

APPENDIX G

UXO CALCULATOR RESULTS

APPENDIX G

Prior to conducting the Phase II Engineering Evaluation/Cost Analysis (EE/CA) field investigation at the Former Waikoloa Maneuver Area and Nansay Sites, initial sampling acreages were determined for each of the 13 sectors to be investigated using the UXO Calculator. The UXO Calculator is a statistical sampling tool developed by the U.S. Army Engineering and Support Center, Huntsville (CEHNC), that provides a data output (provided as attachments) showing the minimum number of acres to be used as a guideline to characterize a sector for OE at a given level of confidence.

Methodology. The initial sampling acreage for each sector, as determined by the UXO Calculator, was used as a guideline during the Phase II EE/CA field investigation so that adequate coverage and data could be obtained to characterize each sector for the presence of OE. In some sectors, this minimum sampling acreage was not necessary because sufficient data was collected during the field investigation to characterize the sector for OE. In other areas, additional sampling acreage was necessary to characterize a sector for OE. Table G-1 shows the Sector Number, Sector Name, Total Acreage, UXO Calculator Sampling Acreage (used as a guideline during the Phase II EE/CA field investigation), and the Total Acreage Investigated during the Phase II EE/CA field investigation.

Table G-1. Initial Sampling Acreages and EE/CA Field Investigation Summary

Sector Number	Sector Name	Total Acreage	UXO Calculator Sampling Acreage ^(a)	Total Acreage Investigated ^(b)
1	Kaniku Lava Flow	10,193	4.7	1,476.75 ^(e)
2a	Waikoloa Village - West	4,062	23.0	38.1
2b	Waikoloa Village - East	4,255	23.0	21.62
3	Keamuku	28,058	4.7	5,067.53 ^(e)
4	Lalamilo Wind Farm	677	22.7	11.56
5	Waikoloa Road	4,273	23.0	33.15
6	Pu'u Pa Maneuver Area	22,501	23.0	1,289.21 ^(e)
7	Holoholoku	21,601	4.7	8,455.41 ^(e)
8	Hawai'ian Homelands	11,070	-- ^(c)	-- ^(c)
9	Kawaihae Road	2,458	23.0	5.52 ^(d)
10	Lalamilo State Land	8,553	23.0	27.23
11	Puako Parcel	2,629	23.0	42.68
12	O'uli Parcel	493	22.5	13.95
13	West Waimea/Kamuela Airport	2,142	23.0	16.14
Total		122,965	243.3	16,498.85

Notes: (a) Computed using UXO Calculator prior to the Phase II EE/CA field investigation.
 (b) Total acreage investigated by visual reconnaissance, geophysical mapping, and visual surface searches.
 (c) Sector 8 not investigated during the EE/CA due to no right-of-entry.
 (d) Eastern portion of Sector 9 not investigated during the EE/CA due to no right-of-entry.
 (e) Acreages for Sectors 1, 3, 6, and 7 are high due to visual reconnaissance in these areas.
 UXO = unexploded ordnance

Sectors 1, 3, 6, and 7. In Sectors 1, 3, 6, and 7, visual reconnaissance surveys were conducted to determine if any of these areas required further investigation (i.e., geophysical mapping and OE sampling). All four of these sectors were identified (see Section 3.1.1) as having little or no military activity conducted on them in the past. The visual reconnaissance surveys were performed in these areas to identify any visible surface evidence of past military use of explosive ordnance. If OE or evidence of past military use was discovered in an area, visual reconnaissance was halted and the area was set aside for later investigation by means of geophysical mapping and intrusive OE sampling. As shown in Table G-1, the number of acres investigated in these four sectors is higher than the remaining sectors due to the extensive coverage obtained in these areas during the visual reconnaissance survey; therefore, the data collected in these areas provides a greater than 90 percent confidence level that if OE were present, it would have been discovered in these areas during the Phase II EE/CA field investigation.

Sectors 2a, 2b, 4, 5, 9, 10, 11, 12, and 13. These sectors were investigated by means of geophysical mapping (see Section 3.1.2) during the Phase II EE/CA field investigation. The UXO Calculator sampling acreages, as shown in Table G-1, were used only as a guideline to obtain sufficient coverage to characterize each sector for OE. Data collected in these sectors was reviewed on a daily basis during the Phase II EE/CA field investigation. Once sufficient data was collected to characterize the sector for OE, geophysical mapping and intrusive sampling crews moved to the next area of concern. In a few sectors, additional sampling acreage was necessary to determine the location and depth of OE in the area. In other sectors, obtaining the predetermined UXO Calculator sampling acreage was not required as sufficient data to characterize the sector for the presence of OE were obtained prior to reaching the planned coverage. For example, if UXO was found in a sector and sufficient data was collected to determine its depth and location (i.e., areal extent), continuing the investigation in this area would likely not provide any new information. Sufficient data would have been collected to recommend and justify an appropriate OE response action for the area.

UXO Calculator Data Output. The UXO test densities (i.e., UXO Test Count) used for determining the initial planned survey coverage (as shown in the attached data outputs) are based on the expected population (determined by current and future land use) for each sector. A test density of 0.1 UXO per acre was used where 20 or more people could reasonably use or pass through the area each day. Where public usage of the land is less than 20 per day, a 0.5 UXO per acre test density was used. The resulting calculations provide the minimum number of acres to be investigated in each sector. Assuming this acreage is investigated, if more than 1 UXO were present in the area, there is a 90 percent probability it would have been discovered.

UXO Calculator Data Output

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 1 - Kaniku Lava Flow

Minimum Discrimination Level

Area of total sector of interest (acres): 10,193

Area of investigated subsector (acres): 4.7

UXO Test Count: 0.5

Probability of 1 or more ordnance items in the investigated area: 90.47%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 2a - Waikoloa Village (West)

Minimum Discrimination Level

Area of total sector of interest (acres): 4,062

Area of investigated subsector (acres): 23.0

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 90.04%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 2b - Waikoloa Village (East)

Minimum Discrimination Level

Area of total sector of interest (acres): 4,255

Area of investigated subsector (acres): 23.0

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 90.04%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 3 - Keamuku

Minimum Discrimination Level

Area of total sector of interest (acres): 28,058

Area of investigated subsector (acres): 4.7

UXO Test Count: 0.5

Probability of 1 or more ordnance items in the investigated area: 90.47%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 4 - Lalamilo Wind Farm

Minimum Discrimination Level

Area of total sector of interest (acres): 677

Area of investigated subsector (acres): 22.7

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 90.06%

UXO Calculator Data Output

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 5 - Waikoloa Road

Minimum Discrimination Level

Area of total sector of interest (acres): 4,273

Area of investigated subsector (acres): 23.0

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 90.04%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 6 - Pu'u Pa Maneuver Area

Minimum Discrimination Level

Area of total sector of interest (acres): 22,501

Area of investigated subsector (acres): 23.0

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 89.99%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 7 - Holoholoku

Minimum Discrimination Level

Area of total sector of interest (acres): 21,601

Area of investigated subsector (acres): 4.7

UXO Test Count: 0.5

Probability of 1 or more ordnance items in the investigated area: 90.47%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 8 - Hawai'ian Homelands

Minimum Discrimination Level

Area of total sector of interest (acres): 11,070

Area of investigated subsector (acres): 23.0

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 89.99%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 9 - Kawaihae Road

Minimum Discrimination Level

Area of total sector of interest (acres): 2,458

Area of investigated subsector (acres): 23.0

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 90.08%

UXO Calculator Data Output

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 10 - Lalamilo State Land

Minimum Discrimination Level

Area of total sector of interest (acres): 8,553

Area of investigated subsector (acres): 23.0

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 90.01%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 11 - Puako Parcel

Minimum Discrimination Level

Area of total sector of interest (acres): 2,629

Area of investigated subsector (acres): 23.0

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 90.08%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 12 - O'uli Parcel

Minimum Discrimination Level

Area of total sector of interest (acres): 493

Area of investigated subsector (acres): 22.5

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 90.00%

Site Name: Former Waikoloa Maneuver Area and Nansay Sites

Sector Name: Sector 13 - West Waimea/Kamuela Airport

Minimum Discrimination Level

Area of total sector of interest (acres): 2,142

Area of investigated subsector (acres): 23.0

UXO Test Count: 0.1

Probability of 1 or more ordnance items in the investigated area: 90.10%