



Remedial Investigation Waikane Valley Impact Area

Munitions Response Program
Kaneohe, Hawaii

Introduction

The Waikane Valley Impact Area (WVIA) is a 187 acre site that was used by the Marine Corps and Army for training from 1953 to 1976. It is located within the Waikane Valley Training Area in the Waiahole and Waikane Valleys, on Oahu's windward side (Kaneohe, Hawaii), approximately 10 miles northwest of Kaneohe Bay (see Figure 1).

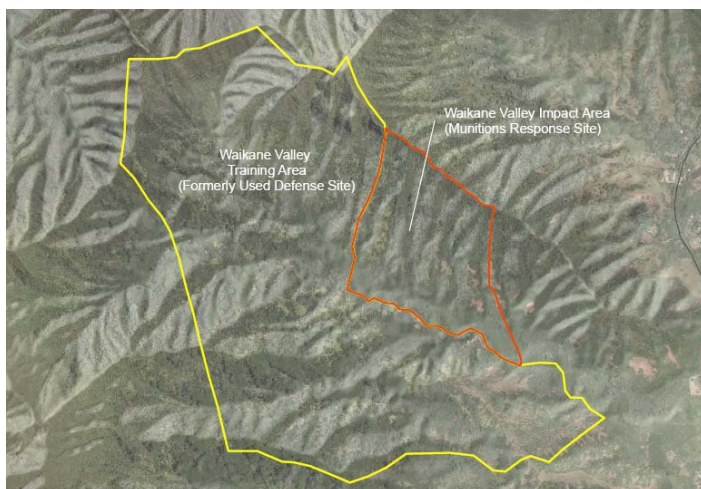


Figure 1: Map of Waikane Valley Impact Area

The former WVIA is being 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) comprised of unexploded ordnance (UXO), discarded military munitions, or munitions constituents (MC) (chemical components of munitions) remaining from past training activities.

Background

A Site Inspection (SI) conducted in September 2008 identified potential risks on the site from MEC items and MC. The SI recommended a detailed Remedial Investigation (RI) be conducted to better understand the risks and identify future actions for the site. The RI was conducted between March and May 2010 with the following objectives:

- Determine the extent and magnitude of explosive and chemical hazards existing at the site
- Evaluate safety hazards and health risks to humans and the environment
- Evaluate the data collected and make recommendations as to appropriate cleanup actions as

needed to reduce risk to safe levels

- Determine potential future land use

The RI field work focused on 5 Areas of Concern (AOCs), which included four target areas identified during the SI and the Waikane Stream Area (see Figure 2).

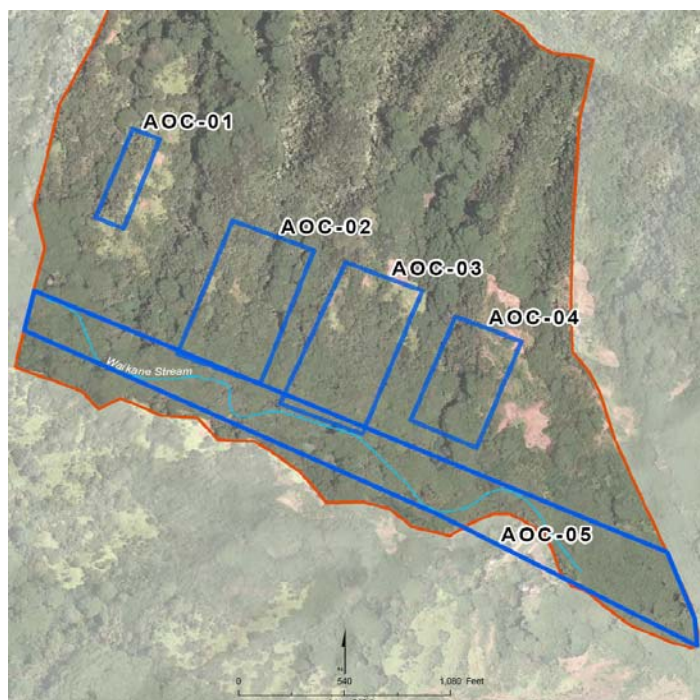


Figure 2: Waikane AOCs

RI Field Investigations

Two types of field investigation were conducted during the RI: (1) identification and clearance of MEC, and (2) soil and sediment sampling for MC. The remainder of this fact sheet is a summary of the results and conclusions from the RI.

Munitions & Explosives of Concern Investigation

All MEC investigation fieldwork was conducted by teams of highly trained UXO personnel. The MEC investigation included both surface and subsurface work.

Surface Clearance: MEC and munitions debris were surface-cleared from all accessible areas of the four target AOCs (see Figure 3). Transect areas were investigated to determine if MEC has migrated downhill by erosion. Each transect area was roughly 3 feet wide and they ranged from 37 to 78 feet in length.

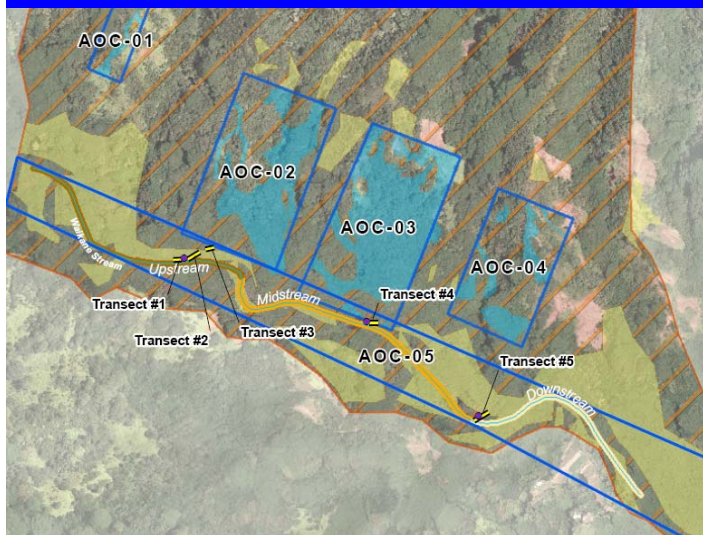


Figure 3: Surface-cleared areas shown in blue

Subsurface Investigation and Clearance: A subsurface investigation to identify and remove MEC down to maximum depth of detection was then conducted within grids within the target areas. For each target area, eight 50-foot by 50-foot grids were established based on the findings from the surface clearance activities: at least 2 grids were located at the densest occurrence of surface MEC within each AOC, and the remaining 6 grids were spread across each AOC to enable characterization of moderate and low density areas. Subsurface investigations were also conducted in the five transects within the Waikane Stream area.



Photo 1: 60mm HE mortar found in AOC-02

Results: Originally 24 acres were planned to be investigated during the RI. Due to the steep terrain and heavy vegetation, approximately 11 acres (accessible areas with less than 30 degree slope) were able to be accessed in AOC 01 through AOC-04. The steep terrain also limited the length of transects that could be established below the AOCs. MEC and MPPEH items were found most concentrated in the 40 acre yellow shaded area on Figure 6. This MEC concentration area includes part of AOC-02 and all of AOC-03 and AOC-04. MEC and MPPEH items were either blown-in-place or consolidated in one location for detonation to eliminate

explosive safety hazards. Over 8,080 pounds of MD were found during RI activities. Munitions debris was inspected, certified to be free from hazards, and shipped to a Mainland scrap metal recycling company, and melted down so that it no longer resembles munitions items.

Area of Concern	Total Area (acres)	Cleared Area (acres)	MPPEH (# of items)	MEC (# of items)	MD (pounds)
1	1.8	0.4	0	0	0
2	7.9	3.4	1	2	650
3	8.5	5.8	90	11	2,250
4	5.9	1.4	1	9	190

Field archaeologists inspected each work area before activities to determine if there were any archaeological features to be avoided. They also inspected any excavations to determine if any cultural feature was discovered or disturbed. No archaeological features were disturbed during the field activities.

Munitions Constituents Investigation

The target AOCs were broken down into 10 Decision Units (DU) for the purposes of soil sampling, and Waikane Stream was divided into three DUs (see Figure 4). Surface and subsurface soil samples were collected at each DU to characterize human health and ecological risks from metals and explosive compounds identified as chemicals of concern during the SI. Sediment samples were collected from three sections along Waikane Stream to determine if metals or the explosive compound RDX may have migrated down-gradient from the targets.

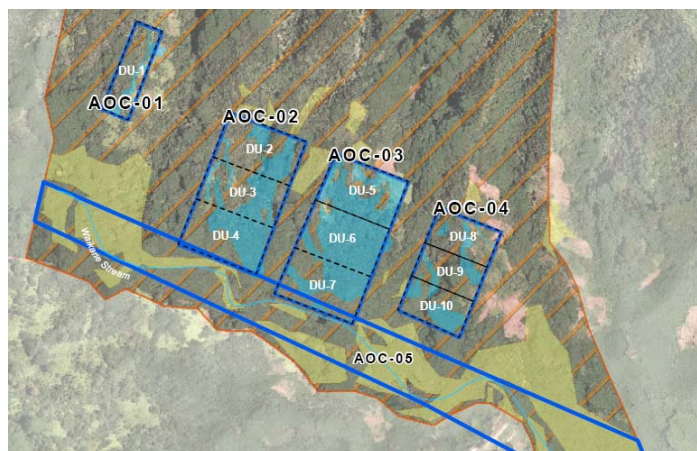


Figure 4: Decision Unit Locations

Soil samples were also taken from 10 Blow-in-Place locations in AOC-02, AOC-03, and AOC-04 to determine if the detonation activities during the RI impacted the soil.

Results: Concentrations of copper, antimony, and TNT were detected above the project screening levels in surface soil as seen in Figure 5. These concentrations appear to be associated with past firing activities



Photo 2: Collecting subsurface soil sample in AOC-3

conducted at the WVIA. Subsurface soil samples did not contain any of these compounds at concentrations above the screening levels.

Sediment samples were analyzed for the explosive compound RDX and metals. RDX was not detected in any of the sediment samples. Copper was detected above the screening level in all of the sediment samples, but the concentrations found are typical for the area. Volcanic soil naturally contains higher amounts of copper and the levels found are not thought to be associated with past military operations on WVIA.

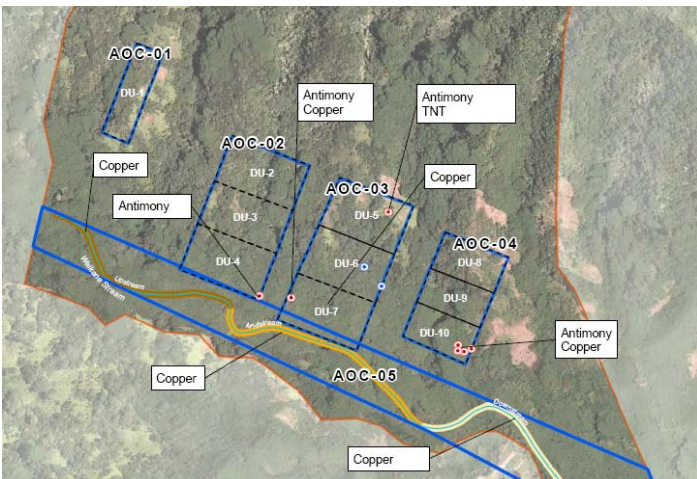


Figure 5: Locations of MC exceedances

Risk Assessments

Both a human health risk assessment and an ecological risk assessment were conducted using the soil and sediment sampling results. The human health risk assessment evaluated potential risks to people from three different exposure scenarios: construction workers, people using the site for recreational purposes, and if the

land were used for residential purposes. The ecological risk assessment evaluated potential risks to avian wildlife (the Hawaiian short-eared owl or Pueo) and aquatic habitats in Waikane Stream. Both assessments found potential risks from exposure to MCs at WVIA to be within acceptable, safe ranges based on USEPA guidelines.

The area south of Waikane Stream was considered to have no risk since no MEC or MD were found in the area. MEC Hazard Assessments were conducted for the AOC north of Waikane Stream with the following results: Target Area (in yellow on Figure 6):

- No action: Hazard Level (HL) 1
- Land Use Controls: HL 2
- Clearance: HL 3

Non-Target Area (in lavender on Figure 6):

- No Action or Land Use Controls - HL3
- Clearance - HL4

Recommendations

The WVIA has been broken down into two areas based on the RI results (See Figure 6):

1. The area shaded green south of Waikane Stream (34 acres) appears to be free of MEC and may be appropriate for unrestricted or minimally restricted use in the future.

2. The entire area north of Waikane Stream contains concentrations of MEC and could be addressed as a whole or in two parts:

- The area shaded yellow covers approximately 40 acres and contains the highest concentration of MEC and the highest potential explosive hazards.
- The area shaded lavender covers approximately 113 acres that were found to contain less MEC, but still pose a potential explosive hazard risk. This includes many of the steepest areas of WVIA, with slopes generally greater than 30 degrees.

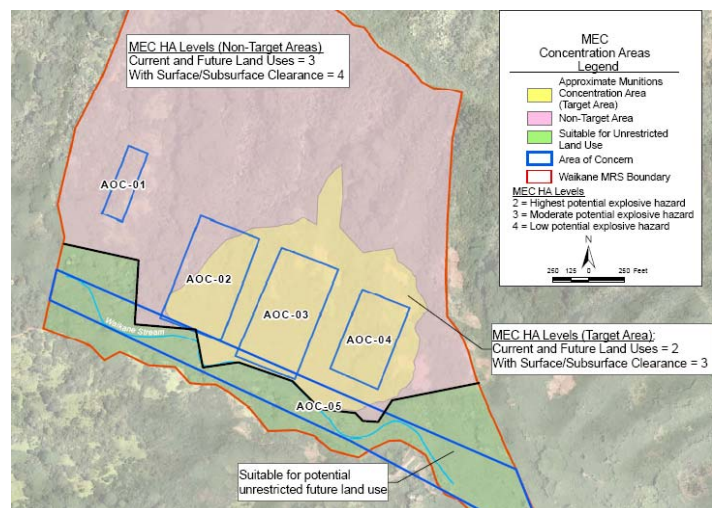


Figure 6: MEC Hazard Areas

A Feasibility Study is recommended to determine appropriate cleanup action or land use controls for each of the areas. Each area will also be evaluated for a "No Further Action" option.

Future Land Use

One of the goals of the RI is to identify future land use options for the WVIA property. The southernmost 34-acre area, which is potentially acceptable for unrestricted land use, is appropriate for residential and agricultural use, and has been used for such historically. The remainder of the site, although mostly inaccessible, may be acceptable for recreational use depending on the response action selected after the FS.

Next Steps

The draft version of the RI Report is now available for public comment until 1 January 2011. Based on the recommendations of the RI, a FS will be conducted to evaluate potential response actions to reduce potential risks from MEC at WVIA. The public will have the opportunity to review and comment on the draft FS Report. The anticipated schedule is as follows:

- Draft RI Report Comments due 1 January 2011
- Draft Final RI Report - February 2011
- Comments on Draft Final Report - March 2011
- Final RI Report - April 2011
- Draft Feasibility Study - June 2011
- Comment period - July 2011
- Draft Final FS Report - August 2011
- Final FS Report - September 2011

Community Safety Precautions

The fence and other safety precautions at WVIA are in place to protect the health and safety of the community. It is not safe to trespass within the WVIA. Residents can live and work safely near the WVIA provided they stay outside the fence surrounding Marine Corps property. Please help MCB Hawaii control access to the fenced property, and remind your family, friends, and fellow community members that it is not safe to venture into the site without appropriate escort.



Photo 3: MD Removed from AOC-3

COMMUNITY INVOLVEMENT

The Draft Remedial Investigation Report for Waikane Valley Training Area Munitions Response Sites, Kaneohe, Hawaii (November 2010) is available for review at the following information repositories:

University of Hawaii at Manoa

Hamilton Library, Hawaiian & Pacific Collection
2550 McCarthy Mall
Honolulu, HI 96822
Ms. Jean Kusano
(808) 956-8227

Kaneohe Public Library

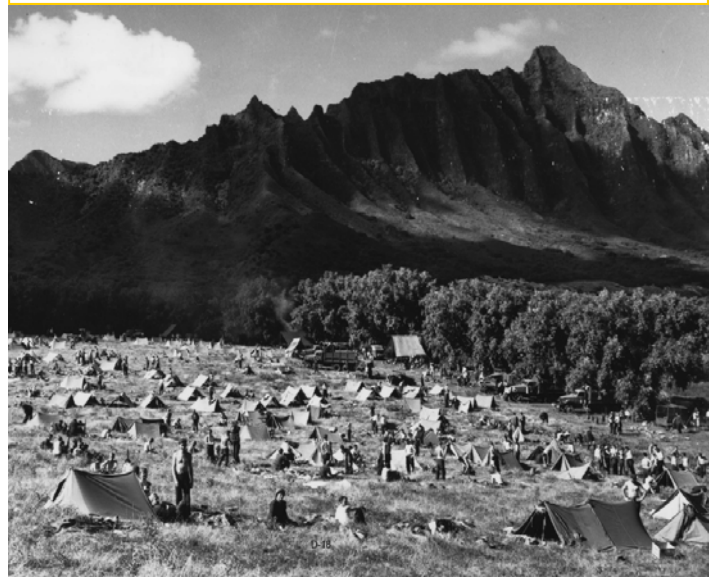
45-829 Kamehameha Hwy.
Kaneohe, HI 96744
Mr. Tom Churma
(808) 233-5674

KEY Project

47-200 Waihee Road
Kaneohe, HI 96744
Ms. Lanette Mahelona
(808) 239-5777

Marine Corps website

www.mcbh.usmc.mil/g4/envIRON/WaikaneRAB.htm



34th Infantry Encampment at Waikane Valley, circa 1943

For More information, Please Contact:
Marine Corps Base Hawaii Public Affairs Office (808) 257-8840