



# Proposed Plan

## Former Moving Target Range (Site UXO 0002) Marine Corps Base Hawaii, Oahu, Hawaii

### MARINE CORPS ANNOUNCES PROPOSED PLAN

The U.S. Marine Corps (Marine Corps) invites the public to review and comment on this **Proposed Plan (PP)** for the Former Moving Target Range (Site **Unexploded Ordnance [UXO] 0002**) at **Marine Corps Base (MCB)** Hawaii (*Figure 1*).

The Marine Corps proposes limited **Munitions and Explosives of Concern (MEC)** surface and subsurface clearance with **Land Use Controls (LUCs)** as

the preferred remedial action alternative for the site. The LUCs would consist of **Institutional Controls (ICs)**, which are legal or administrative mechanisms that restrict access or use of property, with **Engineering Controls (ECs)** such as signage and locked gates.

Long-term monitoring and **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)** five-year reviews would be conducted to ensure that the LUCs provide long-term protection of human health and the environment.

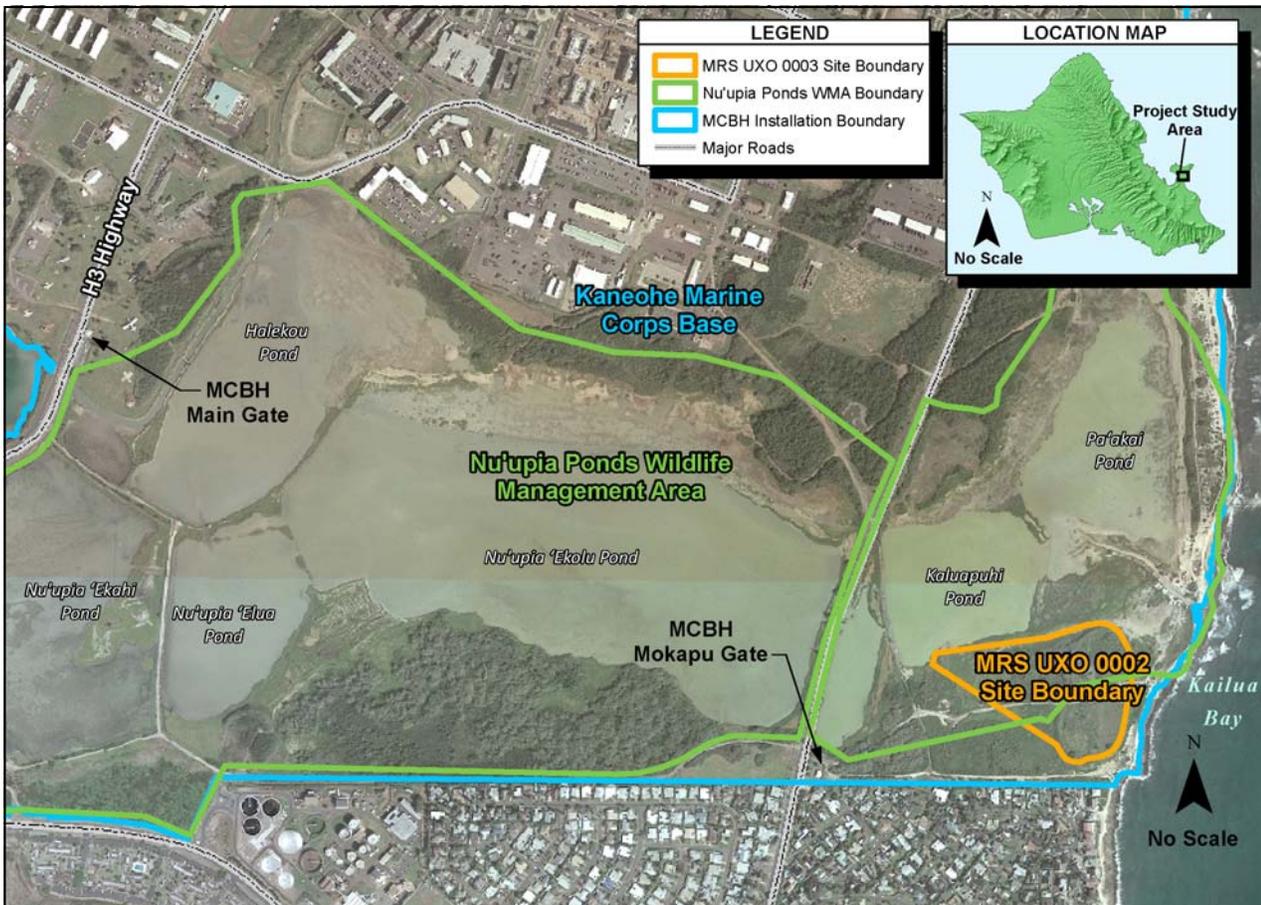


Figure 1: Site Location

Public Comment Period  
October 5, 2015—November 5, 2015

Public Meeting  
October 7 2015, 7:30 p.m., Aikahi Elementary School  
281 Iliha Street, Kailua, Hawaii

October 2015

## INTRODUCTION

This PP summarizes the background and characteristics of the site, explains the findings of human health and ecological risk assessments, and describes the cleanup objectives, evaluation of remedial alternatives, and the preferred alternative. Detailed site information is provided in the reports referenced at the end of this PP.

The Marine Corps has issued this PP to invite public involvement in selecting the final remedy for the site and to fulfill the requirements of CERCLA §117(a) and the **National Contingency Plan (NCP)** §300.430(f)(2). The **Hawaii Department of Health (HDOH)** has concurred with the conclusions and recommendations summarized in this PP.

## SITE BACKGROUND

The Former Moving Target Range is located along the southern boundary of MCB Hawaii, within the Nuupia Ponds **Wildlife Management Area (WMA)** (*Figure 1*). The site was operated as a moving target machine gun range in the 1940s through the 1950s.

The following investigations have been completed at the site:

- **1998** – A **Range Identification and Preliminary Range Assessment (RIPRA)** and **Archival Search Report (ASR)** were completed for MCB Hawaii. The RIPRA was based on 1940s historical photographs and maps of the site which suggested that the firing line was located approximately 200 yards from the berm, with firing directed eastward. This information provided the basis for the subsequent investigations (*USACE 1998*).
- **2008-2011** – The **Site Inspection (SI)** had a site reconnaissance, geophysical survey, and surface soil sampling. No MEC were recovered; however, abundant expended small arms bullets and casings were observed on the ground surface. The surface soil samples were analyzed for **Munitions Constituents (MC)**. Analytical results identified MC concentrations exceeding screening levels for antimony, lead, and **2,4-dinitrotoluene (2,4-DNT)**. The SI report recommended a **Remedial Investigation (RI)** for the site (*USAE 2011*).

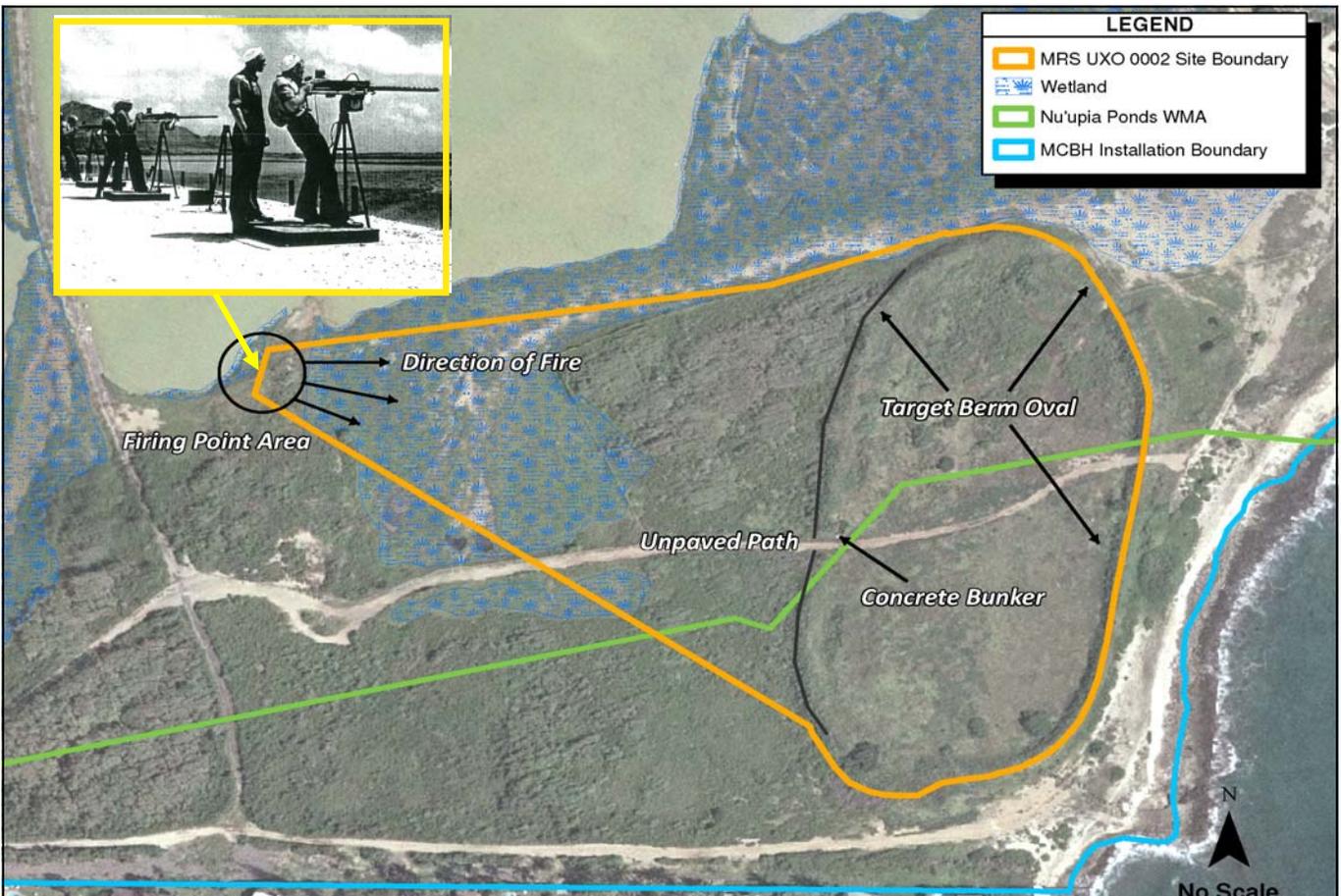


Figure 2: Site Features

- **2011-2013** – A RI was performed to evaluate the nature and extent of MC at the site and to further evaluate the potential presence of MEC. The RI activities included MEC surface and subsurface clearance, environmental sampling (soil, groundwater, sediment, surface water), and assessment of risks to human and ecological receptors (AECOM 2013).

### SITE CHARACTERISTICS

The Former Moving Target Range covers approximately 6.9 acres of the Nuupia Ponds WMA, consisting of open-water ponds, mudflats, dense pickleweed flats and scrub forest. The site itself is comprised of the firing point area and an oval-shaped earthen berm (Figure 2). Several broken-up concrete pads that served as firing platforms remain in the former firing line area. Located inside the berm are several sections of the narrow gage rail track and an abandoned concrete bunker (Photo 1). The rail track was used to move an elevated target behind the berm, which allowed firing on the target without damage to the rail mechanism (Photo 2).

The Nuupia Ponds WMA includes important wetland habitat used for nesting and feeding by the endangered Hawaiian Stilt and Wedge-Tailed Shearwater. Two other endangered water birds and various other bird species frequent the WMA. No military training, storage or other activities are currently conducted or planned for the site.

Surface and subsurface soil, sediment, surface water, and groundwater were sampled during the RI and analyzed for the MC compounds antimony, lead, and 2, 4-DNT. The sampling locations are shown on Figure 3. Although low concentrations of antimony and lead were reported for the surface and subsurface soil samples, and for sediment samples collected from Nuupia Pond, no MC concentrations exceeding project action levels were reported for any of the samples. Therefore, the RI concluded that the extent of MC contamination was delineated and no further sampling was necessary for the site.

During the RI, MEC surface and subsurface clearance were performed on eighteen 50-foot square grids, representing approximately 15 percent of the site (Figure 3).

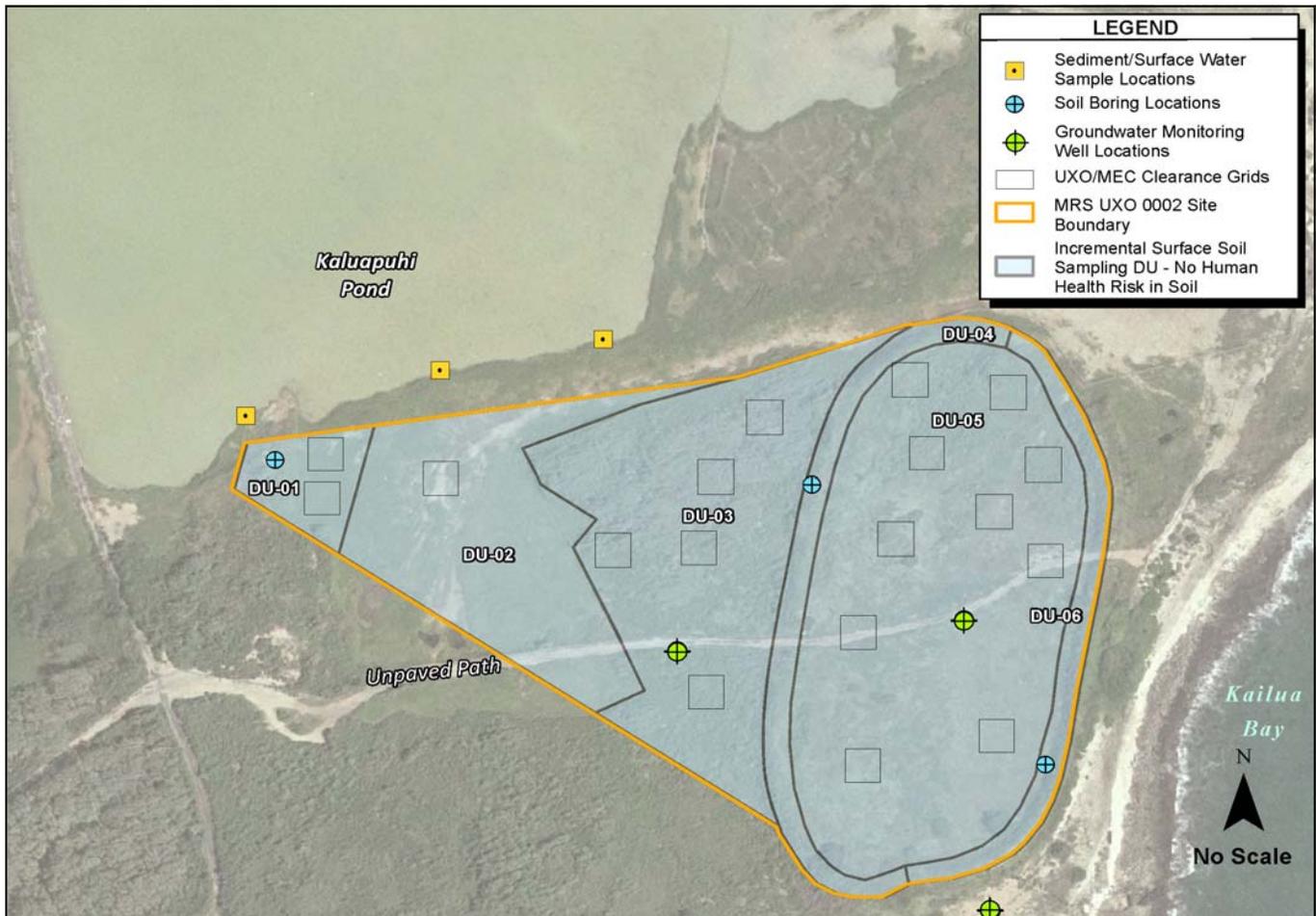


Figure 3: RI Sampling Locations



Photo 1: Concrete Bunker

Fifty unfired .50 caliber rounds were recovered from the former firing point (Photo 3), and were turned over to MCB for disposal. Other materials recovered during clearance were fired .50 caliber rounds, expended 7.62 millimeter blanks, plus several fuzes and body fragments from several hand grenades (Photo 4). The hand grenade fragments were encountered in the subsurface beneath the surface sand and root mat, at depths of less than 1 foot **below ground surface (bgs)**. Based on the 1998 RIPRA, hand grenades were not known to be used at the site. The expended rounds and grenade fragments were properly removed and disposed of as munitions debris that posed no explosive hazards.

### SCOPE/ROLE OF RESPONSE ACTION

Surface and subsurface MEC clearance along the unpaved path, which represents the primary means of access through the site, would reduce the MEC hazard to the human receptors of concern (i.e., wildlife biologists who



Photo 3: Unfired .50 Caliber Rounds

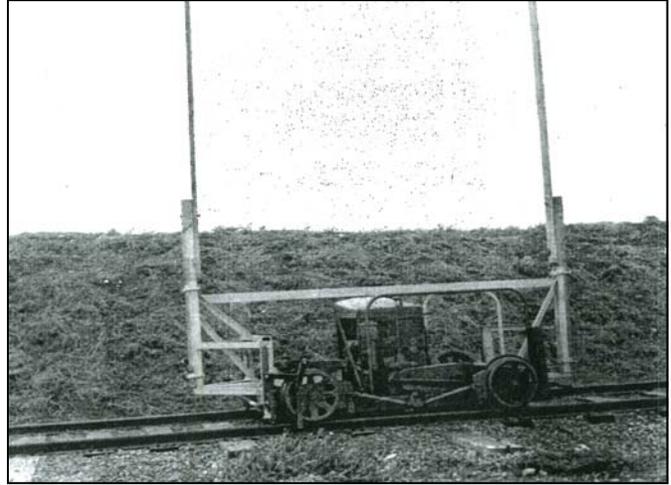


Photo 2: Rail Cart Used To Carry Targets

work at the site, and possible trespassers). The LUCs would protect human health by warning authorized site users (i.e., wildlife biologists) of the health risk associated with exposure to MEC, restricting access by unauthorized personnel (e.g., joggers and trespassers), and prohibiting disturbance of site soil or development and use of the property for anything other than a wildlife management area.

### SUMMARY OF SITE RISKS

**Human Health Risk Assessment (HHRA):** A baseline HHRA was conducted during the RI to evaluate potential risks associated with soil, sediment, surface water, and groundwater. The HHRA concluded that chemical concentrations are below levels that could pose unacceptable risk to human health.

**Ecological Risk Assessment (ERA):** An ERA was conducted for the RI to evaluate risks to ecological receptors

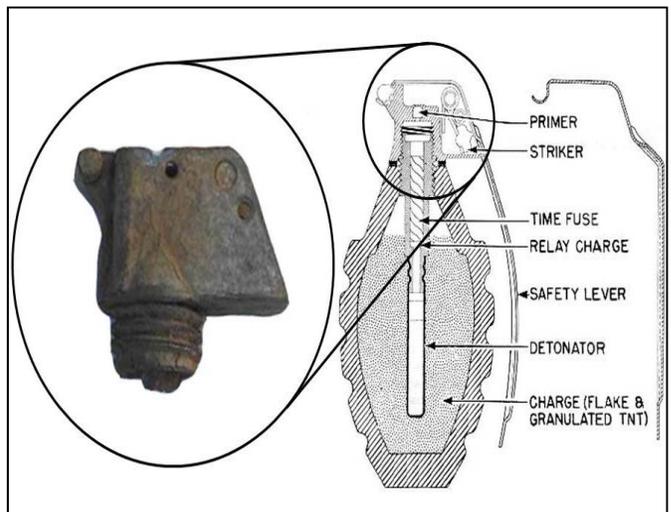


Photo 4: Hand Grenade Fuse Recovered During MEC Clearance

(wildlife). The ERA concluded that risks to ecological receptors potentially exposed to subsurface soil, shoreline sediment, shoreline surface water, and groundwater are acceptable. Surface soil posed no unacceptable risk to plants, soil invertebrates, the short-eared owl, or wading birds, and potential indeterminate, but likely acceptable risk to omnivorous small mammals and birds.

**MEC Hazard Analysis (MEC HA):** A MEC HA assessed the possible residual risk posed by the presence of small arms MEC (e.g., unfired .50 caliber rounds) and live hand grenades. The baseline MEC HA concluded that an elevated hazard potential (Hazard Level 2 out of 4) exists at the site. The RI report recommended a **Feasibility Study (FS)** to evaluate alternatives for remedial action to address the elevated MEC hazard potential (AECOM 2013).

**Risk Assessments Summary:** The HHRA and ERA indicate that risks to human and ecological receptors are within acceptable ranges. However, the MEC HA indicates an elevated hazard potential; therefore, further action is needed to protect human health and the environment.

## REMEDIAL ACTION OBJECTIVES

The following remedial action objectives were developed to address the potential MEC at the site:

- Reduce potential exposure to MEC that may remain on the surface and in the subsurface at the site.
- Protect habitat and wildlife from unnecessary impacts during implementation of remedial action.

## REMEDIAL ALTERNATIVES

The FS evaluated three alternatives (AECOM 2014):

- **Alternative 1:** No Further Action. The no further action alternative is required by CERCLA as a baseline to reflect current conditions (assuming that site conditions would be left in their current state).
- **Alternative 2:** LUCs. LUCs, consisting of ICs and ECs, would prevent soil disturbance and potential exposure to MEC. The ICs would be implemented to warn current and future users of the area (i.e., wildlife biologists) of the MEC hazard and deter other individuals (e.g., joggers and trespassers) from entering the area. The ICs would include deed notifications and restrictions including prohibitions on the disturbance of site soil and development or use of the property for anything other than a wildlife management area. The ECs would include installing signs and gates at strategic locations along the site perimeter to restrict access and deter tres-

passing. Five-year reviews would be conducted to ensure the LUCs remain in place.

- **Alternative 3:** Limited Surface and Subsurface MEC Clearance with LUCs. Surface and subsurface clearance would be conducted along the primary access way, the unpaved access path that crosses the center of the site, out to 5 feet on either side of the path. The MEC would be cleared from soil above the underlying limestone, which is shallow at the site (i.e., generally less than 12-18 inches bgs). The MEC would be removed from the site and disposed of at an approved off-site facility. The LUCs described for Alternative 2 would also be implemented under this alternative.

## EVALUATION OF ALTERNATIVES

The remedial alternatives were evaluated against the nine criteria specified by the NCP (40 Code of Federal Regulations 300.430(e)(a)(iii)) and U.S. Environmental Protection Agency guidance for conducting an RI/FS under CERCLA (EPA 1988). Table 1 shows the rating scale for the nine criteria (5=Excellent and 1=Poor). Table 2 lists the alternatives and evaluates the relative performance of each alternative against the nine criteria.

Table 1: Rating Scale for the Nine Criteria

Criterion	5-Tiered Scale
<b>Threshold Criteria</b>	
1. Overall Protectiveness of Public Health/Environment	(5) Excellent if highly protective (1) Poor if not protective
2. Compliance with <b>Applicable or Relevant and Appropriate Requirements (ARARs)</b>	(5) Excellent if compliant (1) Poor if non-compliant
<b>Primary Balancing Criteria</b>	
3. Long-Term Effectiveness and Permanence	(5) Excellent if highly effective (1) Poor if not effective
4. Reduction of Toxicity, Mobility, or Volume through Treatment	(5) Excellent if reduces all contaminants of concern (1) Poor if no reduction
5. Short-Term Effectiveness	(5) Excellent if highly effective (1) Poor if not effective
6. Implementability	(5) Excellent if highly feasible and available (1) Poor if not feasible and available
7. Cost	(5) Excellent if < \$1,000,000 (1) Poor if > \$4,000,000
<b>Modifying Criteria</b>	
8. State Acceptance	(5) Excellent if highly acceptable (1) Poor if not acceptable
9. Public Acceptance	(5) Excellent if highly acceptable (1) Poor if not acceptable

Table 2: Evaluation of Alternatives

Criteria	Alternative 1 No Action	Alternative 2 LUCs	Alternative 3 Limited MEC Clearance w/LUCs
1. Overall Protectiveness of Public Health/Environment	<b>Rating= 1</b> Provides no additional protection of human health.	<b>Rating= 3</b> The LUCs would reduce the potential for exposure to MEC. ICs would prohibit soil disturbance activities, while ECs would deter trespassing and warn that MEC may be present at the site.	<b>Rating=4</b> Limited clearance of MEC along the unpaved path would reduce the hazard in areas where human activity is greatest. The LUCs would reduce exposure to MEC as described for Alternative 2.
2. Compliance with ARARs	<b>Rating=1</b> Does not comply with ARARs.	<b>Rating=5</b> Complies with ARARs.	<b>Rating=4</b> Complies with ARARs. Limited MEC clearance could disturb the endangered bird habitat; therefore, precautions would be required to ensure habitat protection.
3. Long-Term Effectiveness and Permanence	<b>Rating=1</b> Provides no long-term effectiveness or permanent protection.	<b>Rating=3</b> Provides long-term effectiveness. LUCs, annual site inspections, and five-year reviews would be needed as long as MEC remain in-place. The LUCs would ensure that the site is not disturbed and prohibit activities that could expose receptors to MEC.	<b>Rating=4</b> Provides long-term effectiveness. The MEC would be cleared from the unpaved path. MEC would remain in-place in the uncleared areas. LUCs, annual site inspections, and five-year reviews would remain as described in Alternative 2.
4. Reduction of Toxicity, Mobility, or Volume through Treatment	<b>Rating=1</b> Does not reduce the toxicity, mobility, or volume of MEC.	<b>Rating=1</b> Does not reduce the toxicity, mobility, or volume of MEC.	<b>Rating=3</b> Reduces the hazard by removing MEC from the unpaved path.
5. Short-Term Effectiveness	<b>Rating=1</b> Not effective over the short term.	<b>Rating=3</b> The ECs would deter trespassing and warn that MEC may be present. Other LUCs focus on long-term protection by prohibiting activities that could expose receptors to MEC. A Green and Sustainable Remediation evaluation concluded that Alternative 2 would have fewer impacts than Alternative 3, because it does not involve any field activities.	<b>Rating=3</b> The MEC clearance would involve short-term exposure to UXO technicians; however, UXO technicians are trained and skilled in MEC clearance. The ECs would deter trespassing and warn that MEC may be present. Other LUCs focus on long-term protection by prohibiting activities that could expose receptors to MEC.
6. Implementability	<b>Rating=5</b> Easily implemented as no action is taken	<b>Rating=5</b> Technically feasible and could be readily implemented.	<b>Rating=4</b> Technically feasible; however, MEC clearance could disturb areas of endangered bird habitat; therefore, precautions would be required to ensure habitat protection (e.g., work would be conducted during non-nesting months).
7. Cost (i.e., capital, O&M, and net present value)	<b>Rating=5</b> \$0	<b>Rating=3</b> \$2,243,007	<b>Rating=3</b> \$2,426,959
8. State Acceptance	<b>Rating=HDOH</b> would not accept the No Action alternative.	<b>Rating=HDOH</b> concurs with this alternative.	<b>Rating=</b> Regulatory agencies generally prefer actions that include treatment technologies. However, the options for treatment would disturb the endangered bird habitat.
9. Public Acceptance	<b>Rating=</b> It is anticipated that the public would not accept this alternative.	<b>Rating=</b> It is anticipated that the public would support this alternative.	<b>Rating=</b> It is anticipated that the public would support this alternative
Overall Rating	<b>Rating=2.1</b>	<b>Rating=3.4</b>	<b>Rating=3.6</b>

## PREFERRED ALTERNATIVE

As the lead agency, the Marine Corps recommends Alternative 3, Limited Surface and Subsurface MEC Clearance with LUCs, as the preferred alternative.

The rationale for selecting Alternative 3 is as follows:

- Alternative 1 is an unacceptable solution because it cannot fulfill the NCP threshold criteria for overall protective of public health and the environment and compliance with ARARs.
- While Alternative 2 may be an acceptable solution, Alternative 3 adds an additional layer of protection by performing limited MEC surface and subsurface (to a depth of 12-18 inches bgs) clearance along the unpaved path which is frequented by wildlife biologists (and possibly trespassers), thereby reducing the potential for exposure to MEC.

## GLOSSARY

**Applicable or Relevant and Appropriate Requirements (ARARs):** Requirements, including cleanup standards, standards of control, and other substantive environmental protection requirements and criteria, for hazardous substances as specified under federal and state laws and regulations, that must be met to comply with CERCLA and SARA.

**Comprehensive Environmental Response, Compensation and Liability Act (CERCLA):** Also known as Superfund, CERCLA is the federal law that regulates the environmental investigation and cleanup of sites that could endanger public health, welfare, or the environment.

**Human Health/Ecological Risk Assessment (HHRA/ERA):** Qualitative or quantitative evaluation of the risk posed to human health and/or the environment by the actual or potential presence or release of hazardous substances, pollutants or contaminants (source: EPA Glossary).

**Land Use Control (LUC):** Physical, legal, or administrative mechanisms that restrict the use of, or limit access to, contaminated property in order to reduce risk to human health and the environment.

**Munitions Constituents (MC):** Include material originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and nonexplosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

**Munitions and Explosives of Concern (MEC):** Distinguishes specific categories of military munitions that may pose unique explosives safety risks including: (1) Unexploded Ordnance (2) Discarded Military Munitions, and/or (3) Munitions Constituents present in high enough concentrations to pose an explosive hazard.

**MEC Hazard Analysis (MEC HA):** A MEC HA is the evaluation of existing and potential conditions at a munitions response site that could lead to an explosive event if a member of the general public (i.e., a receptor) interacts with the item. The evaluation considers the likelihood and the severity of the event that may occur.

**National Oil and Hazardous Substances Contingency Plan (NCP):** The federal regulation that guides determination of the sites to be corrected under both the Superfund program and the program to prevent or control spills into surface waters or elsewhere.

**Superfund Amendments and Reauthorization Act (SARA):** SARA amended CERCLA and includes the importance of permanent solutions, new enforcement authorities, increased state involvement, increased focus on human health problems posed by hazardous waste sites, encouraged greater citizen participation, increased the size of the trust fund, and required EPA to make changes to the Hazard Ranking System.

## REFERENCES

- 40 Code of Federal Regulations (CFR) 300. *National Oil and Hazardous Substances Pollution Contingency Plan*. Available: <http://ecfr.gpoaccess.gov>.
- AECOM Technical Services, Inc. (AECOM). 2013. *Remedial Investigation, Former Moving Target Range, Marine Corps Base Hawaii, Oahu, Hawaii*. JBPHH, HI: Naval Facilities Engineering Command, Hawaii. October.
- AECOM. 2014. *Feasibility Study Former Moving Target Range, Marine Corps Base Hawaii, Oahu, Hawaii*. JBPHH, HI: Naval Facilities Engineering Command, Hawaii. December.
- Environmental Protection Agency, United States (EPA). 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. Interim Final. EPA/540/G-89/004. Office of Emergency and Remedial Response. October.

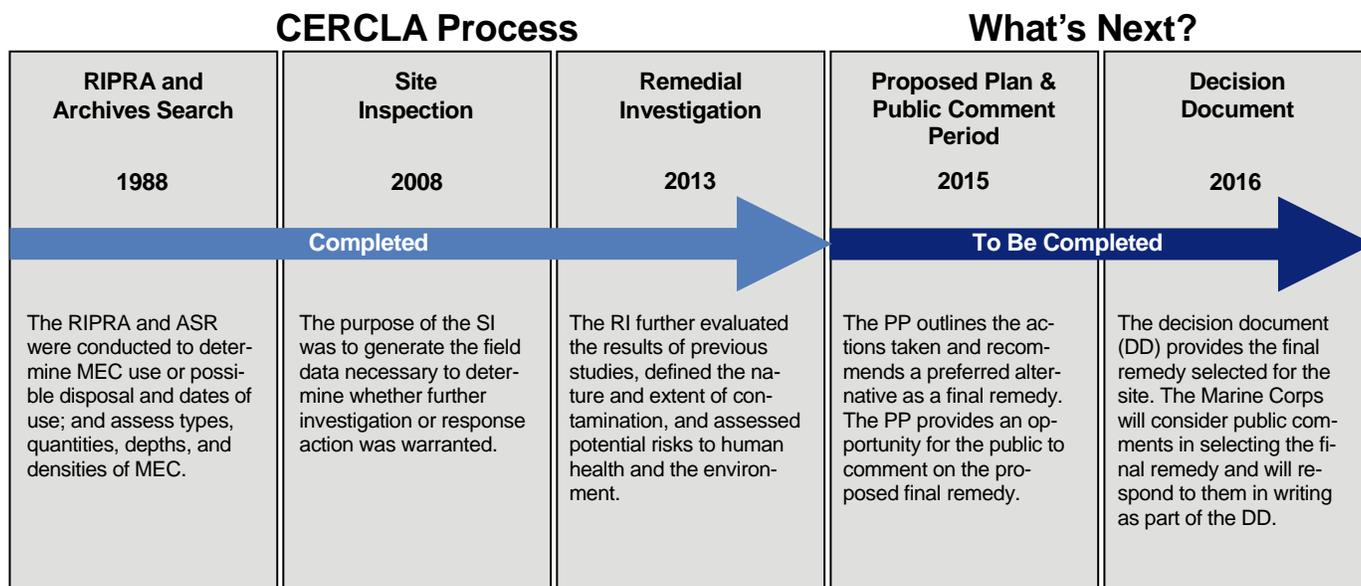


Figure 4: CERCLA Process and What's Next in the Process

United States Army Corps of Engineers (USACE). 1998. *Range Investigation and Preliminary Range Assessment and Archives Search Report, Marine Corps Base Hawaii and Associated Sites*.

USA Environmental, Inc. (USAE). 2011. *Final Site Inspection Report, Munitions Response Sites, Marine Corps Base Hawaii, Kaneohe Bay, Kaneohe, Hawaii. Pearl Harbor, HI: Naval Facilities Engineering Command, Hawaii*. April.

Corps may revise the proposed final remedy based on new information or public comments.

After carefully considering all comments received during the public comment period, the Marine Corps will select a final remedy for the Former Moving Target Range Site in coordination with the HDOH. The selected final remedy for the site will be presented in a DD. Figure 4 depicts the CERCLA process and upcoming steps in that process.

## COMMUNITY PARTICIPATION

The Marine Corps encourages the public to gain a comprehensive understanding of the site and the activities that have been conducted there. Community members and regulatory agencies have provided input by reviewing and commenting on reports/documents. The Marine Corps has provided information to the community through posting site reports and related documents in the information repository for the site, and announcements published in the *Honolulu Star-Advertiser*.

## WHAT'S NEXT

The Marine Corps encourages all interested parties to review and comment on this PP. Comments received from community members are valuable in helping the Marine Corps select the final remedy for this site. The Marine

There are two ways for you to provide your comments during the 30-day public comment period:

1. Send written comments to:

COMMANDING OFFICER  
ATTN LE  
BOX 63062 ENVIRONMENTAL  
KANEHOE BAY, HI 96863-3062

Phone: 808-257-6920  
Fax: 808-257-2794

2. Provide your comments during the public meeting. A court reporter will be present to record comments.

**Public Comment Period:**  
October 5, 2015—November 5, 2015

### For More Information:

All site-related documents are available for review at the Navy information repositories established at the Kailua Library, Kaneohe Library, and University of Hawaii's Hamilton Library.