

## 5.0 INSTITUTIONAL ANALYSIS

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This Institutional Analysis identifies and analyzes the institutional framework necessary to support the development of institutional controls as an effective OE response action alternative for the Former Waikoloa Maneuver Area and Nansay Sites.

### 5.1 PURPOSE AND OBJECTIVES

The purpose of this analysis is to gather background information and document which public and private entities have jurisdiction over potentially OE-contaminated lands and to assess the capability and willingness of these entities to assert institutional controls that would protect the public from explosive hazards at the former maneuver area. More specifically, this report:

- Identifies entities that have jurisdiction over the land within the Phase II EE/CA project boundary
- Defines authority, responsibility, capability, resources, and the willingness of each entity to participate in institutional controls to protect the public from explosive hazards
- Identifies potential institutional control strategies available to implement access controls and/or public safety awareness actions for the property
- Defines and analyzes intergovernmental relationships, joint responsibilities, land use control functions, technical capabilities, funding sources, and recommendations.

### 5.2 REGULATORY BACKGROUND

The following paragraphs provide a brief summary on existing regulations that result in the implementation of an Institutional Analysis.

In 1986, Congress enacted the SARA, which amended certain aspects of the CERCLA, some of which directly related to OE contamination. Chapter 160 of the SARA established the Defense Environmental Restoration Program (DERP). One of the goals specified for the DERP is “correction of environmental damage” (such as detection and disposal of UXO) that creates an imminent and substantial endangerment to public health/welfare or to the environment. The DERP requires that appropriate action consistent with CERCLA be undertaken whenever such “imminent and substantial endangerment” is found at a facility or site that is under the jurisdiction of the Secretary of Defense and is owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination.

The NCP was established by the Clean Water Act (CWA) of 1972 and has been revised and broadened several times since then. Its purpose is to provide the

organizational structure and procedures for remedial actions to be taken in response to the presence of hazardous substances, pollutants, and contaminants at a site. Section 105 of the 1980 CERCLA states that the NCP shall apply to all response actions taken as a result of CERCLA requirements. The March 1990 NCP, given in 40 CFR Part 300, is the latest version of the NCP. Paragraph 300.120 states that the "Department of Defense (DOD) will be the removal response authority with respect to incidents involving DOD military weapons and munitions under the jurisdiction, custody, and control of DOD."

The NCP model requires that any government response be considered openly in coordination with all stakeholders. Further, federal decision making requires development of alternative response strategies to ensure that the most effective (and least objectionable) plans are implemented. OE response action alternatives should be based on a variety of technologies or implementation strategies that are sufficiently different in effect to allow for technical discrimination in the assessment of plans, and to allow for real choice on the part of the stakeholders. A strategy that engages the presence of ordnance is a removal action.

Removals of OE are the traditional response action. In general, a plan of action involves developing and coordinating plans for worker and public safety during the action, site mobilization, operations, and site close out that may include continuing maintenance requirements. When a federal response action is complete, there is a natural tendency for stakeholders to assume that the site is clean. This happens no matter how clearly it is stated that no removal action is complete. Removal produces a condition of fewer ordnance items. If human behavior is the same before and after the removal, the assumption is that the risk has been substantially reduced. However, if, as a result of the removal, human access is facilitated and/or behavior is less cautious, an unknown situation arises that may pose greater risk. Institutional controls are alternative response plans that use governmental or other authorities in addition to the response authority under the DERP.

### 5.3 INSTITUTIONAL CONTROLS

Institutional controls in this EE/CA report were developed using USACE guidance (EP 1110-1-24) for *Establishing and Maintaining Institutional Controls for Ordnance and Explosives (OE) Projects* (December 2000). Institutional controls (discussed in greater detail in Chapter 7.0) 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 on the type of institutional controls being implemented and the support, involvement, and willingness of local agencies and landowners to enforce and maintain institutional controls implemented to eliminate public interaction with OE. For institutional controls to be successful, the government, landowners, and local authorities who have jurisdiction over and the authority to enforce institutional controls, must coordinate and agree on the types of institutional controls to be implemented and who will be responsible for maintaining/enforcing them.

## 5.4 METHODOLOGY

Data used for this Institutional Analysis was collected from various sources, including site visits, record searches, and interviews. Interviews were conducted with individuals representing the County of Hawai'i, the Parker Ranch, and several landowners and agency representatives (Appendix F).

Data collected during the interview and survey processes included jurisdictional boundaries, authorities, responsibilities for land use and public safety, capabilities, resources, and the agencies' willingness to participate in institutional controls. Current and future capabilities for institutional controls, current and future responsibilities for land use, and public safety and capabilities in terms of authorities and resources were also investigated. The methods focused upon identification of institutional controls that would be protective, based upon legally constituted authority that would fit the areas of the former maneuver area to which the controls were applied. The analysis focused upon the identification of institutional controls that could be included in a comprehensive risk management strategy for areas of the former maneuver area that are potentially contaminated with OE.

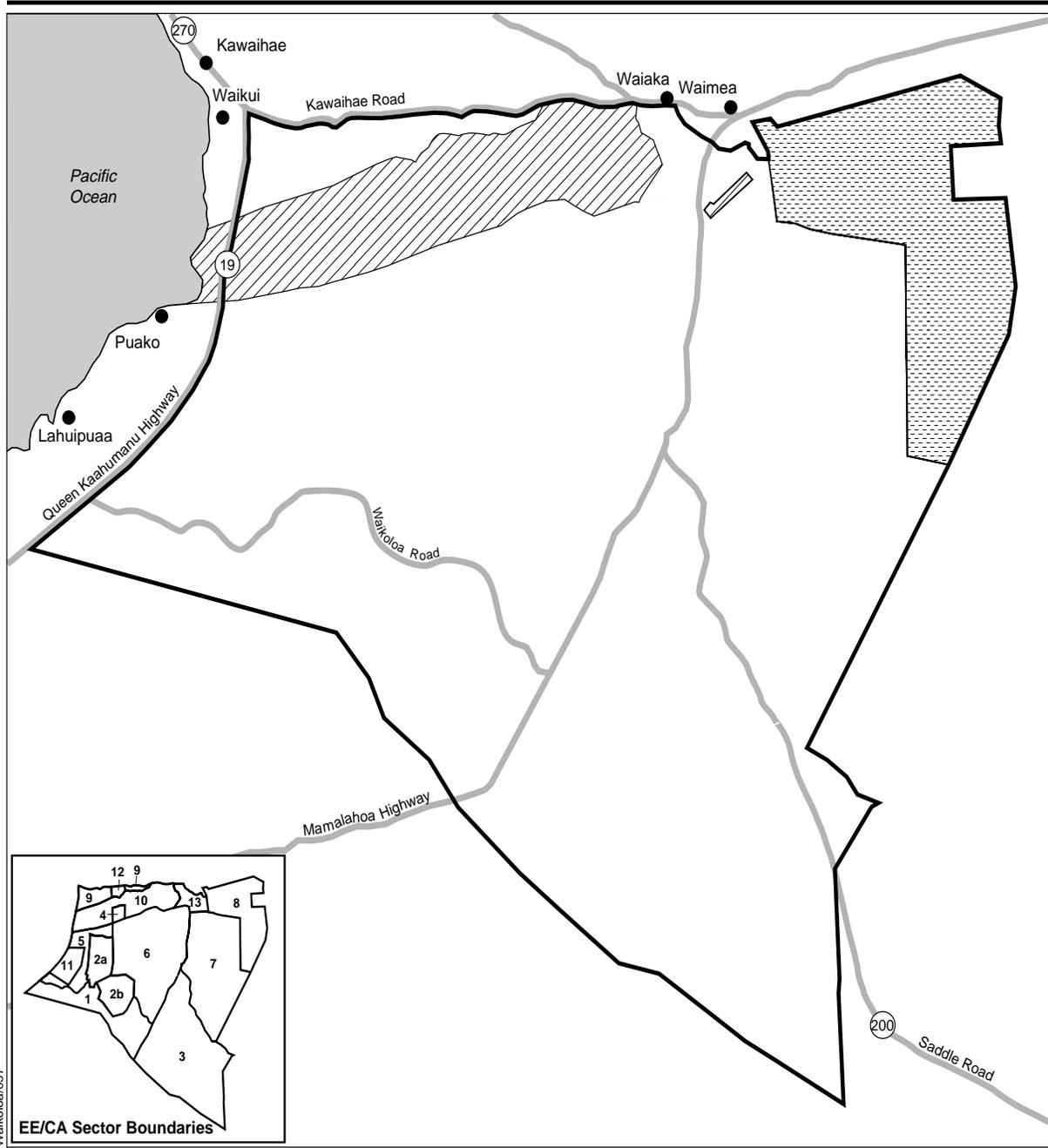
## 5.5 SCOPE OF EFFORT

Agencies that have jurisdiction over the Former Waikoloa Maneuver Area and Nansay Sites include the County of Hawai'i, Department of Hawai'ian Homelands, and the State of Hawai'i Lands (Figure 5-1). Major landowners include the Parker Ranch (Richard Smart Trust), Waikoloa Land and Cattle Company, Waikoloa Village Association, Waikoloa Development Company, Waikoloa Investment Land Trust, Tri Kohala Development Corporation, Pangilaman, Puako Hawai'i Properties, Field Trust, Globe Corporation, and Hawai'ian Homelands (Figure 5-2). In addition, specific regions of the former maneuver area continue to be used for military maneuvers and training exercises under a master lease agreement that is supplemented by a mission-specific permit issued for each new training exercise.

### 5.5.1 State of Hawai'i Lands

Hawai'i was the first of the 50 states to have a state Land Use Law and a state General Plan. The land use regulatory process in the state of Hawai'i is probably one of the most complex in the nation. The passage of the Land Use Law in 1961 established the state Land Use Commission that called for the classification of all lands in the state and authorized the adoption of rules of practice and procedures and regulations for land use within four land use districts: urban, rural, agricultural, and conservation (Figure 5-3).

The four land use districts created by the state Land Use Commission provide the basic legal framework for land uses in the state of Hawai'i. The Urban District is generally defined as lands in urban use with sufficient reserve to accommodate foreseeable growth. In the County of Hawai'i, this district is comprised of approximately 53,291 acres. Rural Districts are defined as lands primarily comprised of small farms mixed with low-density residential lots that

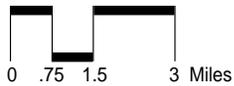


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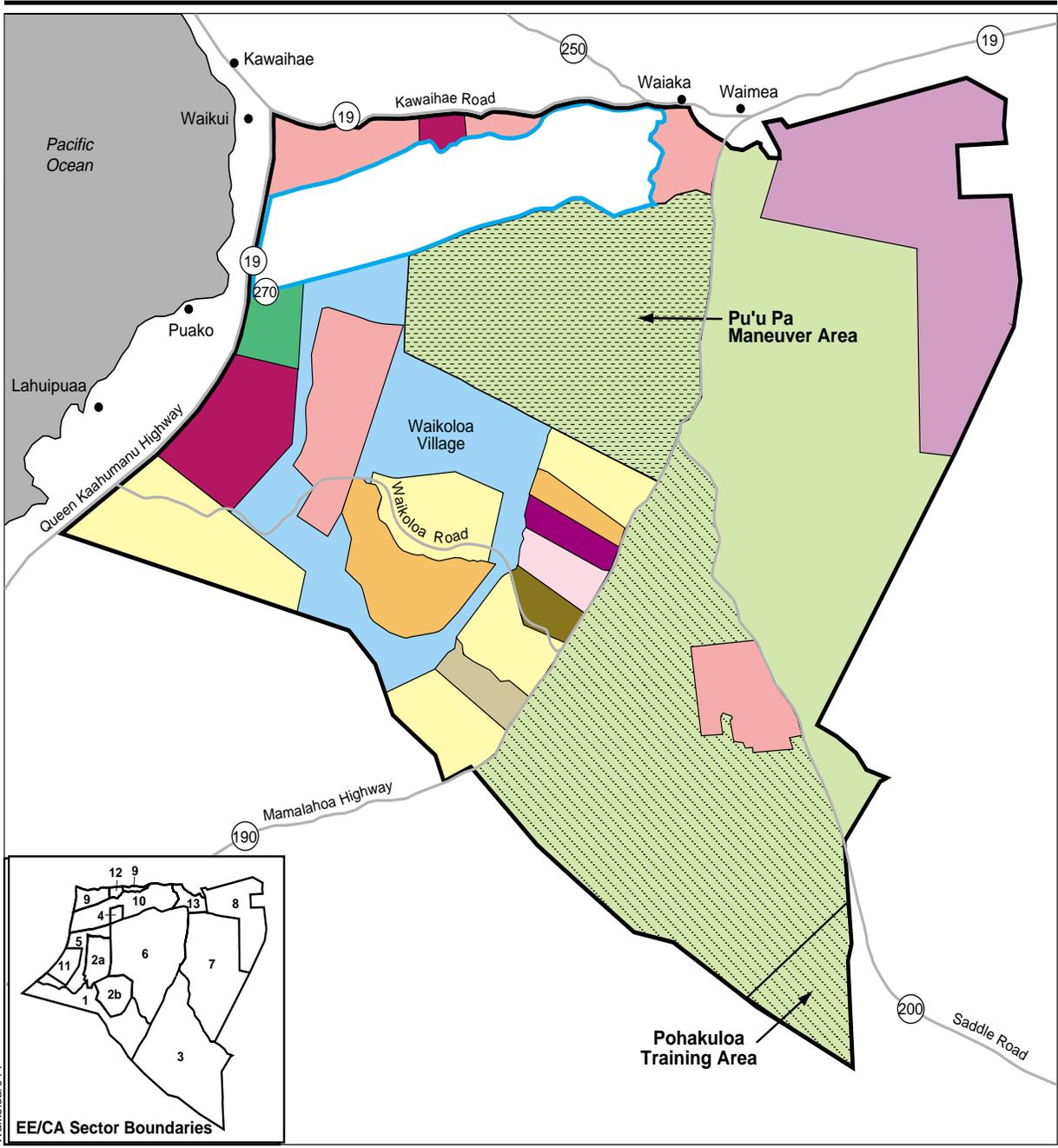
**EXPLANATION**

- Phase II EE/CA Project Boundary
- State of Hawaii
- County of Hawaii
- Department of Hawaiian Homelands

**Land Jurisdiction by Agency**



**Figure 5-1**



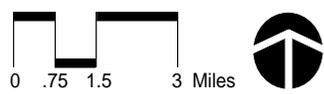
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**EXPLANATION**

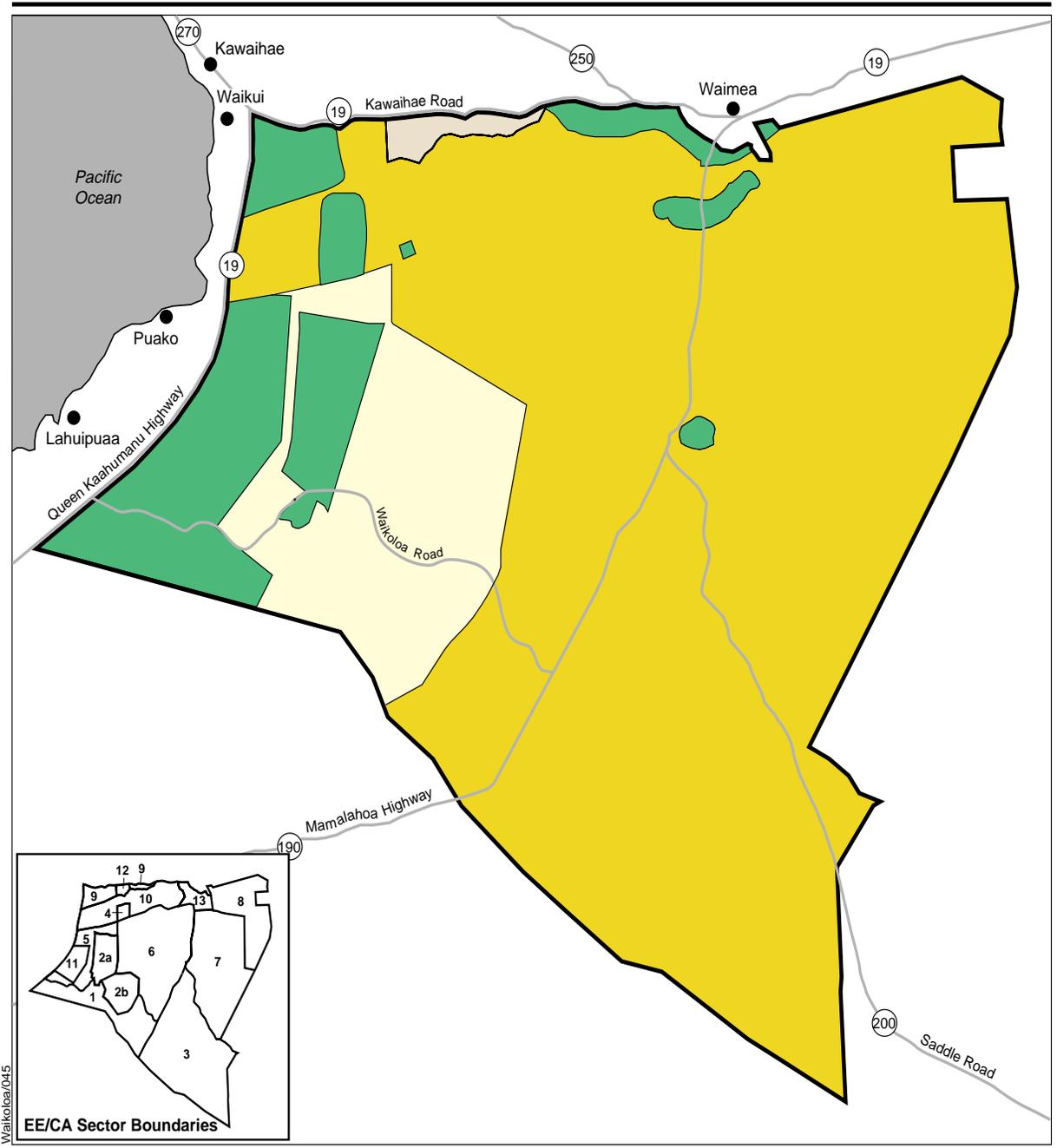
- Phase II EE/CA Boundary
- State of Hawai'i Land
- Parker Ranch (Richard Smart Trust)
- Tri Kohala Development Corporation
- Waikoloa Village Association
- Waikoloa Land and Cattle Company

- Waikoloa Development Company
- Pangilaman
- Puako Hawai'i Properties
- Field Trust
- Waikoloa Investment Land Trust
- The Globe Corporation
- Various Owners
- Hawai'ian Homelands
- Nansay Hawai'i, Inc.
- Keamuku Lease Area
- Pu'u Pa Lease Area

**Land Ownership**



**Figure 5-2**



Waikoloa/045

- EXPLANATION**
-  Phase II EE/CA Boundary
  -  Agricultural Areas
  -  Conservation Areas
  -  Rural Areas
  -  Urban Areas

**State of Hawai'i  
Land Use Designations**



**Figure 5-3**

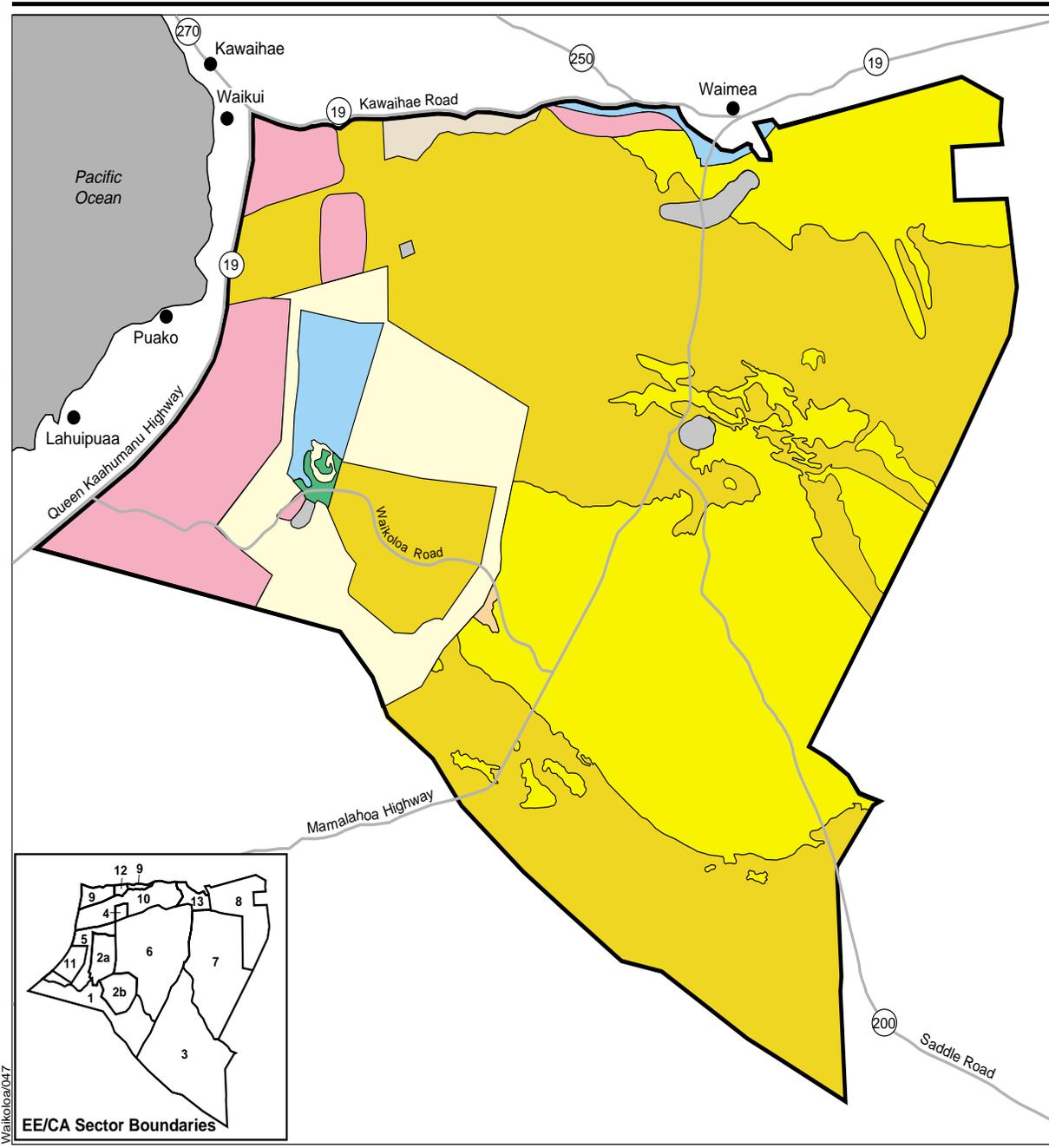
have a maximum lot size of 1/2 acre under the state Land Use Law. Of the four districts, this is the smallest, with approximately 688 acres of the island's total land area. The Agricultural District includes lands with a high capacity for intensive cultivation as well as those with low capacity. The minimum lot size in this district under the state Land Use Law is one acre. The Agricultural District has the second greatest land area within the county with approximately 1,213,715 acres or slightly over 47 percent of the county's land area. Conservation Districts are primarily those lands in the existing forest and water reserve zones. This district has the largest land area with approximately 1,305,706 acres or 51 percent of the total land area of the island (County of Hawai'i, 2001).

Land use within an Urban District is administered exclusively by the county. In the Agricultural and Rural Districts, the state Land Use Commission establishes land use regulations and the counties are responsible for their administration. The counties, however, may adopt more stringent controls than those imposed by the state within these two districts. The exception to the rule of county jurisdiction occurs on lands situated within the state Land Use Urban, Rural, and Agricultural districts that are owned by the state Department of Hawai'ian Homelands and the Federal Government. The County has no land use jurisdiction over these lands. Although over 50 percent of the island's land is in the Conservation District, the County has no land use jurisdiction in these areas, except in coastal areas where conservation district lands are overlaid with special regulations relating to coastal zone management. In the Conservation district, the state Board of Land and Natural Resources administers land uses (County of Hawai'i, 2001).

### **5.5.2 County of Hawai'i**

Hawai'i County adopted their first General Plan document by ordinance on 15 December 1971. Upon adoption of the General Plan in 1971, the Council laid the foundation for establishing a comprehensive planning program for the County of Hawai'i. The General Plan encompasses long-range goals, policies, standards, and courses of action for the entire County. The General Plan also provides the legal basis for all of the other elements of the County's planning structure and establishes the outer limits or boundaries the County must operate within. The General Plan has been amended several times since 1971, most recently in August 1989. Land use designations for the Former Waikoloa Maneuver Area and Nansay Sites, as described by the General Plan, are shown on Figure 5-4. The General Plan is currently being revised and a preliminary draft was released for public review in May 2001. Proposed revisions to the General Plan affecting the Former Waikoloa Maneuver Area and Nansay Sites are shown on Figure 5-5.

Short and middle range plans that further define the long-range goals and policies of the General Plan are related to specific regions or districts (e.g., Hilo, Kona, Kohala, Ka'u), functions (e.g., recreation, agriculture, drainage, highways), and specific areas within a region of the county (e.g., Kailua-Kona, Downtown Hilo).

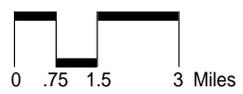


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**EXPLANATION**

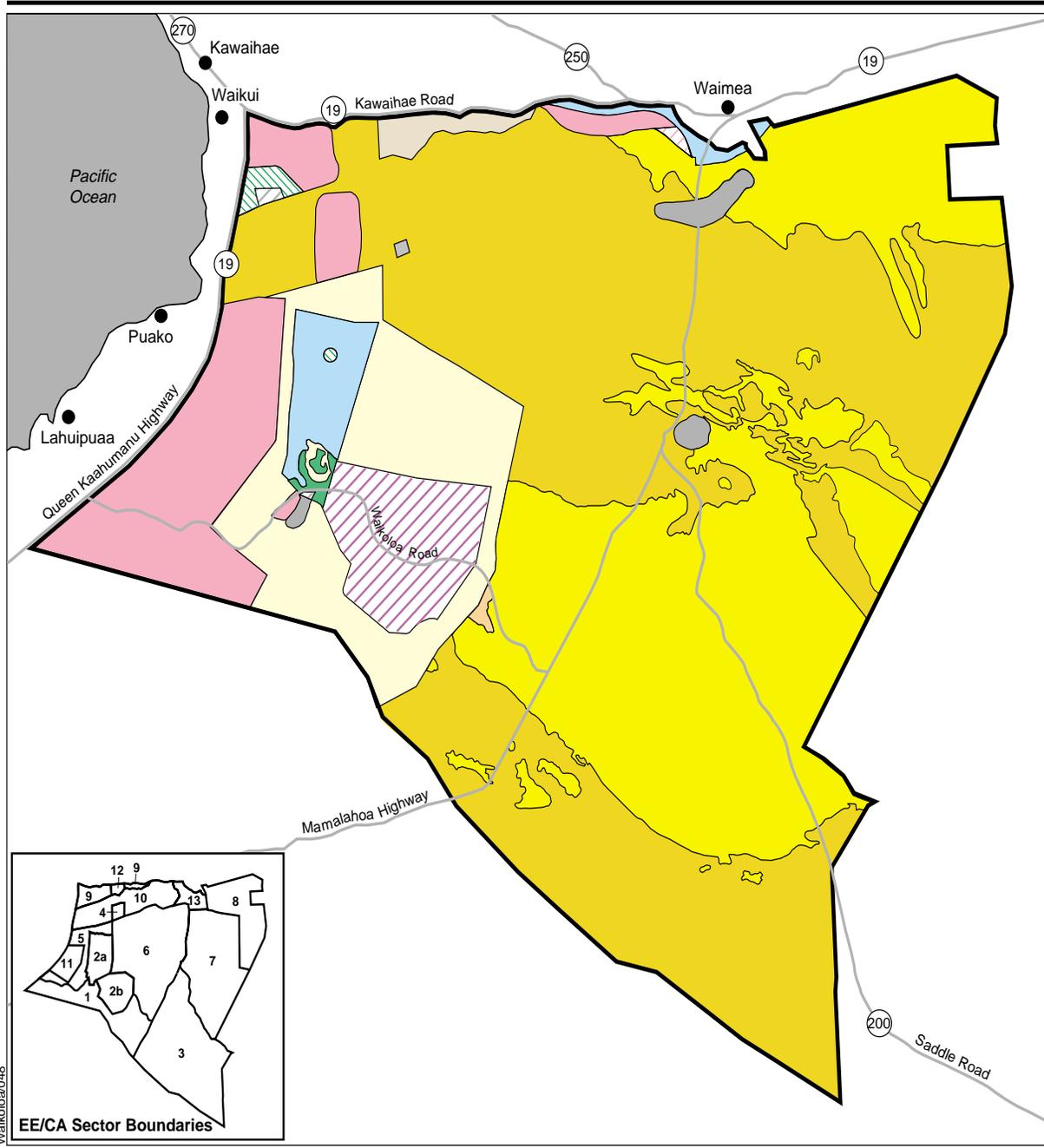
- |                         |                      |
|-------------------------|----------------------|
| Phase II EE/CA Boundary | Medium Density Urban |
| Extensive Agriculture   | Open Space           |
| Intensive Agriculture   | Rural                |
| Industrial              | Urban Expansion      |
| Low Density Urban       |                      |

**County of Hawai'i  
Current Land Use  
Designations**



Source: County of Hawai'i General Plan, 1989

**Figure 5-4**



**EXPLANATION**

- Phase II EE/CA Boundary
  - Extensive Agriculture
  - Intensive Agriculture
  - Industrial
  - Low Density Urban
  - Medium Density Urban
  - Open Space
  - Rural
  - Urban Expansion
  - Proposed Medium Density Urban
  - Proposed Industrial
  - Proposed Urban Expansion
  - Proposed Mixed Uses (rural, open space, and low density urban)
- 0 .75 1.5 3 Miles
- Source: County of Hawai'i Preliminary Draft General Plan, 2001

**County of Hawai'i  
Future Land Use  
Designations**

**Figure 5-5**

Specific mechanisms to implement the planning hierarchy include the Zoning and Subdivision Codes and both the operating and capital improvement program budgets for the county.

### **5.5.3 Department of Hawai'ian Homelands**

The legal basis for the existence of the Department of Hawai'ian Homelands (DHHL) is the Hawai'ian Homes Commission Act (HHCA), 1920, as amended.

Passed by Congress and signed into law by President Warren Harding on 09 July 1921 (Chapter 42, 42 Stat. 108), the HHCA provides for the rehabilitation of the native Hawai'ian people through a government-sponsored homesteading program. Native Hawai'ians are defined as individuals having at least 50 percent Hawai'ian blood.

The DHHL provides direct benefits to native Hawai'ians in the form of 99-year homestead leases. In 1990, the Legislature authorized the DHHL to extend leases for an aggregate term not to exceed 199 years (Act 305, Session Laws of Hawai'i 1990; Section 208, HHCA). Homestead leases are for residential, agricultural, or pastoral purposes. The intent of the homesteading program is to provide for economic self-sufficiency of native Hawai'ians through the provision of land.

Other benefits provided by the HHCA include financial assistance through direct loans or loan guarantees for home construction, replacement, or repair; the development of farms and ranches; technical assistance to farmers and ranchers; and the operation of water systems.

The DHHL is headed by an executive board, the Hawai'ian Homes Commission, whose nine members are appointed by the Governor with the advice and consent of the Senate. Members must be residents of the state at least 3 years prior to their appointment. At least four of the members must have not less than one-fourth Hawai'ian blood. The Chairman of the Commission serves as the full-time administrator of the DHHL; other members of the Commission serve without pay.

The DHHL is made up of three divisions and a planning office. The Homestead Services Division is involved in the direct servicing of homestead lessees and applicants for homestead leases. The Land Development Division is responsible for developing Hawai'ian homelands for homesteading and income-producing purposes. The Land Management Division is responsible for management of the DHHL's non-homestead land, maximizing returns from existing and potential income properties, enforcement activities, and development of a comprehensive land inventory. The Planning Office prepares preliminary studies required for future land development, water resource development, and the proper consideration of archaeological, historical, and environmental concerns.

### **5.5.4 Department of Land and Natural Resources**

The Board of Land and Natural Resources heads the Department of Land and Natural Resources (DLNR). The DLNR manages the state's public lands and the

water and mineral resources on those lands; it also manages the state's aquatic life and wildlife resources, forest reserves, and state parks; and administers the state conservation districts and the endangered species, natural area reserves, boating and ocean recreation, and historic preservation programs. The DLNR develops and enforces rules on conservation and resources and also provides a central repository for all instruments of conveyances.

The Board of Land and Natural Resources is vested with powers for the management of natural resources owned or controlled by the state and their disposition as may be provided by law. The Board is composed of six members, one from each county and two at-large, appointed by the Governor with the advice and consent of the Senate. The Governor appoints the Chairperson of the Board from among its members. The Chairperson serves as the chief executive officer of the DLNR.

The Conservation and Resources Enforcement Division is responsible for enforcing all state laws relating to conservation and resources. The Division, with full police powers, enforces all state laws and rules involving state lands, state parks, historical sites, forest reserves, aquatic life land wildlife areas, coastal zones, conservation districts, shorelines, as well as county ordinances involving county parks.

The Office of Conservation and Environmental Affairs (OCEA) performs comprehensive conservation and environmental affairs services for the DLNR. The OCEA maintains constant awareness of environmental factors affecting the resources of the state and ongoing proposed activities on public and private lands zoned conservation. The OCEA also coordinates the DLNR's responsibilities in relation to these factors.

Toward this end, the OCEA administers, under the direction and supervision of the Chairperson, all conservation district land use activities. It develops and coordinates departmental policy for the use of the state's resources with the operating and staff units; federal, state, and county agencies; and public and private organizations, as well as the general public.

The OCEA initiates and coordinates departmental positions on the environmental effects of proposed actions by federal, state, and county projects, as well as the private sector on conservation lands, and initiates and coordinates departmental positions on environmental affairs relating to land resources.

#### **5.5.5 Landowners**

**Parker Ranch.** The Parker Ranch originated as a cattle ranch more than 150 years ago. Today, the Ranch is a diverse company whose businesses include cattle ranching, commercial leasing, real estate holdings, and visitor activities. Its over 35,000 head of Angus and Charolais cattle produce U.S. Department of Agriculture (USDA) choice beef marketed in the United States and Canada. It is one of the largest cattle ranches in the United States. Approximately 90 percent of the Parker Ranch lands are utilized for cattle grazing and related activities. The Ranch contains 225,000 acres, 850 miles of fence,

275 paddocks, and 45 corrals. The water system consists of 175 miles of pipeline, 9 reservoirs, 145 water tanks, 40 ground tanks, 3 water dams, and 650 water troughs. Annual beef production of the cow-calf operation is in excess of 15 million pounds.

The Parker Ranch offers a variety of scenic hunting areas spanning over 225,000 acres and ranging from sea level to 7,000 feet above MSL. Year round hunting is available for big game species including Polynesian boar, Spanish goat, Vancouver bulls, and axis deer. In addition, upland game bird hunting includes kalij, blue and ring-neck pheasant, erkels, black and gray francolin, chukar partridge, valley and Japanese quail, Rio Grande turkey, sand grouse, and lace neck doves.

**Waikoloa Village Association.** Waikoloa Village is a community consisting of approximately 5,000 residents. The property owners of Waikoloa Village (through the Waikoloa Village Association) own the championship Trent Jones, Jr. Golf Course with clubhouse, fine dining, swimming pool, and tennis courts.

Waikoloa has an elementary school with kindergarten through fifth grades, several churches, a shopping center, and two parks.

Paniolo Estates is a subdivision of 177 homes on 52 acres situated directly across from Waikoloa Elementary School. There are three home styles. Homes range in size from 864 to 1,124 square feet, each with a two-car garage facing the street. The lots vary in size from 7,000 square feet to 10,000 square feet. Paniolo Estates is subject to a Declaration of Conditions, Covenants, and Restrictions and has a Board of Directors elected by the homeowners.

## 5.6 LAND USE

Land use on the former maneuver area is characterized by the activities that occur within its boundaries. The majority of the former maneuver area is in private ownership with uses ranging from agricultural to residential uses.

Housing construction and subdivisions of land have been most active on the east side of Waimea and in the Waikoloa Village. Slightly more than half of the newly created parcels in the South Kohala District occurred at Waikoloa. Housing construction in the Waikoloa Village increased by 589 units (including multiple-family apartments and condominiums) between 1970 and 1985, with a total of 2,170 units by the end of 1997.

Waikoloa Village contains a sizable amount of undeveloped, residential-zoned lands that will eventually contribute significantly to the district's housing inventory. These residential-zoned lands will most likely be developed as market-priced home sites. County-owned land at Waikoloa Village shall be made available for the development of affordable housing. The revised Parker Ranch 2020 project proposes the rezoning of 38 acres to multiple family residential.

South Kohala's Waimea region contains the most extensive truck farming area in the County. Vegetables such as celery, daikon (turnip), carrots, lettuce,

cabbage, broccoli, tomatoes and bell peppers, and fruits such as strawberries are grown for both local and export markets. Certain flowers and foliage are also grown in this region.

Most of the lands in South Kohala are used for cattle ranching. The Parker Ranch is the largest ranch in the area and owns most of the grazing lands.

There are approximately 119,813 acres zoned for agriculture in the South Kohala District. Although land in the Waimea area is considered some of the most productive in the County, there is a need to develop a more reliable agricultural water system to more fully utilize this potential. With the growth in the district spurred by tourism, urban pressures are increasingly competing for basic resources required by agriculture, namely land, labor, and water.

Commercial activity in the South Kohala District is centered in Waimea, Kawaihae, and the Waikoloa Village.

The Waimea area contains a number of commercial facilities and professional services. The major facility is the Waimea Shopping Center. This shopping complex includes a supermarket, various retail stores, restaurants, a bank, and other services. The Parker Ranch Shopping Center, once the major shopping complex in the district, is currently undergoing renovation as part of a larger plan by the Richard Smart Foundation Trust to expand the commercial area of Waimea. In 1992, commercial lands within Waimea were increased by approximately 104 acres as part of the implementation of the Richard Smart Foundation Trust's Parker Ranch 2020 Master Plan that detailed the future growth of residential, commercial, and industrial development in Waimea over the course of 35 years.

Transportation facilities within the district include Kawaihae Harbor, Waimea-Kohala airport, and major highway systems. These transportation facilities provide a vital link between the growing resort areas along the Kohala/Kona coast, the transport of goods from Kawaihae Harbor, and the commercial area within Waimea.

The South Kohala coast has developed into a major destination resort area for the Island of Hawai'i, as well as the state. The three major developers of the area are Mauna Kea Properties, Mauna Lani Resort, and the Waikoloa Land Company. The major hotels within these developments are the Mauna Kea Beach Hotel, Hapuna Prince Hotel, Mauna Lani Bay Hotel and Bungalows, the Orchid at Mauna Lani, Hilton Waikoloa Village, and the Outrigger Waikoloa Beach Hotel. The number of hotel rooms within these 3 resort nodes totals over 3,250.

A limited number of visitor accommodations are also available in Waimea. Some visitor units are also available within the Waikoloa Village.

There are 291 acres of industrial zoned lands within the South Kohala district. Most of the industrial activity in South Kohala takes place in Waimea and Kawaihae Harbor. Many of the industrial activities in Waimea are linked with

agriculture and include a vacuum cooling plant, the preserving of vegetables, warehousing, and dairy operation. These industrial activities, however, are scattered throughout the Waimea area.

Several service-oriented industrial activities are situated in the South Kohala District. Among these activities are government baseyards, utility installations, and development of specialized equipment for the astronomy facilities. Several quarrying operations were established within the district. The West Hawai'i Concrete quarry and processing facility is situated east of Waikoloa. The General Plan Land Use Pattern Allocation Guide map designates this facility and lands in the immediate area for industrial and its related uses.

Public lands with unique recreational and natural resources shall be maintained for public use.

## **5.7 TECHNICAL CAPABILITY**

Legal mechanisms exist within the agencies to protect property owners and the public from hazards contained on a site by warning of the hazard or limiting the access or use of a site. These mechanisms can reduce exposure to OE by limiting public access to a site or limiting the extent of intrusive activities that may occur on a site. Land use on the former maneuver area is currently controlled by three separate agencies (see Figure 5-1).

The County of Hawai'i General Plan defines long-range goals, policies, standards, and courses of action. In addition, the County of Hawai'i General Plan provides a mechanism to limit exposure to OE by controlling land use or by implementing a hazard overlay similar to the Flood Control and Drainage element of the existing General Plan.

The DHHL leases for residential, agricultural, or pastoral purposes include conditions for the approval of improvements and the use of hazardous materials. In addition, the DHHL prepares preliminary studies required for future land development, water resource development, and the proper consideration of archaeological, historical, and environmental concerns.

The Conservation and Resources Enforcement Division within the DLNR enforces all state laws and rules involving state lands, state parks, historical sites, forest reserves, aquatic life land wildlife areas, coastal zones, conservation districts, shorelines, as well as county ordinances involving county parks. In addition, the OCEA performs comprehensive conservation and environmental affairs services for the DLNR. The OCEA maintains constant awareness of environmental factors affecting the resources of the state, and ongoing proposed activities on public and private lands that are zoned conservation.

Many of the private landowners have the technical capability to implement engineering and educational controls to either limit the public's access or limit the public's exposure to the residual OE contamination that remains at the former maneuver area to an acceptable level. Typical engineering controls include fences, warning signs, and security patrols. Typical educational programs

include notifications that ordnance is present, such as an environmental defect restriction, training and education concerning ordnance on the site, and the establishment of administrative requirements for the protection of property owners and the public.

## 5.8 EXISTING INSTITUTIONAL CONTROLS

Within the regulations associated within the three controlling agencies, no legal mechanisms that specifically address ordnance and explosives were located. Engineering controls such as fences, gates, and signs/disclaimers are in place for the Parker Ranch. These controls include some signage warning the public of the presence of UXO. In addition, the Parker Ranch is patrolled using private security personnel who regularly check fence lines and monitor access to the ranch property. The Parker Ranch keeps tight restrictions on key access for their gates and property. Anyone that is authorized access onto the Parker Ranch is required to sign a disclosure statement that UXO may be present on the Ranch. A typical fence at the former maneuver area is shown in Photograph 5-1 and an example of a locked gate with ordnance warning sign is shown in Photograph 5-2.

The remaining regions of the former maneuver area are only partially fenced and gated. Other than those indicated previously, there are no warning signs communicating the hazards associated with OE. Fences typically run along public rights-of-way. Interior property boundaries may not be fenced, with the exception of Parker Ranch property that has fencing to delineate different pasture/grazing areas.

## 5.9 CONCLUSIONS

Within the rapidly growing district of South Kohala, future urban development is focused around Waimea and the Waikoloa Village area.

The South Kohala resorts greatly benefited from the direct flights to Kona International Airport at Keahole from Japan and the mainland United States. These direct flights significantly increased the number of visitors to the South Kohala resort destination areas. As a result of these direct flights and the potential for growth of future visitor accommodations, the visitor industry along the South Kohala coast will expand. The excellent climatic conditions of the area and its ease of access from the Kona International Airport at Keahole provide an optimistic future for the South Kohala coast's major resort destination area.

The continuing resort development along the coast is anticipated to increase the need for employee housing and other residential needs as more in-migration occurs. There are still a number of residential zoned and subdivided parcels available at Waikoloa. Other residential zoned but not subdivided lands are also available at Waikoloa. Development of these lands is dependent upon plans by new owners. It is apparent that in addition to residential lands, other commercial and urban lands will be required to service incoming populations.

Increased development in Waimea, the Waikoloa Village area, and the resort areas to the west of the former maneuver area as well as those resorts residing



**Photograph 5-1.** Fences typical of ranching areas.



**Photograph 5-2.** Warning sign at the Waimea Wastewater Treatment Facility.

within the former maneuver area, will intensify public exposure to OE. The County of Hawai'i, DHHL, and the DLNR, in conjunction with private landowners, have the technical capability to implement institutional controls where appropriate on the former maneuver area. Based on increased development pressures within the South Kohala District, the County of Hawai'i is unlikely to change land use designations at any of the OE sites identified in this EE/CA report. The implementation of other legal mechanisms such as easements, restrictive covenants, and reversionary interests are also unlikely since most of the property is already in private hands and these mechanisms are usually attached to the property deed at the time the property is transferred or sold.

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 police and private security firms.

Results of interviews conducted with several landowners and local agency representatives within the former maneuver area (Appendix F) concluded that warning signs are an acceptable institutional control; however, warning signs should be provided by the USACE and only be installed in areas with a significant potential for OE. Warning signs are not appropriate for areas where no evidence of OE has been recovered. Installation of fencing was concluded to be an unacceptable institutional control. Landowners feel that fencing will prevent local residents and tourists from accessing common areas and preclude use of their surrounding community areas. Agency representatives indicated that display cases would be an extremely effective educational tool and that they would be willing to store and maintain display case information and provide education classes to local schools and businesses. The general consensus amongst stakeholders is that an OE safety awareness training video, in conjunction with an OE safety education class, would be beneficial to local residents (especially children) and local business personnel. Landowners also indicated that a simple OE safety awareness class would be beneficial for residents and business personnel in an area with no evidence of OE. However, in areas where UXO has been recovered, the government should remove the ordnance and be responsible for development, maintenance, and funding of institutional controls (including warning signs, display cases, and resident/worker education programs).

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