7.0 IDENTIFICATION OF RESPONSE ACTION ALTERNATIVES AND EVALUATION CRITERIA

7.1 IDENTIFICATION OF RESPONSE ACTION ALTERNATIVES

The four OE response action alternatives identified and evaluated in this EE/CA report were developed to break or weaken the chain of events described in Chapter 6.0 by reducing public interaction with OE. These alternatives were selected because they generally provide discernible variability in their potential effectiveness, implementability, and cost and because they are consistent with those considered at other ordnance sites throughout the United States. These alternatives are:

- Alternative 1: No Action Indicated (NAI)
- Alternative 2: Institutional Controls (engineering controls, educational programs, legal mechanisms, and construction support)
- Alternative 3: Surface Clearance of OE
- Alternative 4: Subsurface Clearance of OE to Depth of Detection.

Implementation of the NAI alternative would involve no site-specific work. Implementation of Institutional Controls focuses on separating the public from OE and educating the public to recognize the hazards associated with OE. OE clearance alternatives include implementation of technologies for efforts associated with removal of OE from the surface and subsurface (i.e., Surface Clearance of OE and Subsurface Clearance of OE to Depth of Detection). A combination of institutional controls and surface/subsurface clearance can also be implemented at the former maneuver area based upon the presence of UXO and the current and future land use. For example, institutional controls can be implemented to effectively manage residual risk that may remain once a surface clearance has been conducted.

7.1.1 Alternative 1 - No Action Indicated (NAI)

Surface and subsurface OE clearance would not occur under this alternative, which does not include any U.S. Army-initiated actions under current or projected future land use. However, NAI indicates that the FUDS program will review any new information regarding DOD activities as it becomes available. If munitions are discovered in the future, the USACE will reconsider the status of the property. NAI is indicative of a determination that is open to further and future review of an area.

7.1.2 Alternative 2 - Institutional Controls

Institutional controls protect property owners and the public from hazards present at a site by warning of the OE hazard and/or limiting the access or use of a site.

Institutional controls include engineering controls, educational programs, legal mechanisms, and construction support. The overall effectiveness of institutional controls depends entirely on local agencies and private landowner support, involvement, and willingness to enforce and maintain institutional controls implemented to eliminate public interaction with OE.

An Institutional Analysis (Chapter 5.0) was performed to identify local agencies and private landowners and determine how institutional controls could be implemented at the former maneuver area. The analysis identified which, if any, of the described institutional controls were applicable and which agencies or entities would be responsible for implementing, maintaining or enforcing the institutional controls. The following paragraphs describe in detail the four types of institutional controls.

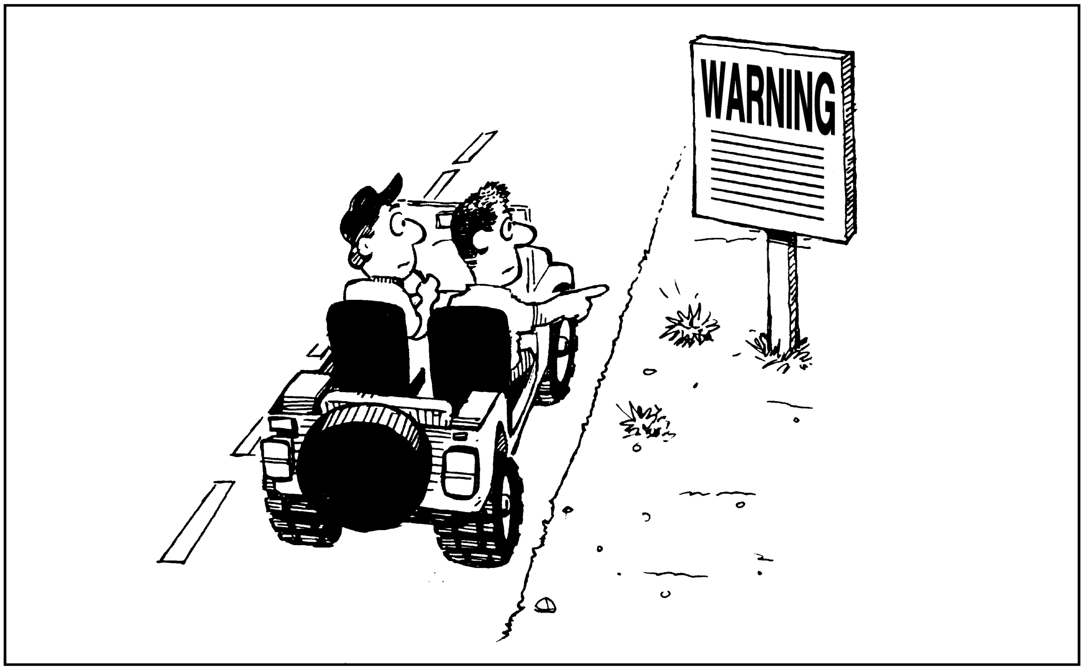
7.1.2.1 Engineering Controls.

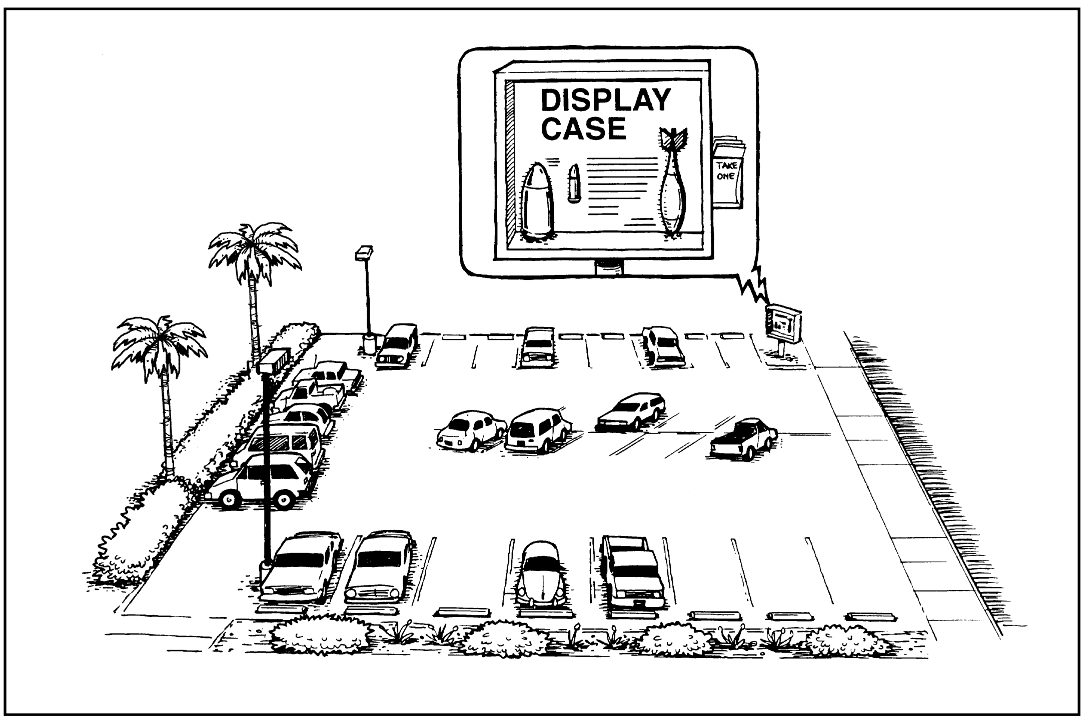
Engineering controls either limit the public's access to a site or limit the public's exposure to the residual contamination that remains on a site to an acceptable level. Engineering controls can take on many forms and are often developed to meet the specific conditions of a site. Engineering controls are most effective when implemented in conjunction with other types of institutional controls (e.g., educational programs, construction support), rather than as stand-alone mechanisms.

When using engineering controls to limit the public's exposure to OE, the current land use of the area around the contaminated site must be considered. For example, if residential areas, schools, or playgrounds surround the property, or if the public frequents the property, the potential for exposure and adverse consequences is increased and, therefore, a higher level of access control would be necessary. Examples of engineering controls that have historically been effective in limiting access and reducing exposure to OE are warning signs, fences, security patrols, and soil caps.

Engineering controls protect against inadvertent access or exposure to the hazards associated with a site. They have the advantage of being passive (i.e., once they are in place they do not require human interaction to provide notice or protection, other than to maintain the integrity of the control). Another advantage of engineering controls is that they provide a direct deterrent to those who are the most likely to come into contact with a contaminated area by either limiting access or providing a warning describing the nature of the hazards posed by a contaminated site. Engineering controls are an important part of institutional control programs in areas where it is particularly important to protect against inadvertent access, such as in areas where it can be expected that children will be in the vicinity. Engineering controls require routine inspection and maintenance in order to remain effective.

Warning Signs. Warning signs (Figure 7-1) can be used to provide notice and information regarding the OE hazard present at a site. Warning signs provide the following information: the nature of the OE hazard, how to avoid the OE hazard,





Waikoloa/033

Institutional Controls

Figure 7-1

and who to contact for additional information. Warning signs installed on posts or warning signs affixed to existing or added fencing can be used to deter access to a site or give notice so that inappropriate uses of the site are avoided. While warning signs on posts may not provide the physical barrier of a fence, a warning sign has the added benefit of providing information to the public concerning the nature of the OE hazard present at a site in areas where fencing may not be optional.

Warning signs on posts can be installed at all major access points of entry and/or along the perimeter fencing of an OE site. There has been considerable debate whether warning signs are an effective means of communicating safety hazards at an OE site, or if they actually encourage scavenging of OE items. Given the potential for an otherwise unwary public to access an area containing OE, and given the current trend in legal liability cases involving injury and death, warning signs communicating a hazard to the public are useful and have been proven effective at similar OE sites throughout the United States. The posted warning signs will inform the public of potential safety hazards and communicate the following information:

- Why a safety hazard exists in the context of the history of the military installation or training area

- How to avoid encountering an OE item (e.g., by staying within picnic or campground areas or on specified roads and trails where OE has been removed, and by avoiding access and/or excavation in areas of suspected OE)

- What to do and whom to contact if an OE item is encountered.

Fences. Fences are probably the most common type of engineering control that has historically been used to limit public access to an OE site. Fences are used to restrict inadvertent public entry to a site that poses a threat to human safety. By providing access only at certain points of entry, appropriate notice can be given to all users and uses incompatible with the existing site conditions.

Fences can physically restrict access to a site and can vary in effectiveness based upon the type and height of the fence installed. Generally speaking, the more substantial a fence, the more effective it is (i.e., a wall is more effective than a barbed-wire fence). Taller fences are considered to be more effective at restricting access than shorter fences. Fences are considered for use in areas where OE is present and where public access to OE would likely result in potential exposures. At sites where the risk of OE exposure is low, fencing may not be necessary. Generally, fences would not be appropriate as a permanent method of exposure prevention because they require continual maintenance and repair, and a determined individual can overcome even the best of fences. A barbed-wire fence affixed with warning signs is considered an effective temporary measure to restrict access to OE sites. This type of fence would prevent individuals from inadvertently accessing an OE site.

Barricades can be of value when closing roads or trails that access OE sites. Barricades currently used throughout the former maneuver area consist of locking gates that limit or preclude public access. Other forms of barricades, including rock barriers or densely vegetated areas, can also be effective in blocking road/trail access. As with fences, barricades are generally more effective when combined with warning signs.

Security Patrols. Security patrols can be instituted by the entity having jurisdiction over an individual area and would involve law enforcement authorities (e.g., South Kohala Police District) or private security firms (in the case of private property). In order to be effective, regulations regarding site access would have to be implemented and then enforced by the entity having jurisdiction over that area. Private entities could restrict trespassing through a combination of local police and private security firms.

Soil Caps. Placing a cap on a contaminated site by covering it with concrete, asphalt, or clay has been proven to be an effective physical barrier to public exposure to certain types of residual contamination. Such an engineering control would have definite application for certain OE-contaminated sites, if the cap were combined with a restriction on any future excavation at the site. By combining the engineering control of the cap with the legal restriction of limiting future use, the risk of the public coming into contact with OE is virtually eliminated.

7.1.2.2 Educational Programs.

The use of educational programs is an effective strategy to manage and reduce residual risk from public exposure to OE. An educational program may take on many forms and be easily tailored to meet the specific needs of a site and the surrounding community. Examples of educational programs include formal education seminars and public notices.

Educating the local community is an extremely important part of any institutional control program. Generally, if people are aware of and understand the hazards associated with an OE-contaminated site, they will take the necessary precautions to avoid exposure. Education programs can be tailored to meet the specific needs of a particular audience (e.g., local homeowners, school children, regulators, and developers) and can be performed as often as necessary to educate those that are at greatest risk for exposure to OE. Educational efforts constitute a stand-alone institutional control, but can also improve the effectiveness of other controls that are part of the overall program.

Formal Education Seminars. Formal education seminars may include periodic community education classes. The classes can be given to a number of different audiences including open public forums, local government and/or regulatory personnel, emergency response personnel, property owners, private developers and real estate agents, children at the local schools, and local business personnel who may have laborers who work in the area of concern. The training seminars can be tailored to meet the specific interests/concerns of the audience, and can be an effective method to “spread the word” as to the nature and extent of the hazards associated with OE and the precautions to be taken in the event that a person comes in contact with OE. The training classes may either be provided by personnel knowledgeable in the specific conditions of the site or through the distribution of OE safety awareness training videos to local organizations and public libraries. In order to be effective, educational seminars need to be continual (e.g., every 6 months) so that the audience of concern does not forget or become complacent about the hazards associated with OE. Formal education seminars that are consistently performed are successful in educating new homeowners and visitors to the area.

Public Notices. The local community can be educated through the implementation of a wide-ranging public notice campaign that may include mass mailings of informational pamphlets, display case installation (see Figure 7-1), public service announcements on local radio or television stations, or periodic notices in local newspapers. This type of educational media will serve to educate the local community and visitors to the area. One method that has been used at sites with a high public turnover rate is to notify any new residents/businesses to the area once they have contacted the local utility to start a new service. Once the utility company has received the request for the new service, they can include in their initial mailing to the new customer a brochure outlining the site-specific hazards and what should be done in the event of an emergency. The following paragraphs provide details concerning various types of public notices that can be used to educate and inform local communities.

Real Estate Environmental Notices. Some state codes require real estate disclosure statements on residential real property proposed for transfer. These state codes usually require disclosure of matters relating to the physical condition of the property to be transferred, including the known presence of hazardous materials or substances.

Community Awareness Meetings. Community awareness meetings are generally held when significant site remediation documents that address OE issues are released to the public and provide information regarding: (1) OE previously recovered at the site, (2) options available to remove ordnance (if required) and enhance public safety, (3) how this information was evaluated in the EE/CA report, and (4) recommendations being made to address ordnance issues at a particular site.

Media Advertisements and Information Spots. Media advertisements and information spots can be important tools in promoting public awareness regarding OE issues at a site. Media advertisements can include newspaper, radio, and television interviews. Although the media is generally limited in terms of the depth of information portrayed, it does have the advantage of reaching the widest possible audience.

Display Cases. Display cases (see Figure 7-1) can be positioned throughout the area of concern with emphasis on local public gathering areas (e.g., post offices, schools, libraries, and shopping centers). Display cases can showcase the types of ordnance used at the site, provide visual schematics/photographs that can be used to educate the public concerning the hazards associated with OE, and provide information concerning whom to contact if OE is found. Display cases typically provide a distribution slot for informational pamphlets/fact sheets that can be picked up by the public.

Informational Pamphlets, Fact Sheets, and Letter Notifications. Informational pamphlets and fact sheets can be developed and distributed to support safety briefings and/or speaking engagements and are also effective as stand-alone educational materials. Informational pamphlets and fact sheets can be developed to warn the public of the hazards of ordnance in the historical context of former military operations that occurred at an OE site. Informational pamphlets and fact sheets can be mailed to residents in the vicinity of an OE site or they can be distributed from central locations such as libraries, or posted on educational display cases positioned at strategic locations throughout the site (e.g., hiking trailheads and local libraries). In that regard, an effective informational pamphlet or fact sheet will contain photographs and/or drawings of typical ordnance items that the public might encounter and previously recovered OE site locations on a map. A telephone number for the appropriate local authority is typically included in the informational pamphlet or fact sheet. Letter notifications (generally distributed via U.S. certified mail) are also an effective means of informing local property owners of the results of the EE/CA investigation and the types of ordnance that have been found surrounding their property. Letter notifications can be mailed to each landowner within an OE site to inform them of the EE/CA investigation results and the proposed recommendations for the area. The initial distribution and development of educational materials would be funded by the USACE. Long-term implementation would be the responsibility of landowners and local agencies.

Internet. As the general public's use of the Internet increases, a Web site can become a valuable public information tool, allowing the reader greater proficiency in understanding OE issues. Web sites are accessible through public Web browsers in local libraries and educational institutions and via Web browsers in the home or workplace. Use of a Web site has several benefits: a large amount of information can be posted (e.g., public notices, news releases, fact sheets, maps, reports, survey results) and the information can be updated on a regular basis.

7.1.2.3 Legal Mechanisms.

Specific legal approaches including easements, restrictive covenants, reversionary interests, zoning, permitting, siting restrictions, and overlay zoning have been used for many purposes other than limiting exposure to environmental risks such as OE. Legal mechanisms are particularly effective types of institutional controls due to the following:

- Other than periodic monitoring necessary for enforcement, legal mechanisms do not require the physical maintenance that is necessary for other types of institutional controls, such as engineering controls.

- Title recording systems, local planning commissions, and other administrative systems and associated staff already exist in most jurisdictions and can be used to implement a legal mechanism as part of an institutional control program. Additional funding may be required for the administering agency depending on the extent of additional effort required due to the implementation of an institutional control program at a site within their jurisdiction.

Legal mechanisms require constant oversight and support in order to remain effective. Administrative programs to implement and enforce legal mechanisms are already in place; however, they are sometimes not effective in protecting against inappropriate land use and should be used in conjunction with other programs. Legal mechanisms are categorized into two broad areas: proprietary controls and local government controls.

Proprietary Controls. Proprietary controls are those institutional controls that are associated with ownership of the land and are, therefore, often included in the deed for the land. Proprietary controls are classified as either nonpossessory or possessory controls.

Nonpossessory proprietary controls means the holder of these interests has a right to use or restrict use of a piece of land, but does not have the right to actually possess it. Examples of this type of control include easements, restrictive covenants, and reversionary interests.

A possessory proprietary control means that the holder of the control retains either a full or partial interest in the future use of the land. Such controls can be achieved either by retaining ownership or by retaining a major share in a joint ownership of a property through a limited partnership with others. Such programs have been used both in the private sector, as well as by the government, where the holder of the possessory proprietary control wishes to retain some say in the future use of a property without having the responsibility of complete and total ownership. Limited partnerships are an example of a possessory proprietary control that has been used in the past to limit future land use.

Easements. The most common nonpossessory proprietary control is known as an easement. An easement is an interest in a piece of land that entitles its holder to use the land or restrict the use of the land owned by another. Easements may be categorized as appurtenant or gross, affirmative or negative, or statutory.

- **Appurtenant Easement.** An easement is considered appurtenant if the holder is the owner of nearby land that benefits from the easement. For example, this occurs when a neighbor is allowed to walk across another person's property to access the beach.

- **Gross Easement.** A gross easement is one in which the holder, usually a company or public entity, does not own the land, but has the ability to use it. For example, this occurs when a gas company is allowed to lay a gas line on another person's property.

- **Affirmative Easement.** An affirmative easement allows the holder of the easement to use the land in a way that otherwise they could not. This is the most common type of easement. An example of an affirmative easement is, again, the gas company that has the ability to lay a gas line on another person's property.

- **Negative Easement.** A negative easement prohibits the use of the land in a manner that would otherwise be legal. An example of a negative easement is the owner of a hazardous waste landfill who is prohibited from developing the property for another use because of the current use of the site.

- **Statutory Easements.** Some states have developed statutory easements, including conservation easements, which restrict the property use to one that is compatible with conservation of the environment or scenery. In the particular case of sites contaminated with OE, an easement may be enacted that would restrict the new property owner to land uses that are compatible with the level of OE clearance performed during the removal action.

As with all proprietary controls, the effectiveness of an easement to control appropriate use of a property containing residual contamination is dependent on the compliance of the property owner with the easement. Generally, only the holder of an easement has the power to enforce compliance with the terms of the easement. This requires that the holder remain aware of activities at the property and is kept informed of any proposed changes in use of the property. If the holder of the easement (e.g., DOD) does not act on a land use violation once it has been identified, third parties (such as local or county governments) do not have the authority to enforce the easement.

Restrictive Covenants. A restrictive covenant, which is also known as a deed restriction, can be used to prohibit certain types of development, use, or construction on a piece of land where residual contamination does not allow unrestricted use of the property. Under a restrictive covenant, legal action can be taken to enforce the restriction if the new property owner does not abide with the development restrictions imposed at the time of sale or lease. A restrictive covenant may be either affirmative or negative. An example of an affirmative restrictive covenant would be a landowner that is required to do something that they would otherwise not be required to do. An example of a negative restrictive covenant would be a landowner that may not do something that they are otherwise normally free to do.

Restrictive covenants tend to be a less desirable method of control than easements. Restrictive covenants have been controversial in the past because many were intended to maintain elite neighborhoods and viewed to be racist in their intent. For this reason, many restrictive covenants have been removed by judicial order. In addition, the variability of state property laws tends to be greater for restrictive covenants than for easements, making them more difficult to administer. In general, a covenant does not give the holder the right to enter and inspect the property to ensure that the owner is complying with the covenant. Therefore, an easement or some other agreement should also be agreed upon at the time a covenant is implemented as an institutional control.

Reversionary Interests. This type of proprietary control is also known as "future estates." The deed establishes certain conditions that would cause the property to revert back to the original owner if the conditions cited in the reversionary interest are violated. As such, this type of institutional control is like an easement, but with the added provision that if the terms of the institutional control are violated, the property will revert back to the original owner (the holder of the reversionary interest). The existence of a reversionary interest does not, in itself, prevent incompatible land uses, but it does provide the means for stopping the incompatible activities by reverting ownership rights to the original owner if a violation were to occur. Reversionary interests have been effectively used in the past to control future land use on sites that contain environmental contamination. Although a reversionary interest does not prevent inappropriate use of a property, it can serve to halt such activities by reacquisition of the land by the holder of the reversionary interest.

Local Government Controls. Local government controls provide potential avenues for the implementation of institutional controls at sites that are contaminated with OE. Controls on land use that local governments have the power to impose and enforce include zoning restrictions, permitting programs, siting restrictions, and overlay zoning.

Zoning Restrictions. The primary method of locally controlling land use is through the development of zoning ordinances and community master plans. A typical zoning program geographically divides an area into zones with different regulations written to apply to each zone. The regulations vary between zones but apply equally to all properties within a zone. Generic zoning categories include residential, commercial, and industrial. The zoning restrictions that have been developed by the local zoning board are often posted in a master plan that lays out the type of land use that is allowed in a particular area.

Permitting Programs. Permitting programs are another means that local governments have to limit land use. In establishing a permit program, the permitting agency determines specific conditions that must be met before a certain use or action is allowed on a property. Existing permit programs include building permits, water/sewer connection permits, and state well drilling permitting systems that have been developed to protect the quality and use of groundwater. Permit programs have also been developed to help ensure that site developers are aware of and comply with special procedures that are required in the development of a parcel (e.g., requiring a builder to replace the existing soil on a parcel because of its poor structural characteristics). Historically, permit programs have been developed in areas where special requirements are necessary to protect human safety and the environment because of residual contamination that remains on a property. For example, a permit program can be established for the former maneuver area that would require a developer to contact the USACE, Honolulu District (CEPOH), to provide construction support (as discussed in Section 7.1.2.4) by clearing the construction footprint of an area (if necessary) prior to excavation for footings or foundations.

The general protection standard for construction safety in OE sites identified in this EE/CA report is to maintain a 2-foot buffer (which will have been subjected to OE excavation and clearance) between the anticipated level of construction disturbance and any potential OE that may lie below the disturbed site. For this reason, and because of the potential for excavation to occur in small, focused areas, construction support has been identified. Construction support would require anomaly detection and excavation similar to that of a Subsurface Clearance of OE to Depth of Detection. Each site where construction support is contemplated should be scrutinized to determine whether there is a reasonable potential to expect OE at depth.

Siting Restrictions. Siting restrictions have historically been used to limit land use in areas subject to natural hazards such as earthquakes and floods. This type of control has also been used to protect natural resources from development (such as with the existing wetlands program). Several states and local governments also have substantial siting restrictions in place that limit the future development of properties within their jurisdiction.

Overlay Zoning. Siting restrictions may be combined with local zoning ordinances or master plans to establish an effective institutional control. This practice is known as "overlay zoning." When using overlay zoning, the specific siting restriction is used as an overlay on the local government's master plan, thereby highlighting any discrepancies between the two. In the case of sites contaminated with OE, the location of the site may be identified on an overlay of the local zoning map or master plan. The overlay would serve to notify those involved in land use planning of the hazards and land use restrictions associated with the site.

An OE overlay could be applied to any land use at the former maneuver area, allowing the county to regulate development in consideration of potential OE issues. For example, if an area identified as an OE site fell within a commercial land use, that area could be identified as "commercial" with an "OE overlay" designation. For an OE overlay to be effective, it should define the depth and areal extent to which OE clearances have occurred at the site. The county could then stipulate the conditions under which excavation or development could occur.

In practice, construction support could be implemented as an "overlay" applied to those areas at the former maneuver area where construction may occur. For example, a portion of the area may be designated for residential development or a parking lot requiring cut and fill. Here, an overall recommendation for an OE clearance throughout the site may be made (to address public access). In portions of the area where cut and fill would be required, deeper OE clearances could be specifically designated in the areas to be cut. The same concept could be applied to a deep utility corridor that may transect the area.

7.1.2.4 Construction Support.

Construction support is a Subsurface Clearance of OE to Depth of Detection of limited footprints in areas where construction would occur. Construction support is an option in areas that have not been recommended for a subsurface clearance. These are areas where there is a very low probability of subsurface ordnance being present (i.e., areas with little or no OE that are recommended for institutional controls only). As a result of the qualitative risk analysis performed in Chapter 4.0, a large portion of the former maneuver area may be recommended for construction support. Details concerning the coordination and prearrangement of construction support with the USACE, Honolulu District (CEPOH), are provided in Section 7.1.2.5, Implementation of Construction Support.

UXO support during construction activities may require the following: (1) UXO safety support or (2) a complete subsurface clearance response, depending on the probability of encountering UXO. If the probability of encountering UXO is low, only UXO safety support will be required. Once a determination is made that the probability of encountering UXO is moderate to high (e.g., OE was employed or disposed of in the area of concern), UXO-qualified personnel must conduct a Subsurface Clearance of OE to Depth of Detection of the known construction footprint and remove all discovered UXO. The level of effort for construction support is both site specific and task specific and will be determined on a case-by-case basis.

Typically, standard OE excavation operating procedures associated with construction support are similar to those described in Sections 7.1.3 and 7.1.4. Construction support would likely be implemented at the time of construction. It should be noted that construction support should be initiated if the following two conditions exist:

- The area identified for construction will be excavated deeper than that anticipated for the land use

- OE is suspected in the area of anticipated ground disturbance associated with construction

In practice, construction support would be implemented as an "overlay" applied to those areas where construction may occur. For an OE overlay to be effective, it should define the depth and areal extent to which OE clearances have occurred at the site.

UXO Safety Support. A UXO team consisting of a minimum of two qualified UXO personnel (one UXO Technician III and one UXO Technician II) shall be used to provide safety support during construction activities in areas potentially contaminated with UXO. The UXO team should review any archival information available regarding the area of the proposed construction activities. If possible, the UXO team should determine the probable types of UXO that may be encountered and specific safety considerations. The UXO team should meet with on-site management and construction personnel and conduct a general work and safety briefing prior to commencement of any on-site activities.

The UXO team should monitor all excavation activities in areas potentially contaminated with UXO. One member of the team should be positioned to the rear and upwind of the excavation equipment for continuous visual observation of activities. If the construction contractor unearths or otherwise encounters suspect

UXO, all excavation activities will cease. The UXO team will assess the condition of the OE item to determine if disposal by means of explosive detonation is required. Once UXO has been encountered in an excavation, no further excavation is permitted at that location until the UXO item has been removed.

Subsurface Clearance of Construction Footprint. The subsurface clearance process requires close coordination among on-site management personnel of the USACE, Honolulu District (CEPOH), construction contractor, and UXO contractor. The UXO team should physically preview the actual construction footprint with other on-site management personnel and discuss visual observations and potential areas of concern. Subsurface clearance actions must be accomplished in strict accordance with the approved Work Plan, Site-Specific Health and Safety Plan, Explosives Safety Plan (ESP), and ESS (if required).

The UXO team should be familiar with these plans and should review any archival information available regarding the area of the proposed construction activities. If possible, the UXO team should determine the probable types of UXO that may be encountered and specific safety considerations. Prior to commencing subsurface clearance activities, the UXO team should provide a general work and safety briefing to all on-site personnel.

In the event subsurface utilities are suspected in an excavation area, the UXO team must attempt to verify their location. All located utilities should be marked by paint, pin flags, or other appropriate means to visually delineate their approximate subsurface routing.

Area preparation may require reduction and/or removal of vegetation that may impede or limit the effectiveness of subsurface clearance actions. Vegetation reduction/removal may be accomplished through manual removal, mechanical removal, controlled burning, or defoliation. A surface clearance may be required to remove any existing OE from the surface of the work area. All OE, OE scrap, and non-OE metallic scrap that may interfere with a subsurface geophysical survey will be removed from the surface of the work area and staged for later disposal. A subsurface geophysical survey will be conducted to identify and locate all anomaly sources. Subsurface geophysical surveys may be completed using detection instrumentation with real time or post-processing identification and discrimination techniques.

<u>Anomaly Excavation</u>. Anomaly excavation operations are required to intrusively investigate and identify the source of all anomalies located during the subsurface geophysical survey of the construction footprint. During excavation operations, only those personnel deemed necessary for the operation shall be within the exclusion zone. Typically, activity-essential personnel will manually complete anomaly excavations of less than one foot using a shovel (or similar hand tool). If an anomaly source is deeper than one foot, earth-moving machinery can be used to assist in excavation efforts unless site constraints or accessibility restrict or prohibit use. Earth-moving machinery should not be used to excavate within 12 inches of an anomaly source. When an anomaly excavation gets within approximately 12 inches of an anomaly source, the excavation should be completed manually with a shovel (or similar hand tool).

After the source of the anomaly is identified and removed, an approved geophysical instrument will be used to validate the process. If the geophysical instrument does not continue to detect an anomaly, then the excavation may be backfilled and restored in accordance with contract requirements.

Estimated costs for implementation of various types of Institutional Controls, including construction support, are provided in detail in Appendix H.

7.1.2.5 Implementation of Construction Support.

Construction support must be precoordinated in advance of construction activities with the USACE, Honolulu District (CEPOH), office. Property owners will be required to provide a to-scale plan map showing the location and footprint of the planned construction, as well as a description of the activity and the anticipated depth of intrusion (e.g., a footer for a garage with a 2-foot below grade excavation; construction of a below ground swimming pool with a planned 9-foot below ground surface excavation).

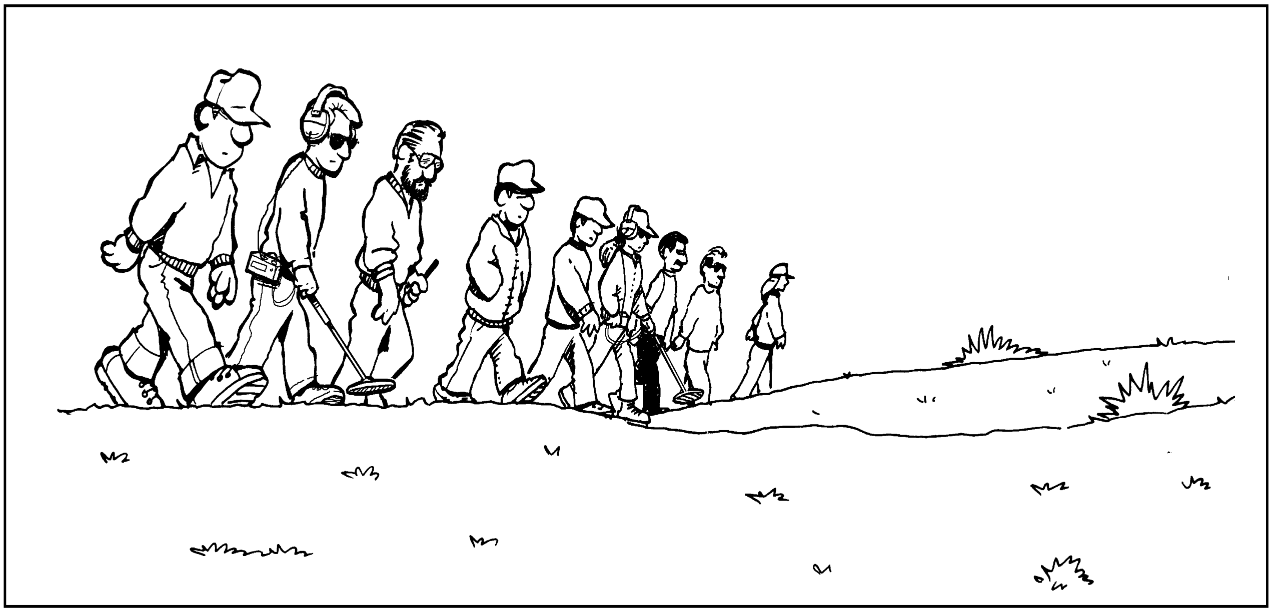
Construction activities that disturb 2 acres or less will require 15 days advance notification to allow the USACE, Honolulu District (CEPOH), to review and accommodate the request (if necessary). Planned construction that will disturb 2 to 5 acres will require 30 days advance notification; construction disturbances greater than 5 acres will require that the property owner notify the USACE, Honolulu District (CEPOH), office 60 days prior to construction to allow sufficient time to procure and mobilize the appropriate support personnel and equipment.

7.1.3 Alternative 3 - Surface Clearance of OE

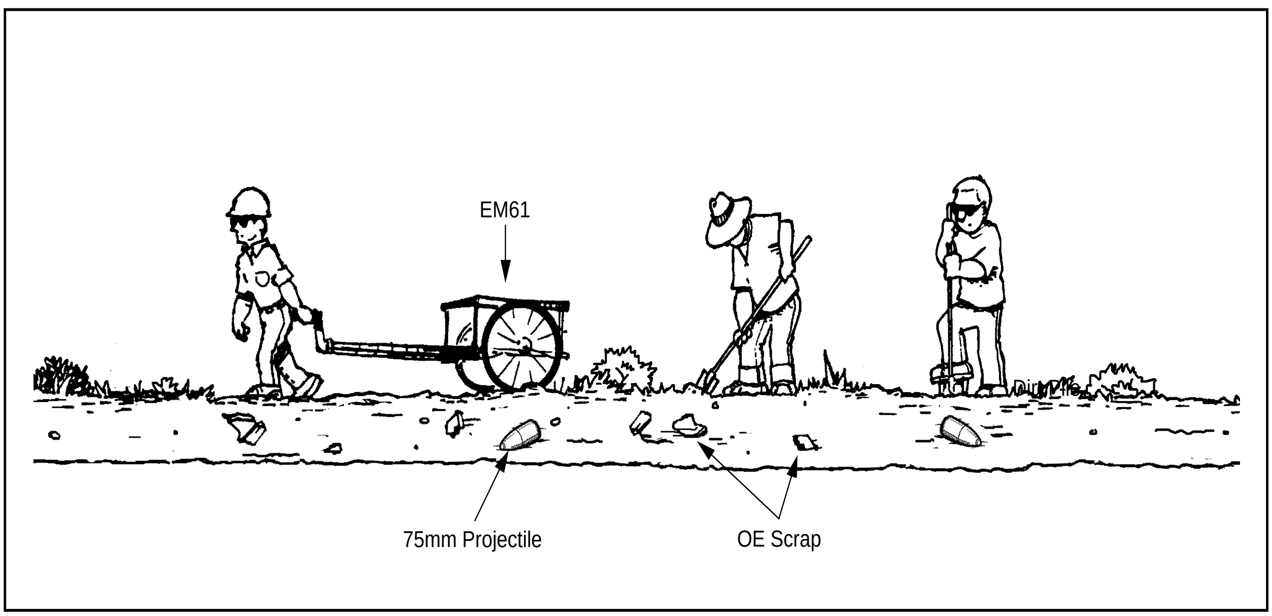
This OE response action alternative includes the location and removal of ordnance from the ground surface (Figure 7-2). For surface clearance, teams of UXO-qualified personnel use visual identification, aided by hand-held metal detectors, to search for ordnance. The surface clearance would be conducted by establishing a system of grids within a series of sweep lanes would be placed. These lanes are typically 5 feet in width or narrower, depending on the geophysical instrumentation used.

Dense vegetation can be a hindrance to and reduce the overall effectiveness of a surface clearance. There are areas at the former maneuver area characterized by dense brush and kiawe that would hinder surface clearance activities.

UXO recovered during the surface clearance would be detonated in place if not safe to move to an on-site area specifically designated for destruction of recovered UXO items. Additionally, surface clearance and detonation of UXO would occur within public safety exclusion zones, which vary in size, depending on the maximum fragmentation range of the UXO item recovered. OE-related scrap would be taken off site and turned in to a scrap metal recycler.



Alternative 3: Surface Clearance of OE.



Waikoloa/034

Alternative 4: Subsurface Clearance of OE to Depth of Detection.

Surface Clearance of OE and Subsurface Clearance of OE to Depth of Detection

Figure 7-2

The average cost per acre to perform a Surface Clearance of OE at the Former Waikoloa Maneuver Area and Nansay Sites is provided in Appendix H.

7.1.4 Alternative 4 - Subsurface Clearance of OE to Depth of Detection

This OE response action alternative includes the subsurface excavation and clearance of all detected ordnance items using geophysical instrumentation within a specified OE site (see Figure 7-2). Risk reduction benefits and costs increase as the depth of clearance increases. Subsurface Clearance of OE to Depth of Detection removes detectable hazards and provides effective risk reduction for areas subject to both surface and limited intrusive activities (e.g., recreational activities and fence post installation). Subsurface Clearance of OE to Depth of Detection would require teams of UXO-qualified personnel to excavate all detected subsurface anomaly sources and dispose of all UXO items discovered. Geophysical methods would be used to map and identify anomalies in the proposed clearance areas. The geophysical methods that would be used to detect subsurface ordnance for a clearance action would be very similar to those employed for the EE/CA field investigation. The subsurface source locations of anomalies identified through processing of the geophysical data would be located (surveyed) and marked with pin flags. UXO-qualified personnel would intrusively investigate the marked locations to identify the source of the anomalies. Depending on the amount of ordnance expected on the surface, a surface clearance might be necessary prior to geophysical mapping and subsequent removal of detectable ordnance. UXO recovered during the intrusive investigation would be relocated if safe and moved for disposal, or detonated in place after establishment of a public safety exclusion zone sized to provide a safe fragmentation distance from the item being detonated.

Subsurface Clearance of OE to Depth of Detection does not address unlimited intrusive activities because no detection, mapping, and clearance of OE based on aboveground-deployed detection methods can be 100 percent effective. Intrusive activities requiring excavations below the level of OE clearance in known OE areas should be evaluated and, if necessary, performed only in conjunction with construction support.

The average cost per acre to perform a Subsurface Clearance of OE to Depth of Detection at the Former Waikoloa Maneuver Area and Nansay Sites is provided in Appendix H.

7.2 ORDNANCE AND EXPLOSIVES RESPONSE ACTION ALTERNATIVE EVALUATION CRITERIA

This section describes the evaluation criteria and process used to determine the most appropriate OE response actions for the Former Waikoloa Maneuver Area and Nansay Sites. The results of the qualitative risk analysis in Chapter 4.0 are used as a basis for the evaluation of the four OE response action alternatives in Chapter 8.0. The evaluation and determination of the most appropriate OE response action alternative for each OERIA evaluation area (Chapter 8.0) is used to form the basis for the specific recommendations made for the Former Waikoloa Maneuver Area and Nansay Sites (Chapter 9.0).

For each OERIA evaluation area in Chapter 8.0 (Figure 8-1), OE response action alternatives are first evaluated in terms of their effectiveness, implementability, and cost. The purpose of this evaluation is to identify the most appropriate OE response action alternatives to render each evaluation area compatible with its current and projected future land use. For effectiveness, the ranking considers protection of human safety, compliance with applicable or relevant and appropriate requirements (ARARs), and long- and short-term effectiveness. For implementability, the alternatives are ranked by technical and administrative feasibility, agency and community acceptance, and availability of services and materials. Cost considerations are made using detailed costing assumptions and costing backup (Appendix H). The exception is the NAI alternative, which has no associated costs.

7.2.1 Effectiveness

Effectiveness is a measure of an alternative's ability to reduce the potential for exposure to or interaction with OE. It is generally a measure of an alternative's ability to meet the criteria of protecting public safety and the identified ARARs. Effectiveness is also evaluated in terms of long-and short-term practicability. A concise interpretation of these criteria is as follows:

Protection of Human Safety. This criterion is a measure of how well the alternative reduces the public's exposure to and interaction with OE, the reduction in terms of possible injury or death to humans, and protection of the environment. As such, it considers the following:

- The net reduction in OE
- The estimated quantity of residual OE
- The expected depth of residual OE
- The potential exposure pathway between humans (considering future land use) and OE
- The potential for an individual to interact with any OE once an exposure occurs.

Effectiveness rankings are based mainly upon whether UXO was recovered during the EE/CA field investigation (or during previous investigations) and the probability of exposure to UXO based on population data and current and future land uses. For Institutional Controls (Alternative 2), it is difficult to account for the benefit in reduction of exposure as a result of display board placement, community awareness outreach programs, or educational media. It has been assumed that the effectiveness of Institutional Controls (Alternative 2) in protecting human safety would be greater than NAI (Alternative 1), but less than Surface Clearance of OE (Alternative 3) or Subsurface Clearance of OE to Depth of Detection (Alternative 4).

Compliance with ARARs. This criterion is a measure of how well the alternative meets the identified chemical-, action-, and location-specific ARARs (federal, state, and local). Currently, no chemical-specific ARARs exist for ordnance sites.

Recommended OE response actions will be conducted in accordance with appropriate regulations. An analysis of the ARARs for the Former Waikoloa Maneuver Area and Nansay Sites is presented in Section 7.3.

Long-Term Effectiveness. This criterion is a measure of how well the OE response action alternative protects human safety once it has been implemented. The remaining potential for exposure or interaction with UXO is characterized by the following factors:

- The magnitude of potential exposures and interaction following implementation of the selected alternative
- The permanence of the exposure and interaction reduction due to implementation of the selected alternative
- The reliability of the controls and maintenance measures in managing residual OE following implementation of the selected alternative.

Short-Term Effectiveness. This criterion is a measure of how well the OE response action alternative meets the exposure and interaction reduction objectives during its implementation. This includes:

- The ability of the alternative to reduce risk during implementation
- The potential for adverse effects on the environment during the alternative's implementation
- The time required to implement the alternative
- The potential for adverse effects on humans, including the community and personnel involved in implementation of the alternative.

7.2.2 Implementability

Implementability is a measure of whether an OE response action alternative can be physically and administratively implemented, such as the ability to construct, excavate, or demolish. It is also a measure of the availability of the services and materials needed to implement the alternative. Other considerations regarding implementability include local agency and community acceptance of a given alternative. A concise interpretation of the criteria governing implementability is as follows:

Technical Feasibility. This criterion refers to:

- The reliability of the action with regard to implementation
- The actual ease of field implementation (e.g., construction, clearance action)

- The ease in undertaking future actions related to the initial undertaking

- The ability to monitor the effectiveness of the action.

Administrative Feasibility. This criterion is a measure of the ease with which an alternative can be implemented in terms of permits and rights-of-entry, coordination of services to support the action (e.g., legal services), or the arrangement of delivery or security services.

Availability of Services and Materials. This criterion is a measure of the availability of goods and services needed to support implementation of the alternative. Examples of this criterion include the availability of specialized personnel (i.e., UXO-qualified technicians) and equipment (e.g., geophysical instruments), availability of explosives for demolition purposes, availability of a suitable disposal facility for the ordnance scrap (i.e., proximity of local scrap metal recycling facility), and the condition of the existing infrastructure to allow ingress and egress of personnel and material to and from the project site.

Local Agency Acceptance. This criterion deals with the acceptance of the alternative by applicable state, county, and city agencies, as expressed by representatives under the agency's authority. Rankings of alternatives under this criterion are marked under the "Agency Acceptance" column in the tables in Chapter 8.0 showing rankings of implementability. Local agency acceptance has been established based on information gathered during several RAB meetings, public meetings, and interaction with local agencies to date, and may be updated at any time during the EE/CA review process.

Community Acceptance. This criterion relates to the degree of acceptance of the alternative by the community, including owners of property adjacent to the area. Public sentiment expressed during town hall meetings, public workshops, city council or county supervisor meetings, or institutional analysis is a means of determining community acceptance. Rankings of alternatives under this criterion are marked under the "Community Acceptance" column in the tables in Chapter 8.0 showing rankings of implementability. Community acceptance has been established based on information gathered during several RAB meetings, community meetings, and interaction with private landowners to date, and may be updated at any time during the EE/CA review process.

7.2.3 Cost

The cost of implementing each of the OE response action alternatives has been estimated. The exception is NAI, which has no associated costs. A detailed summary of these costs and costing assumptions is presented in Appendix H.

For Institutional Controls (Alternative 2), the costs include those associated with access controls (e.g., warning signs), community awareness outreach programs (e.g., display cases, periodic community awareness meetings, informational pamphlets, landowner notifications, OE safety awareness training video), construction support, and administration and maintenance costs associated with these activities. For Surface Clearance of OE (Alternative 3) and Subsurface Clearance of OE to Depth of Detection (Alternative 4), the costs are one-time capital costs and do not include monitoring for sensitive species or habitat restoration.

Examples of capital costs include those costs incurred by the UXO-qualified contractor for conducting the field activities (i.e., surface clearance, geophysical mapping, intrusive OE sampling, and demolition activities) associated with implementing a subsurface clearance. Examples of operation and maintenance costs would include repairing and replacing perimeter signs and educational display boards over a specified length of time.

The benefit of the investment in reducing risk is also considered when ranking the OE response action alternatives. This involves identifying the overall reduction in risk to the public versus the cost of implementing the alternative. For example: if two alternatives provide an equal or comparable amount of protection, the less expensive alternative would provide the greatest benefit for the dollars spent and, therefore, would be ranked as the better alternative in terms of cost benefit.

7.2.4 Example of Alternative Evaluation Process

Table 7-1 provides an example evaluation of the four OE response action alternatives, as presented in Chapter 8.0. As shown in Table 7-1, each alternative is ranked according to the criteria presented in Sections 7.2.1, 7.2.2, and 7.2.3. The alternative that is determined to be the best alternative when assessed with the criteria receives a numerical ranking of 1. The second best alternative receives a numerical ranking of 2, and so forth. Once the numerical ranking has been determined for the three criteria (effectiveness, implementability, and cost) for each of the four OE response action alternatives, the overall score is determined by adding up the individual numerical rankings for each alternative. For example, NAI received a ranking of “4” for effectiveness, a ranking of “1” for implementability, and a ranking of “3 “ for cost. The overall score is determined by adding these up, yielding a final score of “8.” This is continued for each of the four alternatives until all of the individual rankings have been added up and the totals have been placed into the column marked “Overall Score.”

Table 7-1. Example of Alternative Evaluation Process

Alternative	Effectiveness Rank	Implementability Rank	Cost Rank	Overall Score	Overall Rank
1, No Action Indicated (NAI)	4	1	3	8	3
2, Institutional Controls	3	2	1	6	1
3, Surface Clearance	2	3	2	7	2
4, Subsurface Clearance	1	4	4	9	4

Note: Ranking from best to worst; best = 1.
OE = ordnance and explosives

Using the overall score, an overall ranking of the four alternatives is performed in the column marked “Overall Rank.” The alternative with the lowest score (in this case, Institutional Controls) is ranked 1 (best), the alternative with the second lowest score is ranked 2 (second best), and the alternative with the highest score is ranked 4 (last). As shown in Table 7-1, Institutional Controls (Alternative 2) ranked as the best alternative (ranked 1) in this example evaluation based on its effectiveness, implementability, and cost.

Using this comparative evaluation and ranking process, an analysis of the four OE response action alternatives was performed for each of the 20 OERIA evaluation areas at the Former Waikoloa Maneuver Area and Nansay Sites (Chapter 8.0).

7.3 ASSESSMENT OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS)

Section 121 of CERCLA requires that site cleanups comply with federal ARARs, or state ARARs in cases where these requirements are more stringent than federal requirements. ARARs are derived from both federal and state laws. Under CERCLA Section 121(d)(2), the federal ARARs for remedial action could include requirements under any of the federal environmental laws (i.e., Clean Air Act [CAA], CWA, Safe Drinking Water Act [SDWA]). State ARARs include promulgated requirements under state environmental or facility siting laws that are more stringent than federal ARARs and that have been identified in a timely manner, according to 40 Code of Federal Regulations (CFR) Part 300.400(g)(4). A requirement may be either “applicable” or “relevant and appropriate.”

Applicable requirements are defined as those cleanup or control standards, or other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state laws. Applicable requirements are identified on a site-specific basis by determination of whether the jurisdictional prerequisites of a requirement fully address the circumstances at the site or the proposed remedial activity. All pertinent jurisdictional prerequisites must be met for the requirement to be applicable. These jurisdictional prerequisites are as follows:

- The party must be subject to the law
- The substances or activities must fall under the authority of the law
- The law must be in effect at the time the activities occur
- The statute or regulation requires, limits, or protects the types of activities.

A requirement is applicable if the specific terms (or jurisdictional prerequisites) of the statute or regulation directly address the circumstances at the site.

If not applicable, a requirement may be relevant and appropriate if circumstances at the site are sufficiently similar to the problems or situations regulated by the requirement. “Relevant and appropriate” refers to those clean-up standards, or other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law, that, while not necessarily applicable, address problems or situations sufficiently similar to those encountered at the CERCLA site, and whose use is well suited to the particular site (U.S. Environmental Protection Agency, 1993). The relevance and appropriateness of a requirement can be judged by comparing a number of factors including the characteristics of the remedial action, the items in question, or the physical circumstances of the site, with those addressed in the requirement. If there is sufficient similarity between the requirements and circumstances at the site, determination of the requirement as relevant and appropriate may be made.

Determining whether a requirement is both relevant and appropriate is a two-step process. First, to determine relevance, a comparison is made between the response action, location, or chemicals covered by the requirement and related conditions at the site, release, or potential remedy. A requirement is relevant if it generally pertains to these conditions. Second, to determine whether the requirement is appropriate, the comparison is further refined by focusing on the nature of the items, the characteristics of the site, the circumstances of the release, and the proposed response action. The requirement is appropriate if, based on such comparison, its use is well suited to the particular site. The facility must comply with requirements that are determined to be both relevant and appropriate.

In addition to ARARs, nonpromulgated advisories or guidance referred to as "to be considered" (TBC) materials may also apply to the conditions found at a site. TBCs are not legally binding.

There are certain circumstances under which ARARs may be waived. CERCLA Section 121(d) allows the selection of alternatives that will not attain ARAR status if any of six conditions for a waiver of ARARs exists. However, the selected alternative must be protective even if an ARAR is waived. Only five of the conditions for a waiver may apply to a DOD site. The conditions for a waiver are as follows:

- The clearance action selected is only part of a total response action that will attain such level or standard of control when completed.

- Compliance with such a requirement at a particular site will result in greater risk to human safety and the environment (i.e., worker safety) than alternative options.

- Compliance is technically impracticable from an engineering perspective.

- The clearance action selected will result in a standard of performance that is equivalent to an applicable requirement through the use of another method or approach.

- A state requirement has not been equitably applied in similar circumstances on other clearance actions within the state.
- A fund-financed clearance action does not provide a balance between available monies and the need for protection of public safety

and the environment at sites where the need is more immediate (not applicable to DOD sites).

ARARs that govern actions at CERCLA sites fall into three broad categories based upon the chemical contaminants present, site characteristics, and alternatives proposed for cleanup. These three categories (chemical specific, location specific, and action specific) are described in the following subsections.

7.3.1 Chemical-Specific ARARs

Chemical-specific ARARs include those environmental laws and regulations that regulate the release to the environment of materials with certain chemical or physical characteristics or that contain specified chemical compounds. These requirements generally set health- or risk-based concentration limits or discharge limits for specific hazardous substances by media. Chemical-specific ARARs are triggered by the specific chemical contaminants found at a particular site. The U.S. Environmental Protection Agency (EPA) presently considers standards developed under the Resource Conservation and Recovery Act (RCRA), the SDWA, the CWA, and federal Ambient Water Quality Criteria for the protection of aquatic life as potential ARARs. A more stringent standard, requirement, criterion, or limitation promulgated pursuant to a state environmental statute is also a potential ARAR.

7.3.2 Location-Specific ARARs

Location-specific ARARs govern activities in certain environmentally sensitive areas. These requirements are triggered by the particular location and the proposed activity at the site. An example of a location-specific ARAR is compliance with the Endangered Species Act of 1973, as amended, to avoid sensitive ecosystems or habitats. Location-specific ARARs also focus on wetland or floodplain protection areas, or on archaeologically significant areas.

7.3.3 Action-Specific ARARs

Action-specific ARARs are restrictions that define acceptable treatment and disposal procedures for hazardous substances. These ARARs generally set performance, design, or other similar action-specific controls or restrictions on particular kinds of activities. An example might be a state Air Quality Management Authority that sets limitations on fugitive dust generated during grading and excavation activities during a clearance action.

In determining whether a requirement was pertinent to future OE response actions (i.e., Surface Clearance of OE, Subsurface Clearance of OE to Depth of Detection), potential ARARs were initially screened for applicability. If determined not to be applicable, the requirement was then reviewed for both relevance and appropriateness. Requirements that are considered relevant and appropriate command the same importance as applicable requirements. Potential federal and state ARARs determined to be specific to the Former Waikoloa Maneuver Area and Nansay Sites are listed in Table 7-2.

Table 7-2. Applicable or Relevant and Appropriate Requirements (ARARs), Former Waikoloa Maneuver Area and Nansay Sites
Page 1 of 6

Requirement	Citation	Description	Type	Comments
Federal				
Resource, Conservation, and Recovery Act (RCRA) Subpart M (Military Munitions Rule)	40 CFR Part 266	Identifies when military munitions become a solid waste, and, if these wastes are hazardous, the management standards that apply.	Contaminant specific	Recovery, collection, and on-range destruction of UXO and munition fragments are not subject to hazardous waste regulations or permits. OE discovered in burial pits or trenches could be considered solid waste in accordance with the rule. However, this requirement is not applicable until the state implements the federal Military Munitions Rule as a state-implemented federal requirement.
RCRA	40 CFR Part 261.23	Identifies characteristics of reactivity including explosives.	Contaminant specific	Solid waste that meets the characteristics of reactivity will be treated as hazardous.
RCRA, Identification and Listing of Hazardous Wastes	40 CFR Part 261.3	Requires that waste be analyzed to determine if it represents RCRA hazardous waste based on established lists and hazardous waste characteristics, such as reactivity and toxicity.	Action specific	There is the possibility that an analysis of excavated soils may be required to determine if they are classified as a RCRA hazardous waste.
Fish & Wildlife Coordination Act	16 U.S.C. 661 et seq.	Prohibits actions from harming local fish and wildlife	Location specific	Activities are projected to occur in areas populated with wildlife. Provisions of this act should be followed.
Endangered Species Act (ESA)	16 U.S.C. 1533	Prohibits federal actions from modifying critical habitats or jeopardizing the continued existence of protected endangered or threatened species.	Location specific	Prior to and throughout the field activities, all steps necessary will be conducted to minimize the impacts to listed plant and animal species and their habitats (see Section 2.1.6). All on-site employees will undergo a briefing regarding the species present and measures for precluding impacts to those species and their habitat.

Table 7-2. Applicable or Relevant and Appropriate Requirements (ARARs), Former Waikoloa Maneuver Area and Nansay Sites
Page 2 of 6

Requirement	Citation	Description	Type	Comments
Clean Air Act Amendments (CAAA) of 1977 and 1990	42 U.S.C. 7401 et seq. 40 CFR 50 et seq.	Establishes primary and secondary air quality standards necessary to protect health, welfare, plant and animal life, buildings, materials, and visibility. The responsible agency is the U.S. EPA.	Location specific	Activities may occur that would require air quality monitoring for PM_{10}, sulfur oxide, particulate matter, ozone, nitrogen dioxide, and lead.
Archaeological Resources Protection Act (ARPA)	16 U.S.C. 470	The ARPA prohibits unauthorized excavation of, and sets standards for protection of, archaeological resources. Prohibits disclosure of archaeological resources by federal agencies.	Location specific	If any sites (properties) are uncovered or affected by the fieldwork, proper procedures must be in place under the ARPA to evaluate and protect cultural resources.
National Historic Preservation Act (NHPA)	16 U.S.C. 470	Requires action to be taken to locate, identify, evaluate, and protect cultural resources.	Location specific	If additional properties are uncovered or existing sites are affected by intrusive OE sampling, conditions of the NHPA must be followed.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)	42 U.S.C. 9601-11050	Legislation that finances remediation and creates a national policy to identify and clean up sites contaminated by the release of hazardous substances.	Action specific	Provides factors to be considered in determining the appropriate removal action and specifies that public affairs must be coordinated in accordance with directives for the CERCLA response action.
Occupational Safety and Health Administration (OSHA)	29 CFR Part 1910.120	Defines the manner in which hazardous waste and emergency response actions must be carried out. Covers emergency response operations for the release of, or substantial threat of, hazardous substances without regard to the location of the hazard.	Action specific	The possibility of a fire or explosion will exist during intrusive OE sampling activities. All site personnel must be in compliance with 29 CFR Part 1910.120, requiring workers to be 40-hour health and safety trained with an 8-hour refresher. An annual medical surveillance examination is also required.

Table 7-2. Applicable or Relevant and Appropriate Requirements (ARARs), Former Waikoloa Maneuver Area and Nansay Sites
Page 3 of 6

Requirement	Citation	Description	Type	Comments
Hazard Communication	29 CFR Part 1910.1200	Specifies that the hazards associated with all chemicals produced or imported be evaluated, and that information concerning their hazards be transmitted to employers and employees.	Action specific	All employees and visitors are made aware of the hazards associated with OE clearance and UXO demolition activities.
Hazardous Substance	49 CFR Part 172.101	Details DOT classification of hazardous materials.	Action specific	Transportation of explosives to be used in the detonation of UXO as a means of on-site disposal must comply with DOT regulations. UXO-qualified personnel must inspect the loading and unloading of the explosives, and the transport vehicle must be properly maintained and placarded.
National Environmental Policy Act (NEPA)	40 CFR Parts 1500-1508	Requires that public officials and citizens be informed of proposed actions so that informed decisions can be made.	Action specific	Provisions of this act should be followed. Implementation of OE clearance alternatives could require analysis of environmental impacts (i.e., the analysis of cumulative effects and impacts on cultural and/or natural resources).
National Contingency Plan (NCP)	40 CFR Parts 300.120(c), 300.400(e)	Defines format for response from planning to decision making to post-removal monitoring.	Action specific	Permitting is not required for on-site CERCLA response actions.
Public Affairs	40 CFR Part 300	Public affairs coordination must be conducted in accordance with directives for the CERCLA response action.	Action specific	Provisions of this code should be followed.

Table 7-2. Applicable or Relevant and Appropriate Requirements (ARARs), Former Waikoloa Maneuver Area and Nansay Sites

Requirement	Citation	Description	Type	Comments
Transportation	49 CFR Parts 100-199	Regulates transport of hazardous substances in Hawaiʻi.	Action specific	Provisions of this code should be followed.
Federal Transportation Act	49 CFR Part 172.101	The DOT considers OE "hazardous material" for manifesting purposes under the DOT regulations.	Action specific	Transportation of explosives to be used in the detonation of OE as a means of on-site disposal must comply with DOT regulations. UXO-qualified personnel must inspect the loading of the explosives, and the transport vehicle must be appropriately placarded.
OSHA	29 U.S.C. 651-678	Regulates worker health and safety.	Action specific	Under 40 CFR Part 300.38, requirements of the act apply to all response activities under the NCP.
Superfund Amendments and Reauthorization Act (SARA)	Chapter 160	Established the Defense Environmental Restoration Program (DERP) that calls for "correction of environmental damage (such as detection and disposal of UXO) that creates an imminent and substantial endangerment to the public health or welfare or the environment."	Action specific	OE contamination at the former maneuver area was the result of past activities conducted by the U.S. military and constitutes a hazard to human safety and the environment.
State				
Hazardous Waste	Hawaiʻian Revised Statute (HRS) 342J	Provides classification of hazardous waste. Regulates generators, transporters, and treatment, storage, or disposal facilities.	Contaminant specific	Solid waste that poses a substantial existing or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed, will be treated as hazardous.
Wildlife	HRS 195	Provides for the protection of unique natural resources such as geologic and volcanic features and distinctive marine and terrestrial plants and animals.	Location specific	Activities may occur in unique natural resource areas. Natural assets should be protected and preserved within these areas (see Section 2.1.6).

Table 7-2. Applicable or Relevant and Appropriate Requirements (ARARs), Former Waikoloa Maneuver Area and Nansay Sites
Page 5 of 6

Requirement	Citation	Description	Type	Comments
Historic Preservation	HRS 6E	Requires preservation, restoration, and maintenance of historic and cultural property.	Location specific	Activities may occur, possibly affecting historic property, aviation artifacts, or a burial site. Activities within potential areas of historic and cultural resources may require review and comment by the State Historic Preservation Officer (SHPO).
Public Access to Coastal and Inland Recreation Areas	HRS 205A	Establishes and regulates coastal zone management program.	Location specific	Activities may occur within the coastal zone. Activities conducted within the coastal zone will be completed so as to preserve and maintain open space and scenic resources.
Forest Reservations, Water Development, Zoning	HRS 183C	Regulates land within the state that contains important natural resources essential to the preservation of the state's water supply.	Location specific	Activities may occur that require issuance of site plan approvals.
Statewide Trail and Access System	HRS 198D	Establishes Hawaiʻi statewide trail and access program for public access and use.	Location specific	Activities may occur on established Hawaiʻi statewide trails that require fees or permits for the use of trails for commercial or other use. Trails may be regulated for protection of endangered wildlife habitats.
Transporting of Explosives	HRS 396-399	Establishes regulations for the use, storage, and transportation of explosives.	Location specific	Activities may occur requiring the use of explosives for disposal of UXO. These activities will require a certificate of fitness.

Table 7-2. Applicable or Relevant and Appropriate Requirements (ARARs), Former Waikoloa Maneuver Area and Nansay Sites
Page 6 of 6

Requirement	Citation	Description	Type	Comments
Transportation of Hazardous Materials, Hazardous Waste, and Etiologic Agents	HRS 286, Part XII (HRS 286-221 to 227)	Regulates transport of hazardous substances in Hawaiʻi.	Action specific	Activities may occur that require transportation of hazardous material that meets the federal and state criteria of a hazardous material. Materials must be handled and transported according to the appropriate requirements of the federal hazardous materials regulations and additional requirements of this regulation.

CFR = Code of Federal Regulations
DOT = Department of Transportation
EPA = Environmental Protection Agency
HRS = Hazardous Ranking System
OE = ordnance and explosives
PM_{10} = particulate matter equal to or less than 10 microns in diameter
U.S.C. = United States Code
UXO = unexploded ordnance

THIS PAGE INTENTIONALLY LEFT BLANK