedial actions.
Open Burning/Open Detonation (Treatment) of Waste Explosives	40 CFR 265.370 and 265.382 (Subpart X)	Requirements for treatment of explosives through burning	Applies to the treatment of explosives through burning or detonation. Open burning/open detonation is considered "treatment in miscellaneous units." This is a procedural requirement, and does not provide site-specific criteria.	TBC	Substantive requirement, such as those pertaining to required separation distances will be implemented during the remedial action.

TABLE A-3 POTENTIAL ACTION-SPECIFIC ARARS AND TBCS

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Explosives Storage	27 CFR 555 Subpart K 40 CFR 264 Subpart EE	Provides standards for the storage of explosive materials.	Provides specific requirements for storing explosive materials that may be pertinent to MEC response actions. This is a procedural requirement, and does not provide site-specific criteria.	TBC	Substantive requirements for storage of explosives (as appropriate) will be implemented during the remedial action.
Hazardous Waste Management	42 USC 6921 et seq. 40CFR 261 (especially 261.23), 262, 264, 266, 268	Provides for processes and procedures for identifying and managing solid and hazardous wastes	Applicable to characterization of solid waste and management of hazardous waste generated during the remedial action. This is a procedural requirement, and does not provide site-specific criteria.	Not an ARAR	Any waste produced during the remedial action will be characterized.
Oil Pollution Prevention	40 CFR 112	Governs storage of oil or fuels in amounts greater than 1320 gallons, if stored in containers 55 gallons or larger	Includes substantive requirements pertaining to containers storing fuels in amounts greater than 1320 gallons. The regulation includes non-substantive requirements (e.g., preparation of plans) that are not required to be met.	TBC	If oil is used in the cited quantity during the remediation to fuel generators or for other uses, then the design and management requirements of this rule would apply.
Transportation	49 CFR Parts 100-199, specifically Part 107 Subpart G; Parts 171, 172.101, 700, and 704, and 173	Regulates transport of hazardous substances, including explosives and other MEC. Provides packaging, marking and labeling, handling, and training requirements.	Applicable if hazardous materials are transported on site. This is a procedural requirement, and does not provide site-specific criteria.	Not an ARAR	Transportation of MEC for off-site disposal will be conducted in accordance with applicable regulations.

TABLE A-3 POTENTIAL ACTION-SPECIFIC ARARS AND TBCS

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Ammunition and Explosives Safety Standards	Department of the Navy OP5 ,"Ammunition and Explosives Ashore"; NOSSAINT 8020.15C, "Explosives Safety Review, Oversight, and Verification of Munitions Responses"	Set explosives safety standards to protect human health and the environment.	Not promulgated; provide specific requirements for managing munitions and explosives that pertain to MEC response actions.	TBC	Specific requirements for safe removal and management of MEC must be adhered to.
Detonation-in-Place	HNC-ED-CS-98-7, "Use of Sandbags for Mitigation of Fragmentation and Blast Effects Due to Intentional Detonation of Munitions"	Identifies specific criteria for the use of sandbag mitigation during intentional detonations of MEC.	Provides specific technical requirements that may be pertinent to MEC disposal.	TBC	If sandbag mitigation is deemed appropriate during MEC disposal, the specific requirements contained herein must be adhered to.
Explosives Storage	Bureau of Alcohol, Tobacco, and Firearms Publication 5400.7, "Federal Explosives Laws and Regulations" 40 CFR 264 Subpart EE	Provides standards for the storage of explosive materials.	Provides specific requirements for storing explosive materials that may be pertinent to MEC response actions.	TBC	If explosives and/or MEC are stored on-site during the remedial action, the specific requirements contained herein will be adhered to.
Material Potentially Presenting an Explosives Hazard	DoD Instruction 4140.62, "Management and Disposition of Material Potentially Presenting an Explosive Hazard (MPPEH)"	Identifies procedures for inspecting and certifying the safety status of material potentially presenting an explosive hazard	Provides specific technical requirements pertinent to managing MPPEH during MEC response actions.	TBC	MPPEH generated during the remedial action will be managed in accordance with the procedures identified herein.

TABLE A-3 POTENTIAL ACTION-SPECIFIC ARARS AND TBCS

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
	DoD Manual 6055.09-M, *DoD Ammunition and Explosives Safety Standards*, February 29, 2008. Administratively Reissued August 4, 2010.	Provides protection criteria to minimize serious injury, loss of life, and damage to property from military munitions and MEC (e.g., explosives safety quantity distances).	Applies to the selection of remedial alternatives for the site.	TBC	Remedial activities will be implemented in accordance with the explosives safety measures contained herein.
Construction Support	U.S. Army Corps of Engineers EP 75-1-2, "Munitions and Explosives of Concern (MEC) Support During Hazardous, Toxic, and Radioactive Waste (HTRW) and Construction Activities	Outlines requirements for support of future construction activities on the site	Applies to remedial alternatives in which land transfer is accomplished.	TBC	
Navy Environmental Guidance	OPNAVINST 5090.1C, "Navy Environmental and Natural Resources Program Manual"	Navy guidance manual on environmental and natural resources operations.	TBC for operations that may affect the environment or natural resources.	TBC	
State					
Fugitive Dust	HRS Title19, Chapter 342B-11 and 34 HAR Title 11, Chapter 60.1-33: Air Pollution Control	Requires mitigation of fugitive dust visible beyond the property line through implementation of best practical operation or treatment.	Applies to dust produced during vegetation and munitions clearing activities.	ARAR	

TABLE A-3 POTENTIAL ACTION-SPECIFIC ARARS AND TBCS

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Waters of the State	HAR Title 12, Chapter 174C HRS § 342D-50	Provides for the protection and improvement of the quality of waters of the state and to provide that no substance be discharged into such waters without first receiving the necessary treatment or other corrective action. Designates both surface and groundwater.	Applicable to any actions taken during the remedial action that may result in discharges to surface water or groundwater.	ARAR	
Storm water	HAR Title 11, Chapter 55	Defines effluent limitations and other requirements for construction activities that would normally require NPDES permitting by virtue of disturbing more than 1 acre of land.	Stormwater discharge requirements are applicable due to the size of the area proposed to be disturbed in some of the remedial alternatives.	ARAR	
Storm water	HAR Title 11, Chapter 55, Appendix C: NPDES General Permit Authorizing Discharges of Storm Water Associated with Construction Activity	Specifies development of an erosion and sediment control plan, plans for minimizing discharge and erosion during and after construction, and other general provisions including best management practices, storm water controls, and monitoring.	An NPDES permit is not required for on-site activities; however, the requirements and best management practices associated with this general permit are relevant and appropriate for some of the proposed remedial alternatives and should be adhered to. The requirements for state waters with total maximum daily loads (TMDL) do not apply because TMDLs have not been established for Waikane Stream.	ARAR	

TABLE A-3 POTENTIAL ACTION-SPECIFIC ARARS AND TBCS

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Grading, Excavation, Clearing, and Grubbing	HRS Title 12, Chapter 180C, Soil Erosion and Sediment Control Revised Ordinances of Honolulu (ROH) Chapter 14, Sections 13-16	Regulates grading, excavation, clearing, and grubbing activities for management of soil erosion and sediment control	All grading, excavation, clearing, and grubbing activities need to be conducted in accordance with these requirements. One aspect of this is the erosion control plan. HRS Title 12, Chapter 180C exempts federal lands from applicability under this statute, but the Honolulu regulation is nevertheless considered relevant and appropriate.	ARAR	
Hazardous Waste Management	HRS Title 19, Chapter 342J: Hazardous Waste HAR Title 11, Chapters 260-266, 268, 270, 271, 28	Regulates waste management in Hawai'i.	Applicable to characterization of solid waste and management of hazardous waste generated during the remedial action.	ARAR	Any waste produced during the remedial action must be characterized. Other requirements are applicable if hazardous wastes are produced during the remedial action.
Transportation of Hazardous Materials	HRS Title 17, Chapter 286, Part XII: Transportation of Hazardous Materials	Regulates transport of hazardous substances in Hawai'i.	Applicable to any hazardous materials transported on-site during the remedial action.	ARAR	Transport of hazardous materials will be conducted in compliance with applicable regulations.
Litter Control	HAR Title 11, Chapter 68: Litter Control	Regulates handling of litter in Hawai'i	Applicable to solid waste/litter generated during the remedial action.	ARAR	Any refuse produced during the remedial action must be properly disposed of in litter bags or receptacles.

TABLE A-3 POTENTIAL ACTION-SPECIFIC ARARS AND TBCS

Requirement	Citation	Description	Analysis	ARAR/TBC Determination	Comments
Noise	HRS Title 19, Chapter 342F-30 HAR Title 11, Chapter 46: Noise Pollution Control	Defines maximum permissible sound levels to provide for the prevention, control and abatement of noise pollution from stationary noise sources and equipment related to agricultural, construction, and industrial activities.	Applicable to noise produced by detonation-in-place of MEC detected during any surface and/or subsurface clearing activities.	ARAR	

Draft Final

Land Use Control Implementation Plan

Waikane Valley Impact Area

Munitions Response Program
Kaneohe Marine Corps Base Hawaii

February 2013

Department of the Navy
Naval Facilities Engineering Command Pacific
258 Makalapa Drive, Suite 100
Pearl Harbor, HI 96860-3134

Munitions Response Actions, Vieques, Puerto Rico and Other Sites
Contract Number N62470-11-D-8007, CTO KB06

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Figure 1-1: WVIA MRS 1-4

EXHIBITS

Exhibit A: Sample List of Educational Materials for community website

Exhibit B: Checklist for Annual Review

1.0 INTRODUCTION AND PURPOSE

This Land Use Control Implementation Plan (LUCIP) is implemented pursuant to the Final Decision Document (DD), dated February 2013, for the Waikane Valley Impact Area (WVIA) located in Kaneohe, Oahu, Hawaii. The DD selected Land Use Controls (LUCs) as a part to the remedy the southern and northern areas of the WVIA. This LUCIP describes the plan for implementation of LUCs at WVIA

1.1 SITE BACKGROUND

WVIA is a 187-acre area located approximately 10 miles northwest of MCB Hawaii. It was once part of a 2,000-acre lease used for military jungle training and field maneuvers. The remaining acres fall under the Defense Environmental Restoration Program for Formerly Used Defense Sites and are not addressed in this Decision Document.

WVIA's military history dates back to the early 1940s, when the U.S. Army leased over 2,000 acres in the Waiahole and Waikane Valleys between 1943 and 1953 for jungle training, small arms, artillery, and mortar firing, field maneuvers and a bombing range for air to ground ordnance delivery practice. The area was known as the Waiahole Training Area and managed by the U.S. Army as property of Fort Hase.

In 1944, four people were injured, two fatally, when a 60-millimeter (mm) mortar discovered in Waikane Valley accidentally detonated. Three children were injured in 1963, when a souvenir rifle grenade reportedly discovered in Waikane Valley exploded after it was thrown against a wall. There are no other reports of fatalities or injuries attributable to MEC discovered at Waikane Valley.

In 1953, the USMC leased 1,061 acres of the training area. Training consisted of small arms fire, 3.5-inch rockets, and possibly medium artillery fire. Live fire apparently stopped in the early 1960s. Because of fire hazards, incendiaries were prohibited and all ammunition in excess of 0.50 caliber was to be fired into the designated impact area.

The USMC conducted ordnance clearance sweeps in 1976. The 1976 clearance effort resulted in the removal of over 24,000 pounds of practice ordnance and fragments, including 42 items of UXO. The after action report stated that 187 acres of the WVIA can never be certified free of UXO because of the ground cover and topography. The lease was terminated following the clearance effort in 1976 and the land was returned to the original owners who farmed and developed it.

In December 1983, heavy rain exposed ordnance on the property and Marine EOD removed a number of 3.5-inch rockets. In January 1984, Marines conducted a second clearance sweep and removed 480 3.5-inch rockets. In June 1984, an intensive ordnance clearance resulted in the removal of an additional 16,000 pounds of demilitarized practice ordnance and 190 items of UXO from the parcel. The after action report supported the conclusions of the 1976 report that the property could never be certified clear of ordnance.

In 1989, the government acquired title to the 187-acre ordnance contaminated area of the original WVIA because of safety concerns from the ordnance that was assumed to remain on the site after the previous clearance efforts. A perimeter chain-link fence was installed in 1992 and the area remains as government property. The area is currently controlled and maintained by MCB Hawaii. The project site is managed as an "other than operational range", with access controlled with fencing and warning signs. Civilians may legally enter the property only if accompanied by EOD personnel.

1.2 PREVIOUS WVIA INVESTIGATIONS

An Investigation and Preliminary Range Assessment/Archives Search was conducted in 1998, and a Site Inspection (SI) was conducted in 2008. As a result of clearance and initial investigation activities, and to augment data collected during the SI, a Remedial Investigation/Feasibility Study (RI/FS) was deemed necessary. The Remedial Investigation/ Feasibility Study (RI/FS) was conducted in 2010 and 2011 at the WVIA MRS. The RI fieldwork was conducted between March and May 2010. Activities, including MEC clearance, soil and sediment sampling, laboratory analysis of samples, data evaluation, and hazard and risk assessments, focused on five Areas of Concern (AOCs) that were identified based on the results from the 2008 SI. Based on the 2008 SI and 2010 RI findings, the detected concentrations of MCs in soil and sediment at the MRS do not pose potentially unacceptable risks to human or ecological receptors under current, or reasonably anticipated future land uses. However, MEC hazards were addressed in a FS for all portions of the MRS. The FS identified various response alternatives that would be evaluated in order to achieve the identified the Remedial Action Objective (RAO) for the WVIA site. The RAO for WVIA is as follows:

To prevent exposure to MEC through reduction of MEC hazards, and to support future agricultural, recreational, cultural, and forest reserve land use. (unrestricted use/ unrestricted exposure).

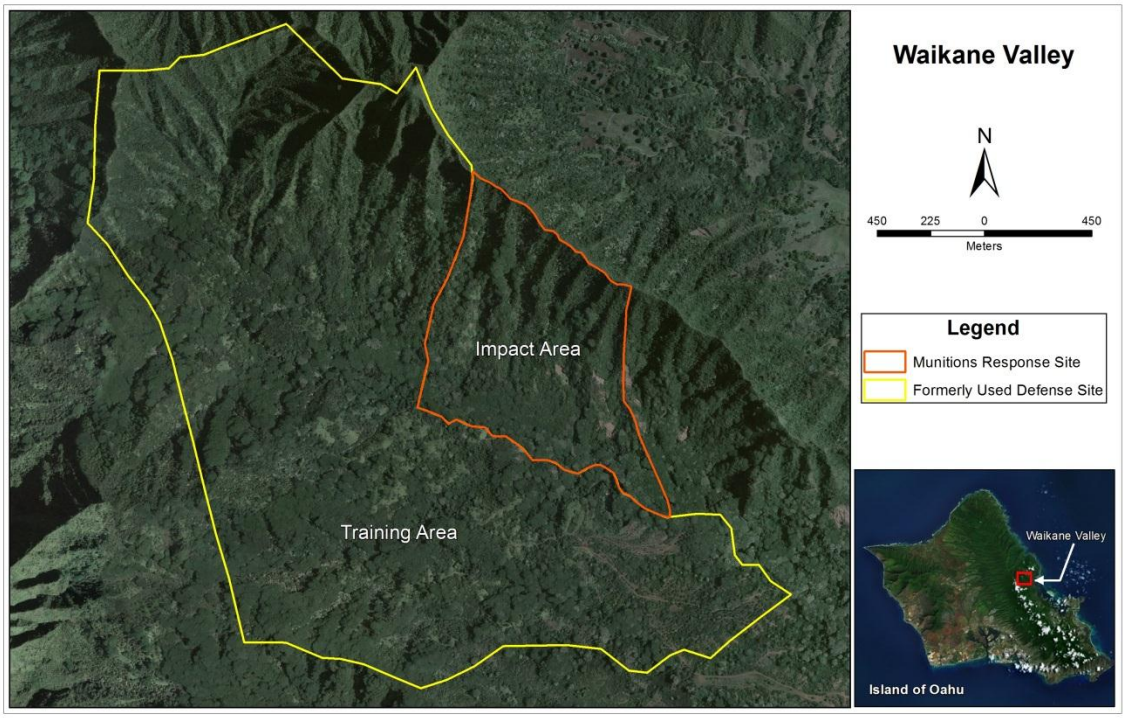
Subsequent to the FS, the Proposed Plan (PP) and the Final DD outline the selected remedy chosen to achieve the RAO. The response action selected in this Decision Document is necessary satisfy the RAO by protecting public health, welfare, and the environment from residual explosive hazards at the site. The Selected Remedy for WVIA is:

- Surface clearance of accessible areas in the Southern Area and the Northern Area
- Subsurface clearance to a depth of 2 feet of a 10-foot wide buffer strip along the boundary separating the Southern and Northern Areas
- Removal of the existing fencing from the Southern Area and installation of new fencing along the north edge of the cleared buffer strip between the Southern and Northern Areas
- Subsurface clearance to a depth of 2 feet in the Southern Area in a 50-foot radius of any MEC found during the surface clearance
- Subsurface clearance to a depth of 2 feet of 50-foot wide corridors to and around the Kamaka Shrine and Waikane Spring, and the installation of fencing along and around these cleared areas, to allow free access to these sites from the Southern Area.
- Additional Land Use Controls, including notification letters to local landowners and an educational program to inform the community of risks and mitigation measures.

1.3 LAND AFFECTED

This LUCIP applies to all 187-acres of the WIVA MRS as describes in Section 1.1 and shown on Figure 1-1.

Figure 1-1: WVIA MRS



2.0 LAND USE CONTROLS FOR THE WVIA

For the WVIA, LUCs are addressed through the following institutional controls, access restrictions, affirmative measures, and prohibitive directives. The intent of the LUCs for the WVIA is to minimize the potential that the public will come into contact with UXO, to educate the public about the potential presence of UXO, and to educate personnel working in the Impact Area as to the potential presence of UXO, how to identify UXO, and what actions to take if suspect UXO is encountered.

2.1 ONGOING DISTRIBUTION OF EDUCATIONAL MATERIALS

The Navy (or its designee) will maintain educational information on a community website (Waikane Valley Restoration Advisory Board (RAB) website) regarding the historical military use of WVIA, the potential presence of UXO, locations where UXO are more likely to be encountered, how to identify UXO, how to minimize the potential of encountering UXO, and what actions to take if suspect UXO is encountered. A sample list of educational materials is attached to this LUCIP as Exhibit A.

2.2 ACCESS CONTROL (FENCING)

The Navy, in consultation with MCB Hawaii (or successor owner of the WVIA), will (i) install and maintain a new fence around the perimeter of the WVIA in accordance with the Remedial Design to restrict public access, (ii) install and maintain an approximate ten (10) foot clear area in front (outside) and behind (inside) of the fence, and (iii) maintain those portions of the existing fencing as dictated by the Remedial Design. Fence shall consist of a seven (7) foot high, galvanized chain link fence with one (1) foot of three

(3) stand barb wire. New fencing shall also be installed in accordance with the final construction design drawings.

2.3 SIGNAGE

The Navy, in consultation with MCB Hawaii (or successor owner of the WVIA) will install and maintain signage on the fencing described in the Remedial Design. The signage shall state "No Trespassing – Impact Area", shall have dimensions of approximately 12 inches by 18 inches, and shall be placed at eye level at 200 foot intervals on the exterior side of such fencing. No changes shall be made to the signage without first consulting MCB Hawaii (or the successor owner of the WVIA).

3.0 LUC RESPONSIBILITES

The Navy, in consultation with MCB Hawaii, is responsible for implementing, maintaining, and reporting on the LUCs. Although the Navy may now or in the future delegate some or all of its duties as indicated in this LUCIP through a third party by contract or through other means, the Navy shall retain ultimate responsibility for the remedy integrity. It is anticipated that MCB Hawaii, or their successors will perform some of the duties required under this LUCIP, but this effort is, and shall at all times be, voluntary. Should MCB Hawaii or their successors cease performing these duties, the Navy shall implement the LUCs or propose modifications to this LUCIP that provide an equivalent level of protection as determined by Hawaii Department of Health (HDOH), in consultation with MCB Hawaii or its successor municipal authority.

4.0 IMPLEMENTATION ACTIONS

Upon concurrence in this LUCIP by the HDOH in accordance with their respective legal authorities, the Navy will undertake implementation actions to confirm compliance with LUC objectives. The Navy will notify the HDOH of any changes in LUC management responsibility.

The following LUC implementation actions will be undertaken by the Navy to ensure that the LUC objectives are met and maintained

4.1 DISTRIBUTION OF LUC PLAN

Within 30 days of receiving HDOH approval of this LUCIP, in accordance with their respective legal authorities, the Navy will undertake the following specific actions:

- Send a copy of this LUCIP to the MCB Hawaii Environmental and Facilities Divisions;
- Send a copy of this LUCIP to the Waikane Valley Restoration Advisory Board (RAB);
- Send a copy of this LUCIP to the City of Honolulu;
- Send a copy of this LUCIP to the HDOH for its records;
- Place a copy of this LUCIP in the central project repository for the WVIA.

4.2 EDUCATIONAL MATERIALS

The Navy (or its designee), in consultation with MCB Hawaii and the Waikane Valley RAB, will complete development of the webpages to host the supplemental educational materials for distribution. Materials shall include those materials listed on Exhibit A.

4.3 FENCING AND SIGNAGE

Fencing and signage will be constructed in accordance with the Final Remedial Design and subsequent design drawings.

4.4 REVIEWS

The Navy (or its designee) will conduct annual reviews to confirm the overall effectiveness of, and compliance with the established LUCs WVIA. Such annual review shall include interviews with personnel of MCB Hawaii (or successor municipal authority) as to the discovery, reporting and disposal of UXO in the WVIA MRS during the prior year. In addition, the annual review with respect to the WVIA will include a physical inspection to evaluate access controls (including integrity of fencing, condition of signage and de-vegetated buffer, and visual evidence of unauthorized access) and monitor for the presence of surface and near surface UXO adjacent to the fencing. Reviews shall also include interviews with MCB Hawaii (or the then current owner of the WVIA) to determine if any utility repair or emergency work was conducted in the Impact Area during the prior year. The Navy shall utilize the checklist attached to this LUCIP as Exhibit B in the course of conducting its annual review. MCB Hawaii will have an opportunity to review and comment on each annual review prior to submission as set forth in Section 4.5 below.

Furthermore, a review/inspection of the effectiveness of the LUCs will also be conducted by the Navy, with the cooperation of MCB Hawaii, as part of the Comprehensive Five-Year review process conducted under Section 121 of CERCLA, as amended by SARA of 1986. Public meetings will be held by the Navy coincident with these five-year reviews to help keep the public informed of site status, including its general condition, presence of UXO, and effectiveness of the remedial action.

4.5 REPORTING AND NOTIFICATION

An annual LUC compliance report will be provided by the Navy to HDOH, MCB Hawaii and the Waikane Valley RAB. If any deficiency(ies) should be found during the annual inspection, a written explanation will be prepared indicating the deficiency and what efforts or measures have or will be undertaken to correct the deficiency and a schedule to correct the same. The correction and enforcement of such deficiencies shall follow the requirements under Section 6.0 Enforcement. If there is to be a delegation of performance of duties by the Navy as permitted by Section 3.0 above, the Navy will promptly notify HDOH, MCB Hawaii and the Waikane Valley RAB of such delegation.

Annual reports will be submitted by the Navy to the Base Realignment and Closure (BRAC) distribution list, which includes HDOH, MCB Hawaii, and the City of Honolulu. A link to the annual report will be provided on the Waikane RAB website described in Section 2.1 above. The annual report will include a summary of the review and any physical site inspections, identification of deviations from this LUCIP, corrective actions necessary due to implementation issues or as a result of changes in site conditions or land use, and proposed changes to inspection and reporting frequency. The annual report will also include a summary of any UXO discovered during the reporting period (including the location of discovered UXO, the type of UXO (if known) and information on the activity conducted that led to the find and the name and affiliation of the individual that reported the discovery), as well as safety procedures followed and the ultimate disposition of any such discovered UXO. The annual report will also address whether the use restrictions and controls referenced in this LUCIP were communicated in the deed(s) and other legal instruments, whether the owners and state and local agencies were notified of the use restrictions and controls affecting the WVIA, and whether use of these areas has conformed to such restrictions and controls.

In the event that UXO is discovered (by intrusive activity or other encounter) within an area addressed by this LUCIP and is reported to the Navy or its designee (e.g., currently MCB Hawaii.) The Navy will then implement the following actions:

- Provide notification of the discovery of UXO to the agencies listed in Section 8.2.

- Coordinate with the MCB Hawaii Explosive Ordnance Disposal (EOD) Unit for removal or destruction the discovered UXO item.

5.0 LUC CHANGES

The Navy shall not modify or terminate Land Use Controls, implementation actions, or modify restrictions regarding land use without approval by HDOH and the concurrence of MCB Hawaii (or successor municipal authority); provided that Navy determines, in its sole discretion, that the requirement for such concurrence shall not place the Navy in violation of its legal obligations. The Navy shall seek prior concurrence before any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs. No changes shall be made without the prior approval of HDOH, and the concurrence of MCB Hawaii (or successor municipal authority); provided that Navy determines, in its sole discretion, that the requirement for such concurrence shall not place the Navy in violation of its legal obligation. In the latter case, Navy shall take reasonable steps to consult with MCB Hawaii (or successor municipal authority) to minimize the impacts of the changes to these parties.

6.0 ENFORCEMENT

Should the LUCs reflected in this LUCIP cease to provide an appropriate level of protection, the Navy shall propose modifications through an Explanation of Significant Differences (ESD) or a DD amendment. If the Navy determines that the LUCs are not being complied with, its actions may range from informal resolutions with the owner or violator, to the institution of judicial action. Any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs will be addressed by the Navy as soon as practicable, but in no case will the process be initiated later than 10 days after the Navy becomes aware of the breach. The Navy will notify HDOH as soon as practicable but no longer as ten days after discovery of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the ICs. The Navy will notify HDOH regarding how the Navy has addressed or will address the breach within 10 days of sending HDOH notification of the breach. Should the Navy become aware that a user of the WVIA has violated any LUC requirement where a local agency (City of Honolulu) may have independent jurisdiction (local regulations and permits), the Navy will also notify the agencies and MCB Hawaii of such violations and work cooperatively with them to re-establish owner/user compliance with the LUC.

7.0 DURATION OF LUCS

LUCs will be maintained until such time that the hazard associated with potential remnant UXO in the soil is at levels to allow for unrestricted use and exposure without the use of LUCs.

8.0 APPROVALS; NOTICE

8.1 APPROVALS

Changes to the LUCIP can only be approved through the process set forth in Section 5.0. Where the approval of a party (hereafter, the “approval party”) is required under this LUCIP for non-substantive changes that may be made without amendment of this LUCIP as provided herein, the Navy (or its designee) shall give the approval party notice thereof, along with any information to be included in such notice pursuant to the terms of this LUCIP. If the approval party fails to respond to the request for approval within thirty (30) days after said request is made, the Navy (or its designee) will send the approval party a second request. If the approval party fails to respond to such second request within ten (10) days after said second request is made, the approval party will be deemed to have approved such request.

8.2 NOTICE

All notices, responses, requests, approvals and other communications required or permitted under this LUCIP between or among MCB Hawaii, HDOH and/or the Navy shall be in writing and shall be first determined and if so, sent by postage pre-paid certified or registered mail (return receipt requested) or by recognized overnight courier (such as DHL, Federal Express, UPS), with delivery charges prepaid, to the respective addresses.

Notices shall be deemed given when delivered (or, if delivery is refused, when so refused).

End of Section

Exhibit A: Sample List of Educational Materials

- Previous WVIA Project Documentation (SI, RI/FS reports, etc.) and fact sheets contained on Waikane Valley RAB Website:
  - http://www.mcbhawaii.marines.mil/Departments/Installations,EnvironmentLogistics/Environmental/WaikaneValleyRAB.aspx
- USACE CEPOH FUDS website:
  - http://www.poh.usace.army.mil/Missions/Environmental/FUDS.aspx
  - http://www.poh.usace.army.mil/Missions/Environmental/FUDS/Waikane.aspx
- Defense Environmental Network and Information eXchange (DENIX) UXO Educational Recourses:
    - http://www.denix.osd.mil/uxo/
    - http://www.denix.osd.mil/uxo/EducationalResources/Posters.cfm
    - http://www.denix.osd.mil/uxo/EducationalResources/SafetyGuides.cfm
    - http://www.denix.osd.mil/uxo/EducationalResources/FactSheets.cfm
    - http://www.denix.osd.mil/uxo/JustForKids.cfm

Exhibit B: Annual Review Checklist

Waikane Valley Impact Area		
check√	*task*	*notes*
☐	Interview of municipal personnel as to the discovery, reporting and disposal of UXO	Name(s) and title(s) of person(s) interviewed: Date(s) of interview: Any UXO discovered? ☐ No. ☐ Yes. (if "yes", provide detail regarding objects discovered, dates and locations of discovery and information regarding reporting and disposal)
☐	Physical Inspection	Date conducted: Condition of fencing, signage and vegetation: Evidence of unauthorized access? □ No. □ Yes. (if "yes", describe) Any surface or near surface UXO? □ No. □ Yes. (if "yes", provide detail regarding objects discovered, dates and locations of discovery and information regarding reporting and disposal)
☐	Verify existence of website and content	Notes: