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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

April 22, 2013

Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu HI 96813

Dear Director:

Subject: **Draft Environmental Assessment and Anticipated Finding of No Significant Impact, Ka'ohe Fire Diptanks, TMK (3rd) 4-4-015:004 (por.), Hamakua District, Island of Hawai'i**

With this letter, the Department of Land and Natural Resources, Division of Forestry and Wildlife, hereby transmits the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for the subject project for publication in the next available edition of the Environmental Notice.

Enclosed are a completed OEQC Publication Form and one hardcopy of the DEA-AFONSI. We have provided your office by email with a pdf of the Draft EA and the OEQC Publication Form in MS WORD.

Please contact John Vetter at (808) 587-4158 in Honolulu if you have any questions.

Sincerely,

Roger H. Imoto, Administrator

Attach: As noted above

Cc: (w/o attach) Ron Terry, Ph.D., Project Environmental Consultant

AGENCY ACTIONS
SECTION 343-5(B), HRS
PUBLICATION FORM (JULY 2012 REVISION)

Project Name: Kaʻohe Fire Diptanks
Island: Hawaʻi
District: Hamakua
TMK: (3) 4-4-015:004 (por.)
Permits: HRS Chapter 6e, Historic Sites approvals.

Proposing/Determination Agency:
Department of Land and Natural Resources, Division of Forestry and Wildlife
1151 Punchbowl Street, Room 131
Honolulu HI 96813
John Vetter 808-587-4158

Consultant:
Geometrician Associates
PO Box 396
Hilo HI 96721
Ron Terry 808-969-7090

Status (check one only):

_**x**_DEA-AFNSI	Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.
__FEA-FONSI	Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
__FEA-EISPN	Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day consultation period ensues upon publication in the periodic bulletin.
__Act 172-12 EISPN	Submit the proposing agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqchawaii@doh.hawaii.gov). NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.
__DEIS	The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.
__FEIS	The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
__ Section 11-200-23 Determination	The accepting authority simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the proposing agency. No comment period ensues upon publication in the periodic bulletin.
__Section 11-200-27 Determination	The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.

__Withdrawal (explain)

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page)**:** The Department of Land and Natural Resources, Division of Forestry and Wildlife, plans to construct water tanks and related infrastructure at two sites on the southwestern slope of Mauna Kea in the Ka‘ohe Game Management Area to assist in fighting fires. The sites are located off Road 1, one about 1/2 mile above the Kilohana Hunter Checking Station, and the other 700 feet south of Pu‘u La‘au. Each site will have a covered, 40,000-gallon holding tank for water obtained from trucks and/or catchment. Via high density polyethylene pipeline placed above ground except where buried beneath roads, the holding tank will feed a smaller, open fire diptank that will be accessed by helicopters equipped with dip buckets. Both sites are in open and previously modified environments accessible by a two-wheel drive vehicle. Ground disturbance will total less than half an acre, and erosion, sedimentation and dust will be controlled by Best Management Practices. The sites are located within the State Land Use Conservation District and Palila Critical Habitat, and the project will protect the values of these areas. No threatened or endangered (T&E) plant species are present at or near the disturbance footprints. Timing of activities will avoid or minimize impacts to T&E animals. No historic or cultural properties will be affected, and visual impacts from the tanks, which will likely be no more than 12 feet tall, will be minor. The project will substantially improve fire protection in this important habitat and recreation area.

DRAFT ENVIRONMENTAL ASSESSMENT

Ka‘ohe Fire Diptanks

TMK (3rd.) 4-4-015: 004 (pors.)
Hamakua District, Hawai‘i Island, State of Hawai‘i

May 2013

State of Hawai‘i
Department of Land and Natural Resources
Division of Forestry and Wildlife

DRAFT ENVIRONMENTAL ASSESSMENT

Ka‘ohe Fire Diptanks

TMK (3rd.) 4-4-015: 004 (pors.)

Hamakua District, Hawai‘i Island, State of Hawai‘i

PROPOSING/
APPROVING AGENCY:

State of Hawai‘i
Department of Land and Natural Resources
PO Box 621
Honolulu, HI 96809

CONSULTANT:

Geometrician Associates LLC
PO Box 396
Hilo, HI 96721

CLASS OF ACTION:

Use of State Land
Use of State Funds

This document is prepared pursuant to:

The Hawai‘i Environmental Protection Act,
Chapter 343, Hawai‘i Revised Statutes (HRS), and
Title 11, Chapter 200, Hawai‘i Department of Health Administrative Rules (HAR).

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APPENDIX 1a Comments in Response to Early Consultation

SUMMARY OF THE PROPOSED ACTION, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW), is planning to construct water tanks and related infrastructure at two sites on the southwestern slope of Mauna Kea in the Kaʻohe Game Management Area to assist the agency in fighting fires. The sites are located off of Road 1, one about a half mile above the Kilohana Hunter Checking Station and the other 700 feet south of Puʻu Laʻau. Each site will have a covered, 40,000-gallon holding tank to contain water obtained from trucks and/or catchment. Via high density polyethylene pipeline placed above ground (except where it is buried beneath roads), the holding tank will feed a smaller, open fire diptank that will be accessed by helicopters equipped with dip buckets. Both sites are in open and previously modified environments that are accessible by a two-wheel drive vehicle. Ground disturbance associated with the project will total less than half an acre, and erosion, sedimentation and dust will be controlled by Best Management Practices. The sites are located within the State Land Use Conservation District and Palila Critical Habitat, and the project will protect the values of these areas. No threatened or endangered (T&E) plant species are present at or near the disturbance footprints. Timing of project activities will avoid or minimize impacts to T&E animals. No historic or cultural properties will be affected, and visual impacts from the tanks, which will likely be no more than 12 feet tall, will be minor. The project will substantially improve fire protection in this important habitat and recreation area.

PART 1: PROJECT DESCRIPTION, PURPOSE AND NEED AND ENVIRONMENTAL ASSESSMENT PROCESS

1.1 Project Location and Description

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW), is planning to construct water tanks and related infrastructure at two sites on the southwestern slope of Mauna Kea in the Kaʻohe Game Management Area (GMA) to assist the agency in fighting fires in the GMA and adjacent lands in the Mauna Kea Forest Reserve and on a former cattle lease now dedicated to māmane forest restoration. Both sites are located on TMK 3-4-4-015-004 adjacent to Road 1. The lower site is about a half mile *mauka* of the Kilohana Hunter Checking Station at 5,900 feet elevation, and the upper site is behind a hill and 700 feet south of the Puʻu Laʻau Ranger Cabin, at 7,375 feet elevation. At the upper site, the fill tank is at UTM 228252 m E / 2194975 m N (UTM Zone 5, NAD 83), and the diptank is at UTM 228198 m E / 2194899 m N. At the lower site, the fill tank is at UTM 224568 m E / 2192430 m N, and the diptank is at UTM 224512 m E / 2192407 m N (Figures 1-3).

Each site will have a covered, 40,000-gallon holding tank to contain water obtained from trucks and/or catchment. The fill tank will likely be about 12 feet high and in no case taller than 20 feet. Via high density polyethylene pipeline placed above ground (except where it is buried beneath roads), the holding tank will feed a smaller, open fire diptank that will be accessed by helicopters equipped with dip buckets. Both sites are in open and previously modified environments that are accessible by a two-wheel drive vehicle. Ground disturbance associated with the project will total less than half an acre. Water from the tanks may also be used for ongoing ecosystem restoration efforts. The sites are located within the State Land Use Conservation District and Palila Critical Habitat and the project will protect the values of these areas. The fire diptanks project would cost approximately $250,000, with most funding except for DOFAW labor derived from a grant from the U.S. Fish and Wildlife Service.

1.2 Purpose and Need

In modern times, wildfire has come to pose a grave threat to Hawaiian ecosystems by converting native habitats into grasslands or shrublands dominated by nonnative species (Cuddihy and Stone 1990). Fires in Hawaiʻi are usually caused by human activity. Unlike many other areas in the world, the majority of dryland native Hawaiian plants are not adapted to wildfires, and they generally perish when exposed to fire. Native shrubs and trees may recover from fire to some degree, but native plant communities are often overwhelmed by more aggressive alien species after fires. Many nonnative species are pyrophytic (adapted to fire) and thrive in the aftermath of wildfires. Unlike native shrubs and trees, many alien grasses recover quickly, increasing in ground cover and biomass after a fire. Fires encourage non-native grass by stimulating growth from the base of clumps and encouraging seed production. The establishment of pyrophytic grasses increases the threat of additional fires. Two-thirds of the dry forests of the Big Island have been lost, primarily due to wildfire carried by invasive grasses (HWMO 2007). Wildfires of course also may lead to injuries and death to people and wildlife, property losses and soil erosion, with consequent impacts to water and air quality.

Figure 1. Location Map

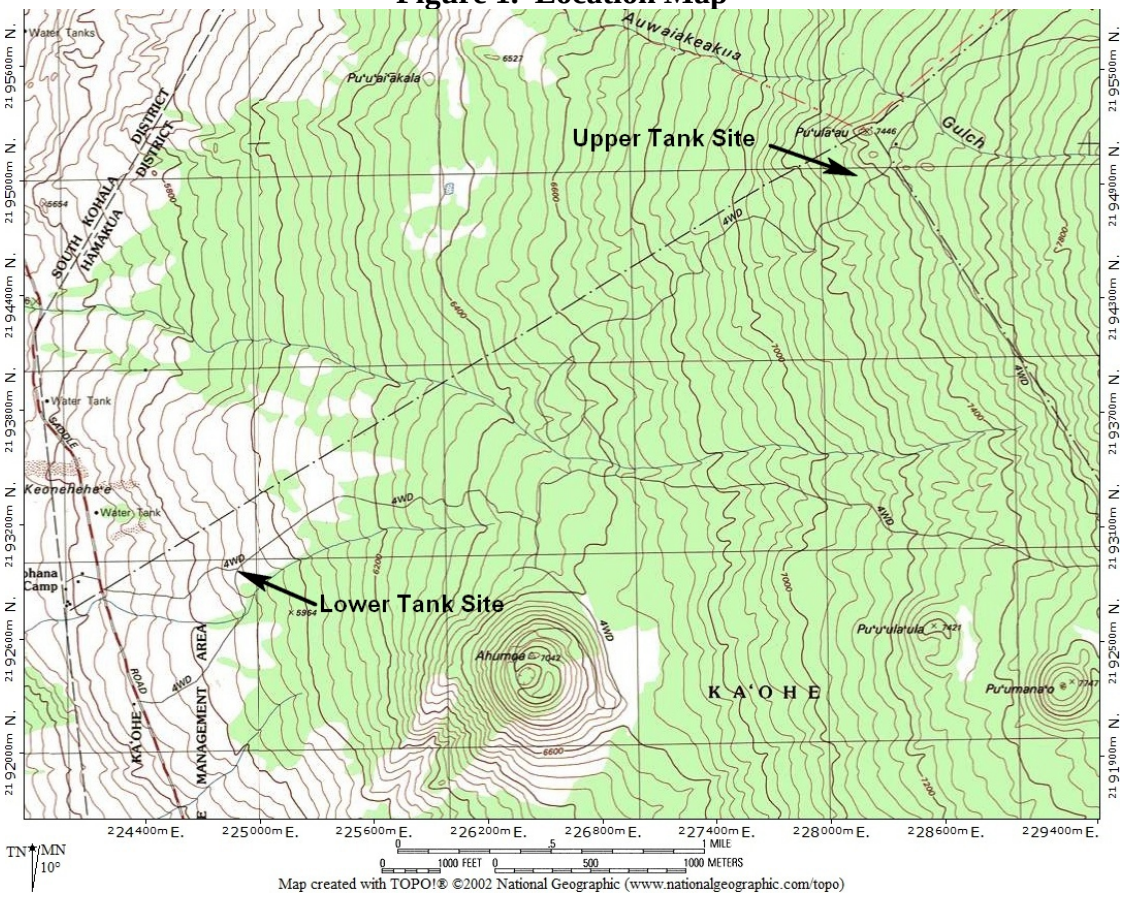

Figure 2. TMK Map

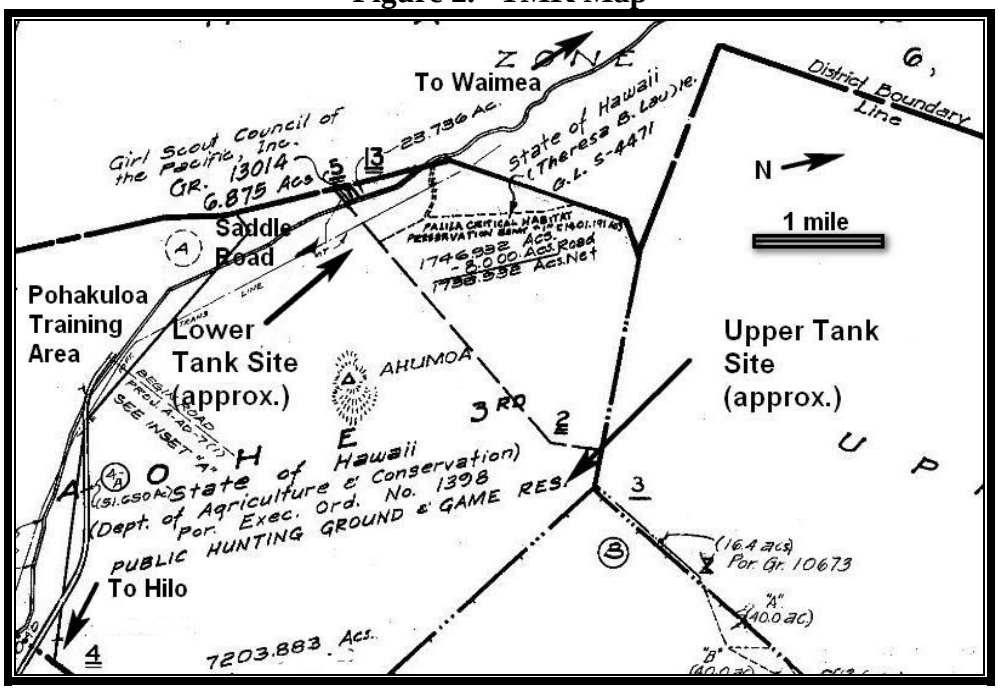

Figure 3. Project Sites in Relation to Palila Areas

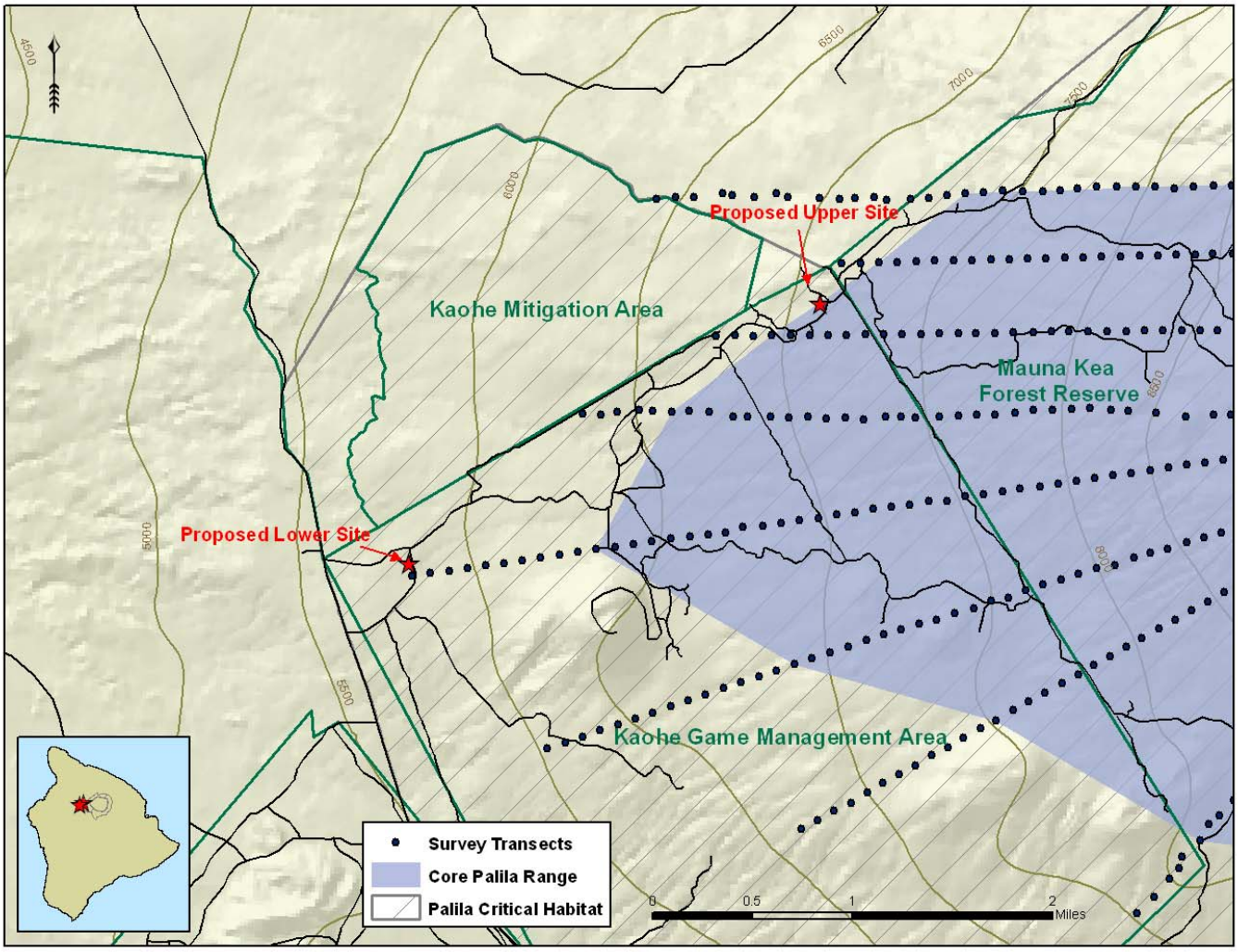

Figure 4. Photos of Project Sites

Lower Fill Tank Site ▲ ▼ Lower Diptank Site

Upper Fill Tank Site ▲ ▼ Upper Diptank Site

Fire represents a major disturbance in much of northwest Hawai‘i, including the Ka‘ohe GMA and adjacent portions of the Mauna Kea Forest Reserve. Maps of wildfires from 1954-2005 compiled by the Hawaii Wildfire Management Organization show that most of the non-bare lava surface between Waimea and Pu‘uwa‘awa‘a has burned, much of it multiple times (HWMO 2007). Dangerous wildfires have affected the southern part of Mauna Kea as recently as 2003, when a large fire burned in the Ka‘ohe GMA, and October 2011, when 1,200 acres burned east of Mauna Kea State Park and Saddle Road had to be closed.

What makes fire potentially devastating in the Ka‘ohe GMA and adjacent areas is the value of the existing habitat. The intact *māmane/naio* forest, valued and protected by ancient Hawaiians, 19th century ranchers, territorial foresters and current wildlife agencies, is in the crosshairs of wildfire. Of particular concern is that the area is the last refuge of the critically endangered Palila (*Loxoides bailleui*), the lone surviving finch-billed honeycreeper found in the main Hawaiian Islands. These birds are currently restricted to the upper elevation slopes of Mauna Kea above 6,000 feet, with over 95 percent of the population restricted to the southwest slope. Palila have evolved an extremely specialized diet dependent on *māmane* trees and associated invertebrates for its survival. Therefore, the only habitats able to sustain Palila over the long term are large areas of forest that contain dense stands of large *māmane* trees and incorporate significant elevational or rainfall gradients to provide year-round food sources.

Very few areas with relatively dense stands of large *māmane* occur along a substantial elevational or rainfall gradient remain on the Island of Hawai‘i. The most prominent area currently exhibiting these criteria is located on the western slope of Mauna Kea near Pu‘u La‘au in the Mauna Kea Forest Reserve, Ka‘ohe GMA and adjacent areas (see Figure 3). This area is part of Palila Critical Habitat as designated by the U.S. Fish and Wildlife Service (USFWS 1997) and presently supports the core population of Palila. In 2002, the grazing lease on a 1,746-acre cattle lease area west of the Ka‘ohe GMA was withdrawn to restore the *māmane* forest as part of mitigation for the Saddle Road Improvements project (FHWA-CFLHD 1999) (called herein the Ka‘ohe Mitigation Area). The proposed fire diptanks are a key part of the strategy to responding to wildfires in this vulnerable area.

1.3 Environmental Assessment Process

This Environmental Assessment (EA) process is being conducted in accordance with Chapter 343 of the Hawai‘i Revised Statutes (HRS). This law, along with its implementing regulations, Title 11, Chapter 200, of the Hawai‘i Administrative Rules (HAR), is the basis for the environmental impact process in the State of Hawai‘i. According to Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to thirteen specific criteria. Part 4 of this document states the finding (anticipated finding, in the Draft EA) that no significant impacts are expected to occur; Part 5 lists each criterion and presents the findings (preliminary, for the Draft EA) for each made by the Hawai‘i State Department of Land and Natural Resources (DLNR). If, after considering comments to the Draft EA, and the Board of Land and Natural Resources (BLNR), the official approving agency, concludes that, as anticipated, no significant impacts would be expected to occur, then the agency issues a Finding of No Significant Impact (FONSI), and the action will be

permitted to occur. If the approving agency concludes that significant impacts are expected to occur as a result of the proposed action, then an Environmental Impact Statement (EIS) must be prepared. As discussed above, funding for the project is through a grant from the U.S. Fish and Wildlife Service, which is separately conducting an environmental review in compliance with the National Environmental Policy Act (NEPA).

1.4 Public Involvement and Agency Coordination

The following agencies and organizations were consulted in development of the environmental assessment:

Federal:
- U.S. Army Garrison, Pohakuloa Training Area Commander
- U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office
- U.S. Geological Survey, PIERC Kilauea Field Station

State:
- Department of Health
- Office of Hawaiian Affairs
- Office of Mauna Kea Management
- DLNR, State Historic Preservation Division, Land Division, Office of Conservation and Coastal Lands

County:
- Civil Defense Agency
- County Council
- Fire Department
- Planning Department

Private:
- Kalepa Baybayan
- Ka‘iu Kimura
- Kimo Pihana
- Parker Ranch
- Sierra Club
- Frank Trusdell
- Waiki‘i Ranch
- Waiki‘i Ranch Homeowners Association

Copies of communications received during early consultation are contained in Appendix 1a.

PART 2: ALTERNATIVES

2.1 No Action

Under the No Action Alternative, the fire diptanks in the Kaʻohe GMA would not be constructed. Critically needed helicopter response to wildfires in *māmane* forests of the Kaʻohe GMA and adjacent areas, which include Critical Habitat for Palila, would require use of fire diptanks located over three to ten miles away in the Pohakuloa Training Area. DOFAW estimates that the optimum acceptable distance from a fire diptank to a wildfire in this area is about two miles or less, which means that the area would continue to be less than acceptably protected.

In related but separate projects, the Hawaii Wildfire Management Organization has been awarded grant monies from the Federal Emergency Management Agency and is finalizing environmental compliance needed to allow construction of new fire diptanks in the Puʻuanahulu and Waikoloa areas (Elizabeth Pickett pers. comm. to R. Terry, November 2012). Pohakuloa Training Area also has plans for more fire diptanks within Keʻāmuku and elsewhere in the facility (U.S. Army Garrison, Hawaii, HQ 2003). These HWMO and U.S. Army diptanks will substantially improve wildfire fighting in northwest Hawaiʻi, but they would still not be optimally situated for fires in the Kaʻohe GMA, Mauna Kea Forest Reserve and adjacent areas. Because of ecosystem protection and public safety concerns in this area with poor road access, DLNR considers the No Action Alternative undesirable.

2.2 Alternative Locations

DOFAW considered other locations within two miles of the Kaʻohe GMA that might could be used as fire diptank sites, including other sites within the GMA, land within the Mauna Kea Forest Reserve and the former cattle lease being restored to *māmane* forest, as well as adjacent land on Parker Ranch, Waikiʻi Ranch, and Pohakuloa Training Area. One site originally proposed for the upper elevation tanks in the Mauna Kea Forest Reserve and specified in early consultation correspondence for this EA was relocated just southwest into the Kaʻohe GMA in order to be less visually obtrusive from the Puʻu Laʻau Cabin. The site originally proposed in early consultation correspondence for the lower elevation tanks was then relocated to avoid conflict with utility easements from just above the Kilohana Hunter Checking Station to about a half-mile *mauka*. The two sites ultimately chosen are located on Road 1, the best maintained unpaved road in the area, which traverses the heart of the Kaʻohe māmane forest. No other sites had the combination of accessibility by heavy trucks (for construction and initial filling of the tanks) and proximity to the core of the Kaʻohe māmane forest. In addition, areas that are not under DOFAW's control would require additional administrative approvals and third-party agreements that could involve lease funds and less than optimum conditions. Much of the private land has relatively poor access as well.

As the proposed sites appear to be in optimum locations with no known environmental or other disadvantages, no alternative sites have been advanced in this Environmental Assessment.

PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Basic Geographic Setting

The two approximately quarter-acre locations adjacent to Road 1 about a half mile *mauka* of the Kilohana Hunter Checking Station and southwest of the Puʻu Laʻau Cabin are referred to throughout this EA as the *project sites*. The term *project area* is used to describe the general environs of this part of the southwest slope of Mauna Kea, including the area benefitted by improved fire protection.

3.1 Physical Environment

3.1.1 Climate, Geology, Soils and Geologic Hazards

Environmental Setting

At about 5,900 and 7,400 feet in elevation respectively, both the Kilohana Hunter Checking Station and Puʻu Laʻau Cabin project sites have a cool climate, with daytime temperatures in the low 60s (Fahrenheit) and nighttime temperatures that often dip into the 40s or lower. Annual rainfall averages about 20 to 22 inches (Giambelluca et al 2012). Geologically, the project sites are located on the southwestern flank of the Mauna Kea volcano, on hawaiite or mugearite lava flows dating from the late Pleistocene, between 14,000 and 65,000 years before the present (Wolfe and Morris 1996). Soil on the project sites is classified by the U.S. Natural Resources Conservation Service (formerly Soil Conservation Service) as being in various series of well-drained, stony, very fine sandy loams (U.S. Soil Conservation Service 1973).

The entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the U.S. Geological Survey in this area of Mauna Kea is Zone 8, on a scale of ascending risk from 9 to 1 (Heliker 1990:23). The low hazard risk is based on the fact that Mauna Kea is a dormant volcano, and most Zone 8 areas have not been affected by lava flows in the past 10,000 years. As such, there is a low risk of lava inundation over relatively short time scales in the project area.

In terms of seismic risk, the entire Island of Hawaiʻi is rated Zone 4 Seismic Hazard (*Uniform Building Code, 1997 Edition*, Figure 16-2). Zone 4 areas are at risk from major earthquake damage, especially to structures that are poorly designed or built, as the 6.7-magnitude quake of October 15, 2006, demonstrated. The project sites do not appear to be subject to subsidence, landslides or other forms of mass wasting.

Impacts and Mitigation Measures

In general, geologic conditions impose no constraints on the proposed action, and the proposed project is not imprudent to construct. The design of the water tank infrastructure will take into account the soil's physical and chemical characteristics, which are not unsuitable for construction of water tanks,

with proper design to accommodate bearing loads, erosion and sedimentation issues. The facilities will also be designed and built in accordance with regulations related to the seismic setting.

3.1.2 Drainage, Water Features and Water Quality

Existing Environment

The project sites were selected specifically to ensure that no drainages or flood zones were located in or near the proposed locations of the water tanks or associated road aprons or pipelines. The area is not mapped within the 100-year floodplain on the Federal Emergency Management Agency's Flood Insurance Rate Maps (FIRM), and therefore the area is considered Flood Zone X, outside the 100-year floodplain.

Impacts and Mitigation Measure

Because the project will not disturb more than one acre of soil and will not involve discharge of hydrotesting and disinfection water, no National Pollutant Discharge Elimination System (NPDES) permit must be obtained by the contractor before the project commences. DOFAW policy is that minor grading activities associated with wildlife and habitat protection actions, such as the current project involving activities on about half an acre of surface that is mostly already disturbed, are not subject to County grading permits. although DOFAW staff and/or contractors are required to implement certain best management practices (BMPs) to prevent or minimize erosion and sedimentation. These BMPs may include, but will not be limited to, the following:

- Minimizing disturbance of soil during periods of heavy rain;
- Phasing of the project in order to disturb a minimum necessary area of soil at a particular time;
- Application of gravel over any areas where soil is disturbed;
- Use of drip pans beneath vehicles not in use in order to trap vehicle fluids;
- Routine maintenance of BMPs by adequately trained personnel; and
- Cleanup of significant leaks or spills and disposal at an approved site, if they occur.

3.1.3 Flora, Fauna and Ecosystems

Existing Environment, Impacts and Mitigation Measures: Plants

The project sites consist primarily of land that was grazed for over a century and is now utilized by game mammals. The original vegetation was a subalpine dry *māmane/naio* forest (Gagne and Cuddihy 1990), with various native herbs, shrubs and grasses in the understory. The long history of grazing and feral mammal browsing has thinned the forest and replaced native elements in the understory with non-natives, although the original canopy species are still dominant.

A botanical survey of the project sites was conducted in January 2013 by DOFAW biologist Lyman Perry, accompanied by Ron Terry. The primary purpose of the survey was to identify rare and threatened or endangered (T&E) species, but all species encountered were identified.

The upper project site was dominated by non-native pasture grasses including orchard grass (*Dactylis glomerata*), Yorkshire fog (*Holcus lanatus*), *Eragrostis brownei* and sweet vernal grass (*Anthoxanthum odoratum*), plus the non-native herbs and shrubs fireweed (*Senecio madagascariensis*), yarrow (*Achillea millefolium*) and mullein (*Verbascum thapsus*), with a few emergent native *māmane* (*Sophora chrysophylla*) seedlings. It should be noted that the upper project site was relocated about 700 feet subsequent to the survey into a more disturbed area with the same suite of mostly non-native species, with no *māmane* seedlings.

The lower project site had two common natives, hard-stemmed love grass (*Eragrostis atropioides*) and a few *ʻaʻaliʻi* (*Dodonaea viscosa*) shrubs, and the non-natives fireweed, mullein, telegraph plant (*Heterotheca grandiflora*), *Brassica nigra*, narrow-leafed plantain (*Plantago lanceolata*), cheeseweed (*Malva parviflora*), *oiwi* (*Verbena littoralis*), tumbleweed (*Salsola tragus*) and *Lepidium virginicum*. Along the proposed route of the pipe from the fill tank to the diptank there were a few native *ʻulei* shrubs (*Osteomeles anthyllidifolia*), which can be avoided.

No T&E plant species were noted on or near the project site. Because of the lack of rare or threatened or endangered plant species, no substantial adverse impacts to botanical resources would occur as a result of building the fire diptanks.

Existing Environment, Impacts and Mitigation Measures: Animals

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *ʻopeʻapeʻa*, all terrestrial mammals currently found on the island of Hawaiʻi are alien species. Most are ubiquitous, and none are of conservation concern. Domestic cattle and feral goats, sheep, and mouflon are present in the Kaʻohe area. The endangered Hawaiian hoary bat may forage in the area, but would not find the project sites themselves suitable roosting habitat, as trees or large shrubs are absent. The diptanks would not adversely impact the Hawaiian hoary bat, as no trees or shrubs would be cut or trimmed, and forest protection from wildfire is beneficial for providing long-term bat roosting and food resources.

Annual bird surveys are conducted by DOFAW on the southwestern slope of Mauna Kea from tree-line to the lower forest reserve boundary. The *māmane/naio* forests in this area contain over 95% of the population of the Palila (*Loxioides bailleui)* (Camp and Banko 2012), as well as populations of three additional native forest bird species. In addition, extensive bird surveys of nearby habitat were conducted as part of the Saddle Road Improvements EIS (FHWA-CFLHD 1999). These surveys combined with casual observations from the current project indicate that the lower site is dominated by introduced avian species, including numerous species of gamebirds and large numbers of House Finches (*Haemorhous mexicanus*), Common Mynas (*Acridotheres tristis*), and Eurasian Skylarks (*Alauda arvensis*). The upper project site includes a mix of native and alien species. Key species in this area include the native Hawaiʻi ʻAmakihi (*Hemignathus virens virens*), ʻApapane (*Himatione sanguinea*), and the endemic *bryani* subspecies of Hawaiʻi ʻElepaio (*Chasiempis sandwichensis*), as

well as alien House Finches, Japanese White-eyes (*Zosterops japonicas*), Eurasian Skylarks, and numerous gamebirds. This site is also on the edge of the core range of the Palila, and Palila are noted from the site (see discussion of Palila below).

Two other native bird species may also use the area, though neither is known to breed at either site. The Pueo, or Hawaiian Owl (*Asio flammeus sandwichensis*), is an endemic sub-species of the widely distributed Short-eared Owl, and is found in the grasslands of the Big Island. In addition, during the botanical reconnaissance of the area, an endangered ʻIo, or Hawaiian Hawk (*Buteo solitarius*), which is commonly seen in forested areas of the Big Island, was observed *mauka* of Puʻu Laʻau. While the low-stature of the forest and lack of suitable nesting at the sites makes the area unsuitable for nesting to occur, DOFAW will arrange for a search for nesting ʻIo by a qualified biologist before work begins at the site. If an ʻIo nest is found in or near the project sites, all land clearing activity will cease until the fledging of the nest.

The most prominent and important native bird at these sites, as discussed in Section 1, is the Palila. The Palila is the last extant representative of the finch-billed clade of Hawaiian Honeycreepers (Drepanidae) found on the main Hawaiian Islands. While fossil evidence shows that the species was formerly widespread on multiple islands at all elevations (Olson and James 1982), historically the species has been restricted to the *māmane-naio* forests at high elevation on the Island of Hawaiʻi. Over the 20th century, Palila disappeared from its historic range on Mauna Loa, Hualalai, and most of Mauna Kea, with the remaining population undergoing a steady decline over the past decade (Leonard et al. 2008, Camp and Banko 2012). The most recent estimate shows that about 2,200 Palila survive in degraded forest on the southwestern slope of Mauna Kea (Camp and Banko 2012).

The Palila was listed by the USFWS as endangered in 1967 (USFWS 1967) and critical habitat was designated in 1977 (USFWS 1977). The area designated as critical habitat encircles Mauna Kea from about 5,500 feet in elevation to 10,000 feet in elevation, encompassing an area of 24,357 ha (hectares). At least 95 percent of the Palila population occurs within a core area of about 7,200 ha on the southwest slope from 6,500 feet in elevation to 9,500 feet in elevation. Protecting the remaining forest in this area from the threat of fire is critical for the short and long-term survival of the species.

Palila have evolved into an extremely specialized bird dependent for its survival on *māmane* trees and associated invertebrates. Few other birds in the world are so highly specialized in their diet and therefore, their habitat requirements. *Māmane* seeds and flowers must be available throughout the year in order to sustain Palila populations, as approximately 90% of their diet is derived from these trees Insects provide additional protein for growth and survival of the young, with caterpillars serving as the chief insect prey items of Palila. Most of the caterpillars consumed are found within *māmane* pods. Breeding effort (number of pairs attempting to nest) and success (number of fledglings produced) of Palila depend heavily on the availability of *māmane* seeds and supplemental insect foods.

Large *māmane* trees can produce many more resources (seeds, flowers, insects, nest sites) than small trees and are preferred by Palila. Elevational and rainfall gradients result in food resources being available to Palila in relatively large quantities throughout the year. Where elevation and rainfall gradients are substantial, *māmane* flowers (and the seeds that follow) are produced in large quantities

at higher elevations first (where rainfall is higher) and at lower elevations later (where rainfall is lower). Palila respond to this changing availability of food by moving up and down the mountain, following the available food resources. Where elevation and rainfall gradients are insignificant, *māmane* seeds and flowers are produced in large quantities usually only once a year and are relatively scarce the rest of the year. Therefore, habitats best able to sustain Palila in the long term are large areas of forest that contain dense stands of large *māmane* trees and incorporate significant elevational or rainfall gradients. Habitat restoration is ongoing in the Kaʻohe Mitigation Area, as well as at Puʻu Mali on the north slope of Mauna Kea, both of which were created from the withdrawal of grazing leases as part of mitigation for the Saddle Road Improvements project (FHWA-CFLHD 1999).

Recent Palila occurrence at the proposed sites can be inferred based on annual surveys conducted by DOFAW. Annually, 13 transects are surveyed within the core habitat of the Palila (see Figure 3). For the upper diptank site, the closest stations are on transect 125 and 126, with the bottom three stations of transect 125 (26-28) approaching within 700 feet of the site. Palila numbers over the last 14 years of surveys range from 1-10 total at these stations, indicating a low density in the area, with no detections at the bottom two stations in 2011. This site is at the very edge of the core area populated by the Palila. The lower diptank site at the Kilohana check station is roughly 350 feet below the last station (51) on transect 126. No Palila have been recorded at this station or the one immediately upslope during the 1998-2011 survey period. The closest Palila detection to this area in 2011 was almost a mile away, and this area does not appear to support a Palila population at this time.

The construction of these fire diptanks is being implemented by DOFAW, with funding from the USFWS – the agencies entrusted with safeguarding this endangered species. While both of the proposed fire diptank sites are within areas designated as Palila Critical Habitat, the proposed project footprint would affect critical habitat of the Palila only very slightly. Moreover, the project will provide a net benefit to these species over the long-term by furnishing an adequate water source close to the core population of the Palila, subsequently reducing the chance of catastrophic fire. In order to ensure that short-term impacts to Palila are avoided or minimized, construction and site preparation of the upper site will occur outside of Palila breeding season. If work needs be conducted outside of this time period, a qualified biologist will search for nesting Palila in the project sites and immediate vicinity before any work begins, and the work will not start until nesting attempts either fledge or fail.

No rare, threatened or endangered invertebrates are known from the area. In any case, native invertebrates would benefit from protection of native forest. No streams or lakes are present, and thus there is no aquatic fauna.

3.1.4 Air Quality, Noise and Scenic Resources

Environmental Setting

The strong and steady winds of the project sites, which are located at elevations on Mauna Kea just above and below the semi-persistent tradewind inversion, assist in maintaining excellent air quality by generally dispersing human-derived pollutants as well as volcano-induced vog. In areas with bare

surfaces, however, the strong winds may also generate dust, especially in areas disturbed by grading, fire or over-grazing.

Sound levels on the project sites are low, reflecting natural sources such as wind and bird song, with only very occasional noise from passing 4WD vehicles and helicopters. No noise-sensitive human receptors are present, but the low noise levels contribute to the area's value for Palila habitat, as discussed above.

The project sites are both moderately scenic. The lower project site above Kilohana Hunter Checking Station has moderately good views of the Saddle and the leeward slopes, and the upper project site below Puʻu Laʻau Cabin site is perched on a slope above the ranchlands of Kohala. Neither site is identified in the Hawaiʻi County General Plan as having scenic character.

Impacts and Mitigation Measures

The proposed action will not measurably affect air quality or noise levels except minimally during construction activities. In order to avoid impacts from dust, DOFAW will minimize the amount of disturbed area at any given time and will avoid ground disturbance during high winds.

Development would entail limited work with heavy equipment in order to construct short lengths of graveled road aprons, level small areas for the tanks, and haul and place crushed rock for the tank bases. These activities will take place in isolated areas and are not expected to generate perceptible noise at the boundaries of the subject properties, and no human noise-sensitive receptors would be affected. Noise impacts to the endangered Palila are discussed in the previous section.

Although the project does involve construction of four tanks with a maximum height of likely 12 feet, but in no case over 20 feet ,and a maximum capacity of 40,000 gallons, the sites would not be visible from any major public vantages. No important viewplanes or scenic sites recognized in the Hawaiʻi County General Plan would be affected by the project, and visual impacts would be negligible.

3.1.5 Hazardous Substances, Toxic Waste and Hazardous Conditions

Environmental Setting, Impacts and Mitigation Measures

No professional evaluation such as a Phase I Environmental Site Assessment (ESA) was performed for the project sites. To DOFAW officials' knowledge, there have been no spills or other incidents involving hazardous or toxic substances, and no such materials are stored on the sites of the proposed construction. The installation of fire diptanks does not pose any unreasonable risk in terms of worker or public exposure to such materials.

3.2 Socioeconomic and Cultural

3.2.1 Socioeconomic Characteristics and Recreational Uses

Environmental Setting

The project generally affects and benefits the native vegetation of leeward Mauna Kea, and thus the community of hunters, birders, hikers and others from the Big Island and elsewhere who benefit from this resource. The 2010 U.S. Census of Population counted 185,079 residents on the Big Island, with a very diverse ethnic mix of 33.7% White, 22.2% Asian, 12.1% Native Hawaiian or Pacific Islanders, and 29.5% with two or more races. With 14.5% over 65 years old (compared to about 14% for the State as a whole), and a median age of 41.5 years (compared to 38.6 for the State), the population is skewed towards the older adults and the elderly. Many younger working-age residents who grow up in Hawai‘i County relocate to other islands or states to find work. Nevertheless, since 1980, Hawai‘i County has consistently been among the 100 fastest-growing counties in the U.S., mainly because it attracts working age adults or retirees, particularly in the Puna, Kohala and Kona districts.

Hunting is the most popular recreational activity in the project area. Hunting in the State of Hawai‘i is regulated by DOFAW and requires a hunting license whether hunting on public or private land. A hunting license is valid for all game in the State of Hawai‘i, including mammals (pigs, goats, sheep, mouflon and black-tailed deer and axis deer, on some islands) and gamebirds. A 2006 survey of recreationalists in Hawai‘i found that 18,000 residents hunted in the previous year (USFWS-USCB 2006). Hunting of feral mammals and game birds is supported in the Ka‘ohe GMA and in the adjacent Mauna Kea Forest Reserve. The Ka‘ohe GMA is designated by DOFAW as Hunting Unit G, where wild pig, sheep and goats may be taken by archery only, with no dogs permitted. It is open year-round on weekends and holidays, and bag limits apply to pigs but not sheep or goats. Bird hunting in season according to regulations is also allowed.

Other key wildlife-related recreational activities include wildlife viewing and hiking. Hawai‘i has 34 endangered bird species that are among the objects of “life lists” for birders from around the world. The 2006 recreational survey estimated that 155,000 Hawai‘i residents and 107,000 visitors engaged in wildlife viewing (USFWS and USCB 2006). The Ka‘ohe area is one of the only places to see the endangered Palila. The Ka‘ohe GMA is also traversed and/or utilized by recreational off-road vehicles, including motorcycles, 4WD trucks, and All-Terrain Vehicles (ATVs).

Impacts and Mitigation Measures

The project will not affect hunting, off-road vehicle us, or birding, nor will it have any other adverse socioeconomic impacts. It will improve fire protection to preserve the *māmane/naio* forest, which aside from its biological benefits, provides recreational opportunities.

3.2.2 Cultural and Historic Resources

Methods

The project sites were selected by the project team of DOFAW fire and wildlife specialists to maximize fire protection while minimizing effects to wildlife, endangered plants and cultural resources. Preliminary sites were inspected with the assistance of Sean Naleimaile of the DLNR-State Historic Preservation Division (SHPD), and one proposed site was shifted several hundred meters in order to respond to potential visual impacts on the historic Puʻu Laʻau Cabin. It has been determined by SHPD that no significant historic properties will be affected by the proposed undertaking for the upper location (see letter of March 22, 2013, in Appendix 1a); a similar determination is expected for the lower site, which was relocated late in project development and is under SHPD review.

For cultural resources and impacts, this EA has relied on consultation by letter of individuals known to have knowledge of cultural resources and practices as well as published material concerning Mauna Kea and the Saddle region. This includes the comprehensive work by Kepā Maly and Onaona Maly of Kumu Pono Associates documenting historical accounts and oral histories related to Mauna Kea and the mountain lands, or *ʻāina mauna* (Kumu Pono Associates 2005). Also critical was a Cultural Impact Assessment (CIA) by Pualani Kanakaʻole Kanahele and Edward Kanahele of the Edith Kanakaole Foundation, along with a study of Traditional Cultural Properties (TCPs) by Dr. Charles Langlas, conducted as part of the Saddle Road Improvements Environmental Impact Statement (EIS) (FHWA-CFLHD 1999, Vols. IV and V). These studies provide a thorough assessment of the cultural background and values in the Saddle between Mauna Kea and Mauna Loa. They included extensive archival research, interpretation of chants and *mele*, and interviews with Hawaiian Home Lands homesteaders and others. Most of the cultural background information in this EA is derived directly from these three documents, findings of which are paraphrased below and referenced where important for clarification or attribution.

Cultural Background and Importance of ʻAina Mauna Area

The project sites are located in the Hāmākua moku (district) of Hawaiʻi Island in the *ahupuaʻa* (traditional Hawaiian land division) of Kaʻohe, which translates to "the bamboo" (Pukui et al. 1974:85). The project sites are on the slopes of Mauna Kea, a mountain with great cultural significance, in an area that is also strongly associated with Hawaiʻi's history of ranching.

The high elevation areas of the island are considered to have religious importance to Native Hawaiians. Place names reflect the relationship of this area of concern with the indigenous people, their philosophy of life, and their gods.

According to work by the Edith Kanakaʻole Foundation, *Lono-nui-akea* was the original name for the Island of Hawaiʻi. It is the sacred name of Lono, the god of stormy weather, dark clouds, and rain. Throughout Polynesia, two islands were honored as *Ka inoa akua* (the god name, or namesake), and the Island of Hawaiʻi was one of these.

The popular interpretation of Mauna Kea is "white mountain." Mauna Kea is known around the world, and is regarded by many as the highest island mountain, the highest mountain in the world from below sea level, and the best mountain from which to make astronomical observations. To the Native Hawaiian, Mauna Kea is a *kupuna*, a grandparent or ancestor, and an *one hanau*, birthplace or home, and its name may more properly relate to Wakea, the Sky Father.

In the words of Pualani Kanakaʻole Kanahele and Edward Kanahele:

> "Wakea and Papa are the original parents of native Hawaiians. Mythologically they are the marriage of sky and earth: Wakea, Sky Father and Papa, Earth Mother. Between the two all things were born. Mauna Kea is the *piko* (center of a beginning or ending) of the island. This piko is the initial provider of the land mass of Hawaiʻi mokupuni. Hawaiʻi was also the *hiapo*, or first island child, of Papa and Wakea. The responsibilities and resources of Hawaiʻi and Wakea are needed for the growth and well-being of the island and all living forms of this mokupuni.
>
> The *kalo* (taro, a staple food) was Wakea and Papa's first food child and regarded as an elder brother who fed all indigenous natives, or *kanaka maoli* from the beginning of time today. During the time of *aliʻi* (chiefs, elite of the society) it was important for them to trace genealogy to the kalo and eventually to Wakea and Papa. When the genealogy could prove the connection they received the status of the senior line or hiapo line. Mauna Kea falls in the senior line genealogy.
>
> The Wakea and Papa beliefs and practices, including the tribute and respect for hiapo and kupuna, extend to contemporary times. Ancestral memory reminds the native Hawaiian that the mountain, like their parents, is the well-spring and provider of physical and spiritual nourishment.
>
> Strands of information from the past are found today in songs and people's actions. Besides land, water is a vital element of life and living. The high mountains attract clouds, then the clouds shed their water and the water soaks into the earth.
>
> The Pohakuloa area has Lilinoe as the female deity of misty rain and heavy fog, while Poliahu is the snow deity which adorns the top of Mauna Kea during the winter. These male and female water forms both belong to the Mauna Kea area.
>
> The ancestors of Native Hawaiians were island people and used the ocean to travel from island to island. Due to the vastness of the ocean and the limited land base, the measurement for survival was the ability to acquire food. Resources for the acquisition of food included the reef, fresh water, and fertile soil. The Hawaiian moon calendar was devised to assist Hawaiians in gathering and planting on fortuitous days. Using the moon calendar, the forefathers calculated the established cycles of all life forms. It was based on many generations of observation and practice, and it proved successful.

Other forms of traditional literature condone the fact that the ancestors made an effort to understand the intricacy of relationships of diverse life forms. One of the reasons for this was to protect and help sustain the food sources. They recognized a hierarchical order as well as a system of harmony and interaction of all existing life forms known to them.

They observed and made critical analyses of their sky, land, and ocean spaces. Rain, ocean, clouds, wind movement, coral species of the ocean, and seeded plants of the uplands are referred to within a common bond for generating regrowth or as a food source. Kane was responsible for regeneration, and the ocean currents, rain, wind, and clouds move together to make this possible. For food systems to regenerate themselves, the sky, land, and ocean spaces unite in a harmonic and natural rhythm to maintain the currents of water particles and clean air. This movement is known as *lokahi*. Lokahi is a system of working in unity and harmony. This knowledge was passed on through protocol, cultural practices, songs, and stories.

Lokahi is the antithesis of hierarchy. Lokahi is the system which bypasses the *hiapo* system and does not give precedence to first born or senior line. It is the system which states that everything is equal because everything, no matter how small or large, has a function which is necessary to maintain the overall well being of the whole entity. Native Hawaiian ancestors lived within these two systems and measured everything by this frame of reference.

One example is the division of ocean, sky, and land. These spaces were divided horizontally and vertically. The land division would be of primary concern for the proposed project. The most familiar is the vertical divisions, or *moku* and *ahupua‘a* sections common to maps of today. The boundary lines run from mountains to the ocean. The vertical boundaries followed mountains, rivers, streams, and cinder cones.

The natural vegetation growth was the measuring device for the horizontal pattern of the second land division. For this division, vegetation growth dictated land division name changes. The forest, like the coral bed, is the food source and therefore a vital system for the continuum of life and life cycles. The trees house food for birds, insects, animals, and man, and produce seeds for regeneration. The forest provides vegetation used for medicinal purposes, spiritual adornment, housing construction, and many other items. The following information identifies the horizontal space and the kinds of flora typical to each of these horizontal land areas.

> Kuahiwi. Kuahiwi means the mountain top, the backbone of the island, which is too high in elevation for heavy vegetation to grow. It is a very important area because of its height.
>
> Kualono. Kualono is the region near the mountain top. Little vegetation grows in this area. The māmane and naio are the only hardy trees to grow at this height. Both of these are hardwood trees. The flower of the māmane was a specialty for the ali‘i because of its shape and yellow color. When he wanted a special lei he would send his runners to fetch māmane flowers. ‘A‘ali‘i can also be found at this height. [The fire diptanks project site is within the Kualono.]

Waomaʻukele. Waomaʻukele is the region named for the wet, soggy ground. This area was located in the rain belt of the island, especially on the koʻolau side of each island. The typical trees of this area are the very large koa, ʻohiʻa, varieties of lobelia, and māmane.

Waoakua. Waoakua is the forested region below the waomaʻukele. This area is said to be occupied by spirits of the forest. Man seldom ventured into this area during ancestral times except when a particular kind of tree was needed and could not be found elsewhere. The large trees acquired from the waoakua and the waomaʻukele deserved substantial offerings. This is the region where the forest had a greater variety of trees. Some of the trees found are kolea, hoʼawa, kopiko, maile, maua, alani, koa, and ʻohiʻa.

Waokanaka. Waokanaka is the forested region *makai* (toward the sea) of the waoakua. This area was frequented by native Hawaiians. They found wood and other materials for weapons, house construction, tools, surfboards, and canoe accessories. They harvested dye, collected medicine, collected bird feathers, gathered vegetation for leis, gathered vegetation for the kuahu, gathered material for making rope, and many other useful things for everyday living. The trees in the waoakua are also found in this area, but the trees of this area may be smaller. Other flora found in this area include pilo, hapuʻu, holei, papala, hau kuahiwi, palapalai ʻolapa, and mamaki.

Kula. Kula referred to the upland grassy plains. The plants of the kula included ʼilima, maʻo, ʻamaʻu, ʻaʻaliʻi, ʻuluhe, and pili.

Kahakai. Kahakai referred to the edge of the ocean. At the kahakai was found the niu, hala, kaunaoa, kamani, hau, milo, naupaka, lama, and alaheʻe. All plants were recognized as useful to the Hawaiian" (FHWA-CFLHD 1998, Vols. IV and V).

In evaluating the effects of the Saddle Road Improvements project, which occupied many of the zones listed above, the Edith Kanakaole Foundation identified these resources and concepts as of sufficient importance to potentially affect the quality of life for native Hawaiians and their relationship to the environment and land.

- Importance of vegetation and the identity of the land sections.
- High cultural value of older or larger trees and *kipuka* which normally housed older trees.
- Priority to promote new growth through the non-disturbance of seed-producing forest areas within the *waomaʻukele* and *waoakua*. Hawaiians did not penetrate these areas if the trees they needed were available elsewhere.
- Importance of food source and regenerative energy of the forest.
- Philosophy of "a life for a life." When it was necessary to cut a large tree from the high forest, an offering of a human sacrifice was made.
- Importance of the *waomaʻukele* as a good source of water, and for maintaining the richness of the rainforest.

Again, quoting Pualani Kanakaʻole Kanahele and Edward Kanahele:

> "Native Hawaiians are people whose daily lives and culture are rooted in and integrated with the surrounding natural and biological world. They recognized and practiced respect for hierarchy or hiapo for man and land alike. The mountain is the sacred child of Wakea, and it is the source for the land. The mountains and land were genealogically connected to native Hawaiians through the original ancestor, Wakea and Papa. The mountains or land, water, and sky were a necessary part of the life cycle. The taro was regarded as an older brother of the land and provided sustenance. The coral was also an older brother (of the sea) and was the means through which other food could be acquired. The hierarchical system assigns rank to man, god, and the elements of the environment. Within the hierarchical food system another set of rules apply. The older or larger trees are primary and most important. The other animals that use these trees as their residence or food source are secondary.
>
> The lokahi system complements and maintains the wellbeing of the whole entity. Everything is important because each has a function.
>
> Water was and is necessary for all life forms. Laws for water and the use of water were formulated so all had exposure to water. Water that did not touch ground was highly prized. Such as the water in the lake on Mauna Kea and the water in the piko of the taro leaf. Water that moved underground or over land from the mountain to the sea was sometimes funneled into irrigation channels and fed the older brother kalo and was also treasured. The mountain and the waomaʻukele attracted the atmospheric water" (FHWA-CFLHD 1998, Vols. IV and V).

Historical Background

According to the radiocarbon dating and oral traditions recently summarized by Kirch (2012), the settlement of Hawaiʻi occurred roughly a millennium ago, with colonists possibly from the southern Marquesas Islands. Early Hawaiian farmers developed new subsistence strategies during this period, adapting familiar patterns and traditional tools for use in their new environment. Order was kept through adherence to their ancient and ingrained philosophy of life and through the principle of genealogical seniority. Hawaiians brought from their homeland a variety of Polynesian customs including the major gods of Kane, Ku and Lono; the *kapu* system of law and order; *puʻuhonua* or places of refuge or asylum; the *ʻaumakua* concept of a family or ancestral spirit and the concept of *mana*, or spiritual power. A time of periodic two-way voyaging followed for the next four centuries, which also brought changes that included an evolution of traditional tools as well as some distinctly Hawaiian inventions. The evolution of the adze was an example of the former, while the latter included the two-piece fishhook and the octopus-lure breadloaf sinker. Another invention was the *lei niho palaoa*, an item worn by those of high rank which represented a trend toward greater status differentiation.

The period of roughly 1400 to 1650 A.D. was a time of increasing in social stratification and major land use changes associated with institution of the *ahupuaʻa* system, where each *moku* was divided

into radial segments each offering the variety of resources found in each elevational zone, from coral reefs to rainforests. Land became intensively managed by the paramount chiefs and subordinates in a hierarchical system, and the common people, or *maka'ainana*, no longer were organized into groups associated with a particular piece of land, as in their ancestral homes in Polynesia. It also was a time of expansive settling, with the development of the most favorable windward areas as well as more marginal areas on the island's leeward side. This was the time of the greatest population growth as large irrigated field systems were developed and expanded into more arid areas. *Loko* or fishpond aquaculture also flourished during this period.

An increase in war marked the Proto-Historic Period (A.D. 1650-1795), both locally and between islands. Some of that warfare involved the lower slopes of Mauna Kea and strategically important *pu'u* near Waimea.

Hawai'i's history took a sharp turn on January 18, 1778 with the arrival of British Capt. James Cook in the islands. On a return trip to Hawai'i 10 months later, Kamehameha visited Cook aboard his ship the *Resolution* off the east coast of Maui and helped Cook navigate his way to Hawai'i Island. Cook exchanged gifts with Kalaniopu'u at Kealakekua Bay the following January, and Cook left Kealakekua in February. However, Cook's ship then sustained damage to a mast in a severe storm off Kohala and returned to Kealakekua, setting the stage for his death on the shores of the bay.

Two American vessels visited Hawaiian waters in 1790. The crew of one of the ships, the *Eleanor*, massacred more than 100 Hawaiians at Olowalu on Maui before leaving crewmember John Young on land. The other vessel, the *Fair American*, was captured off the western coast of Hawai'i and its entire crew – with the exception of Isaac Davis – was killed. Kamehameha did not take part but kept the *Fair American* as part of his fleet. Young eventually made his way to Hawai'i Island where he became governor, living at Kawaihae. By 1796, gaining critical knowledge from the captured sailors, Kamehameha had conquered every island kingdom except Kauai, but it wasn't until 1810, after Kaumuali'i of Kauai pledged his allegiance to Kamehameha, that all of the Hawaiian Islands were unified under a single ruler.

During this period there was a continuation of the trend toward intensification of agriculture, *ali'i*-controlled aquaculture, settling of upland areas and development of traditional of oral history. The Ku cult, *luakini heiau* and *kapu* system were at their peaks, but the influence of western civilization was being felt in the introduction of trade for profit and a market-system economy. By 1810, the sandalwood trade established by Europeans and Americans twenty years earlier was flourishing. That contributed to the breakdown of the traditional subsidence system, as farmers and fishermen were required to toil at logging which resulted in food shortages and a decline in population.

Following the death of Kamehameha I in 1819, the customary relaxing of *kapu* took place. But with the introduction of Christianity shortly thereafter, his successor, Kamehameha II, renounced the traditional religion and ordered that *heiau* structures either be destroyed or left to deteriorate. The family worship of *'aumakua* images was allowed to continue.

The Protestant missionaries who arrived from Boston in 1820 soon were rewarded with land and

government positions, as many of the *ali‘i* were eager to assimilate western-style dress and culture. But at the same time, the continuing sandalwood trade was becoming a heavier burden on commoners, as Ellis noted:

> “About eleven at night we reached Towaihae [Kawaihae], where we were kindly received by Mr. Young. ... Before daylight on the 22nd, we were roused by vast multitudes of people passing through the district from Waimea with sandal-wood, which had been cut in the adjacent mountains for Karaimoku, by the people of Waimea, and which the people of Kohala, as far as the north point, had been ordered to bring down to his storehouse on the beach, for the purpose of its being shipped to Oahu. There were between two and three thousand men, carrying each from one to six pieces of sandal-wood, according to their size and weight. It was generally tied on their backs by bands of ti leaves, passed over the shoulders and under the arms, and fastened across their breasts.”

The rampant sandalwood trade resulted in the first Hawaiian national debt, as promissory notes and levies granted by American traders were enforced by American warships. The assimilation of Western ways continued with the short-lived whaling industry to the production of sugarcane, which was more lucrative but carried a heavy environmental price. In the Waimea area and other uplands, cattle ranching became king.

The cattle brought by Captain Vancouver in 1793 and 1794, protected by a *kapu* placed on them by Kamehameha, multiplied rapidly. By the time the *kapu* was lifted a few years later, wild cattle had become rampant throughout the island, disturbing native gardens and damaging streams, grasslands and forests. Foreign bullock hunters were then employed to keep the herds under control. Although the meat was eaten, the main economic products were the hides. John Parker worked for Governor Kuakini as a bullock hunter in 1831, and before long had founded the famous ranch that still bears his name. By 1847, as Reverend Lorenzo Lyons noted, “two thirds of Waimea has been converted into a government pasture land” (IARII 1997:19). Stone walls were erected around residential settlements and cultivation fields as barriers to prevent damage by cattle. Cattle ranching profoundly changed life by displacing native agriculture, firmly establishing a monetary economy, altering the landscape and forests through direct and indirect means, and bringing in foreigners. Parker Ranch has been a major factor in shaping the natural and cultural landscape of Kohala and parts of Hamakua, including Ka‘ohe. Workers here and at other ranches generated a unique set of cultural practices and traditions known locally as the *paniolo* (Hawaiian for “Spanish” or “Español”) culture.

The Mahele ‘Aina that took place in 1848 placed all land in Hawai‘i into three categories: Crown Lands, Government Lands and Konohiki Lands. Ownership rights were “subject to the rights of the native tenants,” or those individuals who lived on the land and worked it for their subsistence and for their chiefs. In the Mahele, the vast *ahupua‘a* of Ka‘ohe was relinquished by Victoria Kamamalu to Kamehameha III on January 27, 1848 (Buke Mahele 1848:5-6). It was then given by Kamehameha III to the Government Land Inventory on March 8, 1848 (BM:1848:191). There were only four native claims registered, and one awarded, none in the *‘āina mauna*.

Official leases of the area of Ka‘ohe that include the project sites began in 1857 (Keoni Ana to F.

Spencer) for Spencer's Waimea Grazing and Agricultural Company. The lease included all of the mountain lands. Eventually, Parker Ranch obtained the lease and kept it until 1905, when part of the area was withdrawn for the Mauna Kea Forest Reserve. The project sites remained within leased land.

One of the interesting and culturally significant events that occurred in the specific Puʻu Laʻau area somewhere near the upper elevation project site was the 1882 passage of the Dowager Queen Emma, on her way to a ceremonial bath in Lake Waiau. It was recounted in the native newspaper *Kuokoa* on October 14, 1882, which was translated in by Kumu Pono Associates (2005:155). *Mele* celebrating the trip were written and are in the B.P. Bishop Museum collection. In the translation by Mary Kawena Pukui and others, there are references to the Queen enjoying "the sweet voices of the Palila." (Ibid: A155). In an interview of Kalani Kaʻapuni-Phillips by Larry Kimura from 1967, transcribed by Kepā Maly, he said concerning the Queen's journey from Waimea:

> "Queen Emma was a good horsewoman….she could choose which ever horse she was interested in. Waimea had many horses to choose from. They went up to this place called Kahalalaʻau (Puʻu Lāʻau)….At that time, there was great rain, and no shelter. So these people with your renowned elder, they broke the leafing branches of the māmane. They made a house for Queen Emma. This work of your elder and the people with him brought him honor. When this house was made for Queen Emma, Queen Emma said to your grandfather, William Lindsey, 'In living with your wife, if she should give birth.....Name the child, Ka-hale-lau-māmane' " (Ibid:161).

The *māmane* forest was clearly an important attribute of the area, with both cultural and natural significance. An 1892 account of a Mauna Kea survey trip by W.D. Alexander in the Honolulu Commercial Advertiser noted that Waikiʻi was excellent grazing country (i.e., mostly grass), but that a fine grove of *māmane* trees still survived at Auwaiakeakua Gulch, which runs just north of Puʻu Laʻau (Ibid:182).

The value of the *māmane* forest for both commercial (e.g., fence posts) and watershed purposes was increasingly recognized in the later kingdom, Republic of Hawaiʻi and early Territorial days. In an October 13, 1906 report of Territorial Forester Ralph Hosmer, there was a recommendation to remove certain portions of Kaʻohe for sale or lease, as "waste land", because it was good *māmane* forest land that was not particularly suited for grazing. It had traditionally been provided "*manuahi*" (gratis), Hosmer said, and it would make more sense to simply reserve it and protect the forest. He proposed a line extending clockwise from Ahumoa to Puʻu Laʻau to the Paʻauhau boundary over to Kemole, on which a cattle and sheep-proof fence would be built. The manager of Parker Ranch, Alfred A. Carter, was in agreement (Ibid:433, 542).

In 1909, part of the Kaʻohe pasture lease land was withdrawn to create a portion of the Mauna Kea Forest Reserve (Ibid A15). Additional land was withdrawn from Kaʻohe in 1956 for the U.S. Army's Pohakuloa Training Area (Governor's Executive Order No. 1719, Presidential Executive Order No. 1167) (Ibid:15).

It would be some years before a fence completely encircled the mountain and cattle and sheep were

removed from the Mauna Kea Forest Reserve. Famed Territorial Forester L.W. (Bill) Bryan wrote several articles in 1937 in the *Paradise of the Pacific* magazine ("Wild Sheep of Hawaii" and "The Big Fence on the Big Island") documenting the process. He wrote of the considerable damage that wild sheep and goats had done to native forest cover, especially *māmane*. In 1935, the U.S. Government began to assist the Territory of Hawai'i through the Civilian Conservation Corps (CCC), and they built a sheep proof fence around the entire reserve and its 100,000 acres at roughly the 8,000-foot contour, and then killed or captured almost 16,000 wild animals. The 55.5-mile long, 55-inch high, extra heavy galvanized stock wire fence was completed in January of 1937 at cost of $72,000, or $1,300 per mile, and utilized *māmane posts*. (Kumu Pono Associates 2005:239-41). Rally Greenwell, who worked as a *paniolo* all over Parker Ranch and eventually became Ranch Manager, recounted to Kepā Maly in a 2000 interview that Bill Bryan planted the conifers that now grace the Pu'u La'au area (Ibid: A68). He indicated that the cowboys did not generally travel beyond the fence line and that Parker Ranch helped Mr. Bryan maintain the fence. Other cowboys, including Jiro Yamaguchi in his interviews with Maly, said that some cowboys would occasionally *holoholo* up the west side of Mauna Kea from Pu'u La'au, although not to the summit (Ibid:A78).

Cultural Resources and Practices on the Project Site

Although the summit regions are particularly sacred, Mauna Kea, from the lower slopes to the highest peaks, is culturally significant. Other landmarks in the vicinity of the project sites are Ka Pu'u-a-Pele, the top of which marks the joining of the *'apana* of Kona, Kohala, and Hamakua; Ahumoa, another cinder cone; and Pu'u La'au, which is associated with the thriving *māmane* forest and Queen Emma's visit. In general terms, resources of high importance in the Saddle area that were determined by the Edith Kanaka'ole Foundation to be important were the *māmane* forest, *kipuka*, prehistoric trails, and historic trails. The cultural value of *māmane/naio* forest and *kipuka* is associated with the age and size of the trees. Interestingly, the Waimea Hawaiian Civic Club introduced a resolution in 1980 at the 1979 Association of Hawaiian Civic Clubs convention on Maui to protect Mauna Kea. Among other items was a request to have the entire *Māmane/Naio* Forest fenced off, for the purpose of preserving the habitat of the threatened and endangered Palila (Ibid:638).

Although strictly speaking, ranching may not constitute a traditional cultural practice, it is certainly the foundation of the current culture, lifestyle and identity of the Parker Ranch and adjacent areas. The *paniolo*, many but not all of whom are Hawaiian, form a unique subculture that reflects a combination of both its Hawaiian and western roots. The older, and certainly the original, residents of Kuhio Village and Pu'ukapu are very much a part of this *paniolo* subculture. To some extent the ethnic traditions of other cultures have been incorporated into the general cultural milieu of Waimea and Waiki'i and are celebrated by all, with periodic events including cowboy-oriented falsetto and storytelling events, parades and historical festivals sponsored by local schools.

Similarly, hunting, discussed in the section above, is a recreational or subsistence practice with cultural importance as well, as generations of families have utilized the introduced mammals and birds and enjoyed the outdoors.

To summarize the cultural resources and practices present on the project sites, they are surrounded by areas of *māmane* forest but do not themselves have *māmane* trees, because a criterion of selecting a project site was that no *māmane* trees should need to be cut or trimmed. The project sites avoid the Puʻu Laʻau hilltop area (which has actually been quarried) and the cabin. The Kaʻohe Game Management Area no longer supports ranching but is important for hunting. The project sites do not have archaeological remains, nor do they appear to contain any other resources of a potential traditional cultural nature (e.g., prehistoric or historic trails) or evidence of any traditional gathering uses or other cultural practices.

Impacts and Mitigation Measures

The Constitution of the State of Hawaiʻi clearly states the duty of the State and its agencies to preserve, protect, and prevent interference with the traditional and customary rights of native Hawaiians. Article XII, Section 7 requires the State to "protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupuaʻa* tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778" (2000). In spite of the establishment of the foreign concept of private ownership and western-style government, Kamehameha III (Kauikeaouli) preserved the people's traditional right to subsistence. As a result, in 1850 the Hawaiian Government confirmed the traditional access rights to native Hawaiian *ahupuaʻa* tenants to gather specific natural resources for customary uses from undeveloped private property and waterways under the Hawaiʻi Revised Statutes (HRS) 7-1. In 1992, the State of Hawaiʻi Supreme Court reaffirmed HRS 7-1 and expanded it to include:

> "native Hawaiian rights…may extend beyond the ahupuaʻa in which a native Hawaiian resides where such rights have been customarily and traditionally exercised in this manner" (Pele Defense Fund v. Paty, 73 Haw.578, 1992).

Act 50, enacted by the Legislature of the State of Hawaiʻi in 2000, relating to Environmental Impact Statements, stated that:

> "…there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaii's culture, and traditional and customary rights… "[H.B. NO. 2895].

The proposed fire diptank project would take place within, and would protect, the core of the remaining *māmane* forest on Mauna Kea, which was celebrated in traditional Hawaiian culture and valued and gradually protected throughout the historical era as well. No *māmane* trees would need to be cut. The project does not restrict hunting outside the small footprint of the tanks themselves and so would not lead to adverse effects on hunting. The proposed installation of this fire-fighting infrastructure would not likely impact any culturally valued resources or cultural practices. SHPD, the Office of Hawaiian Affairs, and various cultural experts contacted as part of early consultation have been supplied a copy of the EA for their comments.

As discussed above, SHPD has determined that no significant historic properties will be affected by the proposed undertaking for the upper location (see letter of March 22, 2013, in Appendix 1a); a similar determination is expected for the lower site, which was relocated late in project development and is under SHPD review. In the unlikely event that human skeletal remains, undocumented archaeological resources, or cultural or traditional remains are encountered during future development activities within the current study area, work in the immediate area of the discovery shall be halted and the State Historic Preservation Division contacted as outlined in Hawai‘i Administrative Rules 13§13-275-12.

3.3 Infrastructure

Existing Facilities and Services, Impacts and Mitigation Measures

No electrical or telephone lines are present at either site or necessary for the action. As discussed in Section 1.1, no water lines are available and the tanks will be initially filled by water trucks, after which they will rely primarily on catchment.

Access to the sites is from the Saddle Road, at the Kilohana Hunter Checking Station turnoff at the top of the “Seven Steps.” Care is required to exit this driveway because of limited sight distance and the steepness of the unpaved driveway. This section of Saddle Road will be bypassed when the realigned Saddle Road is opened in August 2013, greatly reducing traffic.

Both tanks are situated off of Road 1 (R-1), an unpaved road that serves the Division of Forestry and Wildlife in fulfilling its mission in recreation, fire-fighting and resource management in the Ka‘ohe Game Management Area and the vast Ka‘ohe section of the Mauna Kea Forest Reserve. The road circles Mauna Kea and ultimately connects to the Humu‘ula area of the Forest Reserve, terminating at Hale Pohaku, where it connects to the Mauna Kea Access Road.

The proposed installation of the fire-fighting infrastructure will involve hauling of equipment and materials over the course of several weeks and may cause use very temporary delays of no more than one hour in access along R-1. The heaviest loads will be associated with hauling water to fill the tanks, which will require 35 to 40 trips with a 4x4 1,000-gallon tender truck at each site. DOFAW maintains R-1 and will ensure that any impacts to the roadway surface are repaired. Periodic maintenance of the water tanks is expected to be infrequent and will not cause any substantial impacts.

3.4 Secondary and Cumulative Impacts

3.4.1 Secondary Impacts

The proposed project would not involve major secondary impacts, such as population changes or effects on public facilities. Although the project would involve limited short-term construction labor, these minor services could be provided by DOFAW and/or local firms and labor and would not induce in-migration.

3.4.2 Cumulative Impacts

Planned and Reasonably Foreseeable Projects

No construction or other projects involving an active land use are known to be occurring within a one-mile radius of either project site. A little over a mile away, the Hawai‘i Department of Transportation and the Federal Highway Administration are in the final stages of paving the 10-mile western section of the realigned Saddle Road (State Highway 200). The realigned highway, scheduled to open in August 2013, will connect from the existing Saddle Road from mile marker 41.5 to a new intersection with Mamalahoa Highway at about mile marker 14. As discussed above, this will divert traffic away from the project sites, making it easier to turn into and out of the Kilohana Hunter Checking Station access to R-1.

Also about one mile away is the boundary of the U.S. Army's Pohakuloa Training Area (PTA). In 2011, the U.S. Army published a Notice of Intent in the *Federal Register* that it plans to prepare a programmatic environmental impact statement (PEIS) to evaluate the impact of modernize training ranges, infrastructure, and support facilities at PTA. The project includes constructing and operating an Infantry Platoon Battle Area that would include an Infantry Platoon Battle Course, Live-fire Shoothouse, and a Military Operations on Urban Terrain facility. Although the Army will build additional fire diptanks to support new activities in fulfillment of the *Integrated Wildland Fire Management Plan Oahu and Pohakuloa Training Areas* (U.S. Army Garrison, Hawaii, HQ 2003), as discussed in Section 2, no aspect of the proposed expansion would interact in any adverse way with the proposed fire diptanks project.

About six miles southeast, also within PTA, a research exploratory well project is slated to drill throughout 2013 (UH Hawai‘i Institute of Geophysics and Planetology 2012). This project will evaluate deep aquifers and assess the potential to develop this water resource for use by PTA, Hawaiian Home Lands and the Mauna Kea Observatories. This activity would not interact in any adverse way with the proposed fire diptank project, although it might ultimately provide a more convenient source for water for fire-fighting in the Saddle area.

A consortium of governments and institutions is planning the Thirty Meter Telescope (TMT), a large segmented mirror reflecting telescope to be built on the North Plateau of Mauna Kea (UHH 2010). This billion dollar project is expected to be built starting in the last half of the current decade and will involve traffic and construction impacts, both on Mauna Kea and at support facilities in Hilo. None of the TMT activities would interact in any way with the proposed fire diptanks project.

Cumulative Impacts and Mitigation Measures

Cumulative impacts result when implementation of several projects that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures. The adverse effects of the project – minor and temporary noise and traffic, as well as permanent but minor visual impacts– are very limited in severity, nature and geographic scale. As discussed above, the projects

known to be occurring nearby will not generate impacts with which the very minor and temporary effects from the fire diptanks project would accumulate, and no cumulative impacts are foreseen.

3.5 Required Permits and Approvals

Aside from the Chapter 343, HRS, Finding of No Significant Impact and a finding of no effect to significant historic properties pursuant to Chapter 6e, HRS, no permits or approvals are expected to be required.

3.6 Consistency With Government Plans and Policies

3.6.1 Hawai‘i State Plan

Adopted in 1978 and last revised in 1991 (Hawai‘i Revised Statutes, Chapter 226, as amended), the Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State's long-run growth and development activities. The three themes that express the basic purpose of the *Hawai‘i State Plan* are individual and family self-sufficiency, social and economic mobility and community or social well-being. The proposed project would promote these goals by protecting an area from wildfire, thereby enhancing quality-of-life and community and social well-being.

3.6.2 Hawai‘i State Land Use Law and Game Management Area Designation

All land in the State of Hawai‘i is classified into one of four land use categories – Urban, Rural, Agricultural, or Conservation – by the State Land Use Commission, pursuant to Chapter 205, HRS. The project site is classified within the State Land Use Conservation District, Protective Subzone. According to a February 13, 2013 memo from the DLNR Office of Conservation and Coastal Lands (OCCL) (see Appendix 1a):

> "OCCL believes that the proposed land uses will not require the applicant to submit a Conservation District Use Application (CDUA) and has determined that this proposal is consistent with the park programs and current uses managed by the Division of Forestry and Wildlife (DOFAW). The parcels have been encumbered by a variety of agencies since the early 1900's (i.e., DOFAW and the University of Hawaii); the *Mauna Kea Forest Reserve* was set aside under a Governors Proclamation on *June* 5, *1909* while the adjacent *State of Hawaii Public Hunting Ground and Game Reservation* was created under Executive Order #1398 on *October* 16, *1950.* Under a current DLNR policy, divisions within the department have been working cooperatively to manage areas that jurisdictionally fall under multiple divisions. It is the policy of DLNR that all divisions will comply with Hawaii Revised Statutes (HRS) §183C and HRS §343 and Hawaii Administrative Rules (HAR) §13-5, and therefore each division is responsible for implementing procedures to comply with the aforementioned rules and statutes."

It should be noted that, as discussed in Sections 1 and 2, the initial upper fire diptank site in the Mauna Kea Forest Reserve adjacent to the Pu‘u La‘au cabin was relocated about 700 feet south within the

Kaʻohe Game Management Area (GMA) subsequent to the distribution of early consultation letters. As such, both sites are within the Kaʻohe GMA. As noted above, this is designated by DOFAW as Hunting Unit G, where wild pig, sheep and goats may be taken by archery only, with no dogs permitted. It is open year-round on weekends and holidays, and bag limits apply to pigs but not sheep or goats. Bird hunting in season according to regulations is also allowed. DOFAW is permitted to conduct management activities in hunting areas, including installation of fire-fighting infrastructure, without the need for permits.

3.6.3 Hawaiʻi County Zoning and General Plan

As the sites are within the State Land Use Conservation District, County zoning per se does not apply. The County designates the sites Conservation in the General Plan Land Use Pattern Allocation Guide Map (LUPAG), and the action would be considered consistent with the LUPAG. The sites are not within the Special Management Area, which is meant to protect coastal resources.

PART 4: DETERMINATION

The Hawaiʻi State Department of Land and Natural Resources expects to determine that the proposed project will not significantly alter the environment, as impacts will be minimal, and intends to issue a Finding of No Significant Impact (FONSI). This determination will be reviewed based on comments to the Draft EA, and the Final EA will present the final determination.

PART 5: FINDINGS AND REASONS

Chapter 11-200-12, Hawaiʻi Administrative Rules, outlines those factors agencies must consider when determining whether an Action has significant effects:

1. *The proposed project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources.* No valuable natural or cultural resources would be committed or lost, and the project would protect natural resources from fire.
2. *The proposed project will not curtail the range of beneficial uses of the environment.* The proposed project expands and in no way curtails beneficial uses of the environment.
3. *The proposed project will not conflict with the State's long-term environmental policies*. The State's long-term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policy are to conserve natural resources and enhance the quality of life. The project has a minor footprint, has been designed to avoid environmental impacts and fulfills aspects of these policies calling for protecting the natural environment. It is thus consistent with all elements of the State's long-term environmental policies.
4. *The proposed project will not substantially affect the economic or social welfare of the community or State.* The project will benefit the economic and social welfare of the community by enhancing fire protection.
5. *The proposed project does not substantially affect public health in any detrimental way.* The proposed project will benefit public health by protecting air quality by limiting wildfire.

6. *The proposed project will not involve substantial secondary impacts, such as population changes or effects on public facilities*. No adverse secondary effects are expected to result from the proposed action. The project will not enable development or cause in-migration.
7. *The proposed project will not involve a substantial degradation of environmental quality*. The project will not degrade the environment in any substantial way.
8. *The proposed project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.* The project is meant primarily to protect critical habitat for the endangered Palila. Construction will be scheduled and conducted to minimize impacts to Palila. The area has been inspected by biologists from DOFAW and no other endangered species of flora or fauna is present.
9. *The proposed project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions.* The project is not related to additional activities in the region in such a way as to produce adverse cumulative effects or involve a commitment for larger actions.
10. *The proposed project will not detrimentally affect air or water quality or ambient noise levels.* No adverse effects on these resources would occur. Ambient noise impacts due to construction will be temporary and timed to avoid impact to sensitive fauna, particularly Palila.
11. *The project does not affect nor would it likely to be damaged as a result of being located in environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal area.* Although the project is located in an area with seismic risk, the entire Island of Hawai‘i shares this risk, and the project would not be imprudent to construct and would employ design and construction standards appropriate to the seismic zone.
12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* No scenic vistas or viewplanes identified in the Hawai‘i County General Plan will be adversely affected by the project, and visual impacts will be negligible.
13. *The project will not require substantial energy consumption*. The project involves only minor energy use and no adverse effects are expected.

For the reasons above, the proposed action is not expected to have any significant effect in the context of Chapter 343, Hawai‘i Revised Statues and section 11-200-12 of the State Administrative Rules.

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ENVIRONMENTAL ASSESSMENT

Ka‘ohe Fire Diptanks

State of Hawai‘i
Department of Land and Natural Resources
Division of Forestry and Wildlife

APPENDIX 1a

Comments in Response to Early Consultation

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William P. Kenoi
Mayor

Harry S. Kubojiri
Police Chief

Paul K. Ferreira
Deputy Police Chief

County of Hawai'i
POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawai'i 96720-3998
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January 28, 2013

Mr. Ron Terry
Principal
Geometrician Associates
P. O. Box 396
Hilo, HI 96721

Dear Mr. Terry:

SUBJECT: EARLY CONSULTATION FOR ENVIROMENTAL ASSESSMENT FOR INSTALLATION OF TWO DIP TANKS AT KA'OHE, TMKS (3RD.) 4-4-015:001 AND 004 (PORS.) HAMAKUA DISTRICT, ISLAND OF HAWAII

Staff, upon reviewing the provided documents, does not anticipate any significant impact to traffic and /or other public safety concerns. We are not requesting a copy of the EA or notification when completed.

Thank you for allowing us the opportunity to comment.

If you have any questions, please contact Captain Richard Miyamoto, N. Hilo/Hamakua Patrol Commander, at 775-7533.

Sincerely,

HENRY J. TAVARES, JR.
ASSISTANT POLICE CHIEF
AREA I OPERATIONS BUREAU

RM:lli
130041

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

13-017
Ka`ohe Dip Tanks

January 31, 2013

Mr. Ron Terry
Geometrician Associates, LLC
P.O. Box 396
Hilo, Hawaii

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Installation of Two Dip Tanks at Ka`ohe, TMK: (3) 4-4-015: 001 and 004 (pors.) Hamakua District, Island of Hawai`i

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your letter dated January 18, 2013. Thank you for allowing us to review and comment on the subject document. The document was routed to the relevant Environmental Health divisions and offices. They will provide specific comments to you if necessary. EPO recommends that you review the Standard Comments (www.hawaii.gov/health/epo under the land use tab). You are required to adhere to all Standard Comments specifically applicable to this application.

EPO suggests that you examine the many sources available on strategies to support the sustainable design of communities, including the:
U.S. Environmental Protection Agency's sustainability programs: www.epa.gov/sustainability
U.S. Green Building Council's LEED program: www.new.usgbc.org/leed

The DOH encourages everyone to apply these sustainability strategies and principles early in the planning and review of projects. We also request that for future projects you consider conducting a Health Impact Assessment (HIA). More information is available at www.cdc.gov/healthyplaces/hia.htm. We request you share all of this information with others to increase community awareness on sustainable, innovative, inspirational, and healthy community design.

We request a written response confirming receipt of this letter and any other letters you receive from DOH in regards to this submission. You may mail your response to 919 Ala Moana Blvd., Ste. 312, Honolulu, Hawaii 96814. However, we would prefer an email submission to epo@doh.hawaii.gov. We anticipate that our letter(s) and your response(s) will be included in the final document. If you have any questions, please contact me at (808) 586-4337.

Mahalo,

Laura Leialoha Phillips McIntyre, AICP
Manager, Environmental Planning Office

William P. Kenoi
Mayor

Darren J. Rosario
Fire Chief

Renwick J. Victorino
Deputy Fire Chief

County of Hawai'i
HAWAI'I FIRE DEPARTMENT
25 Aupuni Street • Room 2501 • Hilo, Hawai'i 96720
(808) 932-2900 • Fax (808) 932-2928

January 30, 2013

Mr. Ron Terry
Geometrician Associates
PO Box 396
Hilo, HI 96721

Dear Mr. Terry,

SUBJECT: EARLY CONSULTATION FOR ENVIRONMENTAL ASSESSMENT FOR INSTALLATION OF TWO DIP TANKS AT KAOHE

TMK: (3^{RD}) 4-4-015:001 AND 004 (PORS) HAMAKUA DISTRICT

The Hawai'i Fire Department does not have any comments to offer at this time regarding the above-referenced early consultation for Environmental Assessment.

Thank you for the opportunity to comment. A copy or Notice of Availability of Environmental Assessment is not needed when completed.

Sincerely,

DARREN J. ROSARIO
Fire Chief

RP:lc

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 12, 2013

Geometrician Associates
Attention: Mr. Ron Terry
P.O. Box 396
Hilo, Hawaii 96721

via email: rterry@hawaii.rr.com

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Installation of Two Dip Tanks at Kaohe, Division of Forestry and Wildlife, Applicant, Kaohe, Hamakua, Hawaii, TMKs: (3) 4-4-15:01 and 04 pors.

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (i) the Engineering Division, (ii) Hawaii District Land Office, (iii) Division of Aquatic Resources, and (iv) Commission on Water Resource Management on the subject matter. Should you have any questions, please feel free to call Kevin Moore at (808) 587-0426. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 23, 2013

RECEIVED
LAND DIVISION
2013 JAN 30 PM 1:42
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

TO: FR.

DLNR Agencies:
X Div. of Aquatic Resources
__ Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__ Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

FROM: TO: Russell Y. Tsuji, Land Administrator
SUBJECT: Early Consultation for Environmental Assessment for Installation of Two Dip Tanks at Kaohe
LOCATION: Kaohe, Hamakua, Hawaii, TMKs: (3) 4-4-15:01 and 04 pors.
APPLICANT: Geometrician Associates, LLC

Transmitted for your review and comment is information on the above referenced project. We would appreciate your comments on this document. Please submit any comments by February 12, 2013.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: _____
Print name: Carty S. Chang, Chief Engineer
Date: 1/29/13

cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
REF: Early Consultation for DEA for Installation of Two Dip Tanks at Kaohe, District of Hamakua
Hawaii.001

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone .

(X) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is .

( ) Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Mario Siu Li at (808) 768-8098 or Ms. Ardis Shaw-Kim at (808) 768-8296 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
( ) Mr. Carolyn Cortez at (808) 270-7813 of the County of Maui, Department of Planning.
( ) Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide to the Engineering Division upon its availability the water demands and calculations for the selected site, so it can be included in the State Water Projects Plan Update.

( ) Additional Comments:

( ) Other:

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 1/29/13

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 23, 2013

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
___Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
___Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division Hawaii District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Early Consultation for Environmental Assessment for Installation of Two Dip Tanks at Kaohe
LOCATION: Kaohe, Hamakua, Hawaii, TMKs: (3) 4-4-15:01 and 04 pors.
APPLICANT: Geometrician Associates, LLC

Transmitted for your review and comment is information on the above referenced project. We would appreciate your comments on this document. Please submit any comments by February 12, 2013.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Kevin Moore at 587-0426. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: [signature]

Print name: Gordon Smith
Date: 1/25/13

cc: Central Files

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 14, 2013

Geometrician Associates
Attention: Mr. Ron Terry
P.O. Box 396
Hilo, Hawaii 96721

via email: rterry@hawaii.rr.com

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Installation of Two Dip Tanks at Kaohe, Division of Forestry and Wildlife, Applicant, Kaohe, Hamakua, Hawaii, TMKs: (3) 4-4-15:01 and 04 pors.

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments previously sent under cover of our letter dated February 12, 2013, enclosed are comments from the Office of Conservation and Coastal Lands on the subject matter. Should you have any questions, please feel free to call Kevin Moore at 587-0426.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: AJR

COR: HA-13-91

FEB 13 2013

MEMORANDUM

TO: Russell Y. Tsuji, Administrator
DLNR – Land Division

FROM: Samuel J. Lemmo, Administrator
DLNR – Office of Conservation and Coastal Lands

SUBJECT: **Request for Consultation on the Proposed Installation of a Water System**
Hamakua District, Mauna Kea, Island of Hawaii
TMK: (3) 4-4-015:001 and (3) 4-4-015:004

The Office of Conservation and Coastal Lands (OCCL) is in receipt of your memo dated *January 23, 2013* regarding a request for early consultation on the proposed construction of two (2) water tanks and associated water system, the repair and maintenance of an existing unpaved access drive, and the construction of 400-feet of new unpaved access road all located in the Conservation District Protective Subzone.

The proposed land uses include the construction of two (2) 40,000 gallon covered holding tanks for water that will be filled either by delivery truck or a catchment process. Each tank will be attached to a High Density Polyethylene (HDP) pipeline that will connect the large covered holding tank to a smaller open water tank; the pipe will run along the ground surface, except for road crossings which will require burial of the pipeline. The small open water tanks will be utilized by helicopters as a "dip tank" for fire suppression as well as "ecosystem restoration efforts". Additionally the proposal requires minor improvements to the existing unpaved access drive along with the construction of 400-feet of new unpaved access.

While the information submitted is limited, the OCCL believes that the proposed land uses will not require the applicant to submit a Conservation District Use Application (CDUA) and has determined that this proposal is consistent with the park programs and current uses managed by the Division of Forestry and Wildlife (DOFAW). The parcels have been encumbered by a variety of agencies since the early 1900's (i.e., DOFAW and the University of Hawaii); the *Mauna Kea Forest Reserve* was set aside under a Governors Proclamation on *June 5, 1909* while the adjacent *State of Hawaii Public Hunting Ground and Game Reservation* was created under Executive Order #1398 on *October 16, 1950.*

Under a current DLNR policy, divisions within the department have been working cooperatively to manage areas that jurisdictionally fall under multiple divisions. It is the policy of DLNR that

William P. Kenoi
Mayor

BJ Leithead Todd
Director

Margaret K. Masunaga
Deputy

West Hawai'i Office
74-5044 Ane Keohokalole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563

County of Hawai'i
PLANNING DEPARTMENT

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

February 15, 2013

Mr. Ron Terry
Geometrician Associates, LLC
P.O. Box 396
Hilo, HI 96721

Dear Mr. Terry:

Subject: **Pre-Consultation for Draft Environmental Assessment**
Project: Installation of Two Dip Tanks at Ka'ohe
TMK: (3) 4-4-015:001, 004; Ka'ohe, Hamakua, Hawai'i

Thank you for your letter dated January 22, 2012, requesting comments from this office regarding the preparation of a Draft Environmental Assessment (DEA) for the subject project.

The Department of Land and Natural Resources, Division of Forestry and Wildlife is planning to construct water tanks and related infrastructure at two sites on the southwestern slope of Mauna Kea in the Ka`ohe Game Management Area and Mauna Kea Forest Reserve for fire suppression as well as ecosystem restoration efforts.

The subject parcels consist of 59,945.568 acres. However, the project site will total less than one acre. There is no County zoning for the project site. The project site is located in the State Land Use Conservation District. In addition, according to the County of Hawai'i General Plan 2005 (amended December 2006), it is designated as Conservation by the Land Use Pattern Allocation Guide. Although, the entire island of Hawai'i is within the Coastal Zone Management Area, the subject area is not located within the Special Management Area.

We have no further comments to offer, at this time.

If you have any questions or if you need further assistance, please feel free to contact Bethany Morrison of this office at 961-8138.

Sincerely,

BJ LEITHEAD TODD
Planning Director

BJM:cs
P:\wpwin60\Bethany\EA-EIS Review\preconsultdraftea Kaohe Dip Tanks.doc

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

HISTORIC PRESERVATION DIVISION
DEPARTMENT OF LAND AND NATURAL RESOURCES

601 Kamokila Boulevard, Suite 555
Kapolei, HI 96806

March 22, 2013

Mr. Ron Terry
Geometrician Associates, LLC.
PO Box 396
Hilo, Hawai'i 96721
(rterry@hawaiirr.com)

LOG NO: 2013.1787
DOC NO: 1302SN02
Archaeology

Dear Mr. Terry:

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Environmental Assessment for Diptanks at the Ka'ohe Game Management Area
Ka'ohe Ahupua'a, Hāmākua District, Island of Hawai'i
TMK: (3) 4-4-015:004 pors.

This is in response to your request for a no effect determination for the two proposed site locations for the Mauna Kea Dip tanks. We received your letter on March 1, 2013. Each proposed site will result in no more than 0.5 acres of disturbance. As described in your letter, the project will consist of the installation of two covered 40,000-gallon fill tanks to hold water and to be filled by either trucks and/or catchment. A pipeline will be placed above ground (except where it will be buried beneath the road) to connect the fill tanks to the smaller dip tanks. The sites will be fenced to deter tampering and avoid damage.

On January 29, 2013, SHPD archaeologist Sean Nāleimaile conducted a site visit with Dr. Ron Terry to determine the presence or absence of historic properties. An earlier proposed upper site was near the historic Pu'u La'au Ranger Cabin. An alternative site was chosen following the site visit to minimize impact in any way to the area around the cabin. The alternative site chosen is in the vicinity of the cabin but a hill sits between the site and the cabin and the equipment will not be visible from the cabin site. Both the upper and lower proposed areas have been previously impacted by mechanical equipment for road construction or maintenance.

Based on the current information, SHPD believes that **no historic properties will be affected** by the proposed project. We request a copy of the EA be submitted to our Hilo office for our records.

Please contact Sean Nāleimaile at (808) 933-7651 or Sean.P.Naleimaile@hawaii.gov if you have any questions or concerns regarding this letter.

Aloha,

Theresa K. Donham
Archaeology Branch Chief