

Draft Environmental Assessment

PROPOSED AIRCRAFT RESCUE FIRE FIGHTING STATION, FUELING FACILITY AND HANGAR AT LANAI AIRPORT, TMK (2)4-9-002:041 (POR.)

Prepared for:

The Accepting Authority:

**State of Hawaii,
Department of Transportation,
Airports Division**

October 2009



CONTENTS

Executive Summary	Page i
I. PROJECT OVERVIEW	Page 1
A. PROPERTY LOCATION, EXISTING LAND USE, AND LAND OWNERSHIP	Page 1
B. EXISTING FACILITIES AT LANAI AIRPORT	Page 1
C. LANAI AIRPORT PLANNING BACKGROUND	Page 4
D. PROPOSED ACTION	Page 5
E. AVIATION FUEL AND HANGAR OPERATIONS	Page 12
F. IMPLEMENTATION CONSIDERATIONS	Page 12
II. DESCRIPTION OF EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND PROPOSED MITIGATION MEASURES	Page 14
A. PHYSICAL ENVIRONMENT	Page 14
1. Surrounding Land Uses	Page 14
2. Topography and Soils	Page 14
3. Agriculture	Page 15
4. Flood and Tsunami Hazard	Page 18
5. Flora and Fauna	Page 18
6. Surface Water	Page 19
7. Archaeological Resources	Page 19
8. Cultural Impact Assessment	Page 22
9. Air Quality and Noise Characteristics	Page 23
10. Scenic Resources	Page 25
11. Chemicals and Hazardous Materials	Page 25
12. Traditional Beach and Mountain Access	Page 26
B. SOCIO-ECONOMIC CONSIDERATIONS	Page 26
1. Regional Setting	Page 26
2. Population and Economy	Page 27
C. PUBLIC SERVICES	Page 29
1. Solid Waste Disposal	Page 29

2.	Police, Fire Protection and Medical Services	Page 29
3.	Educational and Recreational Facilities	Page 30
D.	INFRASTRUCTURE	Page 31
1.	Roadways	Page 31
2.	Water System	Page 32
3.	Wastewater System	Page 33
4.	Drainage	Page 33
5.	Electrical and Communication Systems	Page 34
E.	CUMULATIVE AND SECONDARY IMPACTS	Page 35
III.	RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS	Page 36
A.	STATE LAND USE DISTRICTS	Page 36
B.	MAUI COUNTY GENERAL PLAN	Page 36
C.	LANAI COMMUNITY PLAN	Page 38
D.	MAUI COUNTY ZONING	Page 41
E.	COASTAL ZONE MANAGEMENT OBJECTIVES AND POLICIES ..	Page 41
1.	Recreational Resources	Page 41
2.	Historical/Cultural Resources	Page 43
3.	Scenic and Open Space Resources	Page 43
4.	Coastal Ecosystem	Page 44
5.	Economic Use	Page 45
6.	Coastal Hazards	Page 45
7.	Managing Development	Page 46
8.	Public Participation	Page 47
9.	Beach Protection	Page 47
10.	Marine Resources	Page 48
IV.	SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED	Page 50
V.	ALTERNATIVES	Page 51
A.	ARFF ALTERNATIVES	Page 51
1.	No Action Alternative	Page 51
2.	Deferred Action Alternative	Page 51
3.	Remodeling Alternative	Page 51
4.	Design Alternative	Page 52

B. FUEL TANKS AND HANGAR Page 52

 1. No Action and Deferred Action Alternatives Page 52

 2. Design Alternatives Page 52

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF
RESOURCES Page 54

VII. SIGNIFICANCE CRITERIA ASSESSMENT Page 55

VIII. LIST OF PERMITS AND APPROVALS Page 59

IX. PARTIES CONSULTED DURING THE PREPARATION OF THE DRAFT
ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED; AND RESPONSES
TO SUBSTANTIVE COMMENTS Page 60

X. REFERENCES Page i

F:\DATA\LANAI AIRPORT-ccr api\DRAFT EA.wpd

LIST OF FIGURES

Figure 1. Regional Location Map Page 2

Figure 2. Existing Airport Facilities Page 3

Figure 3. Site Plan Depicting Existing and Proposed Improvements Page 6

Figure 4. Replacement ARFF Station Preliminary Floor Plan Page 7

Figure 5. Replacement ARFF Station Elevations Page 8

Figure 6. Hangar Perspective Page 10

Figure 7. Fuel Facility Site Plan Page 11

Figure 8. Soil Classification Map Page 16

Figure 9. Agricultural Lands of Importance to the State of Hawaii Page 17

Figure 10. State Land Use District Boundary Map Page 37

Figure 11. Community Plan Designations Page 39

LIST OF APPENDICES

- Appendix A.** Lanai Airport: Aircraft Rescue and Fire Fighting (ARFF) Station Improvements (2003)
- Appendix B.** Geotechnical Engineering Services Lanai Airport Aircraft Rescue and Fire Fighting (ARFF) Station, Island of Lanai , Hawaii
- Appendix C.** Archaeological Field Inspection and Literature Review Report
- Appendix D.** Cultural Impact Assessment
- Appendix E.** Preliminary Wastewater Flow Calculations Report
- Appendix F.** Preliminary Drainage Report
- Appendix G.** Hangar and Fuel Facility Grading and Drainage Plans
- Appendix H.** Electrical Utility Evaluation by Ronald N.S. Ho & Associates, Inc.

Executive Summary

Project Name: Proposed Aircraft Rescue Fire Fighting Station, Fueling Facility and Hangar at Lanai Airport

Type of Document: Draft Environmental Assessment

Legal Authority: Chapter 343, Hawaii Revised Statutes

Anticipated Determination: Finding of No Significant Impact (FONSI)

Applicable Environmental Assessment review “Trigger”: Use of State lands and funds

Location: Lanai Island
Lanai TMK (2)4-9-002:041 (por.)

Landowner: State of Hawaii
Department of Transportation
Airports Division
400 Rodgers Boulevard, Suite 700
Honolulu, Hawaii 96819-1898

Applicants: State of Hawaii
Department of Transportation
Airports Division
400 Rodgers Boulevard, Suite 700
Honolulu, Hawaii 96819-1898

and

Castle & Cooke Aviation
155 Kapalulu Place
Honolulu, Hawaii 96819

Approving Agency: State of Hawaii
Department of Transportation
Airports Division
400 Rodgers Boulevard, Suite 700
Honolulu, Hawaii 96819-1898
Contact: Van Johnson
Phone: (808) 838-8830

Consultant:

Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793
Contact: Mich Hirano, AICP
Phone: (808) 244-2015

Project Summary:

The State of Hawaii, Department of Transportation, Airports Division proposes construction of a replacement Aircraft Rescue Fire Fighting (ARFF) station to replace the existing substandard ARFF facility at the Lanai Airport. The replacement ARFF station will include: spaces for two (2) fire fighting trucks and one (1) trailer; chemical and equipment storage rooms; watch room; office; kitchen/training room; three (3) dormitory rooms; fitness room; lockers, showers, and toilets; emergency generator; extension of onsite water system, improvements for onsite wastewater treatment and disposal, and security fencing.

In coordination with the Airports Division, Castle & Cooke Aviation proposes to construct a 25,200 sq. ft. aircraft hangar to the west of the ARFF station and install two (2) 15,000 gallon fuel tanks for Jet-A fuel and a single 3,000 gallon tank for aviation gas. The tanks will be located to the west of the hangar and will be placed above ground on a concrete slab measuring 40 feet by 140 feet (including a 40 feet by 20 feet vehicle ramp).

The above actions are collectively being addressed by this single Chapter 343, Hawaii Revised Statutes, Draft Environmental Assessment.

I. PROJECT OVERVIEW

I. PROJECT OVERVIEW

A. PROPERTY LOCATION, EXISTING LAND USE, AND LAND OWNERSHIP

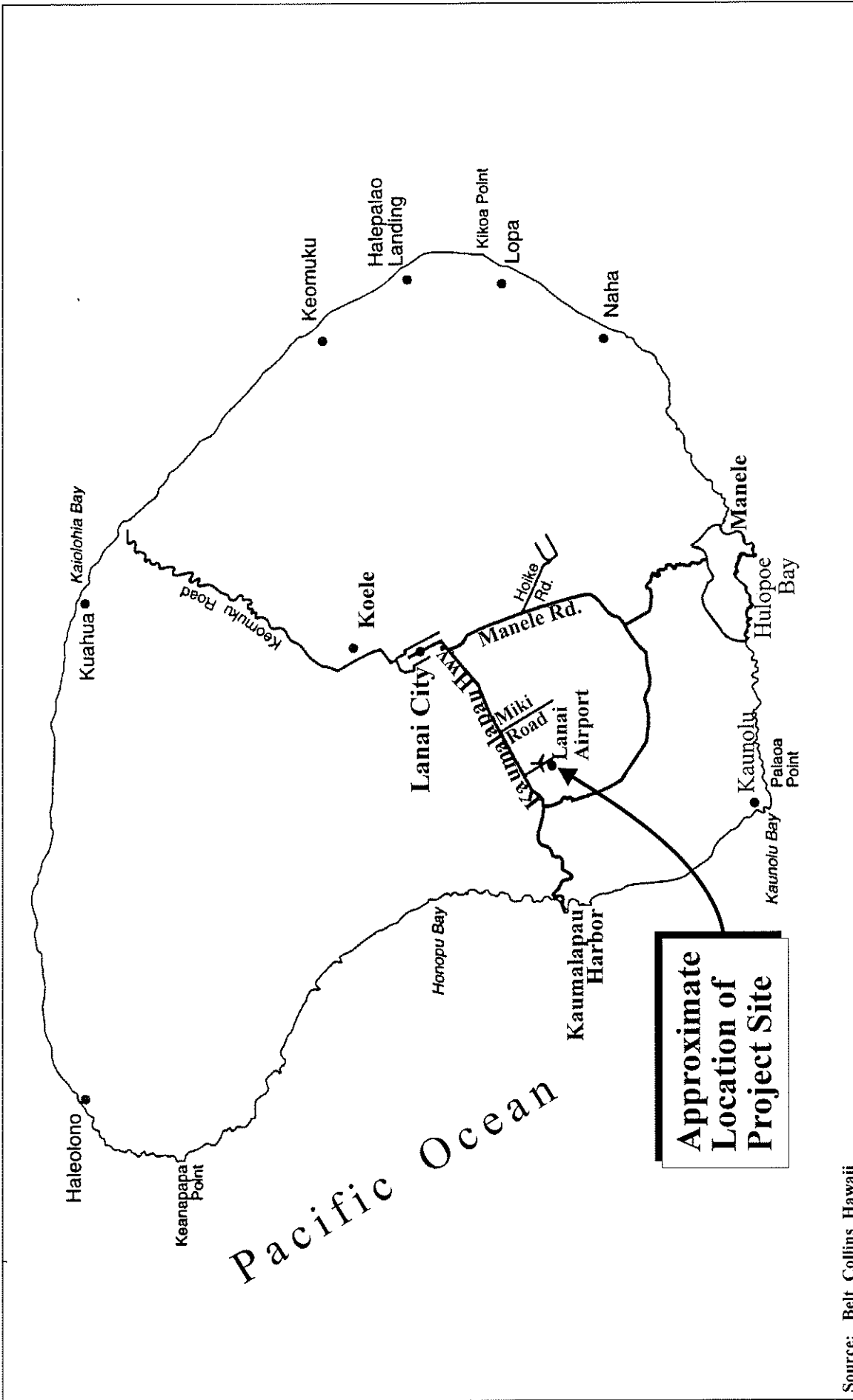
The Lanai Airport is located on the island of Lanai, approximately three (3) miles southwest of Lanai City. See **Figure 1**. Its hours of operation are generally from 6:00 a.m. to 7:30 p.m., seven (7) days a week. The island of Lanai is under the jurisdiction of Maui County. It is the third smallest island of eight (8) main Hawaiian islands. Kaunalapau Highway, the major roadway connecting Lanai City to Kaunalapau Harbor, is 0.6 mile north of the airport. There is an access road off of Kaunalapau Highway to the airport.

The Lanai Airport property is defined by Tax Map Key (2)4-9-002:041 and encompasses an area of 504 acres of land at approximately 1,300 feet above mean sea level (MSL). The airport lies on a relatively flat ridge where the surrounding terrain slopes away from the site in both the easterly and westerly direction. Lanai Airport is located on the land owned by the State of Hawaii on the eastern end of Miki Basin and crosses in the *ahupuaa* (districts) of Kalulu, Kaunolu, and Kamoku. The land was transferred to the State Department of Transportation under Executive Order Nos. 1248, 1279, and 2211. All the surrounding land is owned by the Castle & Cooke, Inc.

B. EXISTING FACILITIES AT LANAI AIRPORT

The Lanai Airport has a single runway configuration, designated Runway 3-21. The runway is 5,000 feet in length and 150 feet wide, and is aligned in a northeast-southwest direction. There is a single taxiway that serves as both an entrance and exit to and from Runway 3-21. The taxiway is 75 feet wide by 287.5 feet long and is aligned perpendicular to Runway 3-21. There is also 317,000 square feet (sq. ft.) of apron space at the airport and it accommodates parking for both air carriers and general aviation aircraft that service Lanai Airport. There is a ramp located to the southwest of the apron which is currently under construction.

The Lanai Airport passenger terminal complex includes the terminal building, administration building, aircraft rescue fire fighting station, cargo/maintenance building, public and employee automobile parking areas, and tenant concession area. Additionally, the airport has an onsite wastewater treatment system to handle wastewater flow. See **Figure 2**.



Source: Belt Collins Hawaii

Figure 1 Proposed ARFF Station, Fuel Tanks and Hangar at Lanai Airport
Regional Location Map

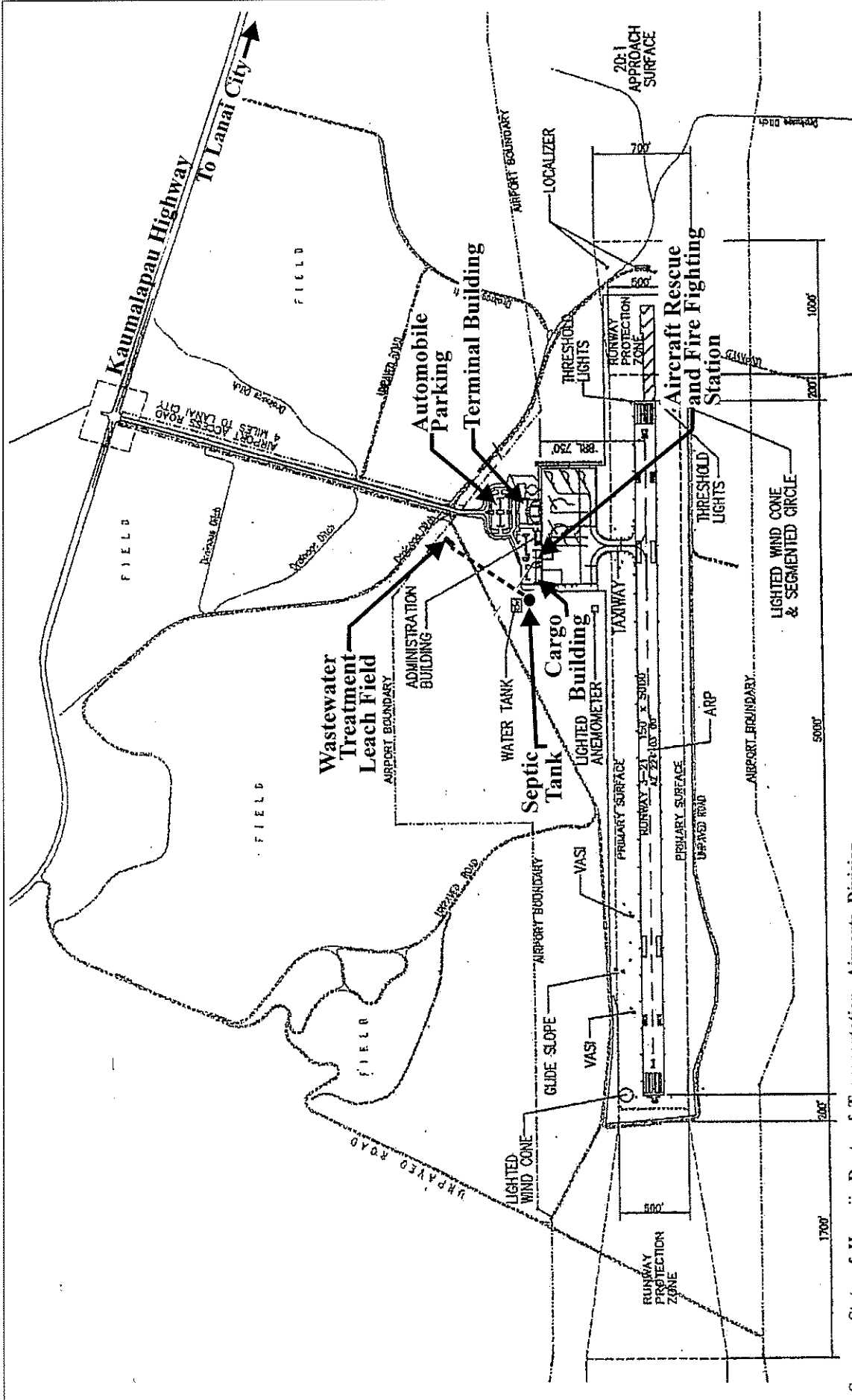


Prepared for: State of Hawaii, Dept. Of Transportation, Airports Division



MUNEKIYO & HIRAGA, INC.

F:\DATA\LANAI AIRPORT-ccr.apr\REGIONAL



Source: State of Hawaii, Dept. of Transportation, Airports Division

Figure 2 Proposed ARFF Station, Fuel Tanks and Hangar at Lanai Airport Existing Airport Facilities



NOT TO SCALE



Prepared for: State of Hawaii, Dept. of Transportation, Airports Division

LANAI AIRPORT-ccr api\existairport

Given current manpower and operational requirements, the existing Aircraft Rescue and Fire Fighting (ARFF) station (originally constructed around 1974) is inadequate both in terms of size and functional spaces. Accordingly, the State Department of Transportation, Airports Division (DOT-A) is proposing to provide upgraded aircraft rescue fire fighting facilities to ensure the immediate safety and long-term operational effectiveness of Lanai Airport.

Separately, there is no fueling facility or aircraft hangar at the Lanai Airport. Therefore, a fuel facility and hangar are being proposed by Castle & Cooke Aviation. These improvements will be funded by Castle & Cooke Aviation.

C. LANAI AIRPORT PLANNING BACKGROUND

In June 1998, the DOT-A initiated a comprehensive planning study to update the airport plan which was prepared in 1990. The purpose of the Master Plan Update was to reevaluate, monitor key conditions, and adjust the 1990 plan recommendations, if required by changed circumstances. Aircraft operations and passenger activity through the 2020 planning period were forecast for Lanai Airport. The Master Plan Update called for extension of the runway by 2,000 feet, a parallel taxiway to the west of the runway, expansion of the aviation apron by approximately 80,800 sq. ft. to the southwest of the existing apron, pavement overlay to improve the strength of the runway and apron surface, jet blast protection which includes 20-foot wide stabilized shoulders along associated taxiways, navigational and landing aids, 1,544-square foot expansion of the passenger terminal building and expansion of the airport parking facilities. The Final Environmental Assessment (EA) which rendered a Finding of No Significant Impact for the Master Plan Update was completed in August 2000.

The new ARFF station, hangar, fuel tanks, and related improvements, as proposed, were not previously addressed by the 2020 Airport Master Plan and Final EA, prepared in August 2000. Based on the foregoing, the DOT-A has determined that a Chapter 343, Hawaii Revised Statutes (HRS), EA will be required for both actions. DOT-A and Castle & Cooke Aviation have been coordinating the planning and design of the above-noted project components. In this regard, DOT-A has determined that a single EA document addressing the foregoing actions collectively is appropriate.

D. PROPOSED ACTION

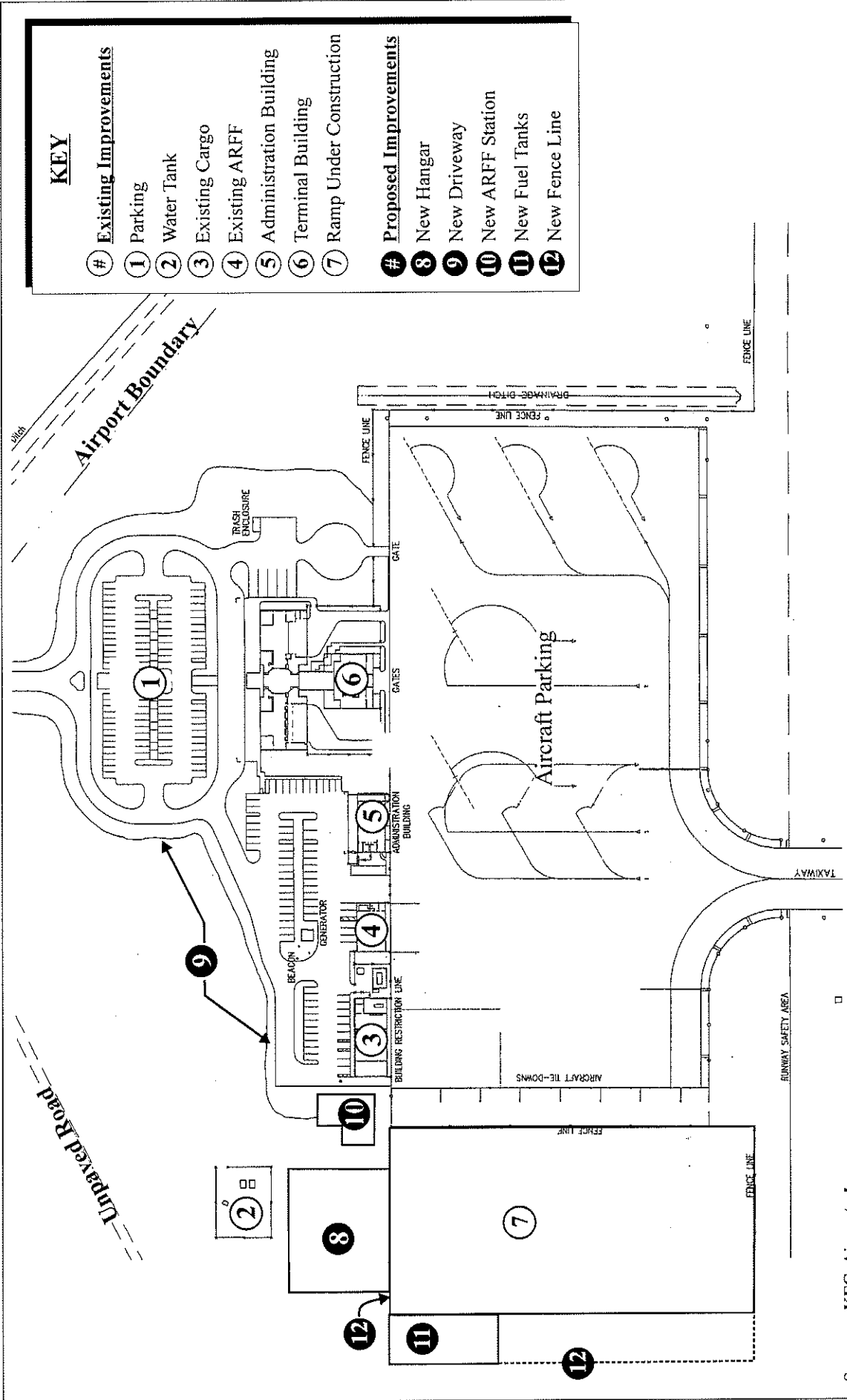
The proposed improvements at the Lanai Airport involve two (2) separate actions. First, the DOT-A proposes to construct a new ARFF station and related improvements.

In 2003, DOT-A carried out an independent Project Definition Report to evaluate the existing ARFF station and recommend improvements. See **Appendix "A"**. The principal failure of the existing ARFF building to meet the standards of Advisory Circular (AC) 150/5210-15 is the inadequate size of the vehicle bays to house current fire fighting equipment. Inadequate storage space for fire fighting equipment and gear, lack of office/administrative space and training space were also cited as a space deficiency. Although the 2003 Project Definition Report recommended the remodeling of the existing ARFF, a new ARFF station is instead proposed to provide an aircraft rescue and fire fighting facility that will meet current Federal Aviation Administration (FAA) standards. The selection of a new facility alternative over the remodeling alternative is further discussed in Chapter V, Alternatives, of this document.

Construction of the new ARFF station will not result in changes to the level of aircraft operations to Lanai Airport. Once the new ARFF station has been constructed, the existing ARFF building will be converted to another aviation related use. The new ARFF station will be a public facility owned by DOT-A to be used for public purposes.

The ARFF station will be located to the southwest of the existing cargo building. See **Figure 3**. The station will be an approximately 6,975-square foot building. It will be a single-story building measuring approximately 74 feet, 8-inches by 92 feet, 8-inches. The station will house two (2) 1,500 gallon fire fighting trucks, and a trailer in the apparatus room. The remaining area of the building will include three (3) dormitory rooms, kitchen/dining room (which will also be used as a training center), administration office, watch/alarm room, equipment storage rooms, laundry facilities and a men's and women's toilet and showers. See **Figure 4** and **Figure 5**. The required parking stalls will be located at the existing parking lot. Related improvements include extension of a driveway to access the ARFF station and extension of utilities to service the ARFF station. The new driveway will be off of the main airport entrance road and be located on the west side of the terminal parking lot area.

The watch/alarm room, administrative office, training center/day room, fitness room, kitchen, and dormitory rooms will have an air condition system. The restrooms and lockers/shower



Source: KFC Airport, Inc.

Figure 3 Proposed ARFF Station, Fuel Tanks and Hangar at Lanai Airport
 Site Plan Depicting Existing and Proposed Improvements

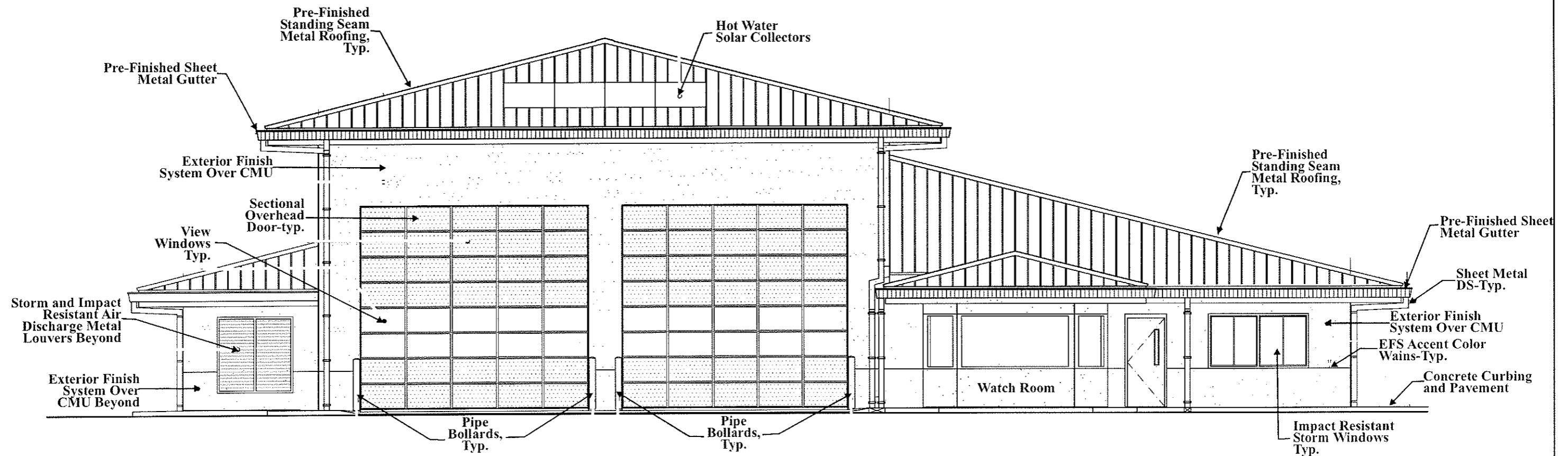


NOT TO SCALE

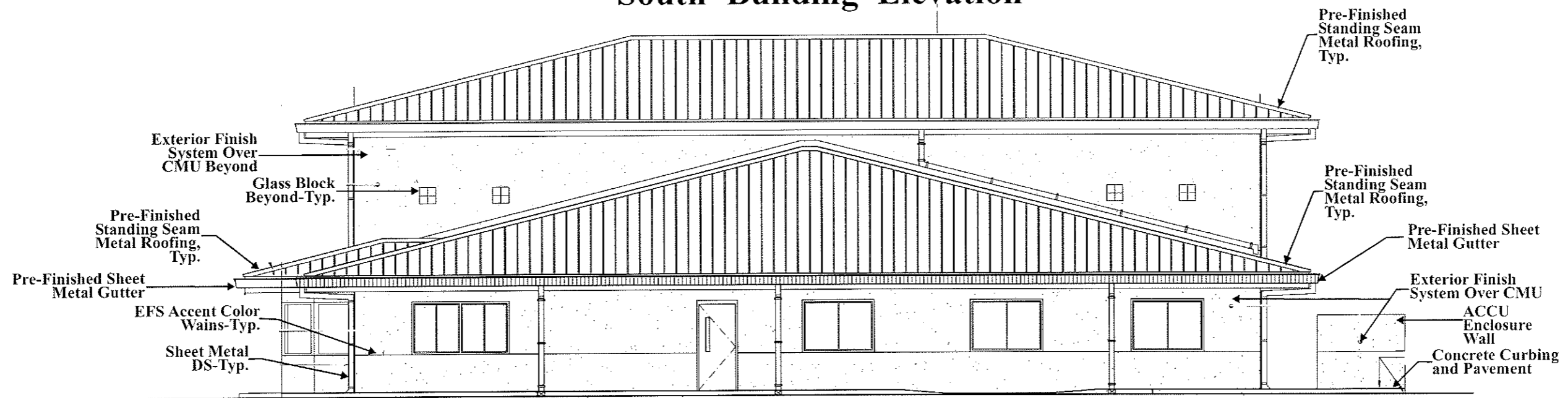
Prepared for: State of Hawaii, Dept. of Transportation, Airports Division

MUNEKIYO & HIRAGA, INC.

LANAI AIRPORT-cv aphisiteplan



South Building Elevation



West Building Elevation

Proposed ARFF Station, Fuel Tanks
and Hangar at Lanai Airport
Replacement ARFF Station Elevations

Source: State of Hawaii, Dept. of Transportation, Airports Division

Figure 5

NOT TO SCALE



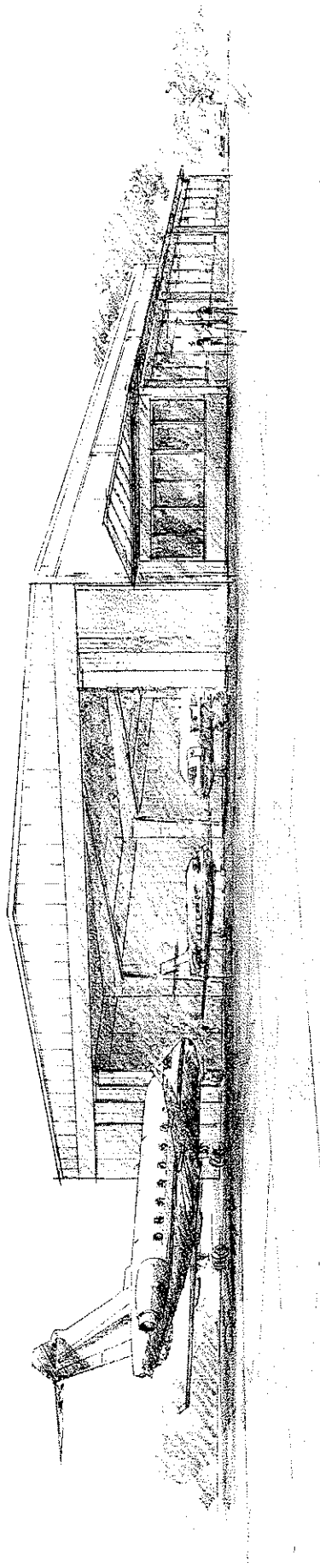
rooms will have natural ventilation. The apparatus room will also have natural ventilation. The ARFF station will include exterior lighting for operation and security purposes. Shielded fixtures will be used for the exterior lights on the building and for area site lights to mitigate potential impacts to seabirds.

It is noted that Federal Aviation Administration Advisory Circular-AC 150/5210-15A does not include a requirement or discussion related to use of Leadership in Energy and Environmental Design (LEED) as it relates to design of the ARFF improvements. Notwithstanding, the design requirements of AC 150/5210-15A, the provisions of Act 96 (Energy Efficiency; Renewable Energy; Alternate Fuel, Twenty-Third Legislature 2006, HB 2175) will be considered.

The replacement ARFF station includes elements which can, to the extent possible, be designed to the provisions of Chapter 196, Energy Resources, HRS, and Section 196-9, Energy and Efficiency and Environmental Standards for State facilities, motor vehicles, and transportation fuel. Specific elements include considering installation of a solar water heating system, specifying Energy Star rated equipment, and incorporating recycling as a standard operating practice.

The second action will be carried out by Castle & Cooke Aviation (CCA) and involves development of an approximate 25,200-square foot airplane hangar measuring 180 feet by 140 feet with a building height of approximately 30 feet. The hangar will have a large open area to store aircraft and an area for offices and washroom facilities. See **Figure 6**. To the west of the hangar, CCA proposes to install two (2) 15,000 gallon fuel tanks for Jet-A fuel and a single 3,000 gallon tank for aviation gas. See **Figure 7**. Both tanks will be double walled for spill containment and placed above ground on an existing concrete slab measuring 40 feet by 140 feet (including a 40 feet by 20 feet access ramp). The tanks and fueling area will occupy an area of approximately 40 feet by 60 feet. Refer to **Figure 7**. To the side of the fuel tanks, on the same concrete pad, will be a vehicle ramp measuring approximately 40 feet by 20 feet. CCA will lease the land for these improvements from DOT-A. Related upgrades include extension of water, extend wastewater system leach field, and electrical system to service these facilities.

Collectively, the ARFF, hangar and fuel tank facilities, and related improvements are referred to as the "Proposed Project".



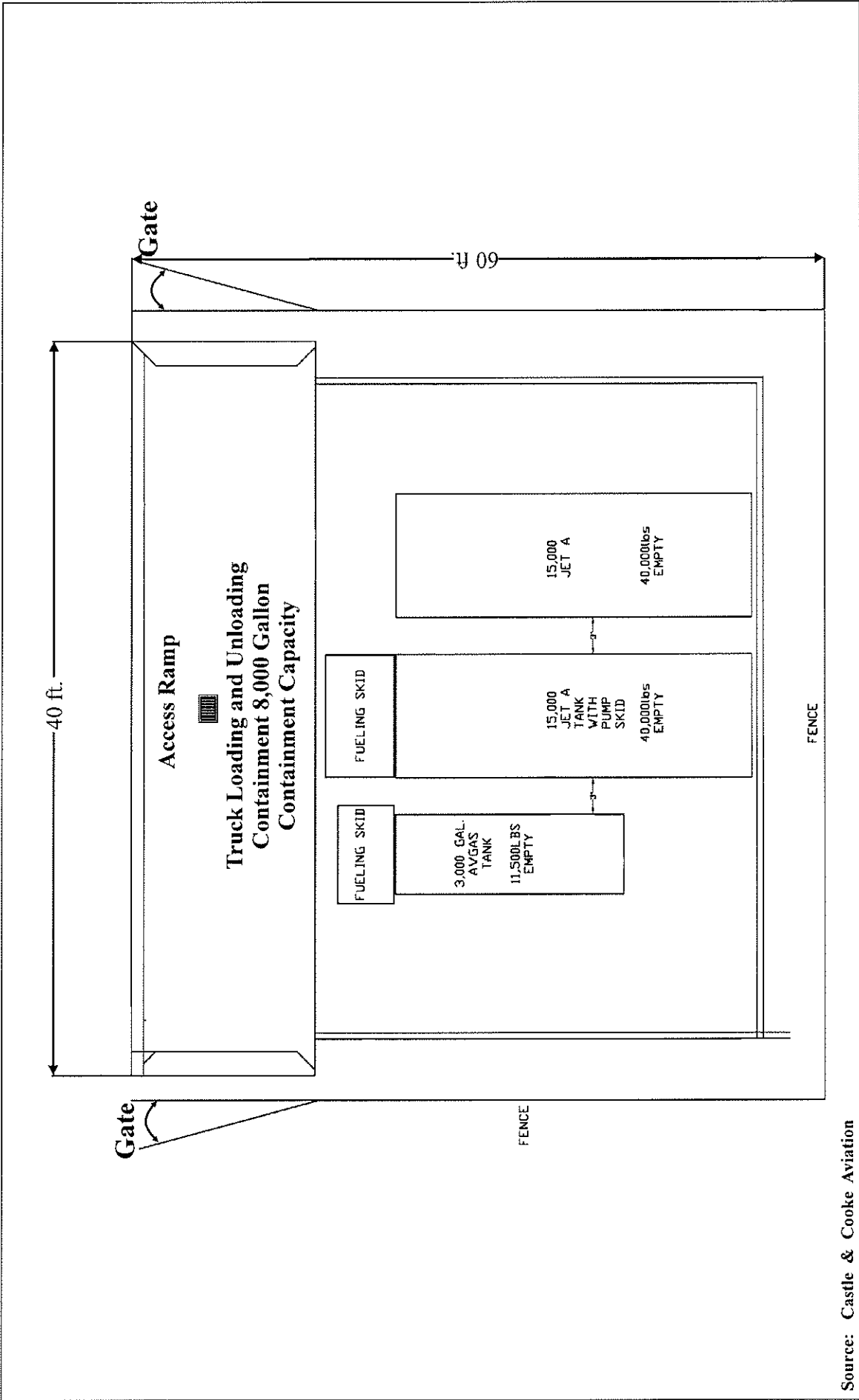
Source: Castle & Cooke Aviation

Figure 6 Proposed ARFF Station, Fuel Tanks and Hangar at Lanai Airport Hangar Perspective

NOT TO SCALE



Prepared for: State of Hawaii, Dept. of Transportation, Airports Division



Source: Castle & Cooke Aviation

Figure 7
Proposed ARFF Station, Fuel Tanks
and Hangar at Lanai Airport
Fuel Facility Site Plan



NOT TO SCALE



Prepared for: State of Hawaii, Dept. of Transportation, Airports Division

LANAI AIRPORT-ccr-apt\FuelFacilitySite

E. AVIATION FUEL AND HANGAR OPERATIONS

The CCA proposed fuel storage facility would hold fuel inventory for delivery either directly or by aircraft refueler truck into general aviation jet aircraft. The facility would be managed and operated by CCA for service to the public providing fuel to any general aviation aircraft that lands at Lanai Airport requiring jet fuel for operation. This would include air ambulance operations with airplanes and helicopters. In unusual or emergency situations, fuel could be provided to airlines operating at the airport, as well as government aircraft. Projections indicate up to approximately 100,000 gallons would be delivered in the first full year of operation with a projected increase as demand dictates up to approximately 250,000 gallons per year at 10 years from start-up. These numbers will be driven by traffic demand at the airport that is influenced primarily by Castle & Cooke hotel operations on the island. Fuel buyers would mostly be general aviation aircraft coming to the island and departing primarily for the US Mainland.

The hangar building would house general aviation aircraft that are based on the island permanently or semi-permanently, as well as visiting aircraft for short-term periods. The hangar provides shelter from the elements for the aircraft. The hangar is sized to allow inside parking of one (1) to five (5) typically sized general aviation jets. Additional numbers of aircraft could be stored inside as well, depending upon the size of the airplane. The adjacent lobby and lounge area with restrooms would be used as a waiting area for airplane crews and passengers after flights, as well as an area to prepare before flights, including safety and weather briefings.

Both the fuel facility and the hangar facility are modest in overall terms of expected use. Castle & Cooke would employ personnel to operate, maintain and oversee these facilities. Employment generated would also be modest initially, but would grow as the demand grows over time. It is likely that one (1) employee would oversee the facility at first with growth in that number expected over time.

F. IMPLEMENTATION CONSIDERATIONS

The actions proposed by the DOT-A and CCA are being coordinated and addressed through a single consolidated Chapter 343, Hawaii Revised Statutes (HRS), EA. However, the project components will be implemented by the respective proposing entities. Thus, design and construction for the ARFF and related improvements will be the responsibility of DOT-A, while design and construction of the new hangar and fuel facilities will be the responsibility of CCA.

Cost and implementation timeline parameters are summarized in **Table 1**.

Table 1. Cost and Implementation Timeline Parameters

Project	Responsible Party	Estimated Cost	Estimated Construction Period
ARFF	DOT-A	\$5.0 million	1 year (2010 - 2011)
Fuel Facilities	CCA	\$1.0 million	2 months (2010)
Hangar	CCA	\$4.1 million	6 months (2011/2012)

**II. DESCRIPTION OF
EXISTING
ENVIRONMENT,
POTENTIAL IMPACTS,
AND PROPOSED
MITIGATION MEASURES**

II. DESCRIPTION OF EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND PROPOSED MITIGATION MEASURES

A. PHYSICAL ENVIRONMENT

1. Surrounding Land Uses

a. Existing Conditions

The Lanai Airport is located approximately three (3) miles from Lanai City and is surrounded by predominately fallow agricultural land with small parcels of agricultural land in cultivation. The airport designated lands cover an area of approximately 504 acres. The airport is located to the northwest of Miki Basin, adjacent to existing heavy industrial uses and the MECO power generation plant. The broad expanse of vacant, undeveloped lands which were formerly utilized for pineapple cultivation, typify the major land uses in the general vicinity of the site.

b. Potential Impacts and Proposed Mitigation Measures

The proposed project, as defined by the ARFF, fuel tanks and hangar, is within the terminal area of the airport. The proposed project is compatible with uses within the airport. The airport lands cover approximately 504 acres and adequately buffer any potential adverse impacts of facility development on adjacent properties.

2. Topography and Soils

a. Existing Conditions

The Lanai Airport is located on the southwestern quadrant of the island near Miki Basin, approximately three (3) miles southwest of Lanai City. The Airport lies on a relatively flat ridge where the surrounding terrain slopes away from the site in both the easterly and westerly directions. The terrain beyond the ends of the runways falls at an average slope of 5 percent to the

southwest and rises at 2 percent to the northeast. The existing elevations in the vicinity of the proposed project range from 1,301 feet mean sea level (MSL) to 1,305 feet MSL. See **Appendix "B"**. Underlying the project site and surrounding area are soils of the Molokai-Lahaina association. Found on uplands, this soil association consists of deep, nearly level to moderately steep, well-drained soils that have a moderately fine textured or fine textured subsoil. Molokai silty clay loam, 0 to 3 percent slopes (MuA), and Molokai silty clay loam, 3 to 7 percent slopes (MuB) define the soil types related to the project site. See **Figure 8**. The MuA soil type is characterized by moderate permeability, slow runoff, and slight erosion hazard. The MuB soil type is defined by slow to medium runoff and slight to moderate erosion hazard.

b. Potential Impacts and Proposed Mitigation Measures

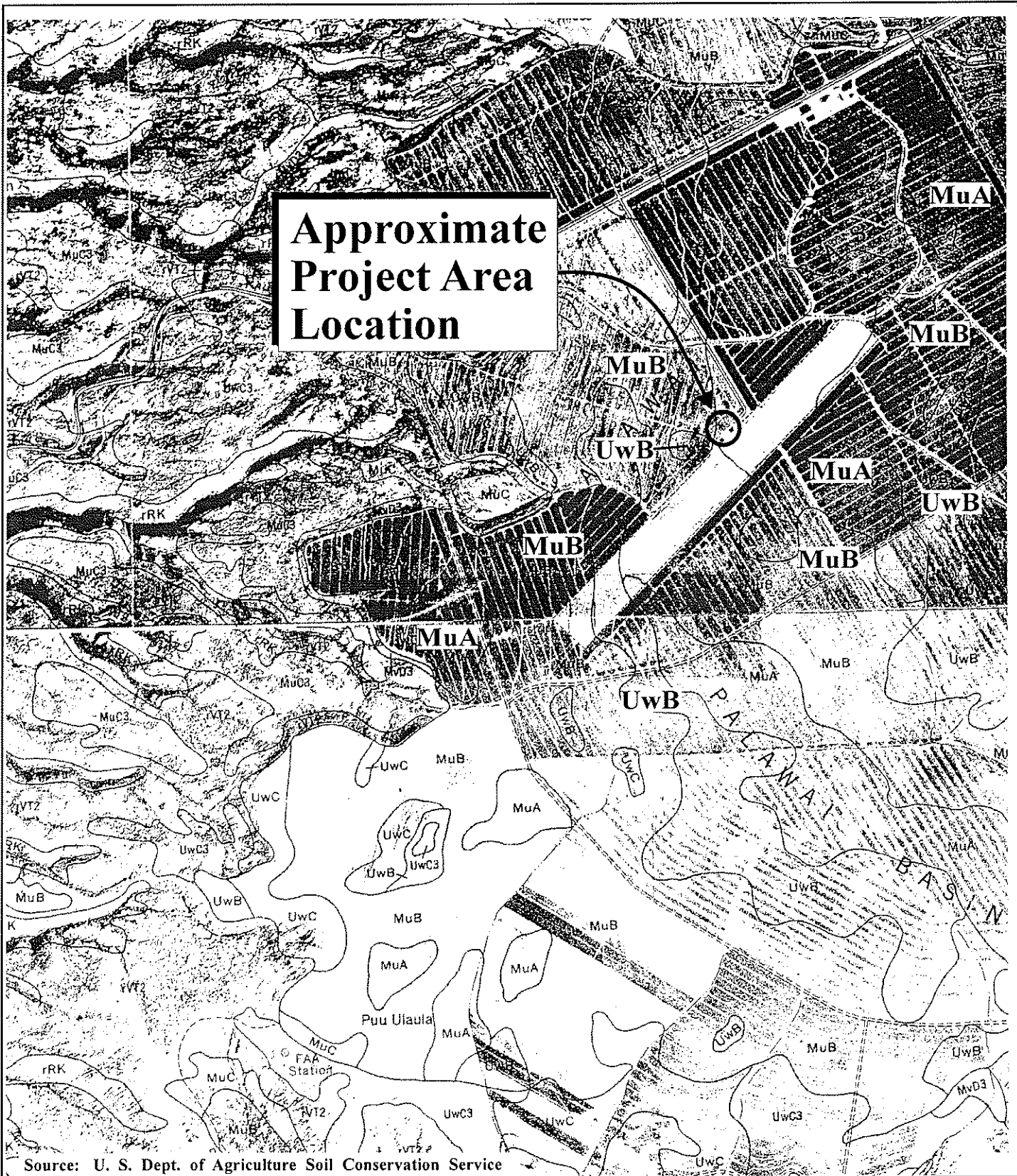
The existing ground rises to the north. Minor grading will be required to create a level development site. The proposed project is not anticipated to adversely impact or alter topographical conditions.

The construction of the proposed project does not induce any significant negative impacts on the soil. Temporary disturbance of soils will occur during the excavation and backfill activities. Minor grading and compaction are not expected to pose any adverse effects on existing conditions.

3. Agriculture

a. Existing Conditions

As classified by the Land Study Bureau, the land underlying the project area has a master soil productivity rating of "D". Under this system, agricultural lands are assigned a rating of "A", "B", "C", "D", and "E", with "A" lands representing those of the highest productivity and "E" lands representing the lowest. In addition, the Agricultural Lands of Importance to the State of Hawaii (ALISH) map of the area indicates that the project site falls within the "unique" agricultural land category. "Unique" agricultural lands possess a combination of soil quality, location, growing seasons, and moisture supply to produce sustained yields of a specific crop. See **Figure 9**.






Source: U. S. Dept. of Agriculture Soil Conservation Service

Figure 8 Proposed ARFF Station, Fuel Tanks and Hangar at Lanai Airport
Soil Classification Map

NOT TO SCALE



Legend

-  Prime Agricultural Lands
-  Unique Agricultural Lands
-  Other Agricultural Lands

**Approximate
Location of
Project Site**

Lanai Airport

Source: State of Hawaii, Dept. of Agriculture

**Figure 9 Proposed ARFF Station, Fuel Tanks
and Hangar at Lanai Airport**
Agricultural Lands of Importance
to the State of Hawaii



NOT TO SCALE

b. **Potential Impacts and Proposed Mitigation Measures**

The project area has been used for airport related activities since the early 1940's. There are no impacts to agricultural productivity parameters as a result of the proposed project. The project area is located adjacent to the existing airport facilities within the boundaries of the Lanai Airport.

4. **Flood and Tsunami Hazard**

a. **Existing Conditions**

A Flood Insurance Rate Map (FIRM) for the Island of Lanai is currently not available. The tsunami evacuation maps for the island of Lanai indicate that the project site is located well beyond the limits of coastal flooding.

b. **Potential Impacts and Proposed Mitigation Measures**

The project area is approximately 1,300 feet above mean sea level (MSL) and outside the tsunami evacuation area. From a historical perspective, there are no adverse flooding concerns associated with the subject property.

5. **Flora and Fauna**

a. **Existing Conditions**

Plant life in the vicinity of the project site consists of lowlying scrub vegetation, while animal life includes introduced species such as mice, rats, pheasant, axis deer, and francolin. The underlying lands were formerly used for pineapple cultivation and then designated airport use in the early 1940's. The project site is adjacent to the built up terminal and apron expansion area. There are no known rare, threatened, or endangered species of flora located on the project site nor are there any wetlands within or in proximity of the site.

Early coordination with the U. S. Fish and Wildlife Service indicates the endangered Hawaiian petrel and the threatened Newell's shearwater may traverse the project area at night during the breeding season (February 1 through December 15).

b. Potential Impacts and Proposed Mitigation Measures

To minimize potential impacts to species listed under the Endangered Species Act of 1973, as amended, all outdoor lighting will be shielded and downcast and night-time construction will be avoided, as much as possible. In the long term, the proposed project is not anticipated to adversely impact biological resources or wetlands.

6. Surface Water

a. Existing Conditions

The coastline of the Pacific Ocean is the only surface water in the near vicinity of the proposed project site.

b. Potential Impacts and Proposed Mitigation Measures

There may be temporary impacts concerning the quality of the surface runoff during site grading activities.

Due to aviation safety considerations care will be taken during construction to ensure storm water runoff will not create standing water which potentially could attract water birds and create a potential aviation hazard. Therefore, a Best Management Practices (BMPs) Plan will be prepared to divert surface runoff into temporary small drainage basins.

The fuel tanks are designed with double walls for safety to prevent leaks and to contain fuel. There will also be a concrete pad and apron under the tanks to contain any fuel spillage during fueling operations.

In summary, both project design measures and implementation of BMPs are expected to avert adverse impacts to ground water and coastal waters.

7. Archaeological Resources

a. Existing Conditions

An archaeological field inspection and literature review was carried out for the proposed Lanai Airport improvements in 2009. See **Appendix "C"**. The

field inspection methods consisted of a pedestrian check of areas of potential effect (APE) where the new ARFF station, hangar and fuel facility, and access roadway are to be located to look for evidence of native plants and extant surface evidence for the presence of significant historic properties or likelihood of finding same and review of historic photographs of the project area. The literature review involved a review of all previous archaeological work conducted in the surrounding area, as well as review of resources providing historical perspectives of the region and traditional stories and accounts. In addition, all relevant Land Claim Awards (LCA) and Royal Patents were researched.

From Kenneth Emory's archaeological survey of Lanai in 1924 he postulated traditional or pre-contact habitation along the rim of both Palawai Basin and Miki Basin was likely sporadic with agricultural activities focused on the cultivation of dry-land crops. Refer to **Appendix "C"**. He noted that evidence of only scattered settlements around the basin, as opposed to evidence of intensive habitation found along the coastline and within Maunalei Gulch, may be a factor of limited or seasonal water availability along the rim and potentially marshy conditions within the basin during the winter months. However, even the seasonal nature of water availability along the plateau lands of Lanai, *uala* (sweet potato) and possibly other dry-land crops (such as dry land kalo, gourd crops) were successfully cultivated in the Palawai and Miki Basins. Refer to **Appendix "C"**. Later, the area became part of the Dole pineapple plantation and the area was under pineapple cultivation. In the early 1940's the property was set aside from pineapple cultivation to airport use.

Previous archaeological work around the Lanai Airport included a preliminary onsite assessment conducted by the Bishop Museum (Sinoto, 1990). Refer to **Appendix "C"**. This study identified formal artifacts on the surface at two (2) locations. The artifacts included two (2) basalt flakes, a small rectangular adze blank, and basalt fragments, and a midden and other historic items. Borthwick and others (1990) performed the follow up archaeological inventory survey and test excavations following the recommendations of the 1990 Bishop Museum study by Sinoto. Borthwick and others located and identified seven (7) locations, including the two (2) that were previously identified. Subsurface testing at these locations

encountered a well developed plow zone, a result of mechanical alteration that extended from the surface to a depth of 45 cm (approximately 18 inches) with no significant subsurface features identified. Due to the negative findings, the study concluded that any original archaeological context was likely destroyed by decades of commercial agriculture. Refer to **Appendix "C"**.

The current field investigation for the proposed Lanai Airport improvements was carried out at the future sites of the ARFF station, hangar and fuel tank storage facility and new access driveway. No significant intact and/or remnant cultural materials from the pre-contact or historic era were observed on the surface. From the field survey observation, it was clear that the project area was extensively altered due to the former agricultural activity and current airport uses

b. Potential Impacts and Proposed Mitigation Measures

The archeological field investigation report recommended that for the construction of the fuel tank storage area, no further work is required. During the construction of the new hangar and construction of the ARFF station and related improvements, including extension of utility services and access driveway, that on-call archaeological monitoring consistent with the recommendations put forth during the development of the Airport Master Plan (Borthwick et al. 1990: Appendix A) be carried out. As such, the current archaeological monitoring plan that has been adopted for the Airport Master Plan will be followed during the construction of the proposed airport improvements, as recommended, in order to mitigate potential adverse impacts on cultural and historic properties.

From a cultural resources standpoint, it should be noted that the lands underlying the project site have been previously disturbed in connection with the construction of the airport. However, should any human burials or cultural artifacts be encountered, work will immediately cease in the area of the find, and the find protected from further damage. The State Historic Preservation Division (SHPD) shall be promptly notified and applicable procedures to ensure compliance with Chapter 6E, HRS, will be implemented accordingly.

8. Cultural Impact Assessment

a. Existing Conditions

A cultural impact assessment was also carried out for the proposed Lanai Airport improvements. See **Appendix "D"**. The upland area of the Miki and Palawai Basins were well known dry land agricultural lands where crops such as sweet potato were cultivated. In order to get a cultural understanding of the area, interviews with *kupuna* and individuals familiar with the site were carried out. Interviews were held with Mr. Kepa Maly, Executive Director of the Lanai Culture and Heritage Center, Mr. Gary Onuma, who worked as a Game Manager for Castle & Cooke, Mr. Robert Hera, who worked for Dole Company for 33 years in and around the project area, and Aunty Irene Perry, who was born in Keomoku and lived on Lanai at Koele and Komoku. Generally the cultural interviews revealed there was a site of the Ili o lono *heiau* in the approximate area of the mid-runway of the airport. This *heiau* was a dry land agricultural *heiau* of the area chief. However, the *heiau* does not remain today and the destruction of the *heiau* coincides with the beginning of pineapple cultivation in the area in the early 1920's. Cultural interviews also made reference to a traditional mauka-makai trail which would provide a route of travel between the coastal and upland settlements and resources. This trail follows the Kamoku-Kalulu *ahupuaa* boundary through what is now the northeastern portion of the airport property near the current day airport parking lot. However, this trail does not exist today. Input on the proposed project was also sought from the Maui Cultural Resources Commission. Refer to **Appendix "D"**.

b. Potential Impacts and Proposed Mitigation Measures

Reference to historic maps show the traditional trail that roughly followed the *ahupuaa* boundary between Kamoku and Kalulu. This trail would have crossed the airport property on its northwestern boundary then cut west approximately where the airport parking is today. The Ili o lono *heiau* was referenced to be located at mid-runway of the airport, but was previously destroyed around the early 1920's. Both the trail and *heiau* are no longer present, and remnants of these historic resources would unlikely be uncovered during the proposed project. Refer to **Appendix "D"**. Other cultural materials including surface artifacts, such as stone tool artifacts and

basalt flakes, may be uncovered during ground alteration. Therefore, cultural and archaeological monitoring is recommended to mitigate any potential adverse impacts to cultural materials that may be discovered during ground altering activities. However, although the area was a well known area for dry land agriculture and the cultural interviewees indicated many past historic sites and trails, they also believed the proposed project would not adversely impact cultural and historic resources.

Comments received during the Cultural Resources Commission review indicated the prehistoric agricultural practices in the Palawai and Miki Basins and discoveries of the stone artifacts found in the pineapple fields of Kamoku and Kalulu *ahupuaa*. However, there was no indication of any adverse impacts to current cultural practices.

9. **Air Quality and Noise Characteristics**

a. **Existing Conditions**

Ambient air quality and noise conditions at the project site may be affected by adjacent airport noise during aircraft take-off and landing. These effects, however, are not considered to be adverse due to existing nature and relation of the proposed uses to airport operations. Airborne pollutants in the area are also attributable to airplane exhaust from landing and departing aircraft at the airport. However, the particulates generated by these emissions are intermittent and quickly dispersed by the prevailing winds. Ambient noise conditions in the area are generally attributable to natural conditions (i.e., wind, rain), as well as traffic along roadways and aircraft traffic.

b. **Potential Impacts and Proposed Mitigation Measures**

Impacts associated with the ARFF station and related airport uses include impacts to existing noise and air quality conditions and the effects of soil erosion during construction. These effects, however, can be minimized through appropriate mitigative measures and BMPs including wind screens, silt fencing and proper maintenance of equipment and machinery.

Limiting construction activities to daylight hours, the use of sound attenuating equipment, and proper vehicle and equipment maintenance can

be utilized to minimize impacts to ambient noise levels during construction. To minimize impacts to air quality and soil erosion during construction activities, applicable mitigative measures, including but not limited to the following, would be utilized as appropriate.

1. Limit construction activities to daylight hours;
2. Minimize the time of construction;
3. Retain existing ground cover as long as possible in order to prevent and minimize erosion and dust during construction;
4. Use temporary area sprinklers or water trucks for immediate sprinkling (as needed) in areas where ground cover is removed;
5. Use temporary berms, cut-off ditches, or silt screen fencing (where needed) to control soil erosion;
6. Water cleared areas thoroughly after construction activity has ceased for the day as well as on weekends and holidays;
7. Sod or replant all cut and fill slopes immediately (as needed) after work has been completed;
8. Cover all exposed areas with grass or an appropriate ground cover (as needed) after work has been completed; and
9. Ensure that adequate measures are implemented to prevent sediment-laden runoff from leaving the project site.

Grading and construction plans, as well as a detailed drainage and erosion control report and BMPs plan, will be prepared in connection with the processing of the building permit application.

In the long term, the new ARFF station, airplane hangar and fuel tanks are not anticipated to have adverse impacts on adjacent uses. Noise impacts associated with the ARFF station operations due to an emergency response are anticipated to be infrequent and of short duration. Similarly, air and noise conditions from additional airport land uses are not anticipated to adversely affect uses on the subject property.

10. Scenic Resources

a. Existing Conditions

The project site is located in a relatively flat area, which is surrounded by a broad expanse of fallow agricultural fields and buffered by undeveloped areas within the airport boundaries. The project area is not located in a scenic view corridor.

b. Potential Impacts and Proposed Mitigation Measures

The ARFF station and airplane hangar are single-story buildings with heights that will be permitted by Federal Aviation Administration regulations. Similarly, the fuel tank facility is a low profile facility, with a maximum fuel tank height below 10 feet from finished grade.

The proposed project will be located adjacent to the built up area near the airport terminal buildings and are not part of a scenic corridor, nor will they affect views from inland vantage points.

11. Chemicals and Hazardous Materials

a. Existing Conditions

The project site was formerly used for pineapple cultivation. The project site has been used for airport operations since the early 1940's. Extinguishing chemicals used in connection with the ARFF include purple K dry chemicals (potassium bicarbonate, regular dry chemical sodium bicarbonate) and 3 percent Aqueous film forming foam (AFFF). All dry chemicals are stored in the ARFF station. The AFFF is stored in a 500 gallon stainless steel tank adjacent to the station.

b. Potential Impacts and Proposed Mitigation Measures

The Lanai Airport has a spill prevention control and counter measure plan (July 2002). This plan would be used as a reference for use of absorbents, dams, dikes and other spill containment practices to deal with chemicals and hazardous waste disposal at Lanai Airport.

As noted previously, the new fuel tanks will be double walled for spill containment and placed above ground on a concrete slab.

12. Traditional Beach and Mountain Access

a. Existing Conditions

The project site is in the midst of the airport terminal area. A traditional beach/mountain access trail was referenced in the cultural impact assessment following the Kalulu-Kamoku *ahupuaa* boundary near the project site. However, this trail is no longer in existence.

b. Potential Impacts and Proposed Mitigation Measures

The proposed project is not anticipated to adversely impact traditional beach or mountain trails.

B. SOCIO-ECONOMIC CONSIDERATIONS

1. Regional Setting

a. Existing Conditions

The island of Lanai is the second smallest of the populated Hawaiian Islands, with a land area of about 140.6 square miles. Of this total area, lands within the State "Agricultural" District occupy 46,678 acres, while lands within the "Conservation" District encompass 38,197 acres. "Urban" and "Rural" designated lands comprise 3,228 acres and 2,397 acres, respectively (Maui County Data Book, 2008).

In the early 1920's, Castle and Cooke, Inc. had acquired more than 98 percent of the island and established a 16,000-acre pineapple plantation surrounding its company town, Lanai City. For most of the 20th century, Lanai remained a plantation community. In the early 1990s, the declining profitability from pineapple cultivation resulted in a gradual transition from an agricultural to visitor industry-based economy.

The island of Lanai is accessible by commercial interisland flights, barge and ferry services, as well as private boats and aircraft. Lanai City serves as the

island's town center and its residential and commercial core, while Lanai Airport is the island's only airport and Kaunalapau Harbor its only commercial seaport. In addition, Manele Small Boat Harbor accommodates various recreational and commercial boating activities.

Lanai's attraction to visitors can be attributed to its comfortable year-round climate and its world renown, first class resorts. With the exception of the Manele Bay Hotel, the remaining visitor accommodations on the island are located in or around Lanai City. These properties include the Hotel Lanai and the Lodge at Koele, another world class luxury resort.

The Lanai Airport conveniently links Lanai to Oahu and other neighbor islands, while the Manele Small Boat Harbor accommodates daily ferry shuttle service to and from Lahaina, Maui.

b. Potential Impacts and Mitigation Measures

As mentioned previously, the proposed improvements will be adjacent to the built up area of the airport terminal and are meant to support the existing operations of Lanai Airport. The proposed projects will be built within the airport boundaries and will be compatible with surrounding uses. The project is not anticipated to have an adverse impact on the character of surrounding land uses or the regional setting.

2. Population and Economy

a. Existing Conditions

The resident population of Lanai has grown steadily within the past 20 years. This gain is evident during the period from 1990 to 1995 as the island's emerging visitor industry attracted new employees for its resort operations.

In 1980, the resident population of Lanai was at 2,119, while in 1990, the population stood at 2,426, an increase of 14.5 percent. From 1990 to 2000 the island's population grew to 3,193, a gain of 31.6 percent (SMS, 2002). The resident population of Lanai is forecasted to increase to 4,308 in 2020 (County of Maui Planning Department, 2006).

The recent global financial crisis and resulting slow down in the economy may affect the population growth in the state and counties of Hawaii. It is anticipated this down turn may continue into 2010/2011. In the long term, however, population growth is expected to increase. The State of Hawaii's population and economic projections to 2035 forecasts Maui County's population to grow at about 1.3 percent annually from 2005 to 2035 and a baseline scenario (average of high and low growth) for visitor arrivals, projects an annual visitor arrival growth rate of 1.0 percent annually from 2005 to 2035 (Department of Business Economic Development and Tourism, January 2008).

With its shift to a visitor industry-based economy, the island of Lanai has emerged as one of the foremost luxury resort destination areas in the world. This accomplishment is evidenced by the success of the Manele Bay Hotel and the Lodge at Koele resorts.

In addition to these resorts, local businesses and service providers contribute to the success of the island's economy, as well as visitor oriented commercial enterprises involved in outdoor recreational activities, such as fishing, diving, hiking, hunting, bicycling, kayaking, sport shooting, snorkeling, whale watching, and sight seeing.

As of August 2009, the unemployment rate for Lanai stood at 11.9 percent compared to 4.8 percent a year ago, August 2008 (State Department of Labor and Industrial Relations, September 2009). The economic slowdown on Lanai is reflective of the current recessionary conditions affecting the State of Hawaii.

b. Potential Impacts and Mitigation Measures

The proposed project, as defined by the ARFF, hangar and fuel tanks, is anticipated to have a beneficial impact on the economy. On a short-term basis, the project will support construction and construction-related employment. Accordingly, the project will have a beneficial impact on the local economy during the period of construction. From a long-term perspective, the project is anticipated to support employment related to the fuel facility and continued sales and services related to fuel supplies and aircraft hangar options. It is anticipated that the hangar and fueling facility

will create one (1) full-time position and will grow with demand. Staffing requirements for the ARFF is not anticipated to increase.

The proposed project is not a population generator. As such, the project is not anticipated to have an adverse impact upon demographic parameters.

C. PUBLIC SERVICES

1. Solid Waste Disposal

a. Existing Conditions

Single-family solid waste disposal on Lanai is provided by the Maui County Department of Environmental Management (DEM), while commercial disposal service is provided by a private disposal service. Opened in 1974, approximately 17 acres of the Lanai landfill's 35.67-acre site is currently utilized as a landfill. The existing landfill is anticipated to reach approximately 10 to 20 years capacity in 2056 (R. M. Towill, 2007).

b. Potential Impacts and Proposed Mitigation

As applicable, coordination will be undertaken with the Solid Waste Division of the County DEM for the disposal of construction waste. In the long term, the proposed action is not anticipated to adversely impact capacity of the existing landfill. Once completed, the State of Hawaii, DOT-A and CCA will utilize private waste disposal services for trash collection and hauling to the County landfill.

2. Police, Fire Protection and Medical Services

a. Existing Conditions

Police and security services for island residents are provided by the Maui County Police Department (MPD). The Lanai Police Station is situated in Lanai City.

Fire prevention, protection, and suppression services for the island of Lanai are provided by the Maui County Department of Fire and Public Safety. Located in Lanai City, the Lanai Fire Station is staffed by fire fighters on

alternating work shifts and is equipped with two (2) vehicles with a water storage capacity of 700 gallons per vehicle.

The Lanai Community Hospital is the major medical facility on the island. The 14-bed facility provides acute and long-term medical care, as well as 24-hour emergency medical service.

Also in Lanai City is the Lanai Health Center which provides out-patient medical care for the island's residents.

b. Potential Impacts and Proposed Mitigation

Police, fire protection and medical services are not expected to be adversely impacted by the proposed action. The project will not extend existing service area limits.

3. Educational and Recreational Facilities

a. Existing Conditions

The Lanai region is served by the State Department of Education's (DOE's) public school system.

Located in Lanai City, Lanai High and Elementary School provides elementary and secondary educational facilities and services for children from kindergarten through the twelfth grade.

Public parks and recreational facilities are administered and maintained by the Maui County Department of Parks and Recreation (DPR). DPR parks and facilities in Lanai City include: the Lanai Community Center, the Lanai Gym and Tennis Courts, and the Lanai Little League Field, Fraser Avenue Park and Kaumalapau Highway/Fraser Avenue Park.

There are also a number of privately owned and maintained recreational facilities that are available for public use. Situated in Lanai City, Dole Park is a privately owned park utilized by the public. Additional privately owned parks utilized by the public include Waialua Park, and Hulopoe Beach Park. Olopua Woods Park and Waialua Park are located in Lanai City, while

Hulopoe Beach Park is situated near Manele Small Boat Harbor in the Manele Project District.

The Lanai Recreation Center is a privately owned and maintained recreational complex which is utilized by the public. The Center encompasses a heated swimming pool, basketball court, exercise track, fitness course, softball fields, recreational building, and playground.

Other privately operated recreational facilities on Lanai include two (2) 18-hole championship golf courses and a 9-hole golf course. The Experience at Koele and the Challenge at Manele adjoin The Lodge at Koele and the Manele Bay Hotel, respectively. In addition to guests, these privately operated facilities are also available for use by the public. The 9-hole Cavendish Golf Course is a privately operated facility in Lanai City which provides recreational opportunities for Lanai residents at no cost.

b. Potential Impacts and Proposed Mitigation

The proposed project is not a population generator. As such, the proposed projects are not expected to generate a need for educational facilities. There are no anticipated adverse impacts to existing recreational facilities and resources.

D. INFRASTRUCTURE

1. Roadways

a. Existing Conditions

Access to the Lanai Airport is off of Kaunalapau Highway. Kaunalapau Highway is a State Highway, Highway 440, running from Lanai City to Kaunalapau Harbor on the western coast of Lanai. It has two (2) travel lanes. The airport access road off of Kaunalapau Highway is also a two (2) lane roadway. The intersection of Kaunalapau Highway and the airport access road is an unsignalized intersection. Traffic levels are fairly low and there are no traffic problems in the area.

b. Potential Impacts and Mitigation Measures

The proposed project is not anticipated to generate additional vehicular traffic that will affect traffic or levels of service at or near the airport and Kaunalapau Highway. The ARFF station is an existing facility. The new ARFF station will not involve additional staff or employment which will increase vehicular traffic on the local roadways. The fueling facility will be used by aircraft flying in and out of the Lanai Airport and the hangar will be used by private individuals to store their aircraft. The latter two (2) improvements will have limited use and are not anticipated to generate additional vehicular traffic to and from the airport.

Access to the new ARFF station and aircraft hangar will be provided by a new driveway off of the airport access road. The traffic related to these facilities will not conflict with the internal traffic flow around the terminal parking lot, and passenger terminal.

Parking for the new ARFF station will continue to be located in the employee parking lot, to the north of the new ARFF station.

2. Water System

a. Existing Conditions

The water system for Lanai is owned and operated by Lanai Water Company. The Lanai Airport water system is part of the domestic water supply system for Lanai City. Water is transmitted to the airport through an existing 6-inch waterline along Kaunalapau Highway. A 2.5-inch waterline connects with the 6-inch waterline and runs along the airport access road to a 120,000 gallon steel water tank located to the northeast of the terminal building.

b. Potential Impacts and Mitigation Measures

It is anticipated the ARFF Station will use approximately 650 gallons of water per day and based on the County of Maui, Department of Water Supply standards for light industrial use, the hangar will use approximately 4,080 gallons of water per day. The water tank and water system is expected to meet the domestic water needs of the airport to 2020 (KFC Airport, Inc., June 1999).

Assessment of the water system capacity for fire flow requirements will be carried out during the design phase of the ARFF station. Upgrades to the existing fire pump at the ARFF for fire flow requirements will be carried out, as determined.

3. Wastewater System

a. Existing Conditions

In order to comply with new State Department of Health requirements prohibiting large capacity cesspools, a septic tank and a leach field were installed at Lanai Airport during the recent upgrades. Wastewater from the terminal and ancillary buildings gravity flows into a central pump station and a 2.5-inch forcemain takes the wastewater to the septic tanks.

The existing septic tank capacity is approximately 2,361 gallons and the leach field is approximately 2,740 sq. ft. See **Appendix "E"**.

b. Potential Impacts and Mitigation Measures

The existing airport facilities, along with the proposed new ARFF station and hangar, are anticipated to generate an approximate total of 2,125 gallons of wastewater per day. Based on the estimated flow, the existing septic tank capacity is adequate to handle the future wastewater flows. The leach field, however, will need to be expanded an additional 802 sq. ft. to handle the additional wastewater flows generated by the proposed improvements. Refer to **Appendix "E"**.

4. Drainage

a. Existing Conditions

The airport lands lie on a relatively flat ridge where the surrounding terrains slope away from the subject property in a westerly direction towards Kalamaiki Gulch or to the southwest towards Miki Basin. The study area comprises of a drainage area of approximately 1.9 acres which sheet flows in the easterly direction towards the existing cargo facility and concrete apron. The study area consists of undeveloped, grassed land which is relatively flat with an average slope of three (3) percent. See **Appendix "F"**. The existing

airport drainage system in the area consists of an unlined grassed swale that directs runoff towards an existing grated drain inlet located west of the cargo facility. The drainage system flows in an easterly direction and discharges in an retention basin on the southern side of the runway. See Grading and Drainage Plan for the hangar and fuel facility, **Appendix "G"**.

b. Potential Impacts and Mitigation Measures

The proposed drainage system and grading plan is developed to direct the storm water runoff towards a drain inlet located to the west of the cargo facility and also to channel the runoff around the ARFF station, hangar, and fuel facility, in an open drainage channel to the existing system of pipe culverts. Refer to ARFF proposed condition drainage plan, **Appendix "F"**, and Grading and Drainage Plan for the hangar and fuel facility, **Appendix "G"**. The increase in storm water resulting from the proposed improvements is estimated to be 1.5 cubic feet per second (cfs). Refer to **Appendix "F"**. The proposed improvements are not anticipated to adversely impact adjacent and downstream properties.

5. Electrical and Communication Systems

a. Existing Conditions

Electrical, telephone, and CATV services to the Lanai Airport are provided by Maui Electric Company (MECO), Hawaiian Telecom, and Time Warner Cable TV, respectively. Overhead lines run along the Kaunapali Highway right-of-way. MECO's underground primary electrical service runs from Kaunapali Highway along the airport access road and into the airport and is metered through one (1) electric meter belonging to the State. The existing electrical distribution system at the Lanai Airport is a State owned system. The telephone and CATV services are routed in the same underground duct lines as MECO's service. See **Appendix "H"**.

b. Potential Impacts and Mitigation Measures

New electrical, telephone and CATV service from the airport boundary to the ARFF and hangar will be routed underground through a concrete encased duct line. The estimated distance is 1,200 lineal feet. Refer to **Appendix "H"**.

It is anticipated the proposed improvements will not have any adverse impacts associated to the extension of electrical and telecommunication services at the Lanai Airport. Appropriate coordination will be undertaken with Maui Electric Company and Hawaiian Telcom to ensure that utility service requirements for project design are addressed as early as possible.

E. CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts are defined as the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions.

The proposed project is not part of a larger action as the ARFF station essentially entails replacing the existing ARFF station which is not compliant with existing FAA design standards. The fuel tanks and aircraft hangar are provided to service existing aviation users at the Lanai Airport. The facilities in themselves are not anticipated to generate more aircraft activity at the airport. There are no community growth impacts resulting from or occurring with the proposed project. The lands upon which the new ARFF station, fuel tanks and aircraft hangar will be located are currently vacant and undeveloped but within the existing Lanai Airport lands.

Secondary impacts are those which have the potential to occur later in time or farther in distance, but are still reasonably foreseeable. They can be viewed as actions of others that are taken because of the presence of the project. Secondary impacts from highway projects, for example, can occur because they can induce development by removing one of the impediments to growth - transportation access.

There are no foreseeable secondary impacts associated with the proposed project. It is not considered a generating component for population, nor will it place a significant additional burden upon infrastructure or the environment.

III. RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

III. RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE DISTRICTS

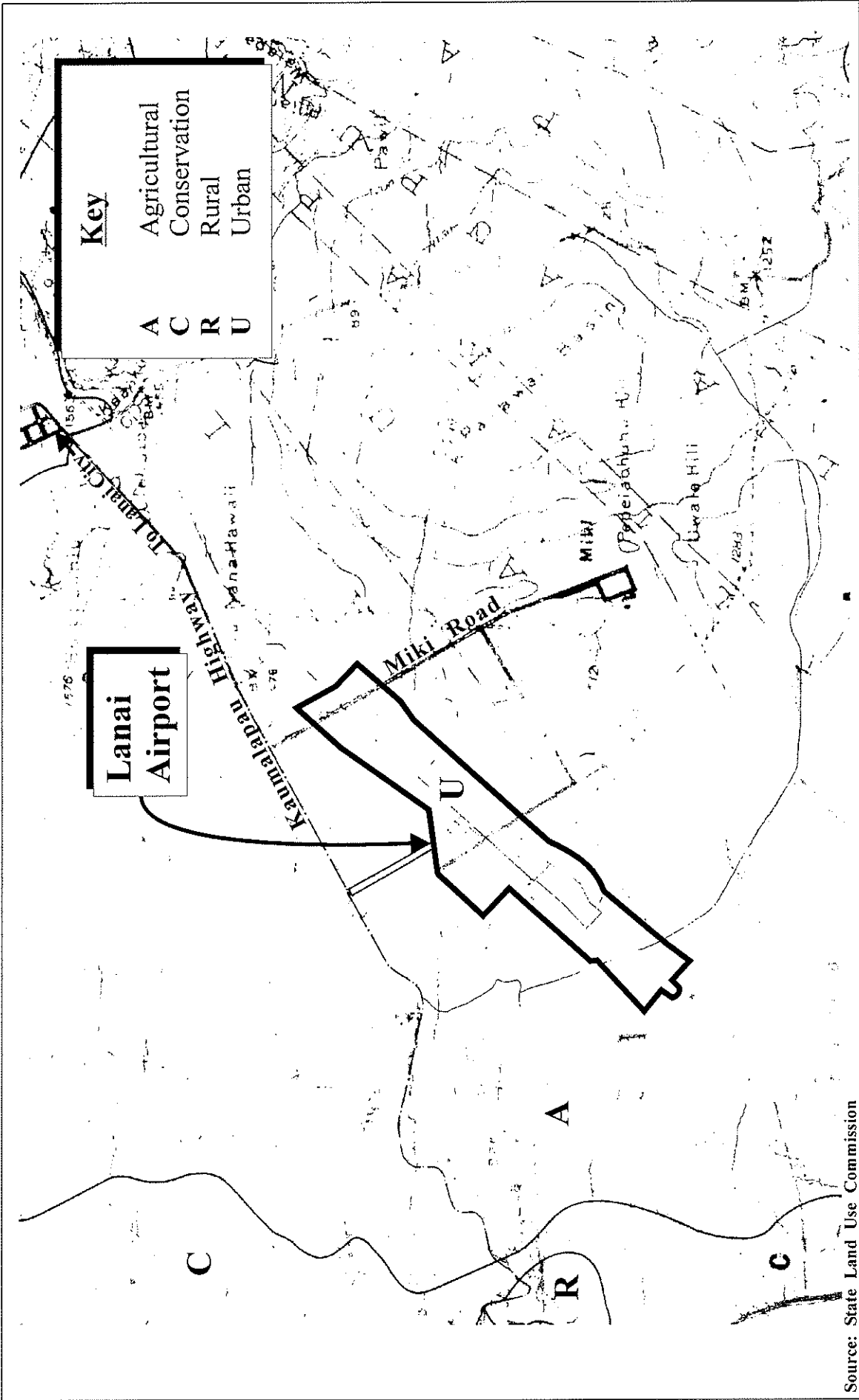
Pursuant to Chapter 205, HRS, all lands in the State have been divided and placed into one (1) of four (4) land use districts by the State Land Use Commission (SLUC). These land use districts have been designated "Urban", "Rural", "Agricultural", and "Conservation". The SLUC classifies the majority of lands on Lanai for "Agricultural" and "Conservation" uses. The island of Lanai encompasses a total land area of approximately 90,500 acres. Of this total area, "Agricultural" lands occupy 46,639 acres, "Conservation" lands encompass 38,197 acres, "Urban" lands comprise 3,257 acres, and "Rural" lands consist of 2,407 acres (Maui County Data Book, 2008). The lands underlying the project site are designated "Urban". See **Figure 10**. Airport and related uses are permitted in the "Urban" district.

B. MAUI COUNTY GENERAL PLAN

The 1990 update of the Maui County General Plan establishes broad objectives and policies to guide the long-range development of the County. As indicated by the Maui County Charter,

"...indicate desired population and physical development patterns for each island within the county; shall address the unique problems and needs of each island and region within the county; shall explain the opportunities and the social, economic and environmental consequences related to potential developments; and shall set forth the desired sequence, patterns, and characteristics of future developments. The general plan shall identify objectives to be achieved, and priorities, policies and implementing actions to be pursued with respect to population density, land use maps, land use regulations, transportation systems, public and community facility locations, water and sewage systems, visitor destinations, urban design, and other matters related to development."

The proposed action is in keeping with the following General Plan objectives and policies relating to land use, economic activity, and transportation.



Source: State Land Use Commission

Figure 10 Proposed ARFF Station, Fuel Tanks and Hangar at Lanai Airport
State Land Use District Boundary Map



NOT TO SCALE

Prepared for: State of Hawaii, Dept. of Transportation, Airports Division



LANAI AIRPORT-ccr.apf\SLUD

Objectives:

1. To use the land within the County for the social and economic benefit of the County's residents.
2. To provide an economic climate which will encourage controlled expansion and diversification of the County's economic base.

Policies:

- a. Maintain a diversified economic environment compatible with acceptable and consistent employment.
- b. Support programs, services, and institutions which provide economic diversification.

Transportation Objective:

1. To support an advanced and environmentally sensitive transportation system which will enable people and goods to move safely, efficiently and economically.

Policies:

- a. Encourage the development of more efficient water and air transportation systems.
- b. Support environmentally sensitive development or modernization of major transportation facilities such as new harbors and airports when they are needed by our residents.

C. LANAI COMMUNITY PLAN

The project site is located in the Lanai Community Plan region, one (1) of the nine (9) Community Plan regions established in the County of Maui. Planning for each region is guided by the respective Community Plans, which are designed to implement the Maui County General Plan. Each Community Plan contains recommendations and standards which guide the sequencing, patterns, and characteristics of future development in the region.

Land use guidelines are established by the Lanai Community Plan land use map, and as indicated, the subject property is situated within an area designated for "Airport" use. See **Figure 11.**

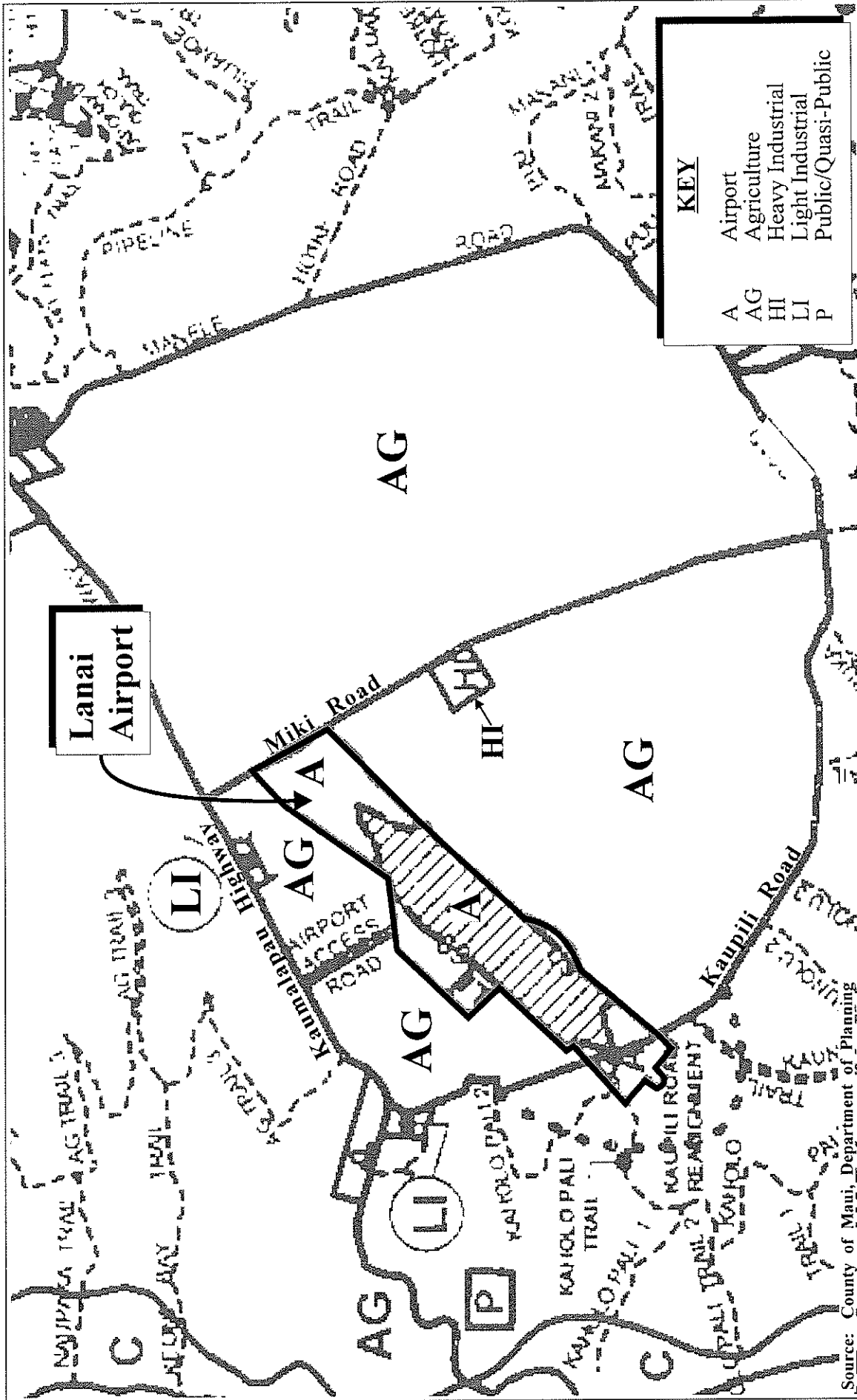
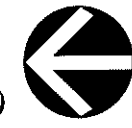


Figure 11 Proposed ARFF Station, Fuel Tanks and Hangar at Lanai Airport Community Plan Designations



NOT TO SCALE



Prepared for: State of Hawaii, Dept. of Transportation, Airports Division

The proposed action is in keeping with the Community Plan's "Airport" use designation for the property.

The Lanai Community Plan sets forth goals, objectives, policies, implementing actions, and standards which identify preferred future conditions, steps to be taken to achieve stated goals, and specific measures which are necessary to attain the desired goals. The proposed action is in consonance with the following provisions of the Community Plan:

ECONOMIC ACTIVITY

Goal:

Create a stable and diverse economic climate which is consistent and compatible with Lanai's rural island lifestyle.

Objectives and Policies:

2. Recognize and promote government services as a means of meeting community needs and providing employment opportunities for local residents.
3. Promote diversification of Lanai's economy by supporting locally-based new business ventures which are sensitive to community needs.

LAND USE

Goal:

Maintain and enhance Lanai's rural atmosphere, respecting its vast open space character and small island town environment which are unique in the State of Hawaii.

Objectives and Policies:

1. Limit State Urban District boundary expansion to areas which are designated for urban uses on the Lanai Community Plan land use map.

PHYSICAL INFRASTRUCTURE

Goal:

Provide adequate, reliable and well-designed public infrastructure systems in a timely fashion to meet the social, economic and public safety and welfare needs of the Lanai community.

TRANSPORTATION

Objectives and Policies:

* * *

3. Encourage commercial concession and lease opportunities for local residents at State harbor and airport facilities.

* * *

8. Ensure that planning, design, operation of, and access to airports and harbor facilities address the needs of the island's residents.

D. MAUI COUNTY ZONING

As designated by Maui County zoning, the subject property is located in the "Airport District". The proposed uses are permitted in the "Airport District".

E. COASTAL ZONE MANAGEMENT OBJECTIVES AND POLICIES

The Hawaii Coastal Zone Management Program (HCZMP), as formalized in Chapter 205A, HRS, establishes objectives and policies for the preservation, protection, and restoration of natural resources of Hawaii's coastal zone.

Although the Lanai Airport is not located within Lanai's Special Management Area (SMA), as set forth in Chapter 205A, HRS, this section addresses the project's relationship to applicable coastal zone management considerations.

1. Recreational Resources

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

- a. Improve coordination and funding of coastal recreational planning and management; and
- b. Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:
 - (i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;
 - (ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;
 - (iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;
 - (iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;
 - (v) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;
 - (vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;
 - (vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and
 - (viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of Section 46-6, HRS.

Response: The proposed action is not anticipated to impact coastal recreational opportunities or affect existing public access to the shoreline. At its closest point, the subject property is more than two (2) miles from the shoreline. The proposed improvements are not a direct generator of, nor do they create a demand for, regional recreational resources.

2. **Historical/Cultural Resources**

Objective: Protect, preserve and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

- a. Identify and analyze significant archeological resources;
- b. Maximize information retention through preservation of remains and artifacts or salvage operations; and
- c. Support state goals for protection, restoration, interpretation, and display of historic resources.

Response: An Archaeological Assessment was carried out on the proposed project sites and no cultural historic resources were discovered. Refer to **Appendix "C"**.

Should human remains be inadvertently discovered during earth moving activities, work shall cease at once in the immediate area of the find, and the find shall be protected from further disturbance. The SHPD shall also be immediately notified and procedures for the treatment of inadvertently discovered human remains shall be followed pursuant to Chapter 6E, HRS.

3. **Scenic and Open Space Resources**

Objective: Protect, preserve and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

- a. Identify valued scenic resources in the coastal zone management area;

- b. Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
- c. Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and
- d. Encourage those developments that are not coastal dependent to locate in inland areas.

Response: The proposed improvements will be designed in accordance with applicable regulatory standards to ensure visual compatibility with the surrounding land uses. The proposed action is not contrary to the objectives and policies for scenic and open space resources.

4. **Coastal Ecosystem**

Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

- a. Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
- b. Improve the technical basis for natural resource management;
- c. Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
- d. Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and
- e. Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Response: The proposed action is located more than two (2) miles from the shoreline and not expected to adversely impact coastal ecosystems.

Appropriate erosion control measures will be implemented to minimize the effects of stormwater runoff during construction of the project and to ensure that coastal ecosystems are not adversely impacted.

5. Economic Use

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

- a. Concentrate coastal dependent development in appropriate areas;
- b. Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and
- c. Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
 - (i) Use of presently designated locations is not feasible;
 - (ii) Adverse environmental effects are minimized; and
 - (iii) The development is important to the State's economy.

Response: The proposed improvements provide facilities that are important to the local economy. The proposed actions are not coastal dependent and are not contrary to the objective and policies for economic use.

6. Coastal Hazards

Objective: Reduce hazard to life and property from tsunamis, storm waves, stream flooding, erosion, subsidence and pollution.

Policies:

- a. Develop and communicate adequate information about storm wave, tsunami,

flood, erosion, subsidence, and point and nonpoint source pollution hazards;

- b. Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;
- c. Ensure that developments comply with requirements of the Federal Flood Insurance Program; and
- d. Prevent coastal flooding from inland projects.

Response: The Lanai Airport is located at elevation 1,300 feet MSL and in an area of minimal flooding. Drainage improvements will be designed in accordance with the Drainage Standards of the County of Maui to ensure that the project will not adversely affect downstream and adjoining properties from the effects of flooding and erosion.

7. **Managing Development**

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies:

- a. Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
- b. Facilitate timely processing of applications for development permits and resolve overlapping of conflicting permit requirements; and
- c. Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Response: This EA has been prepared for public review in compliance with Chapter 343, HRS, and Chapter 200 of Title 11, Administrative Rules, *Environmental Impact Statement Rules* and National Environmental Policy Act.

In addition, all aspects of development will be conducted in accordance with applicable State and County requirements. Opportunity for review of the proposed action is offered through the various regulatory permit processes.

8. Public Participation

Objective: Stimulate public awareness, education, and participation in coastal management.

Policies:

- a. Promote public involvement in coastal zone management processes;
- b. Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and
- c. Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Response: Opportunities for public awareness, education, and participation in coastal management are provided through the Chapter 343, HRS, environmental review process.

9. Beach Protection

Objective: Protect beaches for public use and recreation.

Policies:

- a. Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;
- b. Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and
- c. Minimize the construction of public erosion-protection structures seaward of the shoreline.

Response: At its closest point, the Lanai Airport property is located more than two (2) miles from the shoreline. The proposed project is not anticipated to impact shoreline processes.

10. Marine Resources

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

- a. Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;
- b. Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;
- c. Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;
- d. Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and
- e. Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Response: Best Management Practices (BMP's) will be incorporated during construction to support the policies of effective management of marine resources.

In addition to the foregoing objectives and policies, SMA permit review criteria pursuant to Act 224 (2005) provides that:

No special management area use permit or special management area minor permit shall be granted for structures that allow artificial light from floodlights, uplights, or spotlights used for decorative or aesthetic purposes when the light:

- (1) *Directly illuminates the shoreline and ocean waters; or*
- (2) *Is directed to travel across property boundaries toward the shoreline and ocean waters.*

Response: The proposed project is not located on or near the shoreline. Lighting improvements associated with the establishment of the ARFF station, fuel tanks and hangar

will be shielded and down cast so that seabirds would not be disoriented in their flight pattern and create a hazardous situation for air flight control at the airport.

**IV. SUMMARY OF
ADVERSE
ENVIRONMENTAL
EFFECTS WHICH
CANNOT BE AVOIDED**

IV. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The development of the ARFF station, fuel tanks and hangar will result in some construction-related impacts as described in Chapter II, Existing Conditions, Potential Impacts and Mitigation Measures.

Potential effects include noise generated impacts occurring from construction activities. In addition, there may be temporary air quality impacts associated with dust generated from construction related activities, and exhaust emissions discharged by construction equipment.

The proposed project is not anticipated to create any long-term adverse environmental effects.

V. ALTERNATIVES

V. ALTERNATIVES

A. ARFF ALTERNATIVES

The existing ARFF station has several deficiencies that put it out of compliance with Airport Rescue and Fire Fighting Station Building Design Standards. Alternatives were, therefore, assessed in this context.

1. No Action Alternative

The no action or no build alternative calls for retaining the existing ARFF station at its current condition. Given the existing need for improved emergency facilities at the airport, the no action or no build alternative is not considered a viable alternative. Due to the deficiencies in the existing ARFF station, the FAA may impose penalties and fines until the station meets the design standards.

2. Deferred Action Alternative

Similar to the no action alternative, the deferred action alternative does not present a viable alternative, given the need to improve the ARFF station facilities and bring it into compliance with federal design codes and standards.

3. Remodeling Alternative

This alternative, as identified in the 2003 Project Definition Report (**Appendix "A"**), involves remodeling the existing ARFF station and building an addition at the rear of the current station. Although this alternative has the advantage of having the existing ARFF station operational during renovations, upon further review of current programming requirements for the ARFF, this alternative was deemed to be limited by physical and operational constraints. Expansion on the west side is limited due to the positioning of the existing electrical transformers on concrete pads and an above ground fuel tank. Expansion on the east side is compromised because a gate must be maintained for access to the airfield. In light of these operational constraints, this alternative was not considered favorable when compared to the new ARFF

station alternative which did not have associated constraints due to its location relative to other airport facilities and operations.

4. Design Alternative

During the conceptual planning stage for the ARFF station, several site layouts were considered. It should be noted that the site planning phase involved an examination of the operational requirements for the ARFF function, in order to ensure that spatial and functional criteria for the project were adequately addressed. In addition, the site planning process involved an analysis of space needs, missions and functions, area requirements, spaces and adjacencies, and people/equipment activities schedule. Through the project's planning process, the selected site plan was prepared and reviewed to ensure that all operational and performance standards can be addressed.

Although there may be other site layouts which could be examined, the proposed site layout of the ARFF station is intended to best accommodate the operational needs of the DOT-A in its mission to provide emergency aircraft and fire protection and emergency response services at the Lanai Airport.

B. FUEL TANKS AND HANGAR

1. No Action and Deferred Action Alternatives

The transition of the island's economic base from one that is agricultural oriented to one which is visitor oriented has created the need for new facilities responsive to the visitor and business base of the island. One (1) component of this base is those utilizing Lanai Airport's facilities via private jet service. This specific need will be addressed by the proposed fuel tanks and hangar proposed by CCA. In this context, the no action and deferred action alternatives are not considered preferred as the need for the facilities will only grow over time.

2. Design Alternatives

Both the fuel tanks and hangar components of the project were designed to address functional parameters associated with airport operations. That is, the hangar requires ready access to the ramp area and the fuel tanks require proximity to the aircrafts. Given the locations and relationships of existing airport facilities, the locations of the

tanks and hangars, as proposed, were judged to be viable by both DOT-A and CCA. Program requirements for these facilities dictated physical design criteria adopted for construction.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed action would involve a commitment of fuel, labor, funding, and material resources.

Development of the proposed project will involve the commitment of land for a needed emergency response facility at Lanai Airport, as well as ancillary support facilities, such as fuel supply and hangar facility, which would preclude other land use options for the site. This commitment of land resources, however, is consistent with existing and future land uses in and around the Lanai Airport. Moreover, since the ARFF station is to maintain public safety and health at the airport, the commitment of fuel, labor and funding is justified due to the public benefit provided by ARFF station.

It is noted that the hangar and aviation fuel tanks will be privately developed. Lands for the fuel tank site and airplane hangar site will be leased to CCA by the DOT-A. As such, DOT-A will obtain revenue from the lease of these lands.

VII. SIGNIFICANCE CRITERIA ASSESSMENT

VII. SIGNIFICANCE CRITERIA ASSESSMENT

The "Significance Criteria", Section 12 of the Administrative Rules, Title 11, Chapter 200, "Environmental Impact Statement Rules", were reviewed and analyzed to determine whether the proposed projects will have significant impacts to the environment. The following criteria and preliminary analysis are provided.

1. **Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.**

The proposed project, as defined by the ARFF, fuel tanks and hangar, will not result in any adverse environmental impacts. There are no known, rare, threatened, or endangered species of flora, fauna or avifauna located within the project area.

The archaeological survey of the project area did not locate any significant archaeological features, cultural artifacts, or in situ burials. The development of the property for the ARFF station, fuel tanks and hangar are not expected to result in any adverse impacts to archaeological resources. Should any artifacts or human remains be encountered during construction, work will stop in the immediate vicinity of the find and the SHPD will be immediately notified to establish an appropriate mitigation strategy.

2. **Curtails the range of beneficial uses of the environment.**

The proposed project and the commitment of land resources would not curtail the range of beneficial uses of the environment. The action will be implemented on lands dedicated for airport use.

3. **Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.**

The State's Environmental Policy and Guidelines are set forth in Chapter 344, HRS. The proposed actions do not contravene provisions of Chapter 344, HRS.

4. **Substantially affects the economic welfare, social welfare, and cultural practices of the community or State.**

The proposed project will have a beneficial impact on the local economy during construction. In the long term, the proposed fuel tanks and hangar will support the local economy through the contribution of taxes, salaries, wages, and benefits. The primary social welfare benefit, however, is the improvement of safety facilities provided by the ARFF station at the Lanai Airport. There are no adverse effects from the proposed project upon economic welfare, social welfare and cultural practices of the community or State.

5. **Substantially affects public health.**

No adverse impacts to the public's health and welfare are anticipated as a result of the proposed fuel tanks and hangar. The ARFF station will benefit public health, safety, and welfare by enhancing existing fire protection and emergency response services at Lanai Airport.

6. **Involves substantial secondary impacts, such as population changes or effects on public facilities.**

No population changes are anticipated as a result of the proposed project, since the project components are not considered population generators. The ARFF station will replace the existing ARFF station at Lanai Airport which was determined to be deficient.

From a land use standpoint, the proposed project is in keeping with the "Airport" designation of the Lanai Community Plan. The proposed project complements and is compatible with airport land uses.

The proposed improvements will hookup to an existing onsite wastewater system. No adverse impacts to the domestic water and wastewater capacities and facilities are anticipated. Fire flow capacity and water system assessment will be carried out during the ARFF station building permit processing. Upgrades, if required, will be carried out by DOT-A and CCA. Onsite runoff will be accommodated by existing drainage patterns. The projects are not expected to significantly impact other public services such as fire, health care, and emergency medical services. No adverse impacts upon educational or recreational services are anticipated. Impacts to solid

waste collection and disposal facilities and resources are anticipated to be minimal.

7. **Involves a substantial degradation of environmental quality.**

During the construction phase of the project components, there will be short-term air quality and noise impacts. In the long term, effects upon air quality and ambient noise levels will be minimal. The proposed project is not anticipated to significantly affect the open space and scenic character of the area.

No substantial degradation of environmental quality resulting from the ARFF station, fuel tanks and hangar are anticipated.

8. **Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.**

The proposed project components are considered stand alone projects which are compatible and consistent with airport operations. The proposed actions do not represent a commitment to larger actions. In addition, the proposed actions do not expect to result in any cumulative impacts that would adversely affect the environment.

9. **Substantially affects a rare, threatened, or endangered species, or its habitat.**

There are no rare, threatened or endangered species of flora, fauna or avifauna that will be adversely affected by the proposed project.

10. **Detrimentially affects air or water quality or ambient noise levels.**

Construction activities will result in short-term air quality and noise impacts. Dust control measures, such as regular watering and sprinkling, will be implemented to minimize wind-blown emissions. Noise impacts will occur primarily from construction-related activities. It is anticipated that construction will be limited to daylight working hours. Water quality is not expected to be affected.

In the long term, the proposed project is not anticipated to have a significant impact on air and water quality.

11. **Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.**

The proposed project is not located within and would not affect environmentally sensitive areas. The project area is not subject to flooding or tsunami inundation. Soils of the project area are not erosion-prone. There are no geologically hazardous lands, estuaries, or coastal waters within or adjacent to the project area. The ARFF, fuel tanks and hangar are use appropriate for the Lanai Airport.

12. **Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.**

The project area is not identified as a scenic vista or viewplane. The proposed project will not affect scenic corridors and coastal scenic and open space resources. The ARFF station and hangar are single-story buildings and the building height will not obstruct public view planes.

13. **Requires substantial energy consumption.**

The proposed ARFF station, fuel tanks and hangar will involve the short-term commitment of fuel for equipment, vehicles, and machinery during construction activities. However, this use is not anticipated to result in a substantial consumption of energy resources. The ARFF station will replace an existing aircraft rescue facility that does not meet FAA standards. In the long term, the new hangar will create an additional demand for electricity. However, this demand is not deemed substantial or excessive within the context of the region's overall energy consumption.

Based on the foregoing findings, it is anticipated that the proposed ARFF station, fuel tanks and hangar will not result in significant adverse impacts.

VIII. LIST OF PERMITS AND APPROVALS

VII. LIST OF PERMITS AND APPROVALS

The following permits and approvals may be required prior to the implementation of the project.

State of Hawaii

1. Chapter 343, HRS
2. National Pollutant Discharge Elimination System (NPDES) Permit, as applicable

County of Maui

1. State Declaration of Exemption from Grubbing, Grading, Building, Electrical, and Plumbing Permits

**IX. PARTIES CONSULTED
DURING THE
PREPARATION OF THE
DRAFT ENVIRONMENTAL
ASSESSMENT; LETTERS
RECEIVED; AND
RESPONSES TO
SUBSTANTIVE
COMMENTS**

IX. PARTIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED; AND RESPONSES TO SUBSTANTIVE COMMENTS

The following agencies were consulted during preparation of the Draft Environmental Assessment (EA). Agency comments and responses to substantive comments are included herein.

- | | |
|---|--|
| <p>1. Larry Yamamoto, State Conservationist
U.S. Department of Agriculture
Natural Resources Conservation Service
P.O. Box 50004
Honolulu, Hawaii 96850-0001</p> | <p>6. Russ K. Saito, State Comptroller
Department of Accounting and General Services
1151 Punchbowl Street, #426
Honolulu, Hawaii 96813</p> |
| <p>2. Ranae Ganske-Cerizo, Acting
District Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
70 Hookele Street, Suite 202
Kahului, Hawaii 96732</p> | <p>7. Sandra Lee Kunimoto, Chair
Department of Agriculture
1428 South King Street
Honolulu, Hawaii 96814-2512</p> |
| <p>3. Airports District Office
U.S. Department of Transportation
Federal Aviation Administration
P. O. Box 50244
300 Ala Moana Blvd., Room 7-126
Honolulu, Hawaii 96813</p> | <p>8. Theodore E. Liu, Director
State of Hawaii
Department of Business, Economic Development & Tourism
P.O. Box 2359
Honolulu, Hawaii 96804</p> |
| <p>4. George Young
Chief, Regulatory Branch
U.S. Department of the Army
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858-5440</p> | <p>9. Patricia Hamamoto, Superintendent
State of Hawaii
Department of Education
P.O. Box 2360
Honolulu, Hawaii 96804</p> |
| <p>5. Patrick Leonard
Pacific Islands Manager
U. S. Fish and Wildlife Service
300 Ala Moana Blvd., Rm. 3-122,
Box 50088
Honolulu, Hawaii 96813</p> | <p>10. Micah Kane, Chairman
Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu, Hawaii 96805</p> |
| | <p>11. Chiyome Fukino, M.D., Director
State of Hawaii
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawaii 96814</p> |

12. Alec Wong, P.E., Chief
Clean Water Branch
State of Hawaii
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawaii 96814
13. Herbert Matsubayashi
District Environmental Health
Program Chief
State of Hawaii
Department of Health
54 High Street
Wailuku, Hawaii 96793
14. Laura Thielen
State of Hawaii
**Department of Land and Natural
Resources**
P. O. Box 621
Honolulu, Hawaii 96809
15. Dr. Puaalaokalani Aiu, Administrator
State of Hawaii
**Department of Land and Natural
Resources**
State Historic Preservation Division
601 Kamokila Blvd., Room 555
Kapolei, Hawaii 96707
16. Brennon Morioka, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813
- cc: Ferdinand Cajjgal, Maui District
Engineer
17. Katherine Kealoha, Director
Office Of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, Hawaii 96813
18. Clyde Nāmuo, Administrator
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813
19. Abbey Seth Mayer, Director
State of Hawaii
Office of Planning
P. O. Box 2359
Honolulu, Hawaii 96804
20. Deidre Tegarden, Director
County of Maui
Office of Economic Development
2200 Main Street, Suite 305
Wailuku, Hawaii 96793
21. Gen Inuma, Administrator
Maui Civil Defense Agency
200 South High Street
Wailuku, Hawaii 96793
22. Jeffrey A. Murray, Fire Chief
County of Maui
Department of Fire and Public Safety
200 Dairy Road
Kahului, Hawaii 96732
23. Lori Tshako, Interim Director
County of Maui
**Department of Housing and
Human Concerns**
One Main Plaza
2200 Main Street, Suite 546
Wailuku, Hawaii 96793
24. Tamara Horcajo, Director
County of Maui
Department of Parks and Recreation
700 Halia Nako Street, Unit 2
Wailuku, Hawaii 96793
25. Jeffrey S. Hunt, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawaii 96793
26. Thomas Phillips, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawaii 96793
27. Milton Arakawa, Director
County of Maui
Department of Public Works
200 South High Street
Wailuku, Hawaii 96793

28. Cheryl Okuma, Director
County of Maui
**Department of Environmental
Management**
One Main Plaza
2200 Main Street, Suite 175
Wailuku, Hawaii 96793
29. Donald Medeiros, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawaii 96793
30. Jeffrey Eng, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793
31. G. Riki Hokama, Council Chair
Maui County Council
200 South High Street
Wailuku, Hawaii 96793
32. **Hawaiian Telcom**
60 South Church Street
Wailuku, Hawaii 96793
33. Greg Kauhi, Manager, Customer Operations
Maui Electric Company, Ltd.
P. O. Box 398
Kahului, Hawaii 96733



Natural Resources Conservation Service
P.O. Box 50004 Rm. 4-118
Honolulu, HI 96850
808-541-2600

October 9, 2008

Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano,

Thank you for providing the Natural Resources Conservation Service (NRCS) the opportunity to review the Early Consultation for Proposed Improvements at Lanai Airport, Lanai, Hawaii. Please find enclosed an NRCS Soil Survey Map, and Soil Reports. The Prime and Other Important Farmlands soils report identifies the Important Farmland soil map units. The soils map identifies their location and extent. The Important Farmland information has been enclosed for your aid in determining if a Farmland Impact Conversion Rating Form (AD-1006) is needed for this project. Typically, this form is required on projects that convert farmlands into non-farmland uses and have federal dollars attached to the project. See the website link below for more information on the Farmland Protection Policy Act, and a copy of the AD-1006 form with instructions. No hydric soils are located in the project area. Hydric soils identify potential areas of wetlands. If wetlands do exist, any proposed impacts to these wetlands would need to demonstrate compliance with the "Clean Water Act", and may need an Army Corp of Engineers 404 permit.

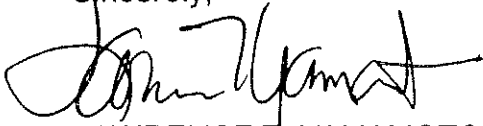
The NRCS Soil Survey Map identifies all soil map units in the project area. The soil reports provide selected soil properties and interpretations, e.g., Small Commercial Buildings, Local Roads and Streets, soil layers with USDA Textures, and Engineering Classifications. The limitation ratings for the selected uses, i.e. Small Commercial Buildings range from slight to moderate. These ratings do not preclude the intended land use, however they do identify potential limitations for the use, which may require corrective measures, increase costs, and/or require continued maintenance.

The NRCS Soil Survey is a general planning tool and does not eliminate the need for an onsite investigation. If you have any questions concerning the soils or interpretations for this project please call, Tony Rolfes, Assistant State Soil Scientist, (808) 541-2600 x129, or email, Tony.Rolfes@hi.usda.gov.

Proposed Improvements at Lanai Airport
Page 2

NRCS - Farmland Protection Policy Act Website:
<http://www.nrcs.usda.gov/programs/fppa/>

Sincerely,

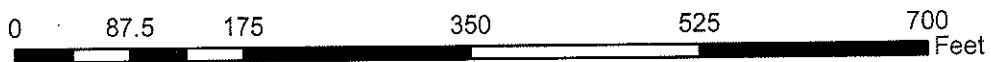
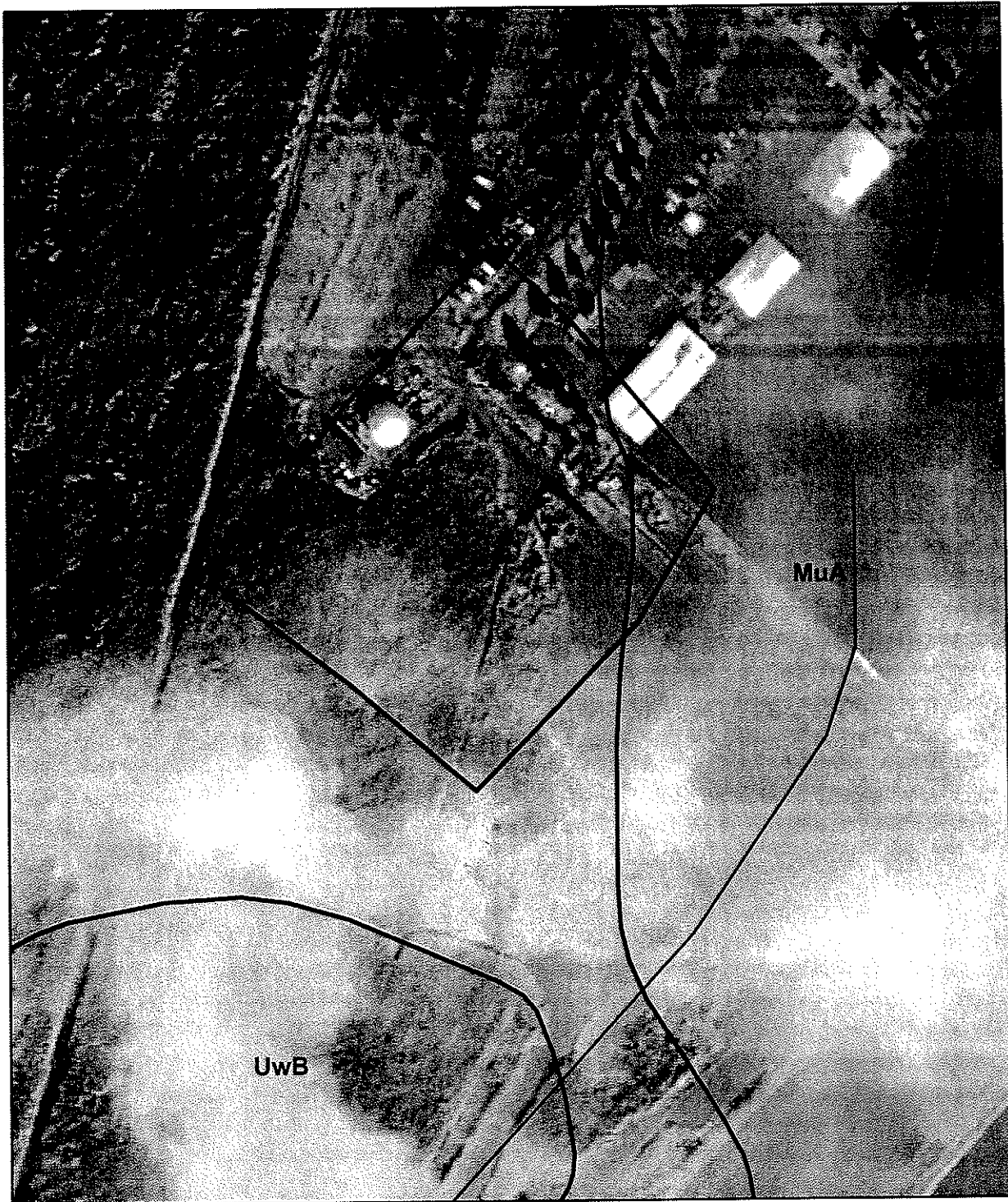
A handwritten signature in black ink, appearing to read 'Lawrence T. Yamamoto', with a stylized flourish at the end.

LAWRENCE T. YAMAMOTO
Director
Pacific Islands Area



cc: Michael Robotham, Assistant Director for Soil Science and Natural Resource
Assessments, USDA-NRCS, Honolulu, HI

Enclosures:

Soils Map for the Lanai Airport, Lanai, Hawaii



Legend

-  Approx. Location Lanai Airport Project
-  Soil Map units

NRCS 10/2008

Prime and other Important Farmlands

Island of Lanai, Hawaii

Map symbol	Map unit name	Farmland classification
MuA	Molokai silty clay loam, 0 to 3 percent slopes	Prime farmland if irrigated
MuB	Molokai silty clay loam, 3 to 7 percent slopes	Prime farmland if irrigated

Selected Soil Interpretations

Island of Lanai, Hawaii

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

*This soil interpretation was designed as a "limitation" as opposed to a "suitability". The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation.

Map symbol and soil name	Pct. of map unit	ENG - Small Commercial Buildings (HI) *	
		Rating class and limiting features	Value
MuA: Molokai	100	Slight	
MuB: Molokai	100	Moderate Slopes are from 4 to 8%	0.26

Roads and Streets, Shallow Excavations, and Lawns and Landscaping

Island of Lanai, Hawaii

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
MuA:							
Molokai	100	Somewhat limited Low strength	0.10	Somewhat limited Too clayey Cutbanks cave	0.50 0.10	Very limited Too clayey	1.00
MuB:							
Molokai	100	Somewhat limited Low strength	0.10	Somewhat limited Too clayey Cutbanks cave	0.50 0.10	Very limited Too clayey	1.00

Engineering Properties

Island of Lanai, Hawaii

Map symbol and soil name	Depth <i>In</i>	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
					<i>Pct</i>						<i>Pct</i>	
MuA: Motokai	0-15	Silty clay loam	CL-K (propose d), ML-K	A-7	0	0	100	100	90-100	80-95	40-50	15-20
	15-72	Clay loam, Silty clay loam	ML-K (propose d)	A-7	0	0	100	100	80-100	70-95	40-50	10-20
MuB: Motokai	0-15	Silty clay loam	CL-K (propose d), ML-K	A-7	0	0	100	100	90-100	80-95	40-50	15-20
	15-72	Clay loam, Silty clay loam	ML-K (propose d)	A-7	0	0	100	100	80-100	70-95	40-50	10-20

This report shows only the major soils in each map unit. Others may exist.



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

October 21, 2009

Lawrence T. Yamamoto, Director
Pacific Islands Area
U. S. Department of Agriculture
Natural Resources Conservation Service
P. O. Box 50004, Room 4-118
Honolulu, Hawaii 96850

**SUBJECT: Early Consultation Comments for the Proposed Lanai Airport
Improvements**

Dear Mr. Yamamoto:

Thank you for your letter of October 9, 2008, relating to the proposed Airport Rescue Fire Fighting station, new hangar and new fuel tanks at the Lanai Airport.

We appreciate receipt of the soil survey data for the project area. The information will be reviewed and applicable portions of the information provided will be incorporated in the Draft Environmental Assessment (EA) document.

A copy of the Draft EA will be provided to your office for review and comment.

Thank you again for the valuable technical information provided.

Very truly yours,

A handwritten signature in black ink, appearing to read "Mich Hirano", written over a horizontal line.

Mich Hirano, AICP
Principal

MH:yp

cc: Phillip Russell, State Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation
Calvin Nishio, Architects Pacific

F:\DATA\LANAI AIRPORT-ccr.ap\NRCS.ecres.wpd



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850



OCT 20 2008

In Reply Refer To:
2009-TA-0007

OCT 17 2008

Mr. Mich Hirano
Project Manager
Munekiyo and Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Subject: Pre-Assessment Review for the Proposed Lanai Airport Improvements, Lanai

Dear Mr. Hirono:

Thank you for your September 23, 2008, letter requesting early project review for the proposed improvements to the Lanai Airport at Lanai City. We received your letter on September 26, 2008. The proposed improvements include the construction of a new Airport Rescue Fire Fighting Station, consisting of a single-story building accessed by a new driveway. A second improvement involves the creation of a 30-foot tall hangar. Based on the project information you provided and pertinent information in our files, the endangered Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) and the threatened Newell's shearwater (*Puffinus auricularis newelli*) (collectively referred to as seabirds) may traverse the project area at night during the breeding season (February 1 through December 15).

To assist you in developing your project to minimize impacts to species listed under the Endangered Species Act (ESA) of 1973 [16 U.S.C. 1531-1544], as amended, we provide the following guidance. Any outdoor lighting, particularly when used during each year's peak fledging period (September 15 through December 15), could result in seabird disorientation, fallout, injury or mortality. Potential impacts to seabirds can be minimized by shielding outdoor lights associated with the project, avoiding night-time construction, installing motion detectors and timers on all light fixtures, and providing all project staff with information regarding seabird fallout. All outdoor lights should be shielded so the bulb can be seen only from below.

If the above measures can not be incorporated into the project design, then a seabird response plan may be needed. Such a plan should include:

- Measures to be taken in the event a seabird is seen circling a light, which may include temporarily turning the light off (when safety permits).
- Efforts to actively search for downed birds in lighted areas during the peak fledging season (September 15 through December 15).

Mr. Mich Hiraga

- Maintenance of a pet carrier on site at all times with instructions on how and where to take retrieved birds.
- A list of qualified bird rescue contacts such as local veterinarians, rehabilitation centers, or Hawaii Division of Forestry and Wildlife (DOFAW) representatives.
- A log of all seabird incidents that is submitted to the U.S. Fish and Wildlife Service and DOFAW within 48 hours of the discovery.
- Documented seabird awareness training and annual refresher training for staff.

If the proposed project is funded, authorized, or carried about by a Federal agency, you should request that the Federal agency consult with us under section 7(a)(2) of the Endangered Species Act (ESA), as amended. Under section 7 of the ESA, it is the Federal agency's (or non-federal designee) responsibility to make the determination of whether or not the proposed project "may affect" federally listed species or designated critical habitat.

We hope this information will assist you in the development of the draft Environmental Assessment for the Lanai airport improvements. If you have questions or would like additional information, please contact Consultation and Technical Assistance Program Fish and Wildlife Biologist Megan Laut (phone: 808-792-9400; fax: 808-792-9581).

Sincerely,



for Patrick Leonard
Field Supervisor



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

October 21, 2009

Patrick Leonard, Field Supervisor
U. S. Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

SUBJECT: Early Consultation Comments for the Proposed Lanai Airport Improvements, 2009-TA-0007

Dear Mr. Leonard:

Thank you for your letter of October 17, 2008, relating to the proposed Airport Rescue Fire Fighting station, new hangar and new fuel tanks at the Lanai Airport.

We understand that the endangered Hawaiian petrel and the threatened Newell's shearwater may traverse the project area. In recognition of this potential, the State Department of Transportation, Airports Division (DOT-A), will employ the USFWS' guidance relating to outdoor lighting. The guidance parameters include shielding of outdoor lights associated with the project, avoiding night-time construction, installing motion detectors and timers on light fixtures and providing staff with information regarding seabird fallout. Moreover, the DOT-A recognizes that a seabird response plan may be needed, if any of the foregoing measures cannot be incorporated into the project.

We note that Federal agency funding is not involved in this project.

A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Patrick Leonard, Field Supervisor
October 21, 2009
Page 2

Thank you again for the valuable input provided to ensure that the jurisdictional interests of the USFWS are reflected in the Chapter 343, Hawaii Revised Statutes, process.

Very truly yours,

A handwritten signature in black ink, appearing to read "Mich Hirano", with a long horizontal stroke extending to the right.

Mich Hirano, AICP
Principal

MH:yp

cc: Phillip Russell, State of Hawaii, Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation
Calvin Nishio, Architects Pacific

F:\DATA\LANAI AIRPORT-ccr api\USFWS.ecres.wpd



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
FORT SHAFTER, HAWAII 96858-5440

NOV 03 2008

October 29, 2008

Regulatory Branch

File Number POH-2008-276

Mich Hirano
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku Hawaii 96793

Dear Mr. Hirano:

This responds to your September 23, 2008 early consultation request letter for two (2) separate improvement projects that are located at the Lanai Airport, Lanai, Hawaii. The first action involves construction of a new Airport Rescue Fire Fighting (ARFF) Station and related improvements; the second action involves development of a 25,200 sq ft hangar, two (2) fuel tanks, and with installation of necessary water, wastewater, and electrical systems for both proposed improvements. We have reviewed the information you submitted with respect to the Corps' authority to issue Department of the Army (DA) permits pursuant to Section 10 of the Rivers and Harbors Act (RHA) of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344).

Based on the information you submitted and our available sources, it appears the review area, the footprints identified for both proposed improvements, are absent of waters of the U.S., including adjacent wetlands, that are subject to our jurisdiction. We anticipate both projects would also not involve work in and/or placement of dredged and/or fill material into waters of the U.S.; therefore, **a DA permit will not be required.**

However, should you decide to alter the method, scope, or location of your proposed activity, please contact this office for a determination of DA jurisdiction and, if applicable, the required DA authorization.

This approved jurisdictional determination is valid for a period of five (5) years from the date of this letter, unless new information supporting a revision is provided to this office before the expiration date. Should you desire to appeal this approved jurisdictional determination, please contact this office to request additional information on the Administrative Appeals Process.

This determination does not relieve you of the responsibility to obtain any other permits, licenses, or approvals that may be required under County, State, or Federal law for your proposed work.

Should you have any questions regarding this approved jurisdictional determination, please contact Ms. Joy Anamizu of my staff at (808) 438-7023 or by e-mail at joy.n.anamizu@usace.army.mil and reference the Corps File No. **POH-2008-276** in all future correspondence and inquiries related to this project.

Sincerely,

A handwritten signature in black ink, appearing to read "George P. Young". The signature is fluid and cursive, with a large, stylized initial "G" and "Y".

George P. Young, P.E.
Chief, Regulatory Branch

**APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers**

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 29-Oct-2008

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Honolulu District, POH-2008-00276-JNA-JD1

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State : HI - Hawaii
 County/parish/borough: Maui
 City: Lanai
 Lat: 20.789
 Long: -156.951
 Universal Transverse Mercator Folder UTM List
UTM list determined by folder location
 " NAD83 / UTM zone 34S
Waters UTM List
UTM list determined by waters location
 " NAD83 / UTM zone 34S
 Name of nearest waterbody: Kalamaiiki Ag Ditch to Kalamaiiki Gulch; Kaunalapau Gulch
 Name of nearest Traditional Navigable Water (TNW): Kaunalapau Harbor, Pacific Ocean
 Name of watershed or Hydrologic Unit Code (HUC): Palawai Basin (HUC 2040000)

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

Check if other sites (e.g., offsite mitigation sites, disposal sites, etc.) are associated with the action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION:

Office Determination Date: 29-Oct-2008

Field Determination Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION

There "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area.

Waters subject to the ebb and flow of the tide.

Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area.

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area:¹

Water Name	Water Type(s) Present

Lanai Airport Improvements (2 projects) (Uplands) | Uplands

b. Identify (estimate) size of waters of the U.S. in the review area:

Area: (m²)
Linear: (m)

c. Limits (boundaries) of jurisdiction:

based on: []
OHWM Elevation: (if known)

2. Non-regulated waters/wetlands:³

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

1. TNW

Not Applicable.

2. Wetland Adjacent to TNW

Not Applicable.

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: []
Drainage area: []
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics

(a) Relationship with TNW:

Tributary flows directly into TNW.
Tributary flows through [] tributaries before entering TNW.
:Number of tributaries

Project waters are [] river miles from TNW.
Project waters are [] river miles from RPW.
Project Waters are [] aerial (straight) miles from TNW.
Project waters are [] aerial(straight) miles from RPW.

Project waters cross or serve as state boundaries.
Explain:
Identify flow route to TNW:⁵

Tributary Stream Order, if known:
Not Applicable.

(b) General Tributary Characteristics:
Tributary Is:
Not Applicable.

Tributary properties with respect to top of bank (estimate):
Not Applicable.

Primary tributary substrate composition:
Not Applicable.

Tributary (conditions, stability, presence, geometry, gradient):
Not Applicable.

(c) Flow:
Not Applicable.

Surface Flow Is:
Not Applicable.

Subsurface Flow:
Not Applicable.

Tributary has:
Not Applicable.

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction:

High Tide Line indicated by:
Not Applicable.

Mean High Water Mark indicated by:
Not Applicable.

(III) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Not Applicable.

(iv) Biological Characteristics. Channel supports:
Not Applicable.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Not Applicable.

(b) General Flow Relationship with Non-TNW:
Flow is:
Not Applicable.

Surface flow is:
Not Applicable.

Subsurface flow:
Not Applicable.

(c) Wetland Adjacency Determination with Non-TNW:
Not Applicable.

(d) Proximity (Relationship) to TNW:
Not Applicable.

(ii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Not Applicable.

(iii) Biological Characteristics. Wetland supports:

Not Applicable.

3. Characteristics of all wetlands adjacent to the tributary (if any):

All wetlands being considered in the cumulative analysis:

Not Applicable.

Summarize overall biological, chemical and physical functions being performed:

Not Applicable.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Significant Nexus: Not Applicable

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE:

1. TNWs and Adjacent Wetlands:

Not Applicable.

2. RPWs that flow directly or indirectly into TNWs:

Not Applicable.

Provide estimates for jurisdictional waters in the review area:

Not Applicable.

3. Non-RPWs that flow directly or indirectly into TNWs:⁸

Not Applicable.

Provide estimates for jurisdictional waters in the review area:

Not Applicable.

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Not Applicable.

Provide acreage estimates for jurisdictional wetlands in the review area:

Not Applicable.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs:

Not Applicable.

Provide acreage estimates for jurisdictional wetlands in the review area:

Not Applicable.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs:

Not Applicable.

Provide estimates for jurisdictional wetlands in the review area:
Not Applicable.

7. Impoundments of jurisdictional waters:⁹
Not Applicable.

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS:¹⁰
Not Applicable.

Identify water body and summarize rationale supporting determination:
Not Applicable.

Provide estimates for jurisdictional waters in the review area:
Not Applicable.

F. NON-JURISDICTIONAL WATERS. INCLUDING WETLANDS

If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements:

Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce:

Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR):

Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (Explain):

Other (Explain):

This JD covers two (2) separate actions co-located at the Lana'i Airport: 1) construction of a new Airport Rescue Fire Fighting (ARFF) Station and related improvements; and 2) development of a 25,200 sq ft hangar with related upgrades to water, wastewater and electrical systems.

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (ie., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment:
Not Applicable.

Provide acreage estimates for non-jurisdictional waters in the review area, that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction.
Not Applicable.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD
(listed items shall be included in case file and, where checked and requested, appropriately reference below):

Data Reviewed	Source Label	Source Description
--Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant	Figures 1-3	Project maps and info provided by agent
--U.S. Geological Survey map(s).	POH-2008-276 (USGS Topo)	TIG's eGIS maps
--Photographs	-	-
----Aerial	POH-2008-276 (Satellite Imagery 2006)	TIG's eGIS maps

B. ADDITIONAL COMMENTS TO SUPPORT JD:

Not Applicable.

¹-Boxes checked below shall be supported by completing the appropriate sections in Section III below.

²-For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

³-Supporting documentation is presented in Section III.F.

⁴-Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵-Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

⁶-A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.

⁷-Ibid.

⁸-See Footnote #3.

⁹-To complete the analysis refer to the key in Section III.D.6 of the instructional Guidebook.

¹⁰-Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

October 21, 2009

George P. Young, P.E., Chief
Regulatory Branch
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

SUBJECT: Early Consultation Comments for the Proposed Lanai Airport Improvements, File Number POH-2008-276

Dear Mr. Young:

Thank you for your letter of October 29, 2008, relating to the proposed Airport Rescue Fire Fighting station, new hangar and new fuel tanks at the Lanai Airport.

We understand that based on your review of information provided in the early consultation letter, a DA permit will not be needed. Further, we understand that this determination does not relieve the State Department of Transportation, Airports Division or Castle & Cooke Aviation of the responsibility of obtaining other required regulatory approvals.

A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Thank you again for the evaluative information provided by the Department.

Very truly yours,

Mich Hirano, AICP
Principal

MH:yp

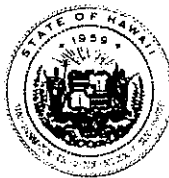
cc: Phillip Russell, State Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation
Calvin Nishio, Architects Pacific

F:\DATA\LANAI AIRPORT-ccr apiArmyDept.ecres.wpd

environment
planning
government

OCT 10 2008

LINDA LINGLE
GOVERNOR



RUSS K. SAITO
COMPTROLLER

BARBARA A. ANNIS
DEPUTY COMPTROLLER

(P)1325.8

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810

OCT - 8 2008

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

Subject: Early Consultation Request for Proposed Improvements at Lanai Airport,
Lanai, Hawaii

Thank you for the opportunity to provide early consultation comments for the proposed improvements at Lanai Airport. The proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If you have any questions, please call me at 586-0400 or have your staff call Mr. Clarence Kubo of the Public Works Division at 586-0488.

Sincerely,

A handwritten signature in black ink that reads "Russ K. Saito".

RUSS K. SAITO
State Comptroller

OCT 10 2008

LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

October 8, 2008

Mr. Mich Hirano, Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawai'i 96793

Dear Mr. Hirano:

Subject: Early Consultation on Improvements at the Lana'i Airport, Lana'i

The Department of Education has no comment or concern on the proposed improvements.

Thank you for the opportunity to comment. If you have any questions, please call Heidi Meeker of the Facilities Development Branch at (808) 377-8301.

Very truly yours,

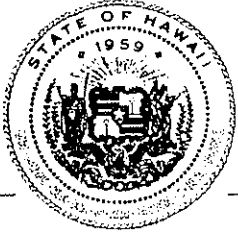
A handwritten signature in cursive script, reading "Patricia Hamamoto".

Patricia Hamamoto
Superintendent

PH:jmb

c: Randolph Moore, Assistant Superintendent, OSFSS
Lindsay Ball, CAS, Hana/Lahainaluna/Lanai/Molokai Complex Areas

OCT 16 2008



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR
ABBEY SETH MAYER
DIRECTOR
OFFICE OF PLANNING

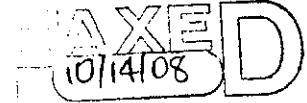
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-12285

October 14, 2008



Mr. Mich Hirano, AICP
Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

Subject: Environmental Assessment for Proposed Improvements at Lanai Airport,
Lanai, Hawaii.

Thank you for the opportunity for an early consultation regarding the Environmental Assessment (EA) for the above referenced proposal. The Office of Planning (OP) understands that these improvements were not included in the Final Environmental Assessment for the updated Lanai Airport Master Plan, dated August 2000. The current proposal is to construct a new Airport Rescue Fire Fighting (ARFF) Station and related improvements, and secondly, to construct a 25,200 square foot hanger with a building height approximately 30 feet. The proposed improvements also include the installation of two (2) 15,000 gallon fuel tanks for jet fuel and a single 3,000 gallon tank for aviation gas. Related upgrades of water, wastewater and electrical systems are also proposed.

OP has the following comments and concerns.

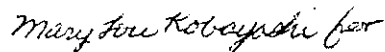
1. The August 2000 Master Plan (update document) indicates that a 120,000-gallon water tank is proposed, but is not adequate to meet the fire demand of 2,000-gallons per minute for two hours (pages 2-19). Would the subject proposal for a new ARFF unit at the airport resolve this concern?
2. We note that the improvements are within the State Urban District, within existing Lanai Airport boundaries.
3. Water supply is a critical issue for the island of Lanai. How would these new improvements affect the water supply for the island?

Mr. Mich Hirano, AICP
October 14, 2008
Page 2

4. OP also notes that the 2000 Airport Master Plan indicates that septic tanks are currently utilized for wastewater disposal. Please provide a description of the new proposals for wastewater disposal. The feasibility of constructing a package Wastewater Disposal Plant and the consolidation of all septic tanks on the Airport property should be explored.
5. The project will have the potential to generate hazardous materials or petroleum contamination of the air, soil or water. Please discuss how public health and safety will be protected.

The Office of Planning looks forward to receiving the EA with the above issues addressed. If you have any questions, please call Lorene Maki at 587-2888.

Sincerely,



Abbey Seth Mayer
Director

C: Brian Sekiguchi, DOT Airports
Theodore Liu, DBEDT

October 21, 2009

Abbey Seth Mayer, Director
**Department of Business, Economic
Development & Tourism**
Office of Planning
235 South Beretania Street, 6th Floor
Honolulu, Hawaii 96804

SUBJECT: Early Consultation Comments for the Proposed Lanai Airport
Improvements, Reference No. P-12285

Dear Mr. Mayer:

Thank you for your letter of October 14, 2008, relating to the proposed Airport Rescue Fire Fighting (ARFF) station, new hangar and new fuel tanks at the Lanai Airport. We provide the following information in response to your comments.


1. A 120,000 gallon water tank is located within the project site. The existing water system is sufficient to meet domestic water demand. Assessment of the existing water system's sufficiency to meet fire flow requirements for the both the ARFF station and new hangar facility will be carried out during the design phase for the ARFF station. If required, the existing fire pump may need to be upgraded or replaced to meet fire flow requirements.
2. With respect to water supply, the new ARFF and hangar facilities is not anticipated to adversely impact the domestic water system. The existing domestic services currently serving the airport, therefore, are not anticipated to be upgraded.
3. Wastewater treatment at the Lanai Airport is provided by a 2,361 gallon septic tank and absorption/leach field of approximately 2,740 square feet. The capacity of the septic tank is sufficient to handle anticipated future flows at the airport. The absorption/leach field, however, will be expanded approximately 800 square feet to handle anticipated wastewater flows resulting from the project. State DOT-A and Castle & Cooke Aviation will make the necessary improvements to the wastewater system.

Abbey Seth Mayer, Director
October 21, 2009
Page 2

4. The Draft Environmental Assessment will address the effects of the proposed actions with respect to hazardous materials and petroleum products.

Thank you again for the valuable input provided by your office. A copy of the Draft EA will be provided to your office for review and comment.

Very truly yours,



Mich Hirano, AICP
Principal

MH:yp

cc: Phillip Russell, State Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation
Calvin Nishio, Architects Pacific

F:\DATA\LANAI AIRPORT-ccr api\DBEDT.ecres.wpd

OCT 10 2008

LINDA LINGLE
GOVERNOR
STATE OF HAWAII



MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

KAULANA H. PARK
DEPUTY TO THE CHAIRMAN

ROBERT J. HALL
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

October 8, 2008

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

Thank you for the opportunity to provide comments on Department of Transportation's proposed construction of an Airport Aircraft Rescue Fire Fighting Station and Castle & Cooke Resorts' development of a foot hanger and other related improvements at Lanai Airport. The Department of Hawaiian Home Lands has no comments to offer.

Should you have any questions, please call the Planning Office at (808) 620-9480.

Aloha and mahalo,

Micah A. Kane
for Micah A. Kane, Chairman
Hawaiian Homes Commission

[Faint, illegible text at the bottom of the page]

OCT 09 2008

LINDA LINGLE
GOVERNOR OF HAWAII



CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to
EMD / CWB

10010PKP.08

October 3, 2008

Mr. Mich Hirano, AICP
Project Manager
Munikeyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

**Subject: Early Consultation Request for Proposed Improvements at Lanai Airport,
Lanai, Hawaii**

The Department of Health (DOH), Clean Water Branch (CWB), has reviewed the subject document and offers these comments on your plan. Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at

<http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf>.

1. Any project and its potential impacts to State waters must meet the following criteria:
 - a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.
 - b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.
 - c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).
2. The document indicates that the subject project will cross Kalihi Stream. Kalihi Stream is identified as a Priority Category 5 waters in the Section 303(d) of the Clean Water Act list of impaired water bodies. Category 5 waters are described as surface waters where available data

and/or information indicate that at least one (1) designated use is not being supported or is threatened, and a Total Maximum Daily Load is needed. Accordingly, the subject document should also include this consideration toward ensuring the protection and improvement of this water body with respect to the subject facility.

3. The Army Corps of Engineers should be contacted at (808) 438-9258 to see if any project requires a Department of the Army (DA) permit. Permits may be required for work performed in, over, and under navigable waters of the United States. Projects requiring a DA permit also require a Section 401 Water Quality Certification (WQC) from our office.
4. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:
 - a. Storm water associated with construction activities, including excavation, grading, clearing, demolition, uprooting of vegetation, equipment staging, and storage areas that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. An NPDES permit is required before the start of the construction activities.
 - b. Hydrotesting water.
 - c. Construction dewatering effluent.

You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 calendar days before to the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html>.

5. You must also submit a copy of the NOI or NPDES permit application to the State DLNR, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the CWB that SHPD has or is in the process of evaluating your project. Please submit a copy of your request for review by SHPD or SHPD's determination letter for the project along with your NOI or NPDES permit application, as applicable.


Mr. Mich Hirano, AICP
October 3, 2008
Page 3

10010PKP.08

6. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 Water Quality Certification are required, must comply with the WQS. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of \$25,000 per day per violation.

If you have any questions, please visit our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/index.html>, or contact the Engineering Section, CWB, at 586-4309.

Sincerely,


ALEC WONG, P.E., CHIEF
Clean Water Branch



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

October 21, 2009

Alec Wong, P.E., Chief
State of Hawaii
Department of Health
Clean Water Branch
P. O. Box 3378
Honolulu, Hawaii 96801-3378

SUBJECT: Early Consultation Comments for the Proposed Lanai Airport Improvements, EMD/CWB 10010PKP.08

Dear Mr. Wong:

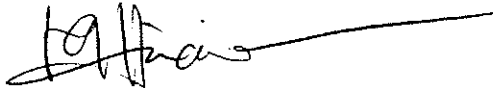
Thank you for your letter of October 3, 2008, relating to the proposed Airport Rescue Fire Fighting (ARFF) station, new hangar and new fuel tanks at the Lanai Airport. The State Department of Transportation, Airports Division (DOT-A) recognizes its responsibilities as it relates to Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. In this connection, we provide the following responses to the Clean Water Branch's comments.

1. Applicable water quality criteria and policies set forth through HAR 11-54 be observed and complied with.
2. Although your comment makes reference to Kalihi Stream, the proposed action is not in close proximity to water bodies and streams.
3. The U. S. Department of the Army (DA) has been consulted as part of the Environmental Assessment early consultation process. By letter dated October 29, 2008, the DA has confirmed that a DA permit will not be required.
4. As applicable, the DOT-A will comply with HAR, Chapter 11-55 as it relates to requirements of the National Pollutant Discharge Elimination System. Applicable coordination with the State Historic Preservation Division will be undertaken in this regard.
5. Other applicable provisions of HAR, Chapter 11-55 will be adhered to.

Alec Wong, P.E., Chief
October 21, 2009
Page 2

Thank you again for the valuable input provided by your office. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

A handwritten signature in black ink, appearing to read "Mich Hirano", with a long horizontal line extending to the right.

Mich Hirano, AICP
Principal

MH:yp

cc: Phillip Russell, State Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation
Calvin Nishio, Architects Pacific

F:\DATA\LANAI AIRPORT-ccr.ap\DOHCWB.ecres.wpd

OCT 15 2008

LINDA LINGLE
GOVERNOR OF HAWAII



CHIYOME L. FUKINO, M. D.
DIRECTOR OF HEALTH

LORRIN W. PANG, M. D., M. P. H.
DISTRICT HEALTH OFFICER

STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2102

October 14, 2008

Mr. Mich Hirano
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

Subject: **Proposed Improvements at Lanai Airport**

Thank you for the opportunity to participate in the early consultation process for the proposed improvements to the Lanai Airport. The following comments are offered:

1. National Pollutant Discharge Elimination System (NPDES) permit coverage may be required for this project. The Clean Water Branch should be contacted at 808 586-4309.
2. The noise created during the construction phase of the project may exceed the maximum allowable levels set forth in Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control". A noise permit may be required and should be obtained before the commencement of work.
3. HAR, Chapter 11-46 sets maximum allowable sound levels from stationary equipment such as compressors and HVAC equipment. The attenuation of noise from these sources may depend on the location and placement of these types of equipment. This should be taken into consideration during the planning, design, and construction of the building and installation of these types of equipment.

It is strongly recommended that the Standard Comments found at the Department's website: <http://hawaii.gov/health/environmental/env-planning/landuse/landuse.html> be reviewed, and any comments specifically applicable to this project should be adhered to.

Should you have any questions, please call me at 808 984-8230.

Sincerely,

A handwritten signature in black ink, appearing to read "H. Matsubayashi", written over a circular stamp or mark.

Herbert S. Matsubayashi
District Environmental Health Program Chief

October 21, 2009

Patti Kitkowski
Acting District Environmental Health
Program Chief
State of Hawaii
Department of Health
Maui District Health Office
54 High Street
Wailuku, Hawaii 96793-2102

SUBJECT: Early Consultation Comments for the Proposed Lanai Airport
Improvements, TMK (2)4-9-002:041 (por.)

Dear Ms. Kitkowski:

Thank you for the Maui District Health Office's comments of October 14, 2008, relating to the proposed Airport Rescue Fire Fighting station, new hangar and new fuel tanks at the Lanai Airport. We offer the following information in response to your comments.

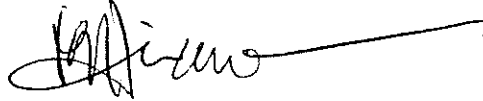
1. As applicable, a National Pollutant Discharge Elimination System (NPDES) Permit will be obtained for the project. Coordination with the Clean Water Branch will be undertaken in this regard.
2. As applicable, a noise permit will be secured in accordance with Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control".
3. Other applicable provisions of Hawaii Administrative Rules, Chapter 11-46 will be adhered to, including those provisions relating to sound levels associated with stationary equipment.
4. As noted, the project design team will comply with all applicable standards and conditions required by the Department.

A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Ms. Patti Kitkowski
October 21, 2009
Page 2

Thank you again for the valuable comments provided.

Very truly yours,

A handwritten signature in black ink, appearing to read "Mich Hirano", with a long horizontal flourish extending to the right.

Mich Hirano, AICP
Principal

MH:yp

cc: Phillip Russell, State Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation
Calvin Nishio, Architects Pacific

F:\DATA\LANAI AIRPORT-ccr.ap\DOHMAUI.ecres.wpd

SEP 30 2008

LINDA LINGLE
GOVERNOR OF HAWAII



LAURA H. THIELEN
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

September 26, 2008

Munekiyo & Hiraga, Inc.
305 High Street Suite 104
Wailuku, Hawaii 96793

Attention: Mr. Mich Hirano

Gentlemen:

Subject: Early Consultation for Draft Environmental Assessment for Proposed
Improvements at Lanai Airport

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Morris M. Atta".

Morris M. Atta
Administrator

LINDA LINGLE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

DEC 04 2008

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI
JIRO A. SUMADA

IN REPLY REFER TO:

STP 8.3020

December 1, 2008

Mr. Mich Hirano, AICP
Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

Subject: Early Consultation
Lanai Airport – Airport Rescue Fire Fighting Station (ARFF) and
Castle and Cooke Resorts, LLC Hangar

Thank you for requesting the State Department of Transportation's (DOT) review of the two subject projects at Lanai Airport. The projects support airport activities and DOT is thus desirous of the projects' successful completion.

Your early consultation on the subject airport projects is appreciated. Further project submittals should be directed to the Airports Division for handling by the appropriate airport staff sections.

Very truly yours,

A handwritten signature in black ink, appearing to read "B. Morioka".

BRENNON T. MORIOKA, PH.D.,P.E.
Director of Transportation

JAN 2 2 2009

PHONE (808) 594-1888

FAX (808) 594-1865



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

HRD08/3859B

January 14, 2009

Mich Hirano
Munekiyo & Hiraga Inc.
305 High Street, Suite 104
Wailuku, HI 96793

RE: Early consultation request for the Draft Environmental Assessment for the proposed improvements at Lāna'i Airport, Lāna'i.

Aloha e Mich Hirano,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned letter dated September 23, 2008. Two improvement projects are being proposed for Lāna'i Airport. The State Department of Transportation proposes to construct a new Airport Rescue Fire Fighting Station with related improvements. The station will be a single-story building that will house two 1,500-gallon fire fighting trucks. The station will also include dormitories, a kitchen and dining room, administrative office, as well as other features. Castle & Cook Resorts LLC proposes to develop a 25,200-square-foot hangar with a 30-foot-high building. The resort also proposes to install two 15,000-gallon fuel tanks and a 3,000-gallon tank for aviation gas to the east of the proposed hangar. OHA has reviewed the project and offers the following comments.

Chapter 343 of the Hawaii Revised Statutes (HRS) requires that the Draft EA include a Cultural Impact Assessment (CIA). The CIA shall include information relating to the traditional and customary practices and beliefs of the area's Native Hawaiians, and the community should be involved in this assessment. Consideration must also be afforded to any individuals accessing the project area for constitutionally protected traditional and customary purposes, in accordance with the Hawai'i State Constitution, Article XII, Section 7.

OHA requests clarification whether an archaeological inventory survey for the project will be submitted to the State Historic Preservation Division for review and approval. If so, OHA should be allowed the opportunity to comment on the criteria assigned to any cultural or archaeological sites identified within the archaeological inventory survey.

Mich Hirano
January 14, 2009
Page 2

We request the applicant's assurances that should iwi kūpuna or Native Hawaiian cultural or traditional deposits be found during the construction of the project, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

In addition, OHA recommends that the applicant use native vegetation in its landscaping plan for the subject parcel. Landscaping with native plants furthers the traditional Hawaiian concept of mālama 'āina and creates a more Hawaiian sense of place.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong by phone at (808) 594-0248 or e-mail him at sterlingw@oha.org.

'O wau iho nō me ka 'oia'i'o,



Clyde W. Nāmu'o
Administrator

C: OHA Lāna'i CRC Office

October 21, 2009

Clyde W. Nāmu`o, Administrator
State of Hawaii
Office of Hawaiian Affairs
711 Kapi`olani Boulevard, Suite 500
Honolulu, Hawaii 96813

SUBJECT: Early Consultation Comments for the Proposed Lanai Airport Improvements

Dear Mr. Nāmu`o:

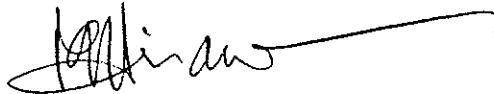
Thank you for your letter of January 14, 2009, providing early consultation comments on the proposed Airport Rescue Fire Fighting station, new hangar and new fuel tanks at the Lanai Airport. We offer the following information in response to your comments.

1. The Draft Environmental Assessment (EA) will include a cultural impact assessment. In this regard, we note that the proposed action will be within or adjacent to a secured airport operations area and will not affect access for individuals in their pursuit of traditional and customary Native Hawaiian practices.
2. The archaeological survey report will be included in the Draft EA document which will be provided to your office for review.
3. The Department of Transportation and Castle & Cooke Aviation have provided its assurance that should iwi kupuna, or Native Hawaiian cultural, or traditional deposits be found during project construction, work will cease in the area of the find, and appropriate agency coordination undertaken to ensure that proper protocols are followed.
4. Where landscaping is provided, planting material will, to the extent practicable, incorporate native plants.

Clyde W. Nāmu`o, Administrator
October 21, 2009
Page 2

Thank you again for the valuable comments provided.

Very truly yours,

A handwritten signature in black ink, appearing to read "Mich Hirano", with a long horizontal flourish extending to the right.

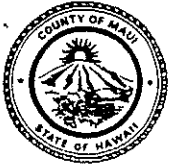
Mich Hirano, AICP
Principal

MH:yp

cc: Phillip Russell, State Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation
Calvin Nishio, Architects Pacific

F:\DATA\LANAI AIRPORT-ccr apt\OHA.ecres.wpd

08/5342 *



COPY



POLICE DEPARTMENT
COUNTY OF MAUI

CHARMAINE TAVARES
MAYOR

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

THOMAS M. PHILLIPS
CHIEF OF POLICE

GARY A. YABUTA
DEPUTY CHIEF OF POLICE

OUR REFERENCE
YOUR REFERENCE

October 14, 2008

DEPT OF PLANNING
COUNTY OF MAUI
RECEIVED
08 OCT 17 A9:57

Mr. Mich Hirano, ACIP
Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Mr. Hirano:

SUBJECT: Early Consultation Request for Proposed Improvements at Lana'i Airport

This is in response to your letter dated September 23, 2008, requesting comments on the above subject.

We have reviewed the information for the above mentioned subject and offer the enclosed comments.

Thank you for giving us the opportunity to comment on this project.

Very truly yours,

Assistant Chief Wayne T. Ribao
for: Thomas M. Phillips
Chief of Police

c: Jeffrey Hunt, Maui County Dept. of Planning

COPY

TO : THOMAS PHILLIPS, CHIEF OF POLICE, MAUI POLICE DEPARTMENT

VIA : CHANNELS

FROM : JOHN K. SANG, POLICE OFFICER II, LANA'I PATROL DIVISION

SUBJECT : EARLY CONSULTATION REQUEST FOR PROPOSED IMPROVEMENTS AT LANA'I AIRPORT

OFC. SANG MAKE:
SOME VALID
POINTS.

AC [Signature]
10/14/08

Sir, this TO/FROM is written to convey my findings with regards to the request submitted by Munekiyo and Hiraga Inc. concerning proposed improvements to the Lana'i Airport. I reviewed the request and sites with the concerns of how it these improvements would impact or be impacted by police service as well as the responsibilities this police department has. The concerns addressed were impact on traffic, safety, security and emergency responses. I also consulted with employees and agents of the Airport with whom officers here on Lana'i have a close working relationship.

On the issue of traffic there appears to be no immediate impact on traffic at the surface of the project. However the request does not adequately describe the purpose of the project. In speaking with people at the Airport there seems to be the possibility that Castle & Cooke LLC's recent venture, Castle & Cooke Aviation (CCA), will likely be the major party using the hangar facility the request does not outline their projections of usage. The effect of the project on traffic will be tied to their operations. As an example, the proposal shows the location of the hangar is at the end of the current cargo parking lot. This lot is now serviced by a one-way one lane road. If this roadway is to be converted in any way to provide access to and from the hangar there will be the need to widen and improve the roadway. By doing this that traffic flow will be channeled through the current airport circle which passes the main terminal. Again, the amount of usage CCA proposes dictates the increase use of that section of roadway.

Another option would be to build a roadway with an access just before the long term parking lot which would lead to the CCA hangar. This would facilitate vehicles to and from the hangar as well as limit the impact on the main terminal traffic circle.

Impact on traffic at the intersection of the Airport road and Kaunalapau Highway will again be tied to the operations of CCA. Currently the intersection is not controlled by any traffic control device. Though traffic on Lana'i is not "bumper to bumper" the amount of usage proposed or projected by CCA should be considered when addressing this intersection. The current design of the intersection is sufficient for the current amount of traffic.

The issue of safety again is tied to that of traffic. An increase in the traffic at the airport, if not properly mitigated, may prove a safety issue. The cargo area and long term parking lot are not sufficiently designed with pedestrian traffic in mind. The long term parking lot most especially is a simple dirt and grass lot. There are no designated walking areas or lighting for the evening

hours. If traffic increases and depending on where CCA proposes their access road the safety of pedestrians, who are likely accessing the main terminal, should be taken in to consideration during the design phase.

Security of the area, as shown in the proposal, does not seem to address security of the hangar or the fuel storage facility. There doesn't appear to be designation of a "no-go" zone in which access to the hangar or fuel storage facility is restricted. Also, in speaking with Airport Rescue Fire Fighters (ARFF) about the proposed plan a concern was raised with regards to the security of their facility. The inclusion of the ARFF station in the "no-go" zone should be considered. As shown in the provided sketch there are at least six potential breach points (i.e. doors and windows). That, coupled with the fact that the ARFF facility is not maintained on a 24-hour basis, could prove a security breach to the runway or other restricted areas.

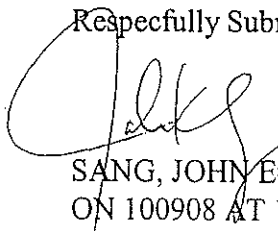
Also not addressed is the security measures for the hangar. As with the current cargo and airport facilities at the fence line this can be mitigated with a simple security fence and secured access from within the building to the restricted areas. So too can the fuel storage facility be secured.

The ability for police and subsequently other emergency agencies to respond effectively and efficiently to any calls for service at the additions will depend highly on the design of the access road(s). If there is proper review and subsequent implementation of this matter the impact on emergency agency responses should be minimal.

Though I believe this is a feasible project for the island I believe those issues listed in this report should be addressed during subsequent developmental phases.

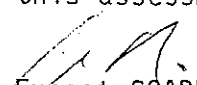
Sir, I hope the information and observations provided in this communication proves useful in this matter. If you have any questions please feel free to call me.

Respectfully Submitted,



SANG, JOHN E#11799
ON 100908 AT 1044 HOURS

Officer John SANG has made several good suggestions in regards to his assessment of this project. He has noted widening of traffic lanes, pedestrian traffic, security of the Airport Fire Rescue facility and security of the Airport Hangar to include access to fuel storage. Report to be forwarded back to Munekiyo & Hiraga Inc. for review of suggestions and concerns that are provided. Officer John SANG can be reached at 244-6496 to clarify any proposals that he has documented via this assessment.



Lt. Ernest SOARES 0321
10/09/08 @1130 Hrs.



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

October 21, 2009

Gary Yabuta, Chief of Police
Maui Police Department
55 Mahalani Street
Wailuku, Hawaii 96793

SUBJECT: Proposed Improvements Located at Lanai Airport, TMK (2) 4-9-002:041

Dear Chief Yabuta:

Thank you the letter from your Department dated October 14, 2008 providing comments on the subject project from Police Officer J.K. Sang of the Lanai Patrol. On behalf of the State Department of Transportation, Airports Division and Castle & Cooke Aviation, we are providing the following information in response to your comments. The responses are related to the general comments regarding traffic increase, vehicular conflict with existing airport parking and passenger terminal access, and general security in and around the airport facilities.

1. We note Maui Police Department's (MPD) comment that there appears to be no immediate impact on traffic. The new Aircraft Rescue and Fire Fighting (ARFF) station will replace the existing ARFF station which is not in compliance with Federal Aviation Administration design standards for such facilities. There will be no increase in staffing associated with the new ARFF station. The fuel tanks and airplane hangar is provided by Castle & Cooke Aviation to accommodate Castle & Cooke Resorts, LLC private aircraft and to provide a facility for existing and future visitors to Lanai. They are not anticipated to generate additional traffic which will significantly increase traffic on the roadways.
2. Access to the proposed new ARFF station and airplane hangar will be provided by a new access driveway from the main Airport access road and will go to the west of the airport parking area and the passenger terminal access road. Therefore, the traffic related to the proposed improvements will not conflict with the airport traffic at points of congestion near the parking lot or passenger terminal.

Gary Yabuta, Chief of Police
October 21, 2009
Page 2

3. The area of the proposed improvements will be gated and fenced to provide security to the buildings and fuel tanks and prevent public trespass to the airport operational areas which could pose a security risk or danger to airport operations.

Again thank you for your comments and response to our request for early consultation on the subject projects. A copy of the Draft Environmental Assessment will be sent to your office for review and comment.

Very truly yours,



Mich Hirano, AICP
Principal

MH:tn

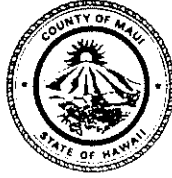
cc: Phillip Russell, State of Hawaii, Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation

F:\DATA\LANAI AIRPORT-ccr api\MPD.ecres.wpd

CHARMAINE TAVARES
Mayor

JEFFREY S. HUNT
Director

KATHLEEN ROSS AOKI
Deputy Director



NOV 21 2008

COUNTY OF MAUI
DEPARTMENT OF PLANNING

November 18, 2008

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

**SUBJECT: COMMENTS ON AN EARLY CONSULTATION REQUEST (EAC)
FOR THE PROPOSED IMPROVEMENTS LOCATED AT LANAI
AIRPORT, ISLAND OF LANAI, HAWAII, TMK: (2) 4-9-002:041,
(EAC 2008/0044)**

The Department of Planning (Department) is in receipt of the above-referenced document for the proposed improvements to the Lanai Airport. The Department understands the proposed action includes the following:

1. The State Department of Transportation, Airports Division will construct a new Airport Rescue Fire Fighting (ARFF) Station and related improvements; and
2. Castle & Cooke Resorts, LLC will construct a 25,200 square foot hangar with a building height of 30 feet, two (2) 15,000 gallon fuel tanks and a 3,000 gallon aviation gas tank.

Based on the foregoing, the Department provides the following comments:

1. The land use designations for the project area are as follows:

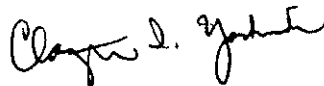
State Land Use:	Urban
Lanai Community Plan:	Airport
County Zoning:	Airport District (see No. 5 below)
2. The Department concurs that the use of state lands or funds is a "trigger" that requires compliance with Chapter 343, Hawaii Revised Statutes (HRS);
3. The Draft Environmental Assessment (EA) should contain a thorough discussion on how the proposed project is consistent with the objectives and polices of Chapter 205A, Coastal Zone Management, HRS;

Mr. Mich Hirano, AICP
November 18, 2008
Page 2

4. The Draft EA should evaluate the various goals, objectives and policies listed in the Lanai Community Plan;
5. The property was conditionally zoned via Ordinance No. 2162, Bill No. 72, and is therefore subject to those four (4) conditions listed in the attached Exhibit "B" of said Ordinance; and
6. County of Maui, Police Department has provided the attached written comments in a letter dated October 14, 2008.

Thank you for the opportunity to comment. Should you require further clarification, please contact Staff Planner Joseph Prutch via email at joseph.prutch@mauicounty.gov or by phone at 270-7512.

Sincerely,



CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

For: JEFFREY S. HUNT, AICP
Planning Director

Attachments

xc: Joseph M. Prutch, Staff Planner
General File
Project File

JSH:CIY:JMP:vb
K:\WP_DOCS\PLANNING\EAC\2008\0044_LanaiAirport\Comments.doc

4-9-002:041

for: Mayor's Office
ORDINANCE NO. 2162
Effective Date: Oct. 5, 1992

- Civil Defense
- Corp. Counsel
- Finance
- Fire
- Human Concerns
- Liquor Control
- Parks Dept.
- Personnel
- X Planning
- Police
- Prosecutors
- Public Works
- Water Supply
- RICHARD HAAKE
- X DAVE DELEON
- SHERI LOMSON
- NOLAN FERREIRA
- JEFF CRANG
- GEORGINA KAWAHARA
- PAM DODSON
- HANNEY-BERRY *lee*

OCT -7 PM 4:14
ORDINANCE NO. 2162
OCT 13 1992 11:32 AM
BILL NO. 72 (1992)

**A BILL FOR AN ORDINANCE TO ESTABLISH
CONDITIONAL AIRPORT DISTRICT ZONING FOR
PROPERTY SITUATED AT LANAI CITY, LANAI, HAWAII**

BE IT ORDAINED BY THE PEOPLE OF THE COUNTY OF MAUI:

SECTION 1. Pursuant to Chapters 19.28 and 19.510 of the Maui County Code, Conditional Airport District Zoning is hereby established for property situated at Lanai City, Lanai, Hawaii, identified for real property tax purposes by Tax Map Key: 4-9-02:por. 1, 41, 46 and 47, comprised of approximately 509.285 acres more particularly described in Exhibit "A", attached hereto and made a part hereof, and in Land Zoning Map No. L-2609 which is on file at the Office of the County Clerk of the County of Maui.

SECTION 2. Pursuant to Section 19.510.050, of the Maui County Code, the zoning established by this ordinance is subject to the conditions set forth in Exhibit "B", which is attached hereto and made a part hereof, and the Unilateral Agreement and Declaration for Conditional Zoning, which is attached hereto and made a part hereof as Exhibit "C".

SECTION 3. This ordinance shall take effect upon its approval.

APPROVED AS TO FORM
AND LEGALITY:

[Signature]
GARY W. ZAKIAN
Deputy Corporation Counsel
County of Maui
c:\ords\airport\epg

DEPT OF PLANNING	
Deputy Dir.	<input type="checkbox"/> Assign
Secretary	<input type="checkbox"/> Rush
Current Div.	<input checked="" type="checkbox"/> See Me
Long Range	<input checked="" type="checkbox"/> Comments
Energy Div.	<input type="checkbox"/> Draft
Admin.	<input type="checkbox"/> Handle
<i>COLEMAN</i>	<input type="checkbox"/> File
<i>WALLS</i>	<input type="checkbox"/> FYI
Copy to:	<input type="checkbox"/> CIRCULATE
<i>APPLICANT</i>	<input type="checkbox"/> Recycle
Today's date	10/13/92
Date Due	
By	<i>[Signature]</i>

PLEASE BACK MAP

ADOPTED
10-5-92

TRK 4-9-02: Por. 1, 41, 46, 47
509.285 Acre

Lanai City L-2609 2162

EXHIBIT "B"

CONDITIONS

Pursuant to Section 19.510.050 of the Maui County Code, the zoning for the parcel of land shall be subject to the following conditions:

- (1) That potable water usage shall be allowed for irrigation purposes for five years beginning the effect date of this agreement. After this five (5) year period, the Petitioner shall use only non-potable water for irrigation if a suitable source of non-potable water is available within a reasonable distance of the airport.
- (2) That night operations for passenger flights shall be limited to the extent practicable.
- (3) That flight patterns over Lanai City shall be avoided to the extent practicable.
- (4) That the Department of Transportation, Airports Division shall consult with the Maui County Council on any proposal to lengthen the runway.

October 21, 2009

Jeffrey S. Hunt, Director
Department of Planning
Attention: Joseph Prutch, Staff Planner
County of Maui
2200 Main Street, Suite 619
Wailuku, Hawaii 96793

SUBJECT: Proposed Improvements Located at Lanai Airport, TMK (2) 4-9-002:041 (por.)

Dear Mr. Hunt:

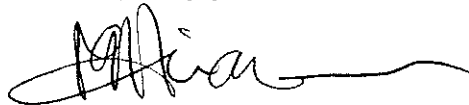
Thank you for your letter dated November 18, 2008, providing comments on the subject project. On behalf of the State Department of Transportation, Airports Division and Castle & Cooke Aviation, we are providing the following information in response to your comments. The responses are in the same order as your comments.

1. The land use designations for the subject project area are noted and will be incorporated in the Environmental Assessment (EA) document.
2. Your concurrence on the triggers for the EA is noted.
3. The EA document will include discussion on how the proposed actions are consistent with the objectives and policies of Chapter 205A, Coastal Zone Management, Hawaii Revised Statutes.
4. The EA document will evaluate the proposed actions in reference to supportive identified goals, objectives and policies of listed in the Lanai Community Plan.
5. The Conditions of zoning for the airport property are noted and we would comment as follows:
 - i. Water supply to the Lanai Airport is provided by Lanai Water Company. A non-potable source of water for irrigation at this time is not available since there is not a suitable source of non-potable water that is available within a reasonable distance of the airport.

- ii. The hours of operation at the Lanai Airport is from 7:00 a.m. to 7:30 p.m. The proposed projects will not affect the hours of operation at the Lanai Airport.
 - iii. The proposed projects involve a new Aircraft Rescue and Fire Fighting (ARFF) station to replace an existing ARFF station that does not meet the current Federal Aviation Administration design standards for aircraft rescue and fire fighting station. Castle & Cooke Aviation also proposes to construct jet fuel tanks and an airplane hangar at Lanai Airport. These improvements will not alter the operational hours at the Airport.
 - iv. The proposed actions do not involve the extension of the runway at Lanai Airport.
6. The response to the Maui Police Department letter will be made under a separate letter, since this letter was directly received at our office in response to our request for early consultation.

Again, thank you for your comments and response to our request for early comments on the subject actions. A copy of the Draft EA will be submitted to your office for review and comment.

Very truly yours,



Mich Hirano, AICP
Principal

MH:tn

cc: Phillip Russell, State of Hawaii, Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation

F:\DATA\LANAI AIRPORT-ccr api\Planning.ecres.wpd



DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
COUNTY OF MAUI

OCT 15 2008

CHARMAINE TAVARES
Mayor

LORI TSUHAKO
Director

JO-ANN T. RIDAO
Deputy Director

2200 MAIN STREET • SUITE 546 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7805 • FAX (808) 270-7165
MAILING ADDRESS: 200 SOUTH HIGH STREET • WAILUKU, HAWAII 96793 • EMAIL director.hhc@mauicounty.gov

October 13, 2008

Mr. Mich Hirano
Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

**Subject: Early Consultation Request for Proposed Improvements at
Lana'i Airport, Lanai, Hawaii**

We have reviewed the Early Consultation Request for the above subject project and would like to inform you that we do not have any comment to offer at this time.

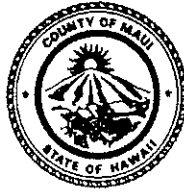
Please call Mr. Wayde Oshiro of our Housing Division at 270-7355 if you have any questions.

Sincerely,

LORI TSUHAKO
Director of Housing and Human Concerns

xc: Housing Division

CHARMAINE TAVARES
Mayor



OCT 09 2008
TAMARA HORCAJO
Director

ZACHARY Z. HELM
Deputy Director

(808) 270-7230
Fax (808) 270-7934

DEPARTMENT OF PARKS & RECREATION

700 Hali'a Nako'a Street, Unit 2, Wailuku, Hawaii 96793

October 02, 2008

Munekiyo & Hiraga
Attention: Mr. Mich Hirano, AICP
305 High Street Suite 104
Wailuku, Hawaii 96793

Dear Mr. Mich Hirano:

Subject: Early Consultation Request for Proposed Improvements at Lana'i Airport,
Lana'i, Hawaii

We have reviewed the Proposed Improvements at Lana'i Airport, and we have no comments or objections to the subject project.

Thank you for the opportunity to comment. Please contact me or Patrick Matsui, Chief of Planning and Development, at 270-7387 if there are any questions.

Sincerely,

A handwritten signature in cursive script that reads "Tamara Horcajo".

TAMARA HORCAJO
Director, Parks & Recreation

xc: Patrick Matsui, Chief of Planning & Development

TH:PM:tk

OCT 15 2008

OCT 15 2008

RALPH NAGAMINE, L.S., P.E.
Development Services Administration

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division



CHARMAINE TAVARES
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
200 SOUTH HIGH STREET, ROOM NO. 434
WAILUKU, MAUI, HAWAII 96793

October 9, 2008

Mr. Mich Hirano, A.I.C.P.
MUNEKIYO & HIRAGA, INC.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

Dear Mr. Hirano:


SUBJECT: EARLY CONSULTATION REQUEST FOR THE
PROPOSED LANAI AIRPORT AIRCRAFT RESCUE FIRE
FIGHTING FACILITY AND RELATED IMPROVEMENTS;
TMK: (2) 4-9-002:041

We reviewed the subject application and have the following comments:

1. Obtain all necessary building permits.
2. The plans submitted for this project do not adequately show sufficient detail to determine whether the project is compliant with building codes. We will review the project for building code requirements during the building permit application process.
3. Any State governmental agency is exempt from a building permit if requested in writing by that governmental agency.

Please call Michael Miyamoto at 270-7845 if you have any questions regarding this letter.

Sincerely,


MILTON M. ARAKAWA, A.I.C.P.
Director of Public Works

MMA:MMM:ls

xc: Highways Division
Engineering Division

S:\LUCA\ZM\Lanai_airport_rescue_fire_imp_ec_49002041_ls.wpd



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

October 21, 2009

Milton M. Arakawa, AICP, Director
County of Maui
Department of Public Works
200 South High Street, Room No. 434
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Comments for the Proposed Lanai Airport
Improvements

Dear Mr. Arakawa:

Thank you for your letter of October 9, 2008, providing early consultation comments on the proposed Airport Rescue Fire Fighting station, new hangar and new fuel tanks at the Lanai Airport.

In response to your comments, we note that the project designs will be in accordance with Chapter 16.26, of the Maui County Code, relating to the Building Code. Moreover, the State Department of Transportation, Airports Division, (DOT-A), understands that protocols for an exemption from the building permit process are available. In this regard, the DOT-A looks forward to working with your Department in ensuring that code requirements are appropriately addressed, whether through the building permit process or the exemption process.

Milton M. Arakawa, AICP, Director
October 21, 2009
Page 2

Thank you again for the valuable comments provided. A copy of the Draft EA will be submitted to your office for review and comment.

Very truly yours,

A handwritten signature in black ink, appearing to read "M. Hirano", with a long horizontal flourish extending to the right.

Mich Hirano, AICP
Principal

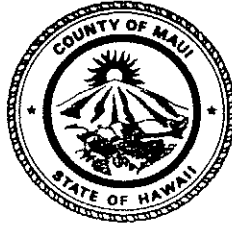
MH:yp

cc: Phillip Russell, State of Hawaii, Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation
Calvin Nishio, Architects Pacific

F:\DATA\LANAI AIRPORT-ccr.apilDPW.ecres.wpd

DEC 10 2008

CHARMAINE TAVARES
Mayor
CHERYL K. OKUMA, Esq.
Director
GREGG KRESGE
Deputy Director



TRACY TAKAMINE, P.E.
Solid Waste Division
DAVID TAYLOR, P.E.
Wastewater Reclamation
Division

**COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT**
2200 MAIN STREET, SUITE 100
WAILUKU, MAUI, HAWAII 96793

December 8, 2008

Mr. Mich Hirano
Project Manager
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

**SUBJECT: PROPOSED IMPROVEMENTS AT LANAI AIRPORT
EARLY CONSULTATION REQUEST
TMK (2) 4-9-002:041, LANAI**

Dear Mr. Hirano,

We reviewed the subject project as a pre-application consultation and have the following comments:

1. Solid Waste Division comments:
 - a. Include a plan for reuse, recycling, disposal of construction waste.
2. Wastewater Reclamation Division (WWRD) comments:
 - a. None. No County sewer in the area.

If you have any questions regarding this memorandum, please contact Gregg Kresge at 270-8230.

Sincerely,

A handwritten signature in black ink that reads "Cheryl K. Okuma". The signature is written in a cursive, flowing style.

Cheryl Okuma, Director



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

October 21, 2009

Cheryl Okuma, Director
County of Maui
Department of Environmental Management
2200 Main Street, Suite 100
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Comments for the Proposed Lanai Airport Improvements

Dear Ms. Okuma:

Thank you for your letter of December 8, 2008, providing early consultation comments on the proposed Airport Rescue Fire Fighting station, new hangar and new fuel tanks at the Lanai Airport.

In response to your comments, we note that a construction waste plan will be required of the project contractors.

With regard to wastewater disposal, the Department of Transportation, Airports Division maintains its own wastewater treatment facility for Lanai Airport. The expansion of the absorption/leach field by 800 square feet will be required to adequately serve the proposed improvements.

Cheryl Okuma, Director
October 21, 2009
Page 2

Thank you again for the valuable comments provided. A copy of the Draft Environmental Assessment will be submitted to your office for review and comment.

Very truly yours,

A handwritten signature in black ink, appearing to read "Mich Hirano", with a long horizontal flourish extending to the right.

Mich Hirano, AICP
Principal

MH:yp

cc: Phillip Russell, State of Hawaii, Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation
Calvin Nishio, Architects Pacific

F:\DATA\LANAI AIRPORT-ccr ap\DEM.ecres.wpd

OCT 15 2008

Council Chair
G. Riki Hokama



Director of Council Services
Ken Fukuoka

Vice-Chair
Danny A. Mateo

Council Members
Michelle Anderson
Gladys C. Baisa
Jo Anne Johnson
Bill Kauakea Medeiros
Michael J. Molina
Joseph Pontanilla
Michael P. Victorino

COUNTY COUNCIL
COUNTY OF MAUI
200 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793
www.maui-county.gov/council

October 10, 2008

Munekiyo & Hiraga, Inc.
Attention: Mich Hirano, AICP
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

**SUBJECT: EARLY CONSULTATION REQUEST FOR PROPOSED
IMPROVEMENTS AT LANAI AIRPORT, LANAI, HAWAII**

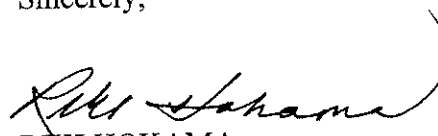
Thank you for the opportunity to provide initial comments on the proposed improvements at the Lanai Airport.

I understand that the proposed Airport Rescue Fire Fighting Station and related improvements will be constructed by the State Department of Transportation and that the proposed 25,200 square foot hanger with storage tanks for Jet A fuel and aviation gas and related improvements will be paid for by Castle & Cooke Resorts, LLC (CCR). Please confirm that the operation and maintenance of the hanger and fuel storage tanks will be the responsibility of CCR.

Also, I suggest that the Lanai Planning Commission be provided the opportunity to comment on the Draft Environmental Assessment (DEA) in coordination with the Maui County Planning Department. The Planning Commission meetings are open to the public and would also provide a venue to inform the Lanai community and receive comments from residents.

Again, thank you for the opportunity for early consultation.

Sincerely,


RIKI HOKAMA
Council Chair

October 21, 2009

Danny A. Mateo, Council Chair
County Council
County of Maui
200 High Street, Seventh Floor
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Comments for the Proposed Lanai Airport
Improvements

Dear Chair Mateo:

By letter dated October 10, 2009, former Council Chair Riki Hokama offered early consultation comments on the proposed Airport Rescue Fire Fighting station, new hangar and new fuel tanks at the Lanai Airport. A copy of Mr. Hokama's letter is attached hereto as **Exhibit "A"**.

We are providing this response to the former Chair's comments for your review and consideration. A copy of this letter will also be transmitted to Mr. Hokama to maintain communication on this matter with him. With this in mind, we offer the following information.

1. We confirm that the operation and maintenance of the hanger and fuel tanks will be the responsibility of Castle & Cooke Aviation.
2. A copy of the Draft Environmental Assessment (EA) will be transmitted to the Lanai Planning Commission for their review.

Separately, we will provide a copy of the Draft EA to your office for your review and comment.

Danny A. Mateo, Council Chair
October 21, 2009
Page 2

If there are any questions on this project, please do not hesitate to call.

Very truly yours,

A handwritten signature in black ink, appearing to read "Mich Hirano", with a long horizontal flourish extending to the right.

Mich Hirano, AICP
Principal

MH:yp

Enclosure

cc: Riki Hokama (w/enclosure)

Phillip Russell, State of Hawaii, Department of Transportation, Airports Division
(w/enclosure)

Tony Marlow, Castle & Cooke Aviation (w/enclosure)

Calvin Nishio, Architects Pacific (w/enclosure)

F:\DATA\LANAI AIRPORT-ccr api\DMateo.ecres.wpd

OCT 15 2008

Council Chair
G. Riki Hokama

Vice-Chair
Danny A. Mateo

Council Members
Michelle Anderson
Gladys C. Baisa
Jo Anne Johnson
Bill Kauakea Medeiros
Michael J. Molina
Joseph Pontanilla
Michael P. Victorino



Director of Council Services
Ken Fukuoka

COUNTY COUNCIL
COUNTY OF MAUI
200 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793
www.mauicounty.gov/council

October 10, 2008

Munekiyo & Hiraga, Inc.
Attention: Mich Hirano, AICP
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Hirano:

SUBJECT: EARLY CONSULTATION REQUEST FOR PROPOSED IMPROVEMENTS AT LANAI AIRPORT, LANAI, HAWAII

Thank you for the opportunity to provide initial comments on the proposed improvements at the Lanai Airport.

I understand that the proposed Airport Rescue Fire Fighting Station and related improvements will be constructed by the State Department of Transportation and that the proposed 25,200 square foot hanger with storage tanks for Jet A fuel and aviation gas and related improvements will be paid for by Castle & Cooke Resorts, LLC (CCR). Please confirm that the operation and maintenance of the hanger and fuel storage tanks will be the responsibility of CCR.

Also, I suggest that the Lanai Planning Commission be provided the opportunity to comment on the Draft Environmental Assessment (DEA) in coordination with the Maui County Planning Department. The Planning Commission meetings are open to the public and would also provide a venue to inform the Lanai community and receive comments from residents.

Again, thank you for the opportunity for early consultation.

Sincerely,

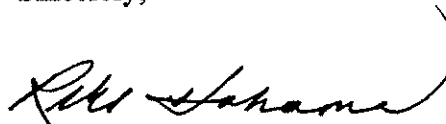

RIKI HOKAMA
Council Chair

EXHIBIT "A"

65



September 30, 2008

Mr. Mich Hirano, AICP
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Maui, Hawaii, 96793

Dear Mr. Hirano,

Subject: Proposed Improvements at Lana'i Airport
Early Consultation Request for Proposed Improvements
Lana'i Airport, Lana'i, Hawaii

Thank you for allowing us to comment on the Early Consultation Request for Proposed Improvements for the subject project.

In reviewing our records and the information received, Maui Electric Company (MECO) has no objection to the subject project at this time. We highly encourage the customer's electrical consultant to submit the electrical demand requirements and project time schedule as soon as possible so that service can be provided on a timely basis.

Should you have any questions or concerns, please call me at 871-2340.

Sincerely,

A handwritten signature in black ink that reads "Ray Okazaki". The signature is written in a cursive, flowing style.

Ray Okazaki
Staff Engineer



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

October 21, 2009

Ray Okazaki, Staff Engineer
Maui Electric Company, Ltd.
210 West Kamehameha Avenue
P. O. Box 398
Kahului, Hawaii 96733-6898

SUBJECT: Early Consultation Comments for the Proposed Lanai Airport Improvements

Dear Mr. Okazaki:

Thank you for your letter of September 30, 2008, providing comments on the proposed Airport Rescue Fire Fighting station, new hangar and new fuel tanks at the Lanai Airport.

In response to your comments, the project's design team will coordinate with Maui Electric Company to ensure that timely service can be provided to the new airport facilities.

If there are any questions on this project, please do not hesitate to call.

Very truly yours,

Mich Hirano, AICP
Principal

MH:yp

cc: Phillip Russell, State of Hawaii, Department of Transportation, Airports Division
Tony Marlow, Castle & Cooke Aviation
Calvin Nishio, Architects Pacific

F:\DATA\LANAI AIRPORT-ccr api\MECO.ecres.wpd

X. REFERENCES

X. REFERENCES

Bisignani, J.D., Maui Handbook, Including Molokai and Lanai, Fifth Edition, 1999.

County of Maui, Department of Planning, Lanai Community Plan, December 1998.

County of Maui, Office of Economic Development, and Maui Economic Development Board, Inc., Maui County Data Book, June 2008.

County of Maui, Socio-Economic Forecast The Economic Projections for the Maui County General Plan 2030, June 2006.

Cultural Surveys Hawaii, Archaeological Inventory Survey of a 173-Acre Parcel, Palawai and Kealia'aupuni, Lana'i, Prepared for Lanai Company, Ltd., February 1990.

KFC Airport, Inc., Lana'i Airport Master Plan Update, Final Report, June 1999.

KFC Airport, Inc., Lana'i Airport Master Plan Update, Final Environmental Assessment, August 2000.

Munekiyo, Arakawa & Hiraga, Inc., Applications for District Boundary Amendment and Change in Zoning, Miki Basin Heavy Industrial Area, November 1999.

Munekiyo & Hiraga, Inc., Final Environmental Assessment - Rural Fiber Optics Communication Lines for Lanai, Maui and Molokai, July 2001.

R. M. Towill Corporation, Public Facilities Assessment Update, County Maui, March 2007.

State of Hawaii, Department of Business, Economic Development and Tourism, Population and Economic Projections for the State of Hawaii to 2035, January 2008.

State of Hawaii, Department of Labor and Industrial Relations, hawaii.gov/labor, September 2009.

SMS, Maui County Community Plan Update Program: Socio-Economic Forecast, June 2002.

Stilson, Greg and Christie, Maui and Lanai, Making the Most of Your Family Vacation, Fifth Edition, 1992.

U.S. Census Bureau, Profiles of General Demographic Characteristics, 2000 Census of Population and Household, Hawaii, May 2001.

U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, August 1972.

University of Hawaii, Department of Geography, Atlas of Hawaii, Third Edition, 1998.

University of Hawaii-Land Study Bureau, Detailed Land Classification, Island of Maui, May 1967.

APPENDIX A.

Lanai Airport: Aircraft Rescue and Fire Fighting (ARFF) Station Improvements (2003)

LANAI AIRPORT:

**AIRCRAFT RESCUE AND
FIRE FIGHTING (ARFF)
STATION IMPROVEMENTS**

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY 2

II. EXISTING CONDITIONS 4

III. OPTION 1: DO NOTHING 10

IV. OPTION 2: REMODEL CURRENT BUILDING; BUILD ADDITION... 10

V. PROJECT JUSTIFICATION 11

VI. SPECIAL REQUIREMENTS 11

VII. SITE SELECTION BASIS 11

VIII. ENVIRONMENTAL 11

IX. COST ESTIMATE..... 12

X. PROJECT SCHEDULE..... 13

XI. BENEFIT-COST ANALYSIS..... 13

XII. PROJECTED OPERATIONS AND MAINTENANCE COSTS 13

XIII. MINUTES OF MEETING..... 14

APPENDICES

- A.** EXISTING LANAI ARFF FACILITY
- B.** OPTION 2: RE-CONFIGURE CURRENT BUILDING AND BUILD ADDITIONS TO THE FRONT AND REAR.
- C.** BIBLIOGRAPHY AND REFERENCES

I. EXECUTIVE SUMMARY

The current Lanai Aircraft Rescue and Fire Fighting (ARFF) facility has several deficiencies that put it out of compliance with AC 150/5210-15, *Airport Rescue and Firefighting Station Building Design*, which governs ARFF building requirements.

Two options were explored:

- **Option 1: Do nothing.**
 1. This is unacceptable as, at the extreme, the FAA may impose civil fines associated with lack of compliance of the ARFF facility.
 2. Furthermore, discussion with the FAA inspector raised the point that the State, as the sponsor, is required to be in compliance with its Grant Assurance to have a ARFF Station that complies with standards set forth in AC 150/5210-15.
 3. Additional penalties and fines may be incurred due to non-compliance with Occupational Safety and Health Administration (OSHA) and Hawaii Occupational Safety and Health (HIOSH).

- **Option 2: Remodel current facility for compliance with AC 150/5210-15 and build an addition at the rear of the building (the new space is currently used for parking).**
 1. **Logistics:**
 - a. Crew: currently there are crew accommodations, so this is not an issue. Temporary relocation of cooking and food storage might be required as remodeling proceeds.
 - b. Equipment: A temporary storage space/module may be required.
 - c. Operations: Minimal impact is anticipated.
 2. **Constraints:**
 - a. As there is no master plan that includes a modified ARFF facility, an Environmental Assessment (EA) and/or an Environmental Impact Statement (EIS) may have to be processed which would add to the length of time to start the work.
 - b. There are electrical transformers on concrete pads and an above-ground fuel storage tank that limits expansion toward the Cargo building. Towards the "old terminal" building, a gate must be maintained for access to the airfield, thus expansion is limited towards that direction.
 3. **Costs:** The anticipated construction and renovation could proceed by building-out the back; remodeling current structure; and adding a forward extension to increase room for ARFF vehicles. Such an approach would minimize transition costs to keep the ARFF operational during construction.

Transition costs include, but are not limited to:

- a. Temporary storage trailers for the duration of site-prep and construction to house materials currently inside the building or

stored outside the building. 2-20' storage containers @ \$1200/month x 6 months.

- b. Temporary personnel facilities: cooking and personal affects storage. This might take the form of trailers: 2 trailers/modular temporary housing @ \$600/month x 6 months.
- c. Temporary utilities to keep ARFF operational.

Option 2 is the preferred option because the current building is useable with modifications and there is enough room to build an addition at the rear.

	Option 1: Do Nothing	Option 2: Remodel Current Building; Build Addition at Rear
Project Cost	Subjects State to FAA, OHSA, HIOSH fines.	\$ 1,260,938

- Funding Sources:
 - Design: 100% State
 - Construction*: 90% Federal/10% State
- * As a safety-related project, the State could request FAA assistance.*

II. EXISTING CONDITIONS

The Lanai ARFF Building (*Figures 1-4*) was built around 1974. Appendix A shows the layout of the current building.



Figures 1 and 2. Existing LNY ARFF Building (Front)



Figures 3 and 4. Existing LNY ARFF Building (Back)

Current crew size and staffing is as follows:

- Staffing: Two (2) personnel on; 42-hour work week; four-days straight; 16-hours daily subject to Fair Labor Standards Act (FLSA);
- Coverage: 7 days; 6:00 am to 8:30 pm (subject to change in airline schedules)

The FAA District inspection report dated April 25-26, 2002 cites items for improvements associated with the ARFF building and its operation. The inspection specifically list requirements governed by Title 14 CFR Part 139, the Airport Certification Manual and the Airport Operating Certificate.

The inspector's report noted the following about the ARFF building and its operations:

1. ARFF Station needs base radio communications equipment.
2. ARFF Station needs training room facility.
3. ARFF alarm and emergency communications system using public telephone number results in false alarms.

4. ARFF station doors need to be hooked into emergency alarm system to ensure that doors will open and not hamper ARFF vehicle access from building.

Additionally, a walk-through was done on June 27, 2003 with ARFF personnel, District personnel, and KFC representatives which noted other necessary facility and operations improvements.

A. Failure to meet standards of Advisory Circular 150/5210-15

The principal failure of the building to meet the standards of Advisory Circular 150/5210-15 (AC 150/5210-15) is the inadequate size of the vehicle bays to house current firefighting equipment.

Specifically, AC 150/5210-15, requires the following clearances around a parked vehicle:

Clearance Area	AC 150/5210-15 Clearance Requirement	LNy Actual Clearance
Behind vehicle	6'-0"	3'
Sides of vehicle	6'-0"	9' and 12'
Between vehicles parked side-by-side	8'-0"	8'
Top of vehicle work platform to ceiling	7'-0"	5'

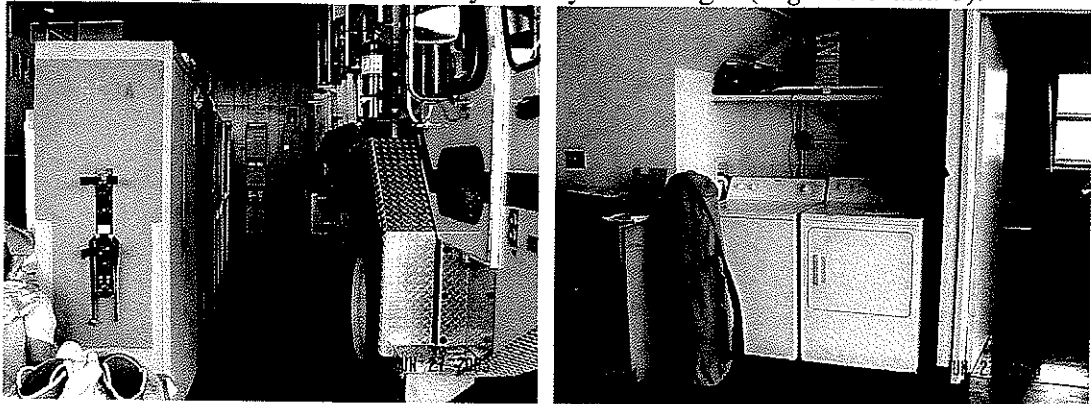
Clearly, the building is undersized for current firefighting equipment and personnel to be in compliance with AC 150/5210-15 with respect to equipment clearances.

B. Inadequate Storage Space

The lack of adequate storage facilities requires that firefighting equipment and gear be stored along the interior walls further reducing vehicle clearances.

1. Right Bay (when looking into the building).

In the right bay, areas alongside the walls are taken up with equipment lockers on the left and a storage cabinet and laundry facility on the right (*Figures 5 and 6*).



Figures 5 and 6. Right Bay Items Along Vehicle (left and right looking into bay).

2. Left Bay (when looking into the building).

In the left bay, areas alongside the walls are taken up with equipment and supplies. Furthermore, there is a tank filling machine located on the back wall (*Figures 7-9*).



Figures 7 and 8. Left Bay Storage Along Wall and Close-up of Tank Filling Machine at Rear of Bay.

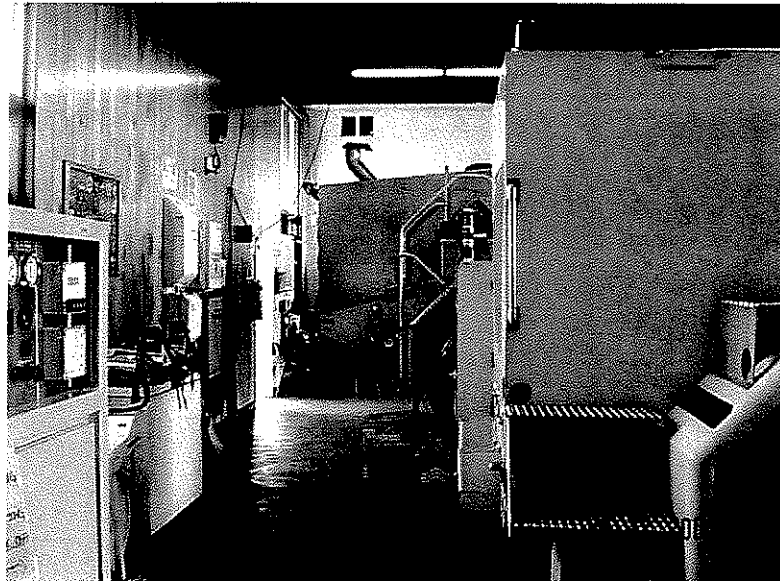
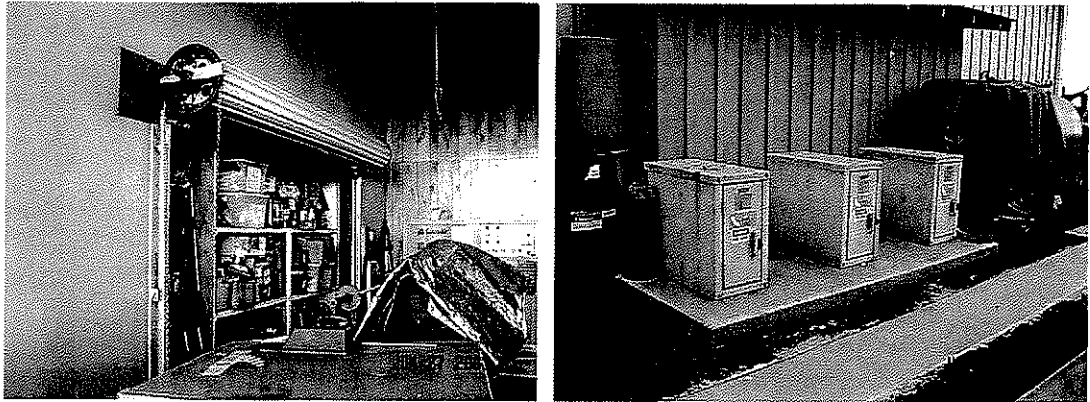


Figure 9. View of Rear Wall from Left Bay to Right Bay

An ancillary storage space was built-out of the left wall, but there is no further room for expansion due to electrical boxes and the proximity of the above-ground fuel tank for the emergency power generator (*Figures 10-12*).



Figures 10 and 11. Left Bay Storage Area (left: inside; right: outside). In exterior view, note transformers on concrete pads and foam tank at the front.

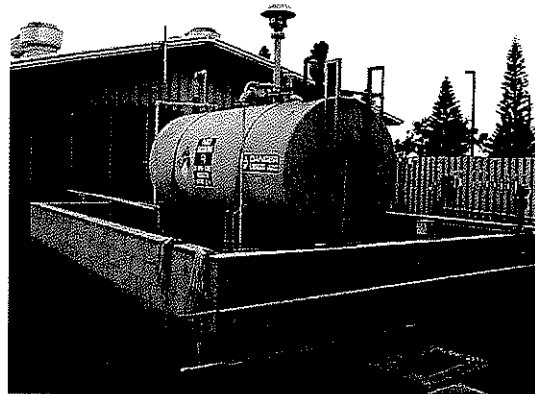


Figure 12. Above-ground fuel tank immediately adjacent to Left Bay Storage Area (see Figures 8 & 9).

3. Exterior Storage

There is no adequate outside storage facility for equipment and/or materials.

C. Inadequate Space for Daily Administrative and Training Requirements.

The only space for administrative and training tasks is a table located at the rear of the right bay (*Figures 13 and 14*).

AFR 139 requires continuous training in 12 subject areas. As noted by the FAA inspector, there is no training room (training is an on-going requirement of ARFF personnel) with audio/visual equipment, white board, etc.

Furthermore, there is no meeting room; meetings occur around a table set-up at the rear of the right bay. Meetings, therefore, are subject to noise from airfield operations.



Figures 13 and 14. Administrative Room and Meeting Area (located in rear of right bay).

D. Crew Spaces

1. Inadequate Cooking facilities

There is a kitchen area adjacent to the right bay which is adequate for current needs. Its compliance with Health Department Code, however, is questionable (Figures 15 and 16).

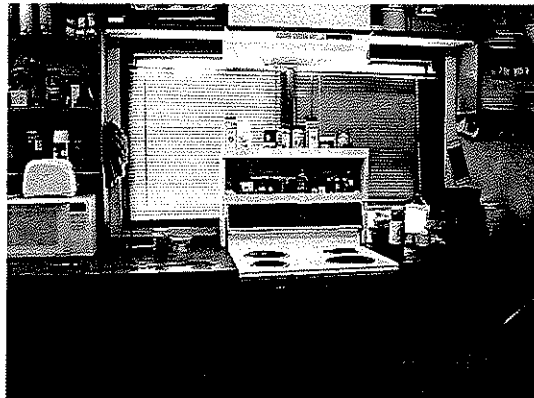


Figure 15 and 16. Cooking and Sink Areas.

2. Living Quarters

Above the kitchen space is the crew bunk area which is accessed via stairs (Figures 17 and 18).

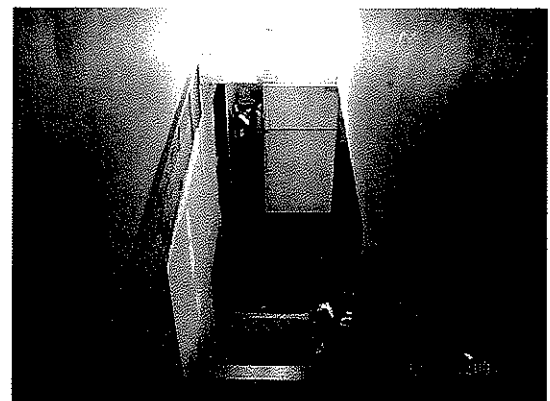
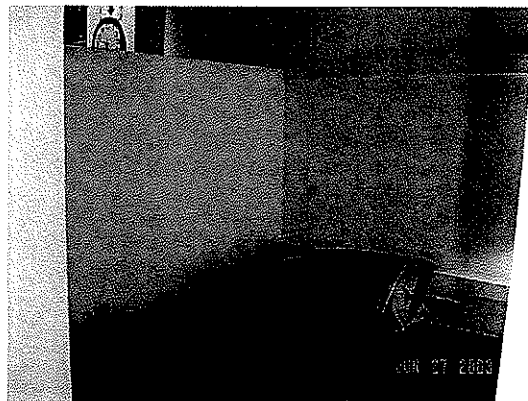


Figure 17 and 18. Bunk Area and Stairs Down to Kitchen.

3. Personal Facilities

The station has laundry facilities (*see Figure 6*). Bathroom and toilet facilities are standard fixtures and are adequate, but may not be ADA-compliant or ready.

E. Potential OSHA/HIOSH Violations

Note: HIOSH has adopted the Federal OSHA standards.

Deficiency	Potential Violations of Federal Standards in regards to Occupational Safety and Health (CFR Regulation)	Potential Fine (\$) and Frequency
1. Inadequate area for the treatment of blood-borne pathogens.	<ul style="list-style-type: none"> • 29 CFR 1910.(c)(2)(ii) • 29 CFR 1910.1030(d)(2) • 29 CFR 1910.120.(n)(7)(iv) 	<i>Subject to regulatory agency and severity of violation.</i>
2. Inadequate temporary sleeping quarters.	<ul style="list-style-type: none"> • 29 CFR 1910.120.(n)(5) 	<i>Subject to regulatory agency and severity of violation.</i>
3. Inadequate of facilities for required sanitation.	<ul style="list-style-type: none"> • 29 CFR 1910.120.(n)(6) • 29 CFR 1910.120.(n)(7) 	<i>Subject to regulatory agency and severity of violation.</i>
4. Inadequate food storage facilities.	<ul style="list-style-type: none"> • 29 CFR 1910.120.(n)(6) 	<i>Subject to regulatory agency and severity of violation.</i>
5. Inadequate food preparation facilities.	<ul style="list-style-type: none"> • 29 CFR 1910.120.(n)(6) 	<i>Subject to regulatory agency and severity of violation.</i>
6. Inadequate ventilation and exhaust system of toxic fumes.	<ul style="list-style-type: none"> • 29 CFR 1910.94 • 29 CFR 1910.107(d) 	<i>Subject to regulatory agency and severity of violation.</i>
7. Inadequate and inappropriate storage of hazardous chemicals.	<ul style="list-style-type: none"> • 29 CFR 1910.(o)(2) • 29 CFR 1910.106 • 29 CFR 1910.120.(n) 	<i>Subject to regulatory agency and severity of violation.</i>
8. Inadequate storage facilities for job-related Personnel Protective equipment.	<ul style="list-style-type: none"> • 29 CFR 1910.120(g) • 29 CFR 1910.132 • 29 CFR 1910.134 • 29 CFR 1910.156 	<i>Subject to regulatory agency and severity of violation.</i>

F. Infrastructure Deficiencies

In addition to the deficiencies noted by the FAA, the following infrastructure improvements are required regardless of what option is selected.

1. Plumbing System/Infrastructure

- a. **Water for dealing with chemical or biological containments.** There is no specific wash down area or ability to capture run-off from wash down.
- b. **Wash rack.** There is no wash rack.

2. Lighting

- a. **Limited interior lighting** must be upgraded for reading, etc.
- b. **Outside night operations.** Limited lighting exists.
3. **Diesel exhaust extraction.** Could be breakoff hose attached to exhaust on truck that vents to roof (allows doors to be open); or could be system with negative pressure (but doors are closed). Should be integrated with response system: alarm → doors go up → exhaust extraction system automatically starts.
4. **Communication/Safety.** There is no ground to air base radio for ARFF station and for the ARFF quick response pick-up truck.
5. **Other:** Open joist ceiling in the ARFF is in violation of fire code.

III. **OPTION 1: Do Nothing**

This option is not viable given the potential fines and penalties by various regulatory agencies (see I.E.).

IV. **OPTION 2: Utilize Current Facility as a Starting Point (see Appendix B)**

- A. The following portions of the current building and/or its surrounding area could be used as follows:
 1. Build-out back of building (19' x 42' slab-on-grade addition).
 - a. Cannot go to the side (fence on right-side as you look into the bays; electrical and fuel tank on the left-side as you into the bays).
 - b. Build forward extension to increase depth of vehicle parking areas.
 - c. Build out back because space is available and allows for simple construction.
 2. Re-configure current space with addition of new areas having functions:
 - a. Storage.
 - b. Kitchen, dining, training, day-room with exterior access, watch room, alarm room, and office.
 - c. Mechanical and electrical room.
- B. The priorities for this plan's phasing include:
 1. Upgrade crew accommodations
 2. Upgrade equipment storage and truck accommodation
- C. The limitations for this plan's approach include: interior height limitation to within vehicle parking areas. Raising the roof is not feasible.
- D. The costs for this plan include:
 1. Infrastructure (as defined previously) such as wash rack, standpipe, etc.
 2. Other infrastructure
 3. Building and Construction costs
 4. Building code and ADA compliance/readiness.
 5. Future co-ed accommodations.

V. PROJECT JUSTIFICATION

Code and regulatory compliance necessitates that this project be done. This includes, but is not limited to those set forth by the FAA, OSHA, HIOSH. (see I.E.)

VI. SPECIAL REQUIREMENTS (N/A= not applicable)

- A. Real estate acquisition – **N/A**
- B. Easements – **N/A**
- C. Construction permits – **Required**
- D. Environmental Assessment or Environmental Impact Statement – **Required as a remodeled ARFF facility is not included in the Master Plan.**
- E. Other projects required prior to this project due to project impact or conflicts with adjacent or nearby facilities – **N/A**
- F. Tenant relocations, temporary facilities required – **Possibly crew and equipment during construction.**
- G. Tenant commitments or letters of interest – **N/A**

VII. SITE SELECTION BASIS (N/A= not applicable)

- A. Verification of suitability of site selected – **N/A**
 - 1. Description of all options considered – **N/A**
 - 2. Comparison and recommendation of sites – **N/A**
- B. Constraints – **N/A**
 - 1. Airfield clearance criteria
 - 2. Noise criteria or sound attenuation requirements
 - 3. Building height limitations
 - 4. Set back criteria from roads, airfield, curbs, sidewalks, etc.
 - 5. Environmental contamination – during excavation and during operations of facilities
 - 6. Established pedestrian and vehicular traffic patterns
 - 7. Flood plain maps
 - 8. Future construction in the area

VIII. ENVIRONMENTAL (N/A= not applicable)

- A. Environmental Permits – **Dependent upon Environmental Assessment or Environmental Impact Statement.**
- B. Potential abatement considerations such as asbestos, lead based paint, etc. – **N/A**
- C. Utility Requirements such as: Underground storage tanks, Oil-water separators, Water main connections, Sanitary sewer connections or wastewater treatment facilities, Electrical, Drainage, Fire protection requirements, etc. – **Electrical**

IX. COST ESTIMATE

		OPTION 2
Item	Identified Cost Element	REMODEL CURRENT BUILDING; BUILD ADDITION AT REAR
1	Demolish interior walls, toilet fixtures, counters/cabinets, overhead doors and add new walls, & cabinets in existing building.	\$ 35,000
2	Add slab & footings, overhead doors, wood framing and metal roofing.	\$ 65,000
3	Rear extension with personnel rooms.	\$ 126,000
4	Concrete slab for vehicle wash down and vehicle wash equipment (separate item)	\$ 65,000
5	Wash area with underground containment.	\$ 30,000
6	Re-route water, sewer/drain & electrical lines.	\$ 30,000
7	Provide additional lighting and vehicle storage room exhaust system.	\$ 28,000
8	Add air conditioning to personnel rooms.	\$ 30,000
9	Upgrade structure to comply with building code.	\$ 24,000
10	Add emergency generator with concrete pad, walls & propane fuel tank.	\$ 50,000
11	Total Identifiable Construction Cost	\$ 483,000
12	Lanai Escalation Factor of 45% of Item 11	\$ 217,350
13	Total Lanai Construction Cost (Item 11 + Item 12)	\$ 700,350
14	Design & Construction Management at 45% of Item 13	\$ 315,158
15	Project Cost (Item 13 + Item 14)	\$ 1,015,508
16	Environmental Impact Assessment Statement Preparation	\$ 120,000
17	Transition Costs	\$ 10,800
18	Project Sub-total (Item 15 + Item 16 + Item 17)	\$ 1,146,308
19	Contingency @ 10%* of Item 11	\$ 114,631
19	GRAND TOTAL	\$ 1,260,938

Note:

Existing Ground Floor 2,200 s.f.; Existing loft space 360 s.f.; Front Extension 385 s.f.; Back extension 777 s.f.

X. PROJECT SCHEDULE

Task	Q1 04	Q2 04	Q3 04	Q4 04	Q1-2 05
Select Design Consultant	120 Days				
Design Facility		120 Days			
Bid & Procure				90 Days	
Construction					180 Days

Notes:

- 1 Days are elapsed days.
- 2 Quarters are calendar quarters.

XI. BENEFIT-COST ANALYSIS

The “costs” of doing nothing (Option 1) are the potential fines that might be levied by the FAA, OSHA, and HIOSH for non-compliance. In addition, without an ARFF facility that complies with AC 150/5210-15, the State is not in compliance with the Grant Assurance program for Lanai Airport.

Applicable impact measures from the FAA’s *Assessing the Economic Impact of Transportation Projects: How to Choose the Appropriate Technique for Your Project* include, but remain difficult to quantify for an infrastructure project:

1. **User Impacts**
 - a. **Money cost of travel:** N/A
 - b. **Travel time:** N/A
 - c. **Safety:** Respond to incidents in an effective manner.
 - d. **Comfort, reliability, etc.:** N/A
2. **Economic Impacts** – Design, project management, and construction activities should benefit local service providers.
3. **Government Fiscal Impacts** – Source of project funding is user fees, both Federal and State.
4. **Other Societal Impacts** – N/A

XII. PROJECTED OPERATIONS AND MAINTENACE COSTS

Estimated operations and maintenance costs (annual) assumed to be 5% of identified costs:

	<u>Option 1:</u> Do Nothing	<u>Option 2:</u> Remodel Current Building; Build Addition at Rear
Project Cost	Subjects State to FAA, OHSA, HIOSH fines.	\$ 1,260,938
Annual Maintenance @ 5% of Project Cost	\$0	\$ 63,047

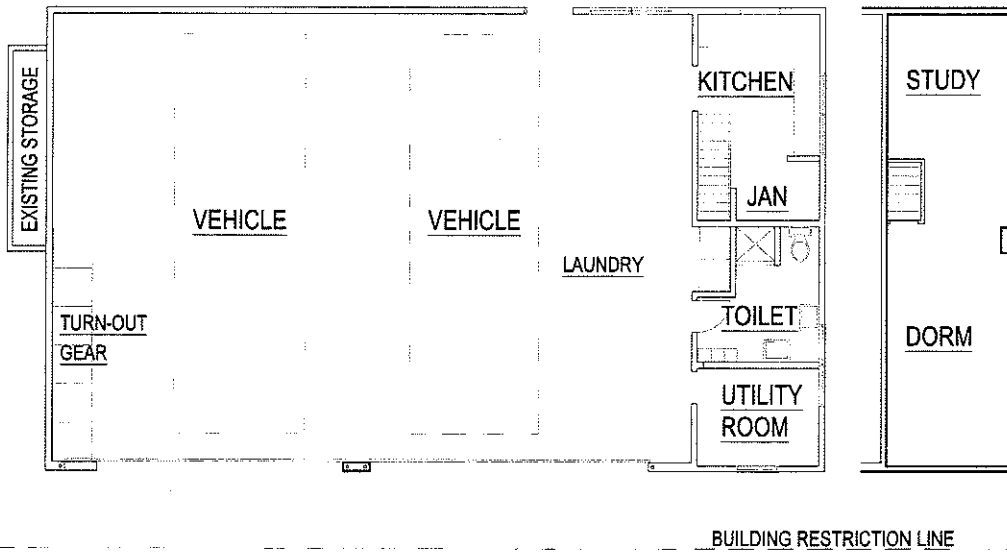
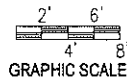
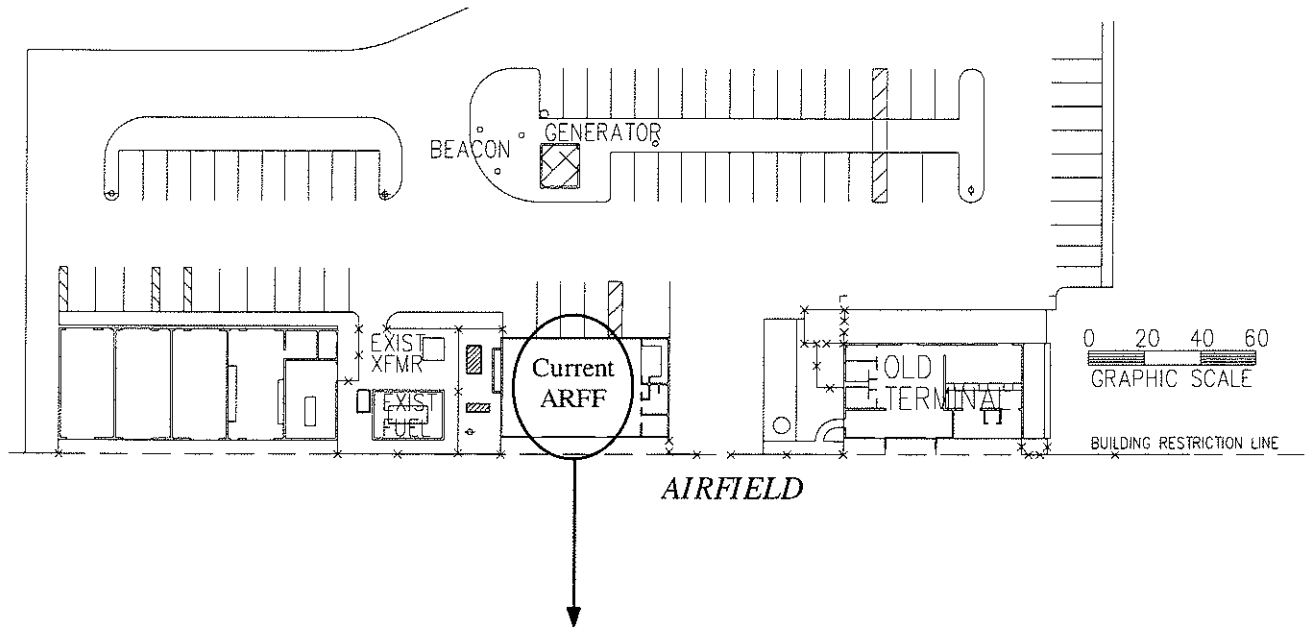
XIII. MINUTES OF MEETING

A site walk-through was conducted on June 27, 2003 to gather documentation on current conditions and possible options.

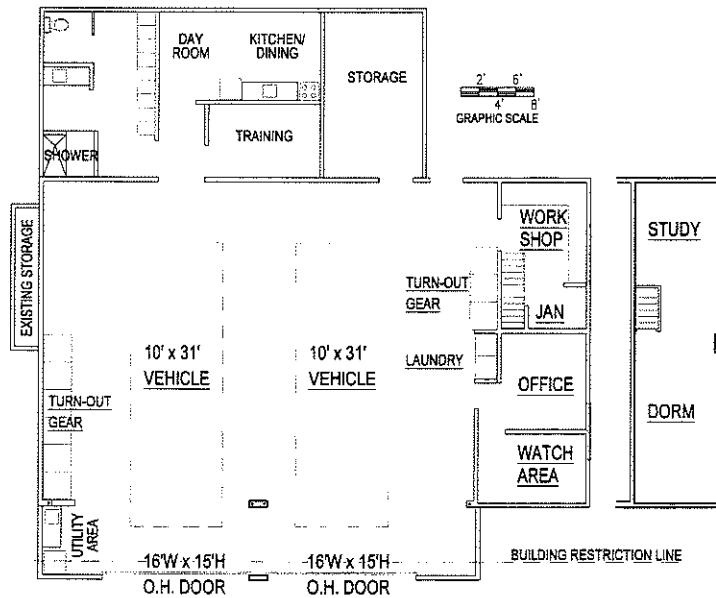
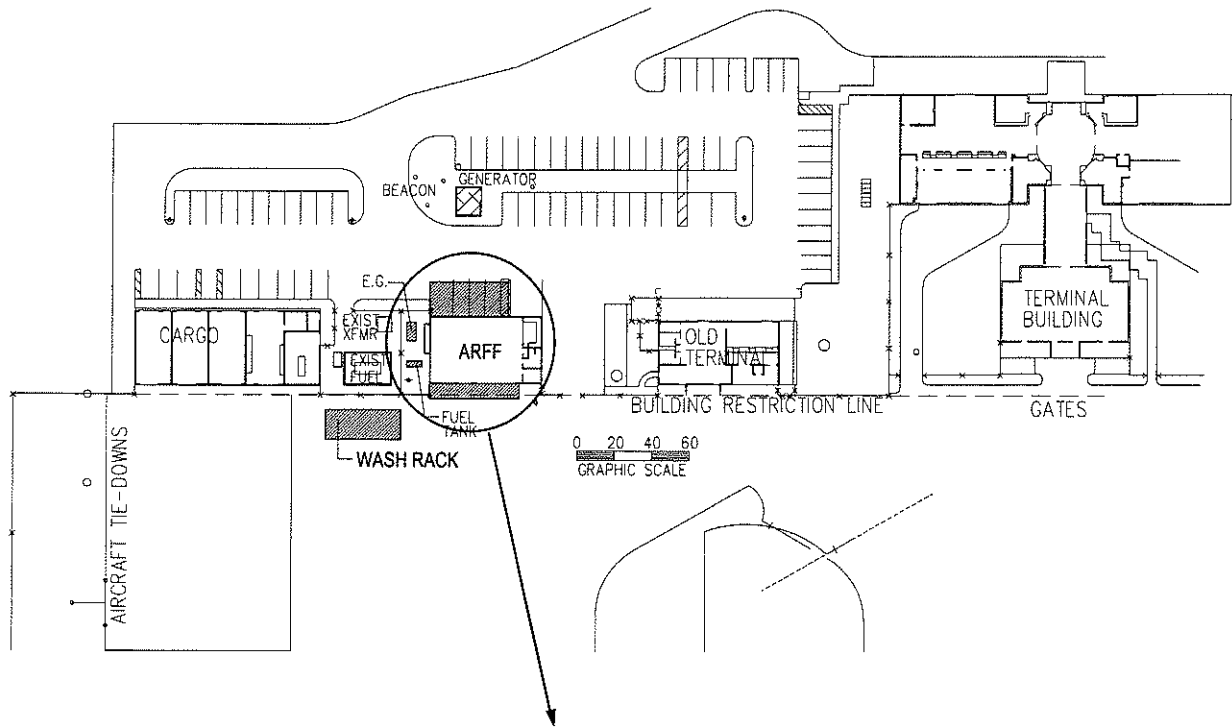
SIGN-IN SHEET
 PROJECT: LANAI ARFF FACILITY
 DATE: June 27, 2003

Name	Organization	Phone/Fax	e-mail
Andy Lee	KFC	836-7787	
DERRYL SEWALD	DOT-H	838-8866	
MARK NAKAO	KFC	836 7787 834 4833	munkaoe@kfcinc.com
PATRICK FEWELL	DOT-A	872-3840	
Jim Johnson	DOT-A	872-3818 872-3829	James.Johnson@hawaii.gov
George K. Purdy IV	ARFF LMY	565-6611	
Guy A. De Silva	ARFF LMY	565-6611	
William Alford	AOM III.	565-6757	

APPENDIX A - EXISTING LANAI ARFF FACILITY



APPENDIX B – RE-CONFIGURE CURRENT BUILDING. BUILD EXTENSION TO THE FRONT. BUILD ADDITION AT THE REAR.



APPENDIX C – BIBLIOGRAPHY AND REFERENCES

FAA Advisory Circular AC 150/5210-15, *Airport Rescue and Firefighting Station Building Design*.

APPENDIX B.

Geotechnical Engineering Services Lanai Airport Aircraft Rescue and Fire Fighting (ARFF) Station, Island of Lanai, Hawaii

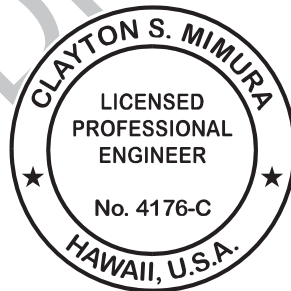
DRAFT

**GEOTECHNICAL ENGINEERING SERVICES
LANAI AIRPORT AIRCRAFT RESCUE AND
FIRE FIGHTING (ARFF) STATION
ISLAND OF LANAI, HAWAII**

W.O. 6055-00(B) JUNE 17, 2008

Prepared for

ARCHITECTS PACIFIC, INC.



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.

DRAFT

SIGNATURE _____ 4-30-10
EXPIRATION DATE
OF THE LICENSE



GEOLABS, INC.
Geotechnical Engineering and Drilling Services
2006 Kalihi Street • Honolulu, HI 96819

Hawaii • California

DRAFT

June 17, 2008
W.O. 6055-00(B)

Mr. Calvin Nishio, AIA
Architects Pacific, Inc.
938-C Kapahulu Avenue
Honolulu, HI 96816-1481

Dear **Mr. Nishio:**

Geolabs, Inc. is pleased to submit our report entitled "Geotechnical Engineering Services, Lanai Airport Aircraft Rescue and Fire Fighting (ARFF) Station, Island of Lanai, Hawaii" prepared for the design of a new ARFF station for the Lanai Airport.

Our work was performed in general accordance with the scope of services outlined in our fee proposal dated May 18, 2007.

Please note the soil samples recovered during our field exploration (remaining after testing) will be stored for a period of two months from the date of this report. The samples will be discarded after that date unless arrangements are made for a longer sample storage period. Please contact our office for alternative sample storage requirements, if appropriate.

Detailed discussion and recommendations are contained in the body of this report. If there is any point that is not clear, please contact our office.

Very truly yours,

GEOLABS, INC.

DRAFT

Clayton S. Mimura, P.E.
President

CSM:RP:as

[h:\6000 Series\6055-00(B).rp1-pg.2]

DRAFT
GEOTECHNICAL ENGINEERING SERVICES
LANAI AIRPORT AIRCRAFT RESCUE AND
FIRE FIGHTING (ARFF) STATION
ISLAND OF LANAI, HAWAII

W.O. 6055-00(B) JUNE 17, 2008

TABLE OF CONTENTS

	Page
SUMMARY OF FINDINGS AND RECOMMENDATIONS	ii
1.0 GENERAL	1
1.1 Introduction	1
1.2 Project Considerations	1
1.3 Purpose and Scope	1
2.0 SITE CHARACTERIZATION	3
2.1 Regional Geology	3
2.2 Site Description.....	4
2.3 Subsurface Conditions	4
3.0 DISCUSSION AND RECOMMENDATIONS.....	5
3.1 Site Grading.....	5
3.1.1 Site Preparation.....	6
3.1.2 Fills and Backfills.....	7
3.1.3 Fill Placement and Compaction Requirements	7
3.2 Building Foundations	8
3.3 Slabs-On-Grade	10
3.4 Pavement Design	11
3.5 Underground Utilities	12
3.6 Drainage	13
3.7 Design Review.....	14
3.8 Post Design / Construction Observation Services.....	14
4.0 LIMITATIONS	15

LIST OF PLATES

Plate 1 Project Location Map
Plate 2 Site Plan

LIST OF APPENDICES

Appendix A Field Exploration
Appendix B Laboratory Testing

DRAFT
GEOTECHNICAL ENGINEERING SERVICES
LANAI AIRPORT AIRCRAFT RESCUE AND
FIRE FIGHTING (ARFF) STATION
ISLAND OF LANAI, HAWAII
W.O. 6055-00(B) JUNE 17, 2008

SUMMARY OF FINDINGS AND RECOMMENDATIONS
--

Subsurface information from previous borings from nearby locations was used for design of the project.

Based on information available near the proposed Lanai Airport ARFF station, we believe that the site is generally underlain by stiff residual soils over highly weathered basalt rock formation. The residual soils consisted of stiff to hard silts and clays. Some boulders might be encountered embedded within the residual soils at various depths. Based on the elevation and location of the project site, we do not anticipate groundwater at a shallow depth.

Based on the subsurface conditions and the design concept, we believe that the proposed new Lanai Airport ARFF station may be supported on shallow foundations, consisting of spread and/or continuous footings. An allowable bearing pressure of up to 3,000 psf may be used to design shallow foundations bearing on the recompacted in-situ soils or compacted fills. This bearing value is for dead-plus-live loads and may be increased by one-third (1/3) for transient loads, such as those caused by wind or seismic forces.

Based on the existing topography and the site plan provided, we envision that less than 2 feet of site grading work will be required to achieve the finished grades for the proposed new buildings.

The text of this report should be referred to for detailed discussion and recommendations.

END OF SUMMARY OF FINDINGS AND RECOMMENDATIONS

SECTION 1.0 - GENERAL

1.1 Introduction

This report presents the results of our geotechnical engineering services performed for the proposed *Lanai Airport ARFF station* project on the Island of Lanai, Hawaii. The project location and general vicinity are shown on the Project Location Map, Plate 1.

This report summarizes our findings and geotechnical engineering recommendations resulting from our field exploration, laboratory testing, and engineering analyses. These recommendations are intended to assist in the design of site grading, building foundations, slabs-on-grade, pavement, utility excavation, and drainage. The findings and recommendations presented herein are subject to the limitations noted at the end of this report.

1.2 Project Considerations

The project site is located in the western half of the Lanai Airport on the Island of Lanai. The new ARFF station building will be on the west side of the existing airport cargo building. This project will involve the development of a new ARFF station building, a new service station and water storage units. A paved parking area adjacent to the new station and landscaping around the new facility and parking area will also be provided. In addition, the existing septic tank/leach field will be improved. Structural details of the proposed buildings were not available at the time this report was prepared.

Based on the site plan provided, the existing ground surface elevations range from +1,301 to +1,305 feet Mean Sea Level (MSL). In general, the site slopes down slightly from west to east. Based on the relatively level condition, less than 2 feet of grading work should be expected.

1.3 Purpose and Scope

The scope of our work was to obtain an overview of the subsurface conditions to develop a soil/rock data set to formulate geotechnical engineering recommendations for the proposed site development. Our work was performed in general accordance with our

fee proposal dated May 18, 2007. The scope of our work included the following tasks and work efforts:

1. Mobilization and demobilization of a truck-mounted drill rig and two operators from Honolulu to the project site and back.
2. Drilling and sampling of six boreholes to depths of 5 to 20 feet below the existing ground surface (three at 20 LF, two at 10 LF, and one @ 5 LF). Also, collection of bulk soil samples for CBR analyses.
3. Coordination of the field exploration, logging of the borings, and percolation testing by our field geologist.
4. Laboratory testing of selected samples obtained during the field exploration as an aid in classifying the materials encountered and evaluating their engineering properties.
5. Analyses of the field and laboratory data to formulate geotechnical engineering recommendations for the proposed structures.
6. Preparation of this formal report summarizing our work on the project and presenting our findings and recommendations.
7. Coordination of our overall work on the project by our project engineer.
8. Quality assurance of our work and client/design team consultation by our principal engineer.
9. Miscellaneous work efforts, such as drafting, word processing, and clerical support.

Detailed descriptions of our field exploration methodology and the Logs of Borings are presented in Appendix A. Results of the laboratory tests performed on selected soil samples obtained from our field exploration are presented in Appendix B.

END OF GENERAL

SECTION 2.0 - SITE CHARACTERIZATION

2.1 Regional Geology

The Island of Lanai is a shield volcano built by eruptions at the summit and along three rift zones more than 1.20 to 1.46 million years ago. The principal rift zone trends northwestward as a broad ridge, and is responsible for the conspicuous elongation of the island in that direction. A less conspicuous bulge on the southern side of the island is a result of building on the southwest rift zone. The summit of the shield collapsed to form a caldera from which a shallow graben, bordered by an echelon of step faults, extends south-southeast toward Manele Bay. Numerous dikes exposed in the sea cliff indicate that this Manele graben lies along another rift zone.

The caldera was largely, but not completely filled by lava flows, and the present Palawai Basin is a remnant of the caldera. Just to the west, Miki Basin (with an average diameter of about 0.9 miles) is a nearly filled pit crater. The top of the ridge between them is about 140 feet above the floor of the Palawai Basin. On the south side, the floor of Palawai Basin merges with that of the Manele graben, through which the last lava flows in the caldera overflowed onto the outer slope of the volcano. On the northeastern side, Palawai Basin is bordered by a steep slope about 492 feet high, beyond which lies a nearly level bench of about 0.9 miles wide. The thick, massive character of the lava flows in this bench indicates that it is a part of the floor of the filled caldera. Beyond the bench, another steep slope rises to Lanaihale Summit (3,316 feet altitude). Southwest of the Lanaihale Summit, at an elevation of 1,000 to 2,000 feet, is the Central Plateau of Lanai. The soils consist of well-drained, fine-textured and moderately fine-textured soils developed in volcanic ash and in material weathered from basic igneous rocks.

At the northern side of Lanaihale Summit is Maunalei Gulch, one of several pit craters filled by talus breccias and later lava flows. So far as is known, all of the lavas of Lanai are tholeiitic basalts. The lava flows range from about 1 foot to 100 feet in thickness but average about 20 feet and seldom exceed 49 feet, except where they have been ponded in depressions.

The project site is on the west side of Miki Basin. Most of the soils in the project area are residual and saprolite soils, derived from the in-situ weathering of igneous rocks. In general, residual and saprolite soils grade to weathered basalt formations with depth.

2.2 Site Description

The project is within the Lanai Airport on the Island of Lanai, Hawaii. The proposed ARFF station building will be on the west side of existing airport cargo building. The project location and vicinity are shown on the Project Location Map, Plate 2.

Based on the plan provided, the site generally slopes downward from west to east. The existing ground surface elevations range from +1,301 to +1,305 feet MSL.

2.3 Subsurface Conditions

Six borings from 5 to 20 feet below the ground surface are planned for the proposed new ARFF station. The approximate boring locations will be shown on the Site Plan, Plate 2.

Based on our knowledge and other adjacent projects in the proposed ARFF station area, we believe that the site is generally underlain by residual soils over highly weathered basalt rock formation at deeper depth. The residual soils consisted of stiff to hard silts and clays. Some boulders might be encountered embedded within the residual soils at various depths.

Based on the location and elevation of the site, we do not expect to encounter groundwater at shallow depth. However, it should be noted that groundwater levels at the project site might fluctuate depending on seasonal precipitation, rainfall, temperature, surface water runoff and other factors.

Detailed descriptions of the materials encountered in the borings will be presented on the Logs of Borings in Appendix A. Results of the laboratory tests performed on selected soil samples retrieved from our field exploration are presented in Appendix B.

END OF SITE CHARACTERIZATION

SECTION 3.0 - DISCUSSION AND RECOMMENDATIONS

Based on our subsurface conditions at the site, we believe that shallow foundations, consisting of spread and/or continuous footings should be used to support the proposed new buildings. An allowable bearing pressure of up to 3,000 pounds per square foot (psf) may be used to design shallow foundations bearing on the recompacted on-site soils or new compacted fills. This bearing value is for dead-plus-live loads and may be increased by one-third (1/3) for transient loads, such as those caused by wind or seismic forces.

Based on our laboratory test results, the on-site soils indicated a low to moderate expansion potential when subjected to fluctuations in the soil moisture content. Therefore, we recommend providing a 12-inch thick layer of non-expansive, select granular fill material below the slabs and pavement area. Special attention should be given to the subgrade preparation requirements in order to reduce the potential for shrink/swell effects on concrete slabs and pavement. Details are presented in the "Site Preparation" section herein.

Detailed discussion of these items and our geotechnical engineering design recommendations are presented in the following sections herein.

3.1 Site Grading

Based on the existing topography, we anticipate that the grading work will generally consist of minor cuts and fills of less than 2 feet thick. The following grading items are addressed in the succeeding subsections: (1) Site Preparation, (2) Fills and Backfills, and (3) Fill Placement and Compaction Requirements.

Due to the swell/shrinkage potential of the on-site clayey subsoil, the compaction and moisture condition are critical elements of the earthwork. It is important for a Geolabs representative to monitor the site grading operations to observe whether undesirable materials are encountered during the excavation process and to confirm whether the exposed soil/rock conditions are similar to those encountered in our field exploration.

3.1.1 Site Preparation

At the on-set of earthwork, areas within the contract grading limits should be cleared and grubbed thoroughly. Vegetation, debris, deleterious material, and other unsuitable materials should be removed and disposed of properly off-site or stockpiled in a designated area to reduce the potential for contamination of the excavated materials.

Soft and yielding areas encountered during clearing and grubbing should be over-excavated to expose firm natural material, and the resulting excavation should be backfilled with well-compacted engineered fill. The excavated soft soils should be properly disposed off-site and/or used on landscaping areas, where appropriate. Contract documents should include additive and deductive unit prices for over-excavation and engineered fill placement to account for variations in the over-excavation quantities.

After clearing and grubbing, the existing ground should be scarified to a depth of 8 inches and moisture-conditioned to about 2 percent above the optimum moisture and compacted to a minimum of 90 percent relative compaction. For pavement subgrades, the minimum relative compaction should be 95 percent. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil established in accordance with ASTM D 1557. Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.

Where shrinkage cracks are observed after compaction of the subgrade, we recommend preparing the subgrade soil again as recommended above. Saturation and subsequent yielding of the exposed subgrade due to inclement weather and poor drainage may require over-excavation of the soft areas and replacement with well-compacted fill. The excavated soft soils should be disposed properly off-site and/or used on landscaping areas, where appropriate.

3.1.2 Fills and Backfills

Based on the topography at the project site, we anticipate minor cuts or fills up to 2 feet may be required for the proposed building foundation.

General fill material, if required, should consist of low-expansive materials less than 3 inches in largest dimension. The material should have a laboratory California Bearing Ratio (CBR) value of 12 or higher and a swell potential of less than 1 percent in accordance with ASTM D 1883. The fill material should also be free of vegetation and deleterious materials. It should be noted that the general fill requirements presented herein are intended as guidelines only and may be modified based on Geolabs additional laboratory testing and field observation on the available fill materials.

We recommend placing a 12-inch thick non-expansive, structural fill layer under the building slabs as well as the pavement area. This fill should consist of non-expansive select granular material, such as crushed coral or basalt. The material should be well-graded from coarse to fine with particles no larger than 3 inches in largest dimension and should contain between 10 and 30 percent particles passing the No. 200 sieve. The material should have a laboratory CBR value of 25 or more and should have a maximum swell of less than 1 percent when tested in accordance with ASTM D 1883.

Aggregate base course and select borrow subbase material required for the pavement sections should consist of crushed basalt aggregate and should conform to the County of Maui, Department of Public Works, "Standard Specifications for Public Works Construction," dated September 1986. Geolabs should test imported fill materials for conformance with these recommendations prior to delivery to the project site for its intended use.

3.1.3 Fill Placement and Compaction Requirements

Fills should be moisture-conditioned to about 2 percent above the optimum moisture, placed in level lifts not exceeding 8 inches in loose thickness, and compacted to at least 90 percent relative compaction. Base course and select

borrow subbase materials at the pavement area should be moisture-conditioned to above the optimum moisture, placed in level lifts not exceeding 8 inches in loose thickness, and compacted to a minimum of 95 percent relative compaction. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil established in accordance with ASTM D 1557. Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.

Compaction should be accomplished by using sheepsfoot rollers, vibratory rollers, multiple-wheel pneumatic-tired rollers, or other types of acceptable compaction equipment.

Because moisture-conditioning and compaction of the clayey subgrade soils are critical elements of earthwork, Geolabs should conduct observations and soil density tests during site grading to assist the contractor in obtaining the required degree of compaction and the proper moisture content. Where compaction is less than required, additional compactive effort should be applied with adjustment of moisture content as necessary to obtain the specified compaction. It should be noted that the moisture requirement of the fills and subgrades (about 2 percent above the optimum moisture) is an important requirement for the use of on-site clayey soils.

3.2 Building Foundations

Based on the subsurface at the project site, we recommend using shallow spread and/or continuous footings to support the proposed structures, including the ARFF station building, service station building and water storage units. An allowable bearing pressure of 3,000 psf may be utilized for the design of building foundations bearing on properly compacted fill, or recompacted stiff on-site materials. This bearing value is for dead-plus-live loads and may be increased by one-third (1/3) for transient loads, such as those caused by wind or seismic forces.

For footings bearing on the recompacted on-site soil or new compacted fill, the bottom of the footing excavations should be recompacted to at least 90 percent relative

compaction to provide a relatively firm and smooth bearing surface prior to the placement of reinforcing steel or concrete. Soft and/or loose materials encountered at the bottom of footing excavations should be over-excavated to expose the underlying firm materials. The over-excavation should be backfilled with select granular material compacted to a minimum of 90 percent relative compaction, or the footing bottom may be deepened to the underlying firm materials.

Footings should be embedded a minimum of 2 feet below the lowest adjacent finished grade. Foundations next to utility trenches or easements should be embedded below a one horizontal to one vertical (1H:1V) imaginary plane extending upward from the bottom edge of the utility trench or as deep as the inverts of the utility lines. This requirement is necessary to avoid surcharging adjacent below-grade structures with additional structural loads and to reduce the potential for foundation settlement.

If the foundations are designed and constructed in accordance with our recommendations, we estimate total settlements of footings may be on the order of about 1 inch. We estimate differential settlements between adjacent footings to be on the order of about 0.5 inches.

Lateral loads acting on the structure may be resisted by passive earth pressure acting against the near-vertical faces of the foundation system and by friction between the bottom of the foundation and the bearing soil. Resistance due to passive earth pressure may be estimated using an equivalent fluid pressure of 300 psf. This assumes that the soil around the footings is relatively undisturbed or well-compacted. Unless covered by pavements or slabs, the passive resistance in the upper 12 inches of soil should be neglected. A coefficient of friction of 0.35 may be used for footings bearing on properly compacted fill or on-site stiff clayey material.

We recommend that a Geolabs representative observe footing excavations prior to placement of reinforcing steel and concrete to confirm the foundation bearing conditions and the required embedment depths. Due to the expansive nature of the on-site clayey material below the foundations, observation of the foundation excavations and preparation

operations should be designated a “Special Inspection” item in accordance with Section 1701 of the uniform building Code (1997).

3.3 Slabs-On-Grade

We anticipate that the project site is underlain by near-surface clayey soils with low to moderate expansion potential when subjected to moisture fluctuations. The lightly-load slabs-on-grade should be designed properly due to the potential for structural distress caused by the expansive soil. To reduce the potential for structural distress resulting from swelling of the subgrade soils, we recommend properly preparing the subgrade soils prior to fill placement as discussed in the “Site Preparation” section above. In addition, a minimum of 12 inches of non-expansive, structural fill (capping fill) material should be provided below the building slab areas.

For interior building slabs (not subjected to vehicular traffic or machinery vibration), we recommend placing a minimum 4-inch thick layer of cushion fill consisting of No. 3 Fine gravel (ASTM C 33, No. 67 gradation) below the slab to serve as a capillary break and to provide more uniform support of the slab. To reduce the potential for moisture infiltration and subsequent damage to floor coverings, an impervious moisture barrier is recommended on top of the cushion fill. Flexible floor coverings, such as carpet or sheet vinyl, should be considered since they can better mask minor slab cracking. It is also recommended that the interior wall design incorporate some flexibility to accommodate a small amount of possible ground movements.

To further reduce the potential of water infiltration from the area adjacent to the building footing into the subsurface and causing building structural distress, we recommend considering a concrete sidewalk around the perimeter of the building structures. If the concrete sidewalk around the building perimeter is chosen, the 12-inch thick non-expansive, select granular fill recommended below the building slabs should extend out to the edges of the concrete sidewalk and should be compacted to at least 90 percent relative compaction. The concrete sidewalk slab may be supported directly on the 12-inch thick non-expansive select granular fill. Construction joints, at intervals equal to the width of the sidewalk, should be provided with expansion joints at right-angle intersections.

It should be noted that the moisture content requirement of the clayey subgrades (at least 2 percent above the optimum moisture) is an important requirement considering the expansive nature of the on-site clayey soils. Therefore, moisture content of the subgrade soils underneath the sidewalk should be properly conditioned and maintained until the placement of the select granular fill and concrete.

It should be emphasized that the areas adjacent to the slabs should be backfilled tightly against the slab edges with low expansion, relatively impervious soils. These areas should also be graded to divert water away from the slabs and to reduce the potential for water ponding around the slabs and foundations.

3.4 Pavement Design

Based on the information and plan provided, we envision both flexible and rigid pavements might be constructed to serve the new Lanai Airport ARFF station. In general, we anticipate that the vehicle loading for parking areas will consist primarily of passenger vehicles and light to medium trucks. We anticipate that the vehicle loading for certain areas will consist of heavy trucks such as the fire trucks and tankers. We envision that the parking areas will consist of asphaltic concrete and the areas traversed by the fire trucks and tankers will consist of Portland cement concrete. Based on the above assumption, we recommend using the following flexible and rigid pavement sections for preliminary design purposes:

Asphaltic Concrete Pavement

2.0-Inch Asphaltic Concrete

10.0-Inch Aggregate Base Course (95 Percent Relative Compaction)

12.0-Inch Total Pavement Thickness over Compacted Subgrade

Portland Concrete Pavement (areas subjected to fire trucks)

6.0-Inch Portland Cement Concrete

6.0-Inch Non-Expansive Select Granular Fill (Aggregate Subbase)

12.0-Inch Total Pavement Thickness over Compacted Subgrade

The non-expansive, select granular fill under the pavement area should be placed in level lifts of about 8 inches in loose thickness, moisture-conditioned to above the optimum moisture, and compacted to at least 95 percent relative compaction. The

non-expansive, select granular fill should be kept moist prior to placement of base course and/or Portland cement concrete. The subgrade below the non-expansive, select granular soil should be scarified to a depth of about 8 inches, moisture-conditioned to about 2 percent above the optimum moisture, and compacted to at least 95 percent relative compaction.

Base course and select granular fill materials should consist of crushed basalt aggregate compacted to no less than 95 percent relative compaction. CBR and density tests should be performed on the actual subgrade soils encountered during construction to confirm the adequacy of the above sections.

Aggregate base course and aggregate subbase course materials should meet the material requirements for Base Course and Subbase Course as specified in Sections 30 and 31, respectively, of the Standard Specifications for Public Works Construction, Department of Public Works, County of Maui, September 1986. Imported fill material should be tested for conformance with these recommendations prior to delivery to the project site for its intended use.

In general, paved areas should be sloped and drainage gradients should be maintained to carry surface water off-site. Surface water ponding should not be allowed on-site during or after construction. If concrete curbs are used to isolate landscaping in or adjacent to the pavement area, we recommend extending the curbs a minimum 2 inches into the soil below the aggregate base course (Flexible Pavements) or aggregate subbase layer (Rigid Pavements) to reduce migration of landscaping water into the pavement section. In addition, a subdrain system is recommended to collect excess water from landscaping for long-term usage.

3.5 Underground Utilities

We anticipate that utilities for the new Lanai Airport ARFF station will primarily consist of water, sewer and drain lines. Based on the soil condition at the project site, we anticipate that the excavation of utility trenches will encounter stiff to hard silts and clays. We envision that conventional excavation methods may generally be utilized for the trench excavation. However, boulders may be encountered at a shallow depth within the residual

soils, which may pose some difficulties during the excavation. The contractor shall determine the method and equipment to be used for underground utility excavation and shall comply with the applicable federal, state, and local requirement.

For support of the utility lines, we recommend using granular bedding consisting of 6 inches of No. 3B Fine gravel (ASTM C 33, No. 67 gradation) under the pipes. The initial backfill up to about 12 inches above the pipes should consist of free-draining material, such as No. 3B Fine gravel, to reduce the potential for pipe damage from compaction of the backfill. It is critical to use a free-draining granular material to reduce the potential for formation of voids below the haunches of pipes and to provide adequate support for the sides of the pipes. The use of on-site soils as backfill directly around utility pipes is not recommended. Improper trench backfill could result in backfill settlement and utility pipe damage.

The upper portion of the trench backfill from a level of 12 inches above the pipes to the finish subgrade should consist of the approved on-site soils or general fill material. The backfill material should be moisture-conditioned to at least 2 percent above the optimum moisture content, placed in level lifts not exceeding 8 inches in loose thickness, and compacted to a minimum of 90 percent relative compaction to reduce the potential for future ground subsidence. The upper 3 feet of the trench backfill below the pavement subgrade should be compacted to no less than 95 percent relative compaction. Mechanical compaction equipment should be used to compact the materials at the project site. Water tamping, jetting, or ponding should not be allowed to compact the backfill material.

3.6 Drainage

The surface and subsurface drainage at the site are especially critical considering the nature of the soils at the site. We believe that the finished grades adjacent to the structures should be sloped to shed water away from the foundations and to reduce the potential for ponding. It is also advised to install gutter systems around the structures and to divert discharge away from foundation and pavement areas. Excessive landscape watering near the foundations and slabs should also be avoided. Gravel strips adjacent to

slabs and foundations should be avoided. Planters next to foundations should be avoided or have concrete bottoms and drains to reduce water infiltration into the subsoils.

These drainage requirements are essential for the proper performance of the above foundation recommendations since ponded water could cause subsurface soil saturation and subsequent loss of strength of the near-surface soils. The foundation excavations should be backfilled properly against the footings immediately after setting of the concrete to reduce water infiltration. Drainage swales should be provided as soon as possible and should be maintained to drain surface run-off away from walls and foundations.

3.7 Design Review

Drawings and specifications for the proposed construction should be forwarded to Geolabs for review and written comments prior to bid advertisement. This review is necessary to evaluate adherence of the plans and specifications to the intent of the foundation and earthwork recommendations provided herein. If this review is not made, Geolabs cannot assume responsibility for misinterpretation of the recommendations presented.

3.8 Post Design / Construction Observation Services

It is recommended to retain Geolabs for geotechnical engineering services during construction. The critical items of construction monitoring that require "Special Inspection" include observation of the subgrade proof-rolling, fill and select granular fill placement and compaction, shallow foundation excavations and other aspects of earthwork construction. This is to observe compliance with the intent of the design concepts, specifications, or recommendations and to expedite suggestions for design changes that may be required in the event that subsurface conditions differ from those anticipated at the time this report was prepared. The recommendations provided herein are contingent upon such observations. If the actual soil conditions encountered during construction are different from those assumed or considered herein, then appropriate modifications to the design should be made.

END OF DISCUSSION AND RECOMMENDATIONS

SECTION 4.0 - LIMITATIONS

The analyses and recommendations submitted in this report are based in part upon information obtained from the field borings and bulk samples. Variations of conditions between and beyond the field borings and bulk samples may occur, and the nature and extent of these variations may not become evident until construction is underway. If variations then appear evident, it will be necessary to re-evaluate the recommendations presented in this report.

The field boring and bulk sample locations are approximate, having been estimated from the Site Plan transmitted by Architects Pacific, Inc. on May 21, 2008. Elevations of the field borings were interpolated from the contour lines shown on the same plan. The boring locations and elevations should be considered accurate only to the degree implied by the methods used.

The stratification breaks shown on the Logs of Borings depict the approximate boundaries between soil/rock types and, as such, may denote a gradual transition. Water level data from the borings were measured at the times shown on the graphic representations and/or presented in the text herein. These data have been reviewed and interpretations made in the formulation of this report. However, it must be noted that fluctuation may occur due to variation in seasonal rainfall, and other factors.

This report has been prepared for the exclusive use of Architects Pacific, Inc. and their project consultants for specific application to the *Lanai Airport Aircraft Rescue and Fire Fighting (ARFF) Station* project in accordance with generally accepted geotechnical engineering principles and practices. No warranty is expressed or implied.

This report has been prepared solely for the purpose of assisting the design engineers and architect in the preparation of the commercial building foundation design, pavement design, and grading recommendations for the proposed project. Therefore, this report may not contain sufficient data, or the proper information, for use to form the basis for preparation of construction cost estimates or contract bidding. A contractor wishing to bid on this project should retain a competent geotechnical engineer to assist in the

interpretation of this report and/or performance of site-specific exploration for bid estimating purposes.

The owner/client should be aware that unanticipated soil conditions are commonly encountered. Unforeseen soil conditions, such as perched groundwater, soft deposits, hard layers or cavities, may occur in localized areas and may require additional probing or corrections in the field (which may result in construction delays) to attain a properly constructed project. Therefore, a sufficient contingency fund is recommended to accommodate these possible extra costs.

This geotechnical engineering exploration conducted at the project site was not intended to investigate the potential presence of hazardous materials existing at the site. It should be noted that the equipment, techniques, and personnel used to conduct a geo-environmental exploration differ substantially from those applied in geotechnical engineering.

END OF LIMITATIONS

DRAFT

CLOSURE

The following plates and appendices are attached and complete this report:

- Plate 1 - Project Location Map
- Plate 2 - Site Plan
- Appendix A - Field Exploration
- Plate A - Log Legend
- Plates A-1 and A-6 - Logs of Borings
- Appendix B - Laboratory Testing
- Plates B-1 thru B-X - Laboratory Test Data

-o0o0o0o0o0o0o0o0o-

Please note: Plates and appendices have been excluded from this draft report. Plates and appendices will be included in the formal report at a later date.

Respectfully submitted,

GEOLABS, INC.

DRAFT

By _____
Clayton S. Mimura, P.E.
President

CSM:RP:as

[h:\6000 Series\6055-00(B).rp1.-p.21]

APPENDIX C.

Archaeological Field Inspection and Literature Review Report

**An Archaeological Field Inspection and Literature Review
for the
Lānaʻi Airport Improvement Project
Kamoku, Kalulu, and Kaunolu Ahupuaʻa, Lahaina
District, Lānaʻi Island
TMK: (2) 4-9-002:041**

Prepared for
Munekiyo & Hiraga, Inc.

DRAFT

Prepared by
Tanya L. Lee-Greig, M.A.
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawaiʻi, Inc.
Wailuku, Hawaiʻi
(Job Code: KAMOKU 2)

July 2009

Oʻahu Office
P.O. Box 1114
Kailua, Hawaiʻi 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1993 Main Street
Wailuku, Hawaiʻi 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Management Summary

Reference	An Archaeological Field Inspection and Literature Review for the Lāna'i Airport Improvement Project, Kamoku, Kalulu, and Kaunolu Ahupua'a, Lahaina District, Lāna'i Island, TMK: (2) 4-9-002:041 (Lee-Greig and Hammatt 2009)
Date	July 2009 (DRAFT)
Project Number (s)	CSH Job Code: KAMOKU 2
Investigation Permit Number	CSH completed this field inspection under state archaeological permit No. 08-14 issued by the State Historic Preservation Division (SHPD), per Hawai'i Administrative Rules (HAR) Chapter 13-13-282
Project Location	Lāna'i Island, Lāhainā District, Kamoku, Kalulu, and Kaunolu Ahupua'a, Lahaina District, Lāna'i Island, TMK: (2) 4-9-002:04, as depicted on the South Lāna'i USGS 7.5-minute topographic quadrangle (1998).
Land Jurisdiction	<p>Land Owner: Government – State of Hawai'i Department of Transportation – Airports Division (HDOT-A)</p> <p>Project Proponent: Government – State of Hawai'i Department of Transportation – Airports Division (HDOT-A) Private – Castle & Cooke Resorts, LLC. (C&C Resorts, LLC)</p>
Agencies	State of Hawai'i Department of Transportation – Airports Division (HDOT) Department of Land and Natural Resources' State Historic Preservation Division (DLNR/SHPD)
Project Description	<p>The proposed project will involve two separate actions:</p> <ol style="list-style-type: none"> 1. HDOT-A is proposing to construction a new single story, 74'4" by 82' Airport Rescue Fire Fighting Station with related improvements (driveway extension for access and utility extension) located to the southeast of the existing cargo building. 2. C&C Resorts, LLC is proposing an approximate 25,200 sq.ft. hangar and the installation of two above ground 15,000 gal. Jet A fuel tanks and a single above ground 3,000 gal aviation gas tank.

Area of Potential Effect (APE)	<p>While the Lāna'i Airport encompasses an approximate area of 93 acres total, this field inspection focused on the footprint of the proposed actions above. This narrow scope is deemed appropriate as the entire property has been subject to previous archaeological inventory survey during the Lāna'i Airport Master Plan (). Therefore the APE is comprised of four discreet locations (see):</p> <ol style="list-style-type: none"> 1. The proposed location for the new approximate 25,200 sq. ft. hangar 2. The proposed driveway extension to located between the new hangar and the new ARFF 3. The proposed location for the new approximate 6,100 sq. ft. ARFF 4. The proposed location for the new fuel storage area
Historic Preservation Regulatory Context	<p>As an HDOT project within state lands, the project is subject to State of Hawai'i historic preservation review legislation [Hawai'i Revised Statutes (HRS) 6E-8/Hawai'i Administrative Rules (HAR) Chapter 13-13-275, respectively].</p>
Document Purpose	<p>This investigation does not fulfill the requirements of an archaeological inventory survey investigation (per HAR Chapter 13-276); however, through detailed historical, cultural, and archaeological background research, and a field inspection of the project APE, this investigation identifies the likelihood of encountering historic properties that may be affected by the proposed actions. This document is intended to facilitate the project's planning and support the project's historic preservation review compliance. Based on the findings of this investigation, cultural resource management recommendations are presented (see Section 5).</p> <p>A companion cultural impact assessment (CIA) study (Dagan and Hammatt <i>in prep.</i>), prepared to support the project's Hawai'i state environmental review, per the guidelines of the Hawai'i State Department of Health's Office of Environmental Quality Control "<i>Guidelines for Assessing Cultural Impacts</i>", further evaluates the project's potential impacts to cultural resources. Both documents will support the project's historic preservation consultation effort.</p>
Fieldwork Effort	<p>The field inspection was carried out on June 12, 2009 Colleen Medeiros Dagan, B.S. and took one day to complete.</p>
Number of Historic Properties Identified	<p>0</p>

Cultural Resource Management Recommendation	See Section 4 Field Inspection Results and Section 5 Summary and Recommendations for detailed field results and assessment of potential for project effect.		
	Action	Potential Impact	Recommendation
	Construction of new above ground fuel tank storage.	No historic properties affected	No further work
	Construction of new hangar	No surface historic properties affected, Low potential for encountering intact subsurface cultural deposits	On-call monitoring consistent with recommendations put forth during the development of the Airport Master Plan (Borthwick et al. 1990; Appendix A)
Construction of the new ARFF with related improvements	No surface historic properties affected, Low potential for encountering intact subsurface cultural deposits	On-call monitoring consistent with recommendations put forth during the development of the Airport Master Plan (Borthwick et al. 1990; Appendix A)	

Table of Contents

Management Summary	i
Section 1 Introduction	1
1.1 Project Background	1
1.2 Scope of Work	5
1.3 Environmental Setting	5
1.3.1 Natural Environment.....	5
1.3.2 Built Environment.....	7
Section 2 Methods	9
2.1 Field Methods	9
2.2 Document Review	9
Section 3 Background Research	10
3.1 Traditional and Historical Background.....	10
3.1.1 Mythological Accounts.....	10
3.1.2 Traditional Hawaiian Habitation and Subsistence of the Pālawai and Miki Basin Area.....	13
3.1.3 Early Historic Period	17
3.1.4 Mid- to late-1800s.....	18
3.1.5 1900s.....	19
3.1.6 Late Historic to Modern Land Use	20
3.2 Previous Archaeological Research	22
3.2.1 Archaeological Studies Specific to the Lāna‘i Airport	25
3.3 Background Summary and Predictive Model	26
Section 4 Field Inspection Results	27
Section 5 Summary and Recommendations	29
Section 6 References Cited	30
Appendix A SHPD Section 106 Review for the Lāna‘i Airport Master Plan.....	1

List of Figures

Figure 1. A portion of the 1998 South Lāna'i 7.5-minute USGS topographic quadrangle with project location in black cross-hatch.....	2
Figure 2. 1998 TMK map [TMK:(2) 4-9-002] showing project area location in red cross-hatch. .3	
Figure 3. Overall site plan for the proposed improvements to the Lāna'i Airport (courtesy of Munekiyo & Hiraga, Inc. – red shading added).....	4
Figure 4. A portion of the 1998 South Lāna'i 7.5-minute USGS topographic quadrangle, showing the project area relative to the local soil series (U.S. Department of Agriculture, Natural Resources Conservation Service 2001).	6
Figure 5. Existing ARFF at the Lāna'i Airport, view to north.	7
Figure 6. Eastern end of cargo bay at Lāna'i Airport, view to north.....	8
Figure 7. Runway apron extension from east corner, view to west.....	8
Figure 8. A portion of the J. F. Brown and M. D. Monsarrat map (1878) showing Kamoku, Kalulu, and Kaunolu Ahupua'a, as a traditional land division of the island of Lāna'i, current project area in black cross-hatch, area noted as potato patch circled in red.....	11
Figure 9. A portion of the Map of Lāna'i showing <i>ahupua'a</i> divisions and placenames with numbered locations as gathered by Kenneth Emory (Emory 1924a: Plate I), highlighted place name locations near the project area indicate areas of settlement noted along the rim of the "great basin"	15
Figure 10. Hawaiian Pineapple Company, Ltd. (1929) survey map showing, place names, areas of Land Commission Awards relative to the current project area.	17
Figure 11. Original Lāna'i Airport circa 1947 (photo courtesy of the Lāna'i Culture & Heritage Center).....	21
Figure 12. 1953 aerial showing runway for the Lāna'i Airport and surrounding pineapple fields (photo courtesy of the Lāna'i Culture & Heritage Center)	22
Figure 13. Map of Lāna'i showing <i>ahupua'a</i> and the distribution of house sites and <i>heiau</i> known to Kenneth Emory in 1921 in relation to the current project area (green dots represent visible house sites, rectangles correspond to <i>heiau</i> locations, and the numeric reference ranks the <i>heiau</i> [brown rectangles] according to size). (Emory 1924:49).....	23
Figure 14. portion of the South Lanai USGS topographic quadrangle showing previous archaeological studies in the vicinity of the project area.	24
Figure 15. Northwest edge of ramp (left of frame) showing the location for the proposed new hangar (right of frame), view to southwest.....	27
Figure 16. Proposed location for the new ARFF, view to west.....	28
Figure 17. Remnant asphalt foundation from the original airport structure, view to southeast.	28

List of Tables

Table 1. Summary of Land Commission Awards (LCAs) identified within the upland areas of Kamoku, Kalulu, and Kaunolū Ahupua‘a (Lāna‘i Culture and Heritage Center 2009). ...16

Table 2. Summary of Potential Effect and Recommendations for the Proposed Actions29

Section 1 Introduction

1.1 Project Background

At the request of Munekiyo & Hiraga, Inc., Cultural Surveys Hawai'i, Inc. (CSH) conducted a literature review and field inspection proposed improvements within a portion of the Lāna'i Airport property located in Kamoku, Kalulu, and Kaunolu Ahupua'a, Lahaina District, Lāna'i Island, TMK: (2) 4-9-002:041 (Figure 1 and Figure 2).

The State of Hawai'i Department of Transportation – Airports Division (HDOT-A) and Castle & Cooke Resorts, LLC. (C&C Resorts, LLC) are proposing the following improvements at the Lāna'i Airport (Figure 3):

1. HDOT-A is proposing to construction a new single story, 74'4" by 82' Airport Rescue Fire Fighting Station with related improvements (driveway extension for access and utility extension) located to the southeast of the existing cargo building.
2. C&C Resorts, LLC is proposing an approximate 25,200 sq.ft. hangar and the installation of two above ground 15,000 gal. Jet A fuel tanks and a single above ground 3,000 gal aviation gas tank.

While the Lāna'i Airport encompasses an approximate area of 93 acres, the field inspection focused on the footprint of the proposed actions above. This narrow scope is considered appropriate as the entire property has been subject to previous archaeological investigation (Sinoto 1989) and inventory survey (Borthwick et al. 1990) for the overall Lāna'i Airport Master Plan (Park Engineering et al. 1991). Therefore the APE for this document is comprised of four discreet locations (see Figure 3):

1. The proposed location for the new approximate 25,200 sq. ft. hangar
2. The proposed driveway extension to located between the new hangar and the new ARFF
3. The proposed location for the new approximate 6,100 sq. ft. ARFF
4. The proposed location for the new fuel storage area

This investigation does not fulfill the requirements of an archaeological inventory survey investigation per HAR Chapter 13-276; however, through a detailed literature review and a follow up field inspection of the project APE, this investigation identifies the likelihood of encountering historic properties that may be affected by the proposed actions.

A companion cultural impact assessment (CIA) study (Dagan and Hammatt *in prep.*), prepared to support the project's Hawai'i state environmental review, per the guidelines of the Hawai'i State Department of Health's Office of Environmental Quality Control "*Guidelines for Assessing Cultural Impacts*", further evaluates the potential for significant impact to cultural resources. This document, along with the CIA, is intended to facilitate the project planning and support historic preservation review compliance for the proposed actions.

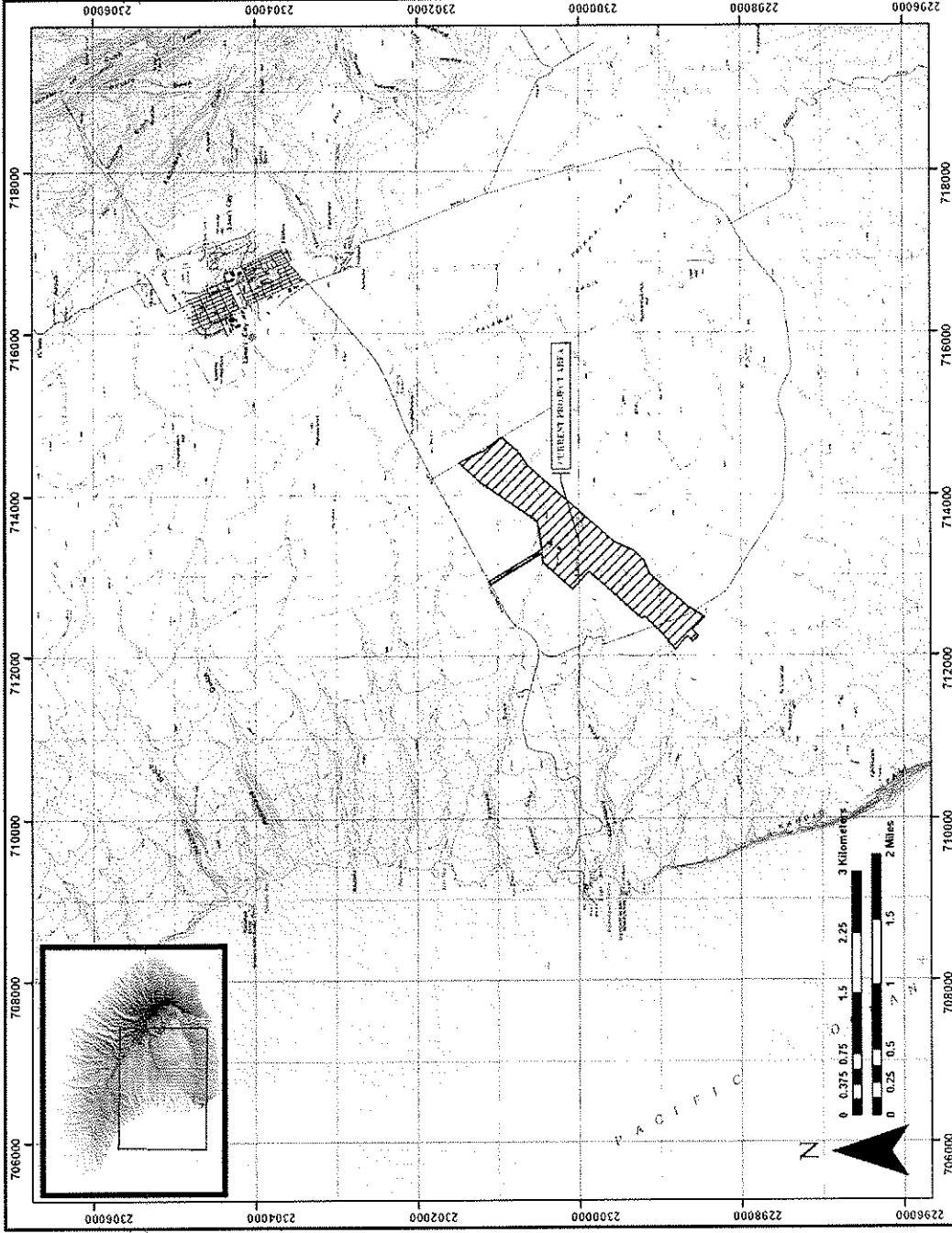


Figure 1. A portion of the 1998 South Lāna'i 7.5-minute USGS topographic quadrangle with project location in black cross-hatch.

An Archaeological Field Inspection and Literature Review for the Lāna'i Airport Improvement Project

TMK: (2) 4-9-002:041

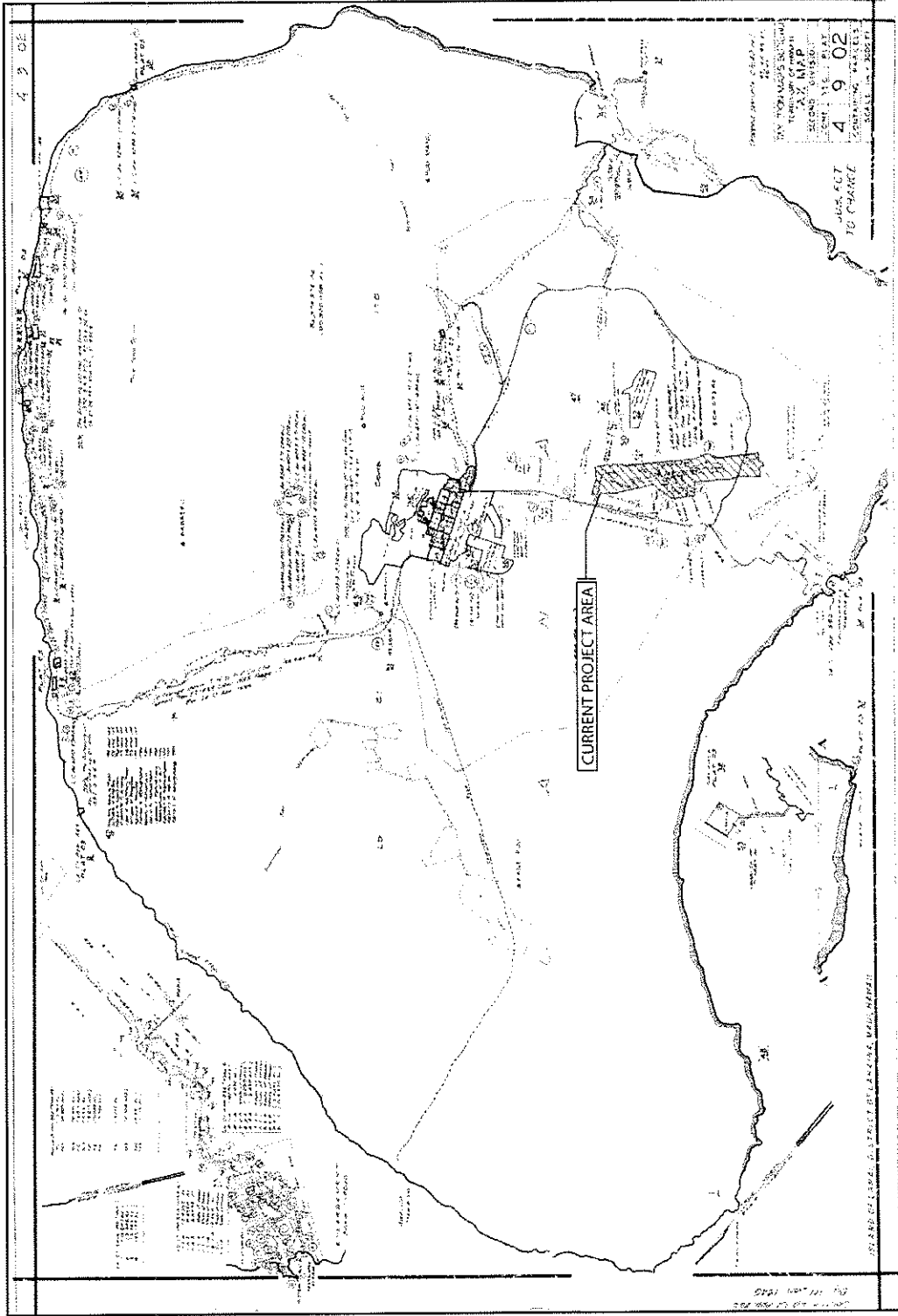


Figure 2. 1998 TMK map [TMK:(2) 4-9-002] showing project area location in red cross-hatch.

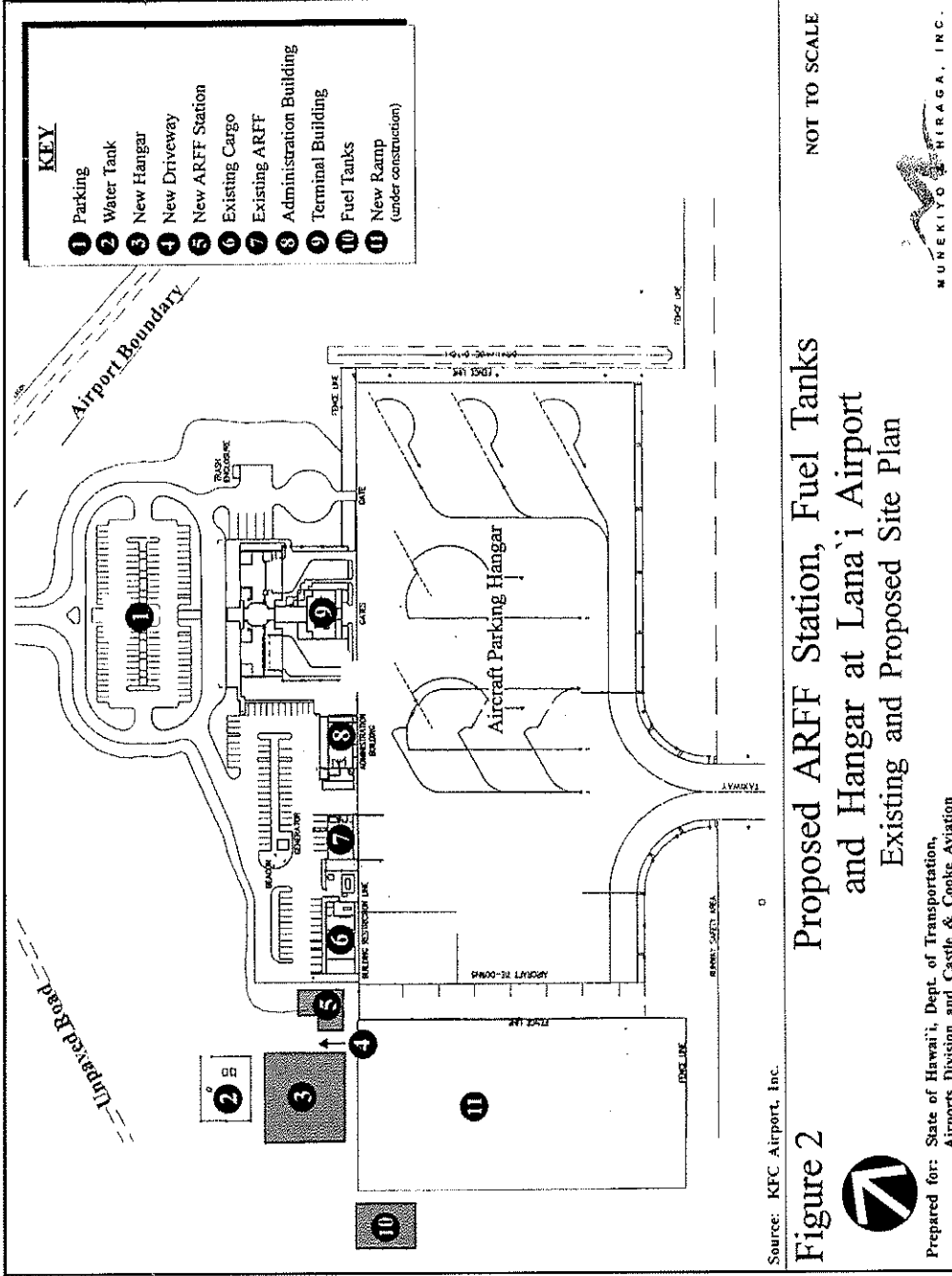


Figure 3. Overall site plan for the proposed improvements to the Lana'i Airport (courtesy of Munekiyo & Hiraga, Inc. – red shading added)

1.2 Scope of Work

The scope of work included:

- 1- Research on the historic background of the project area, including searches of historic maps, written records, and Land Commission Award documents. This research would also focus on the specific project area, and provide detailed background on previous archaeological reports, in order to construct a history of land use and determine if archaeological sites have been recorded on or near this property;
- 2- A general ground survey of the project APE for the purpose of identifying surface archaeological features. If present, archaeological features would be assessed for potential impact by the proposed actions, and sensitive areas requiring further investigation or mitigation would be identified;
- 3- Preparation of a literature review and field inspection report that includes the following:
 - results of the historic research and the limited fieldwork;
 - an assessment of archaeological potential based on the historic research, with recommendations for further archaeological work, if needed;
 - and, provisions for mitigation recommendations if archaeologically sensitive areas are encountered.

1.3 Environmental Setting

1.3.1 Natural Environment

At an elevation between approximately 350m to 400m (1138ft to 1312ft) above mean sea level (AMSL), the lands that comprise the Lāna'i Airport are located along the edge and within the nearly filled pit crater of Miki Basin (Macdonald et al. 1983:405) on fairly flat to gently sloping topography. The general soils for this locality are of the Molokai-Lahaina association and consist of deep, nearly level to moderately steep, well drained soils on uplands (Foote et al. 1972: General Soil Map). More specifically, the soils within the project area are classified as Molokai Silty Clay Loam 0-3% slopes (MuA), Molokai Silty Clay Loam 3-7% slopes (MuB), and Uwala Silty Clay Loam (UwB) (Figure 4). MuA soils are found on smooth slopes and have a moderate permeability rate with a slow runoff and slight erosion hazard (Foote et al. 1972:96). At the time of the 1972 USDA soil survey, MuA soils were used entirely for pineapple on the island of Lāna'i. MuB are generally similar to that of MuA soils with a slow to medium runoff rate and slight to moderate erosion hazard (Foote et al. 1972:96) being the primary difference. UwB have smooth slopes with moderate permeability and a slow to medium runoff rate that results in a slight to moderate erosion hazard (Foote et al. 1972:123). Found only on the island of Lāna'i, soils that fall under the UwB classification were primarily used for pineapple cultivation (Foote et al. 1972:124).

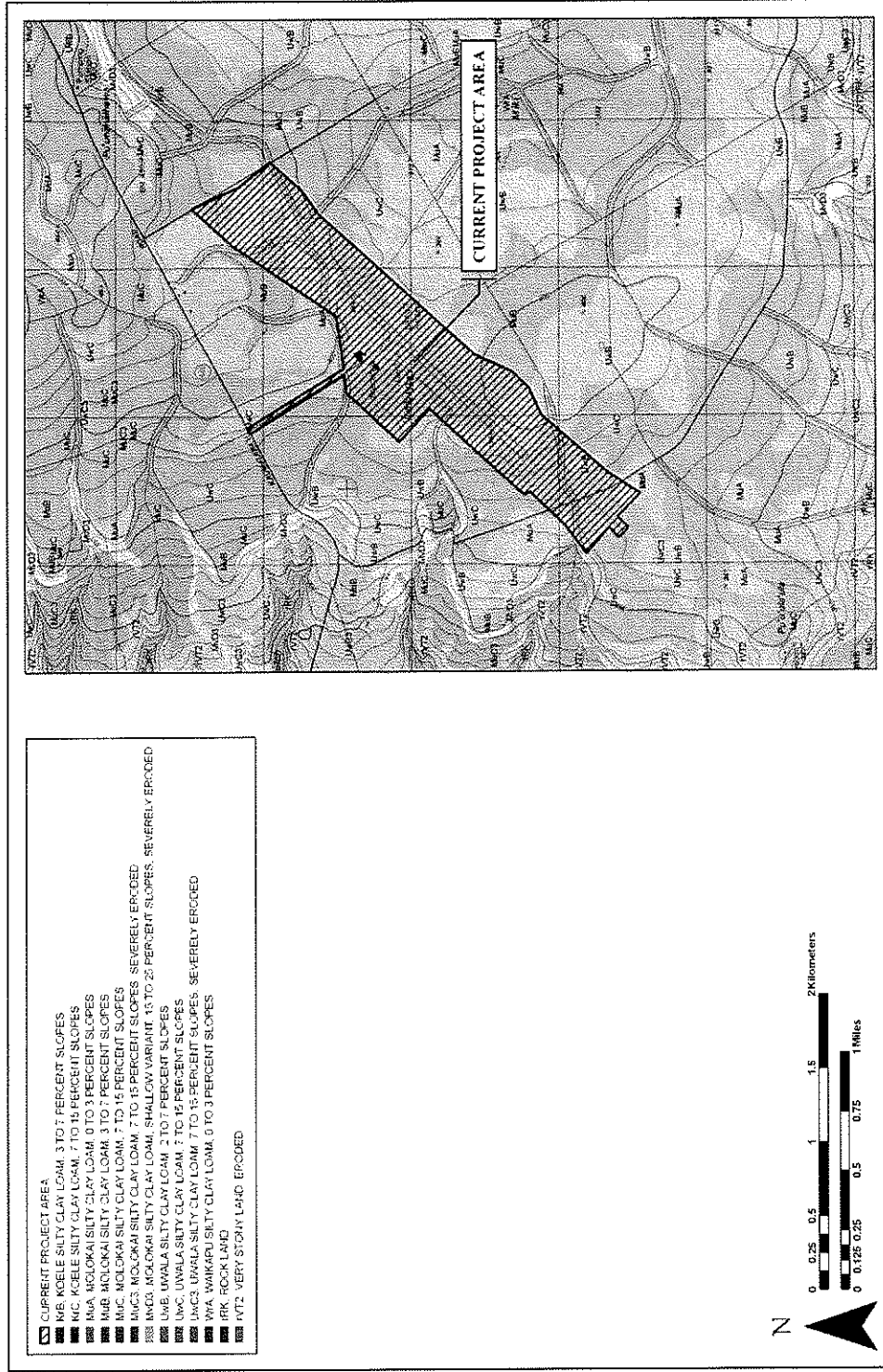


Figure 4. A portion of the 1998 South Lānaʻi 7.5-minute USGS topographic quadrangle, showing the project area relative to the local soil series (U.S. Department of Agriculture, Natural Resources Conservation Service 2001).

Rainfall accumulation within the project area averages between 15 and 23 inches per year with the heaviest rainfall occurring during the winter months (Giambelluca et al. 1996). This level of precipitation with the soils described above would have supported a lowland dry and mesic forest, woodland, and shrubland native ecosystem (Pratt and Gon 1998: 122). Naturally occurring native vegetation within the project area would have likely consisted of *pili* (*Heteropogon contortus*) grasslands and dry or mesic shrublands of 'a'ali'i (*Dodonaea viscosa*), 'ākia (*Wikistroemia sp.*), ko'oko'olau (*Bidens species*), 'ūlei (*Osteomeles anthyllidifolia*), and other shrubs (Pratt and Gon 1998:127). The lands within and surrounding the project area, however, have been plowed over and intensively cultivated in pineapple for approximately 70 years from 1922 until 1992. Current vegetation consists of sparse and very low lying alien grasses with over 50% of the project area revealing bare ground.

1.3.2 Built Environment

The built environment of the project area is limited to the facilities and roads associated with the daily operations of the Lāna'i Airport (Figure 5, Figure 6, and Figure 7) with the surrounding lands consisting of fallow pineapple fields.

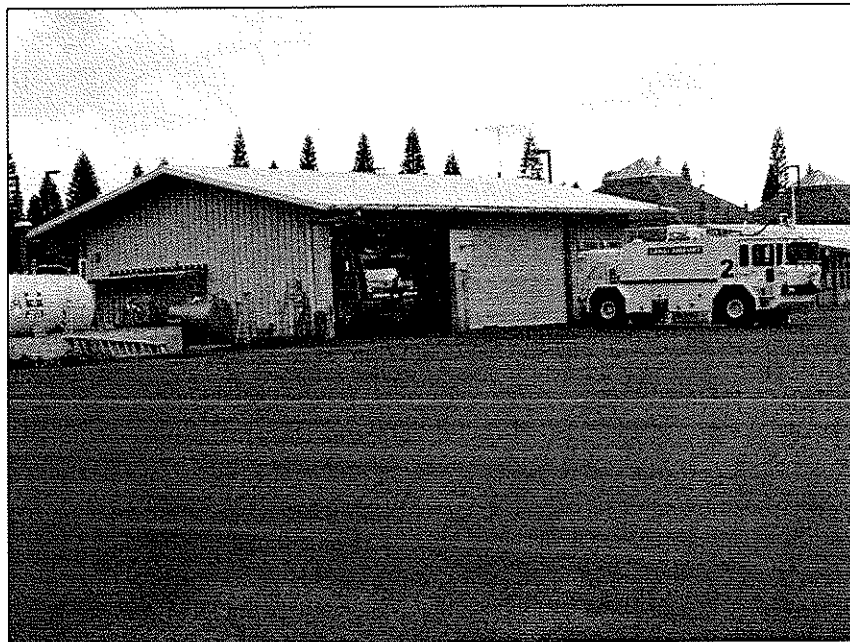


Figure 5. Existing ARFF at the Lāna'i Airport, view to north.

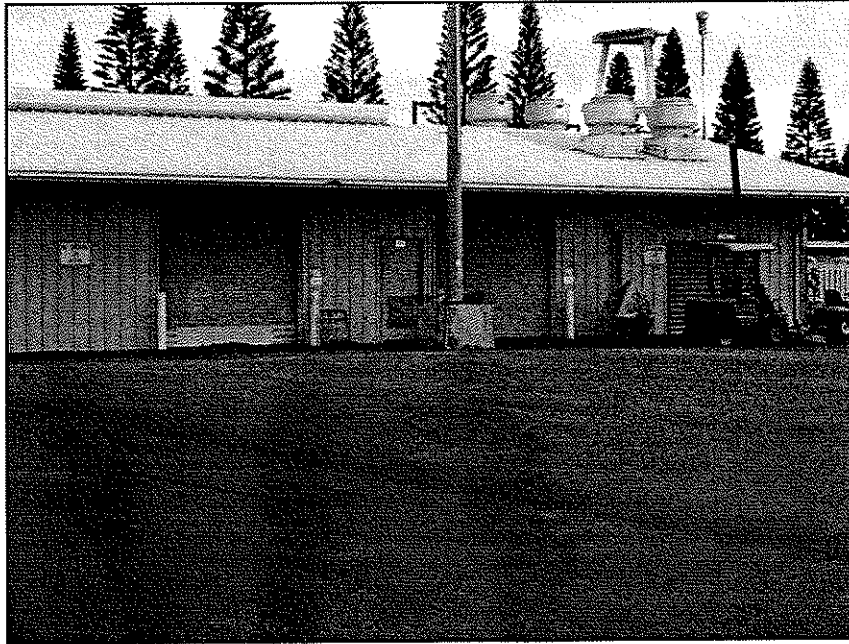


Figure 6. Eastern end of cargo bay at Lāna'i Airport, view to north.

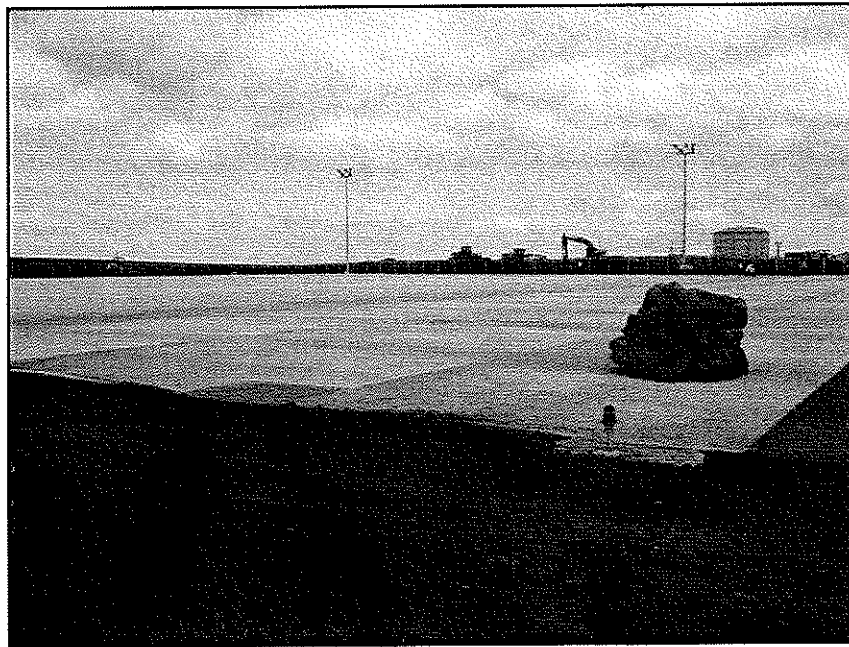


Figure 7. Runway apron extension from east corner, view to west.

Section 2 Methods

The archaeological field inspection was conducted by archaeologist Colleen Medeiros Dagan, B.S. on June 12, 2009..

2.1 Field Methods

The field inspection methods consisted of :

1. A pedestrian check of areas of potential effect whereby each area was visually inspected for native or indigenous plants and/or extant surface evidence for the presence of significant historic properties; and
2. Photographic documentation;

2.2 Document Review

As part of the literature review and field inspection, a review of all previous archaeological work conducted in the surrounding area was performed. In addition, a variety of resources devoted to historical perspectives of the region and traditional stories and accounts were reviewed. Research venues included the State Historic Preservation Division of the Department of Land and Natural Resources, the Survey Office of the Department of Accounting and General Services, as well as other private collections. All relevant Land Claim Awards (LCA) and Royal Patents were researched using documentary resources available online at Lāna'i Culture & Heritage website (Lanai Culture & Heritage Center 2009).

Section 3 Background Research

The division of Lāna'i's lands into political districts may have occurred under the direction of the chiefs of Maui, as Lāna'i historically appeared to be "subject or tributary to Maui" during the times of Kamalalawalu (about 1550-1600 AD) (Fornander 1919 Part I: 206-8). The island was apportioned into the following thirteen *ahupua'a* land divisions that were established during traditional times: Ka'ā, Kamoku, Kalulu, Kaunolū, Keāliakapu, Keāliaupuni, Pālāwai, Kāma'o, Ka'ohai, Pawili, Maunalei, Mahana, and Paoma'i. Unlike *ahupua'a* divisions of the other seven major islands of the Hawaiian Chain, some of the *ahupua'a* divisions on Lāna'i Island have the unique characteristic of traversing across the island from one coastline to the other (Figure 8). The current project area is located on the north-northwestern edge of Miki Basin and crosses Kamoku, Kalulu, and Kaunolu Ahupua'a, within the *mokupuni* of Lāna'i (Moffat and Fitzpatrick 1995:23). While Kamoku Ahupua'a retains the common "pie-shaped" *mauka-makai* boundary configuration, both Kalulu and Kaunolu Ahupua'a are of the unique bi-coastal boundary configuration whereby the two *ahupua'a* extend from one end of the island to the other.

3.1 Traditional and Historical Background

The most comprehensive summary of traditional accounts dealing with the "formation of Lāna'i, first habitation, general traditions, early history and place names" appears in Kenneth P. Emory's *The Island of Lāna'i: A Survey of Native Culture* (1924a). Emory suggests through "genealogies and traditions" that Lāna'i "began to be populated by important numbers about 1400 A.D." (Emory1924a:123). Based on the number of house sites he observed and approximating five persons per household, Emory estimated the pre-1778 population of the island at around 3,000 (1924a:122). The traditional life style focused on subsistence farming and fishing within the context of the *ahupua'a* or traditional land unit.

3.1.1 Mythological Accounts

3.1.1.1 *The Ghosts of Lāna'i*

The northern coastal place name of Laewahie refers to the point on Lāna'i where Kaululā'au built a signal fire to the people of Lahaina. Fornander (1919:542) recorded the story of Kaka'alaneo, the chief of all of West Maui. His son, Kaululā'au, grew up as a boy involved in great mischief. Because he uprooted the sacred breadfruit grove of Lahaina, his father had no choice but to banish his son to the uninhabited island of Lāna'i. At that time, Lāna'i was the abode of ghosts, and Kaululā'au was sent there to be killed by them. Tabrah (1976) notes the many tricks the ghosts tried to use to murder Kaululā'au, and her account notes the location of the signal fire to the people of Lahaina after he had defeated all of the ghosts of the island as Naha, located in the *ahupua'a* of Kaohai. (The literal translation of Kaohai is "firebrand.") Kalākaua (1888:212, 230) records the legend of Kaululā'au conquering the ghosts of Lāna'i in two separate stories, one of which details his fight with the *Mo'oaleo*, a lizard god of the island as the most difficult of the ghosts to overcome. He does not give the location of the signal fire used by Kaululā'au. (There is a village named Kaululā'au on the coast of Pawili Ahupua'a.) The legend ends with Kaululā'au being reunited with his father, mending his mischievous ways, and opening the island of Lāna'i for settlement.

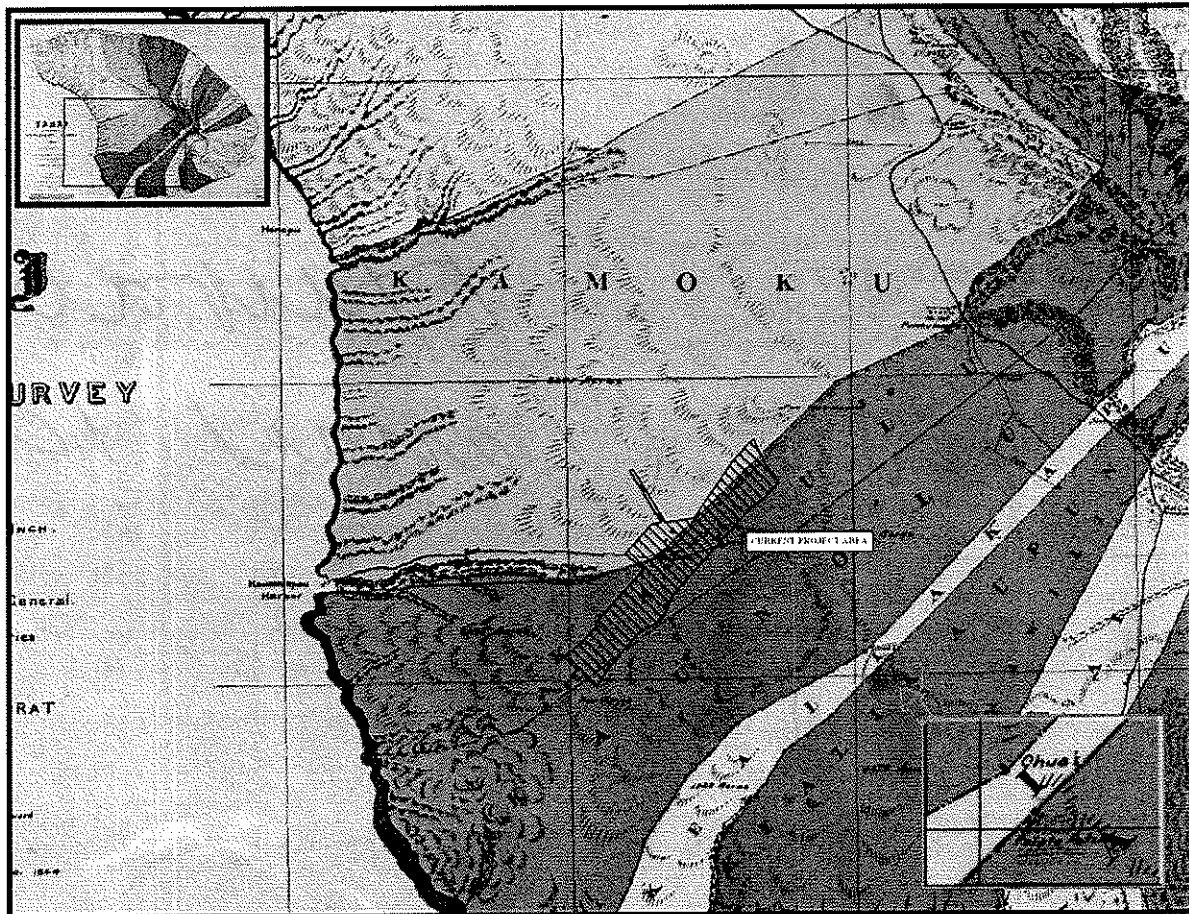


Figure 8. A portion of the J. F. Brown and M. D. Monsarrat map (1878) showing Kamoku, Kalulu, and Kaunolu Ahupua'a, as a traditional land division of the island of Lāna'i, current project area in black cross-hatch, area noted as potato patch circled in red.

3.1.1.2 The Story of the 'Ōhelo

The “Story of the ‘Ōhelo”, as translated from the original Hawaiian by Abraham Fornander (1919), describes the origin of the sacred offering of ‘ōhelo to the goddess Pele, and the importance of Lāna‘i Island in the telling of the story. According to Fornander, the many sisters of Pele followed her east from Tahiti across the Pacific Ocean. As Malulani, Kaohelo, Hi‘iaka, and Pele arrived at the Hawaiian Islands, Malulani choose Lāna‘i to dwell on, while Pele, Kaohelo, and her younger sisters traveled on to the island of Hawai‘i.

Kaohelo had a son named Kiha, who was given instructions by Kaohelo as she neared death where she should be buried. “Take my body to the very navel of your grandmother, right on top of Kīlauea; then bury me there.” This her son did. The flesh of Kaohelo became the creeping vine and her bones became the bush-plant of the ‘ōhelo. Her head was treasured by Pele as the smoldering fire of Kīlauea. The remainder of her body brought volcanic fire to Haleakalā on Maui, Keālia on Oahu, and also to Kaua‘i.

When Malulani, living on Lāna'i, heard of the death of their youngest sister, she went to Hawai'i to retrieve her body, but found that small pieces of her body were strewn across the landscape sprouting into vines and bushes of the *'ōhelo*. She gathered as much of her sister's remains as she could, but upon returning to Lāna'i, was surprised to find the pieces of Kaohelo's body had been strung as leis and worn as adornment. Saddened by this, Malulani died.

Hi'iaka then came to Lāna'i to recover the body of Malulani, whereupon small bundles containing her remains were scattered across the island of Hawai'i, causing small hills and islets to remain to this day. In this way, the island of Lāna'i is part of the legend of how the *'ōhelo* came to be spread across the islands of Hawai'i, and why the *'ōhelo* is the special sacred offering to Pele (Fornander 1919, V, III: 576-580).

While the mythological and traditional accounts specific to this section of Kamoku, Kalulu, and Kaunolu are relatively scarce, an analysis of the place name meanings and characteristics or features for the region surrounding the project area may yield some insight into the patterns of life in an area. Literal translations of several of the place names and /or characteristics and features for land areas and divisions near to the project area are listed below:

Ili o Lono (Ka 'Ili o Lono)	Land section of Lono (personal); plateau land (Emory 1924a:30); site of an ancient <i>heiau</i> near the former house site of Papalua, situated on the boundary between Kalulu and Kamoku Ahupua'a (Maly and Maly 2009:Table 1 and p17)
Kaapela	Rolling over soft grass; plateau land; site of a school house; old name of place close by is Mauipapahu (Emory 1924a:30)
Kalulu	The calm; a district; an ahupua'a (Emory 194a:31); the shelter (Pukui et al. 1974:79)
Kamoku	Lit., the district or the cut-off portion (Pukui et al. 1976:82); the piece cut off (Emory 1924a:31); one of three ahupua'a that crosses from the leeward to windward side of the Lāna'i (Maly and Maly 2009: Table 1)
Kanaena	An offering to the gods (Emory 1924a:31)
Kaunolū	To give property on a wager secretly, the <i>akua</i> of Molokai; bay and district; spelling Kaūnōlū (Emory 1924a:32); site of deserted Hawaiian village (Pukui et al. 1974:95); noted for the "Heiau Kaulana o Kaunolu" near the boundary of Kealia Kapu and Kaunolu, one of three ahupua'a that crosses from the leeward to windward side of the Lāna'i (Maly and Maly 2009: Table 1)
Keahialoa	The fire at Loa; hill; highest point on the island as seen from Kaena point (Emory 1924:32); the long fire burning
Kilauea	Place name translation not given, noted simply as plateau land (Emory 1924a:33); spewing, much spreading (referring to volcanic eruptions) (Pukui et al. 1974:111)
Koulii	The little <i>kou</i> tree (Emory 1924:33);
Miki	Place name translation not given, noted simply as a basin on the plateau (Emory 1924a:34)

Nihokela	Projecting tooth (Emory 1924a:35)
Pakiki	Unyielding (Emory 1924a:35)
Paoole	Digging without a digging stick (Emory 1924a:35)
Pulehuloa (Pu'ulehuloa)	Big roasting (Emory 1924:36)
Puu Nanaihawaii (Pu'u Nānā i Hawai'i)	Hill to view Hawai'i (Emory 1924:36)
Puu o Miki	Hill of Miki (Emory 1924a:36)
Puu Ulaula	Red crater (Emory 1924a:36); red hill (Pukui et al. 1974:206)
Puukauila	Kauila (tree) hill (Emory 1924a:36)

The above place names describe an area consistent with what one might expect of a leeward environment that was likely covered in *pili* (Kaapela) with some reference to woodland plant species that may have been stunted due to seasonal water availability (Koulii), and while the lands and water limitations may have seemed unyielding at times (Pakiki) it was also an environment suitable for agricultural endeavors (Ili o Lono and Paoole).

3.1.2 Traditional Hawaiian Habitation and Subsistence of the Pālawai and Miki Basin Area

Traditional or pre-contact habitation along the rim of both Pālawai Basin and Miki Basin was likely sporadic with agricultural activities focused on the cultivation of dry-land crops. The following excerpts from the metes and bounds descriptions for Kamoku, Kalulu, and Kaunolū Ahupua'a contained within Boundary Commission documents that were generated during the Mahele note the presence of scattered house sites, with some making specific reference to the crater or rim of the basin (Maly and Maly 2009):

Kamoku

4. N 72° 43' E true 2080 feet along Kalulu to a cross cut in a stone amongst a lot of stones at the former site of an old *Heiau* called "Ili o Lono."

6. N 65° 44' E true 4939 feet along Kalulu along North edge of crater to a red wood post on the North wall of the crater at a place called Pulehuloa near Keliihananui's house.

11. S 74° 8' W true 6258 feet along Paomai passing to the North of a couple of *Hala* clumps to two Triangular pits at an old house site. [Maly and Maly 2009:40-41]

Kalulu

3. N 54° 17' E true 6694.5 feet along Kaunolu passing between Maakuia's house and his sheep pen to a point 14 feet East of a rock with a cross cut on it.

5. N 53° 14' E true 13359 feet along Kaunolu across Crater passing West of school house to a point on terrace marked by a *Mamane* post.

16. Thence along Kamoku down the N.W. edge of the Kapano valley to the Government road, passing near Kawaonahale's house keeping straight on across a side ravine coming in from the North (called Keaaku) to a red wood post at the top of the North wall of the Palawai Crater at a place called "Pulehulua," near Kealiihananui's house, which red wood post bears [page 112] S 44° 53' W true 8052 feet from last mentioned point on ridge. South 28°32' West true 11633 feet along Palawai (Passing around the east side of the above mention Grant [Grant 2971 to Kapahoa]) and across Palawai crater to a rock marked with a cross on the South edge of crater at an old house site near a large straw house owned by Puupai

18. S 46° 19' W true 10141.4 feet along Kamoku down road to a cross cut in a stone amongst a lot of stones at the former site of an old *Heiau* called "Ili o Lono." [Maly and Maly 2009:38-39]

Kaunolu

3. N 54° 17' E true 6694.5 feet along Kalulu passing between Maakuia's house & his sheep pen to a point 14 feet East of a rock with a cross cut in it. [Maly and Maly 2009:48]

During his island wide survey of the archaeology of Lāna'i, Kenneth Emory (1924b:28) also postulated that the basin area was a scene of early settlement based on the remains of pre-contact settlements identified below Puulehulua (80¹) and Kanaenae (27) along the west rim at Paoole (137) and Puukauila (74) (Figure 9). Within the basin, however, Emory (1924b:28) noted only an occasional enclosure or platform but no trace of house remains on level ground. Evidence of only scattered settlements around the basin, as opposed to evidence of intensive habitation found along the coastline and within Maunalei Gulch, may be a factor of limited or seasonal water availability along the rim and potentially marshy conditions within the basin during the winter months. The seasonality of water availability and scarcity of resources during certain times of the year was noted by M.D. Monsarrat in a letter dated June 2, 1877 to W.D. Alexander during the Boundary Commission survey of the Kaunolu Ahpua'a boundaries:

It is beginning to get very dry here and water scarce. Potatoes are also very scarce and expensive. *Pai ai* are a dollar apiece in Lahaina now having jumped from seventy five cents since I came over. (M.D. Monsarrat in Maly and Maly 2009:12)

¹ Numbers following placenames correspond to numbered locations illustrated in Plate I of Emory's *The Island of Lana'i, A Survey of Native Culture* (1924a).

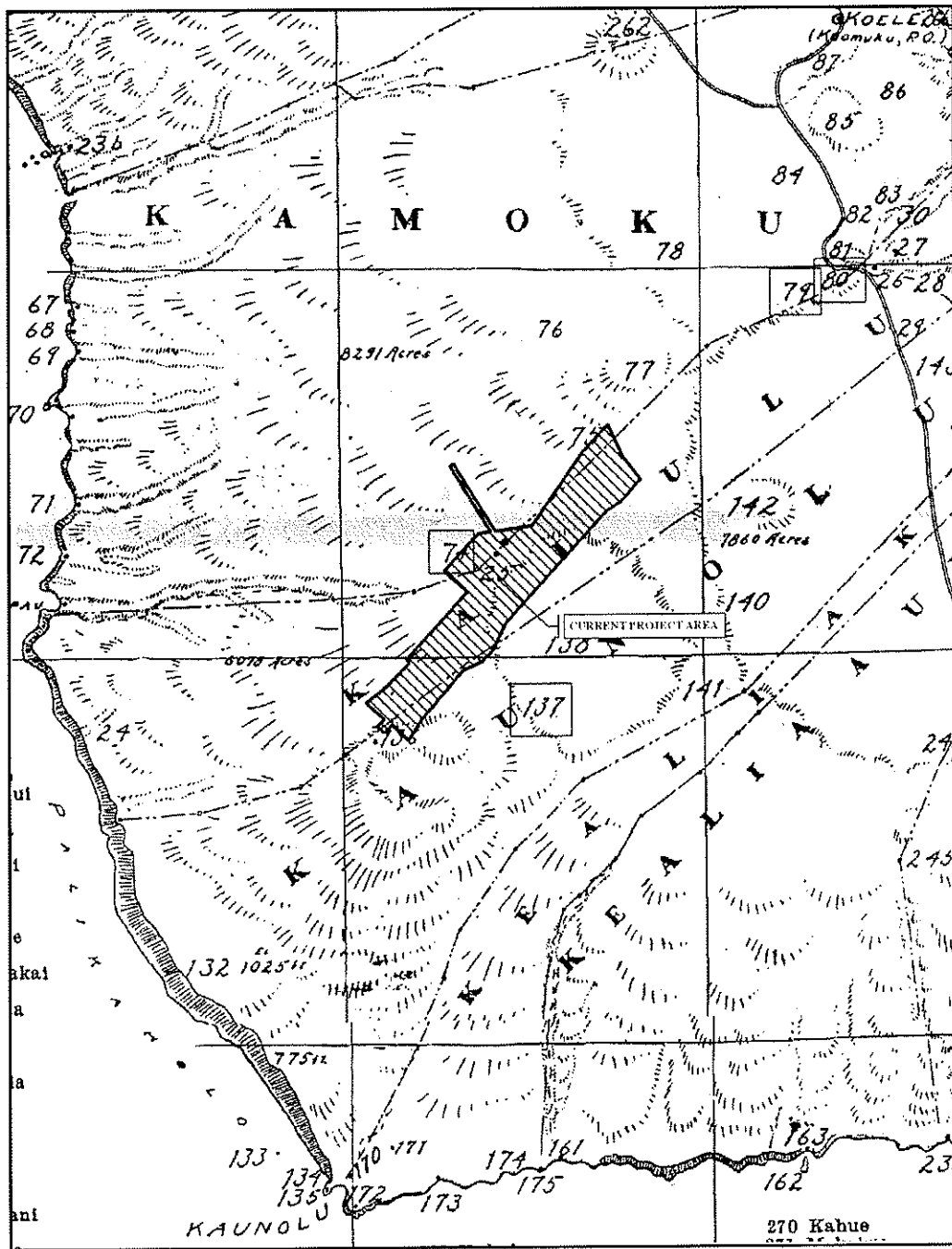


Figure 9. A portion of the Map of Lāna'i showing *ahupua'a* divisions and placenames with numbered locations as gathered by Kenneth Emory (Emory 1924a: Plate I), highlighted place name locations near the project area indicate areas of settlement noted along the rim of the “great basin”

Because the island of Lāna'i lies in the rain shadow of the West Maui mountain range, the landscape of the entire island is reflective of a leeward environment where water is a precious commodity. Fresh and brackish water wells dotted the coast, with one or two on the western coast of the island providing an ample water supply for the then permanent residents at Kaunolu (Emory 1924a:46). Mountain springs were numerous with a permanent water supply found at Maunalei Gulch where the only perennial stream could be found (Emory 1924a:47). Water collection on the plateau lands and presumably basin area, however, was different and unique. The following description of gathering water in the uplands is taken from Emory (1924a:46):

(i)n the days before sheep, goats, cattle and horses were grazing on the plateau lands, dew could be collected from the thick shrubbery by whipping the moisture into large bowls or squeezing the dripping bush-tops into the vessels. Oiled tapa was also spread on the ground to collect the dew. Water accumulating in natural depressions in rock or in cup marks was husbanded carefully.

Even with the seasonal nature of water availability common in leeward environments in general, and along the plateau lands of Lāna'i in particular, 'uala (sweet potato) and possibly other dry-land crops (e.g. dryland *kalo*, gourd crops) were successfully cultivated (Emory 1924a; Handy et al. 1991; Munro 2007; see also Figure 8 and Table 1). An indication of this is the name of the hill, or rise, west of Miki Road that is identified as 'Uala Hill on the South Lanai USGS Quadrangle (see Figure 1), and known as Pu'u o 'Uala by the Kaupiki family of Lāna'i. In oral testimony gathered by Mr. Kepa Maly (Executive Director, Lāna'i Culture and Heritage Center) and shared with the authors, the Kaupiki family recalled that the sweet potato that grew there were reported to be tasty and reach lengths of one foot or more. Testimony presented before the Board of Land Commissioners for *kuleana* claims in the plateau and basin area show very clearly that dryland agriculture along the rims of Palawai and Miki Basins was ongoing during the time of the Mahele. At Kaunolū, Kalulu, and Kamoku there are a total of seven claims, some with multiple *apana* (parcels), that mention sweet potato gardens and pasture lands, with testimony for LCA 6815 Parcel 2 indicating both a sweet potato garden and a gourd garden (Table 1. and Figure 10).

Table 1. Summary of Land Commission Awards (LCAs) identified within the upland areas of Kamoku, Kalulu, and Kaunolū Ahupua'a (Lāna'i Culture and Heritage Center 2009).

LCA #	Claimant	Ahupua'a	Land Use
06815:3	Kaiwi	Kaunolū	1 <i>mala uala</i> (sweet potato patch) at Paoole
6818:1 and 2	Haole	Kaunolū	1 <i>mala uala</i> and 1 <i>moku mauu</i> (grass land/pasture section) respectively
6822	Kahuikilani	Kamoku and Kalulu	1 <i>pahale</i> (house lot) and <i>mala uala</i>
8556:2 and 3	Kaauwaeaina	Kamoku and Kalulu, <i>ili</i> of Pueo	1 <i>moku mauu</i> and 1 <i>pauku</i> respectively
6820	Kanohohookahi	Kaunolū	1 <i>pahale</i> and <i>moku mauu</i>
6816:1	Naholowaa	Kaunolū	6 <i>mala uala</i>
6814:2 and 3	Pakele	Kaunolū	1 <i>moku mauu</i> in each <i>apana</i>

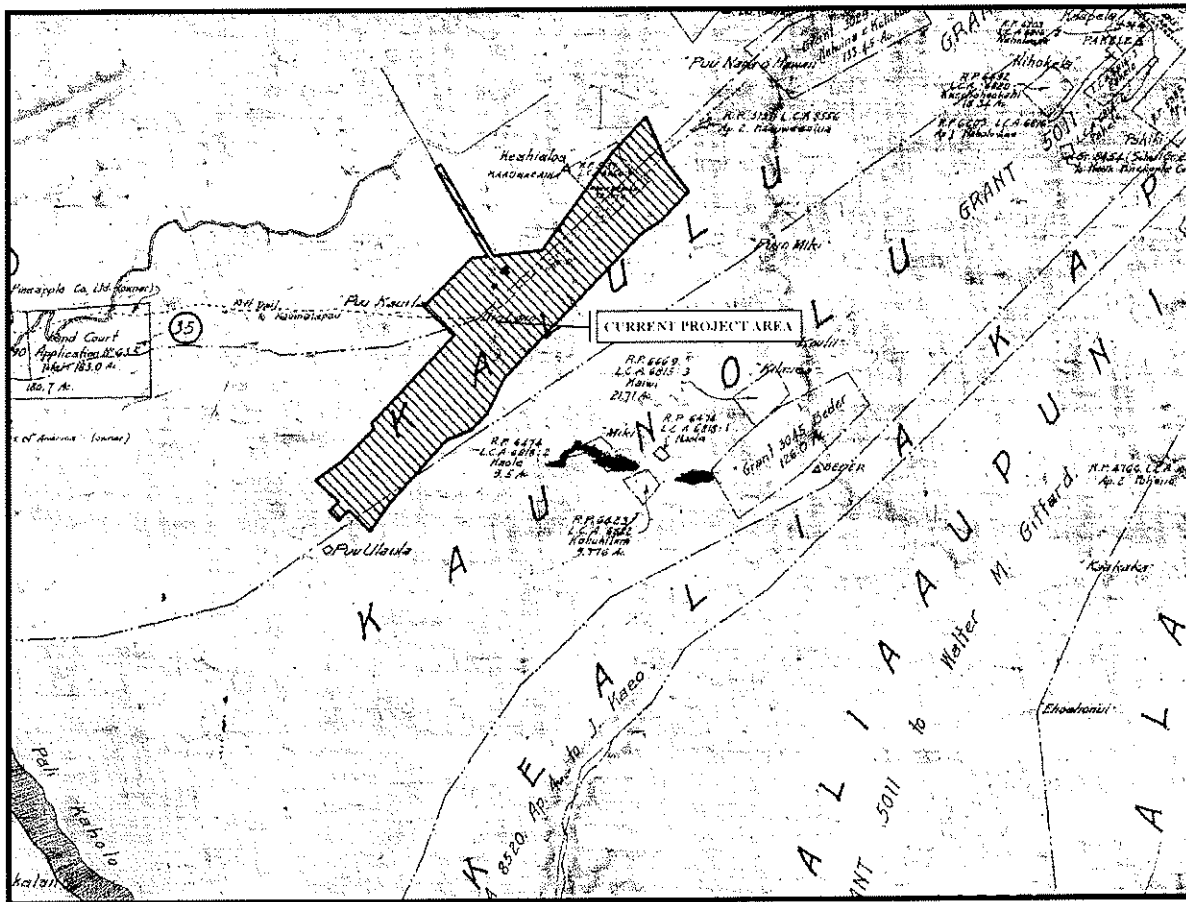


Figure 10. Hawaiian Pineapple Company, Ltd. (1929) survey map showing, place names, areas of Land Commission Awards relative to the current project area.

3.1.3 Early Historic Period

Lāna'i was first seen by Captain James Cook during his voyage to the Sandwich Islands in January and February of 1779. The expedition had returned to the Hawaiian Islands in order to re-supply following many months of mapping the west coast of America (Ellis 1969). William Ellis, Assistant Surgeon to the expedition, noted the first time that the ships *HMS Resolution* and *Discovery* sighted “Aranni” [Lāna’i], as the ships made their way past “Kaaow’ree [Kaho’olawe] nearly adjoining to Mow’wheel” in 1779. It was during this voyage that Ellis went on to describe Lāna’i as an island under the dominion of the king of Maui (Ellis 1969: Vol. 2, 187). An account of a shipwreck on the reef of Lāna’i in the late 1820’s was detailed by an American Navy Lieutenant, Hiram Paulding, when his ship, the U.S.S. *Dolphin*, arrived to aid the survivors of the “Loudon”, a ship out of New York. Paulding’s description of the events stated that the chief of Lāna’i was “encouraging the natives of the island to plunder the Loudon, which carried a large amount of specie and bullion.” The account continued with the Captain of

the U.S.S. *Dolphin*, John Percival, chartering a vessel and saving the treasure with the intervention and aid of Boki, the governor of O'ahu (Paulding 1831).

During the early and middle 1800s, the Hawaiian demography was affected by two dramatic factors: radical depopulation resulting from Western disease; and nucleation around the developing port towns. The traditional Hawaiian population was largely dispersed and, although there were royal centers and areas of more concentrated population, these areas never came close to rivaling the populations of the historic port towns that developed on Hawai'i's shorelines during the 1800s. In this regard, Kuykendall (1938:313) notes that in the period from 1830 to 1854:

The commercial development during this period, by magnifying the importance of a few ports, gave momentum and direction to a townward [sic] drift of population; the population of the kingdom as a whole was steadily going down, but the population of Honolulu, Lahaina and Hilo was growing.

By the 1830's, protestant missionaries sent to the Sandwich Islands from the east coast of America were reporting having established a thriving congregation on Lāna'i. Letters written in 1830 listed 10 schools on Lāna'i Island attended by 506 students. Of these students, the missionaries reported that 206 could read, and 42 could write (Richards 1831).

3.1.4 Mid- to late-1800s

In 1848, the Mahele initiated extreme social, economic, and political changes within traditional Hawaiian culture on all of the islands. The Mahele resulted in the division of lands according to a system of private ownership based on Western legal concepts. In the first phase of this process, Kamehameha III subdivided his lands among the highest *ali'i* (royalty) *konohiki* (chiefs), and some favored *haole* (foreigners). This process of redistribution severed the political and social relationships of the traditional system of land use (Moffatt and Fitzpatrick 1995:11). Following this change, *maka'āinana* (commoners) were then permitted to pursue legal title and ownership to land they had cultivated and inhabited through a Land Commission Award, in addition to the outright purchase of other government lands. At the end of the Mahele, naturalized foreign citizens were given the right to purchase land in Hawai'i. The ultimate result of this decision placed more land in the hands of non-Hawaiians than native Hawaiians between the years of 1850 and 1865 (Moffatt and Fitzpatrick 1995:51). In many cases, the purchases or leases to non-Hawaiians included entire *'ili* (a subdivision of an *ahupua'a*) or *ahupua'a* (land division usually extending from mountain to sea).

The *ahupua'a* of Kamoku, while depicted as Crown Lands on the available maps (see Figure 8), was "omitted" (Interior Department Memos 1860-70s) at the time of the Mahele (1848) and subsequently leased as government lands (ca. 1860) (Hammatt et al. 1988:20). According to the *Buke Kakau Paa* (Buke Mahele 1848), the ledger that contained the recorded division of lands between Kamehameha III, the *ali'i*, and the *konohiki*, the *ahupua'a* of Kalulu and Kaunolū were set aside as government lands (see also Figure 8). By the mid-1800s much of the upper plateau lands of Kamoku and adjacent *ahupua'a* had been become open *pili* grasslands. This is indicated in the native and foreign testimonies given during the mid-1800s as part of the Mahele and Kuleana Acts (see also Table 1).

At a total of seven, there appear to be relatively few LCA records for lands across the uplands of Kamoku, Kalulu, and Kaunolū Ahupua'a near the current project area (see discussion in Section 3.1.2 Traditional Hawaiian Habitation and Subsistence). This scarcity, in the case of Kamoku Ahupua'a, is a possible result of the omission of the *ahupua'a* during the original division of lands. By the mid-1800s much of the upper plateau lands of Kamoku and adjacent *ahupua'a* had been become open *pili* grasslands. This is indicated in the native and foreign testimonies given during the mid-1800s as part of the Mahele and Kuleana Acts.

As previously stated, an additional aspect of the Mahele was the sale of land to naturalized foreigners. These changes in land tenure had a significant impact across the Hawaiian Islands, in particular Lāna'i. As a representative of the Mormon Church in Hawai'i, Gibson leased "Crown Lands" (lands reserved by the Royal Family of Hawaii during the Great Māhele of 1848) from King Kamehameha III, for the raising of sheep and for other agricultural purposes, beginning in 1861. By the end of 1861, the island of Lāna'i, almost in its entirety, was controlled by Walter Murray Gibson through either fee simple title or government lease. The authorities of the Mormon faith, from their Salt Lake, Utah Church, pressed Mr. Gibson to deed his property interests on Lāna'i to the Church, and in 1864, Mr. Gibson was cut off from the Mormon Church for his refusal to comply. His interests in real property involving the *ahupua'a* of Pālāwai, Keālia Aupuni, Keālia Kapu, Pawili, Kamao, Ka'a, and Kaohai were inherited by his daughter, Talula Lucy Hayselden, in 1888 (Tabrah 1976).

3.1.5 1900s

In 1907, 48,460 acres of *ahupua'a* land held by the government, including Kaunolū and Kalulu Ahupua'a, was ceded to Walter M. Giffard (Grant 5011), acting for W.G. Irwin (Munro 2007:21). The lands acquired through W.M. Giffard were exclusive of *kuleana* lands that were within the boundaries of the government lands and the three Royal Patent Grants described above. A portion of the 1929 Wright, Harvey and Wright survey map (Figure 10) of Lāna'i shows that the area in which the current project area lies is a portion of the large grant awarded to Walter M. Giffard (Grant 5011). Soon after, Charles Gay, following the acquisition of the Neuman and Payne land interests on Lāna'i in 1902 and the remaining Hayselden interests in 1903, set his sights on and acquired the Irwin land interests following the transfer of lands in 1907. With the exception of *kuleana* lands, Charles Gay owned nearly all of Lāna'i Island after 1907. From 1907 to 1922, the lands that were consolidated under Gay passed hands and economic ventures several times, finally settling with the Hawaiian Pineapple Company, Limited in 1922 (Munro 2007:24).

A legal battle and a three-year drought forced Charles Gay to sell all of his property on Lāna'i to a consortium of ranchers from Honolulu (Tabrah 1976). Ranching on the island was barely profitable. The Baldwin family, Maui's most famous ranchers, could not find a way to gain a profit from the island. In 1920, the Baldwin-owned Lanai Ranch Company brought 12 Asian chital deer (*Axis axis*) to Lāna'i from Moloka'i, where good hunting ranges had been established for sportsmen (Graf and Nichols 1966). Despite these efforts, ranching was abandoned.

By 1922, with faltering demand for cattle, sheep and deer, the Baldwins sold their holdings on Lāna'i Island to the Hawaiian Pineapple Company. The construction of office buildings, warehouses, shops and dwellings for 250 workers and their families began immediately. By

1927, three thousand acres of the Pālāwai Basin, including the current project area, had been planted in pineapple, the first construction phase to establish Lāna'i City had been finished, and a roadway linking the new piers at Kaumalapau with Lāna'i City had been paved (Freeman 1927). The cultivation of pineapple on Lāna'i had become integral in Hawai'i supplying more than 90 percent of the world output of canned pineapple.

By 1939, the population of Lāna'i was reported at four thousand, with virtually all of the residents working to maintain the fifteen thousand acres of pineapple fields (Mackie 1939). The expansion of the market to accommodate Hawaiian pineapples occurred so rapidly, with so much success, that new machinery was quickly developed to take advantage of the gentle topography of Lāna'i. The long, flat fields (Figure 11 and) could accommodate mechanical harvesters, which operated by straddling rows of pineapple plants, and moving slowly behind men who broke the ripe fruit off their stalks. With this technology, pineapples picked in the morning on Lāna'i, about sixty miles from Honolulu, were canned and ready for shipment by nightfall the same day (McClellan 1939).

3.1.6 Late Historic to Modern Land Use

In 1961, James D. Dole's pineapple lands on the island of Lāna'i was merged with the assets of Castle & Cooke, a prominent Hawai'i-based corporation. World-wide prices for pineapple continued to drop throughout the 1970's as competing countries, most notably Cuba and the Philippines, supplied the market with cheaper pineapple. During the 1980's, Castle & Cooke began a long-term program to phase the island out of pineapple cultivation, and expand tourism on Lāna'i. In 1988, David Murdock, Chairman of Castle & Cooke, Inc., opened a resort hotel and companion championship golf course at Mānele Bay. A second resort hotel and golf course in the uplands of Kō'ele was opened in 1990. The final pineapple harvest and phasing out of all pineapple operations in 1993 (Boyd 1996) marked the end of an era for Lāna'i Island leaving much of the lands that were once in pineapple, including the current project area, open and fallow.

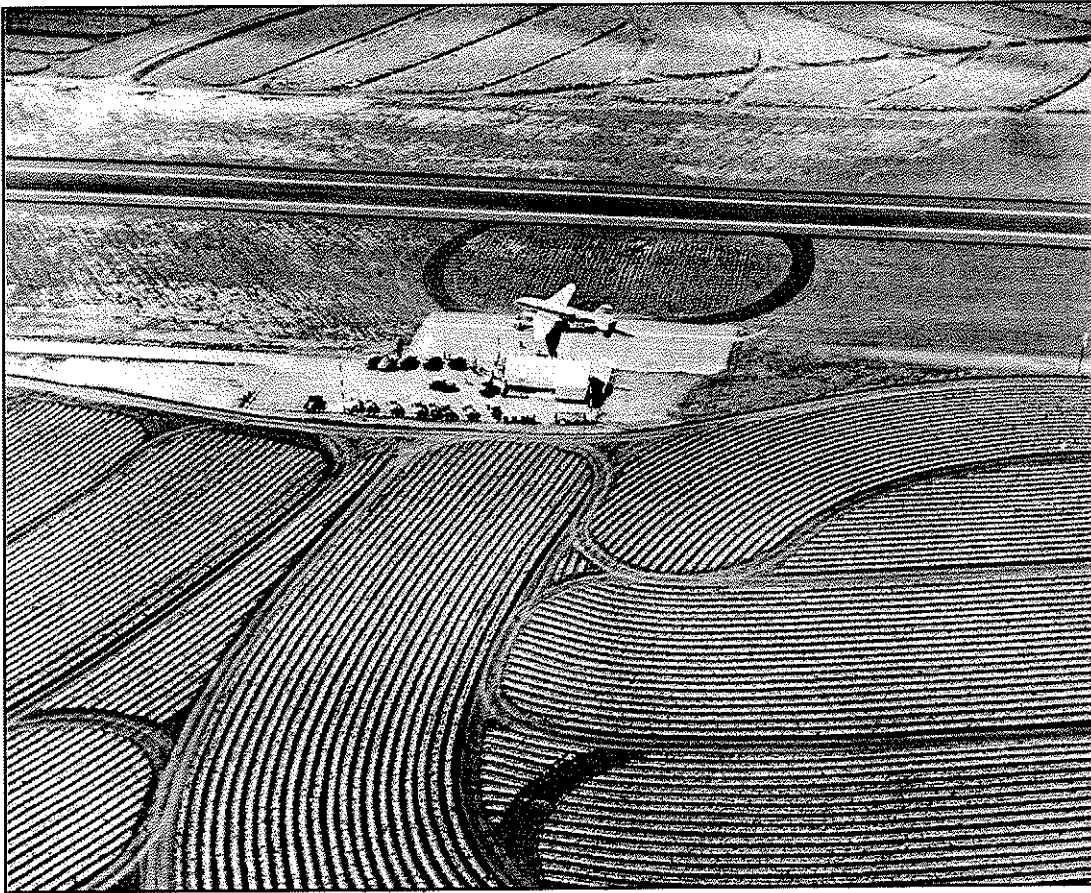


Figure 11. Original Lāna'i Airport circa 1947 (photo courtesy of the Lāna'i Culture & Heritage Center).

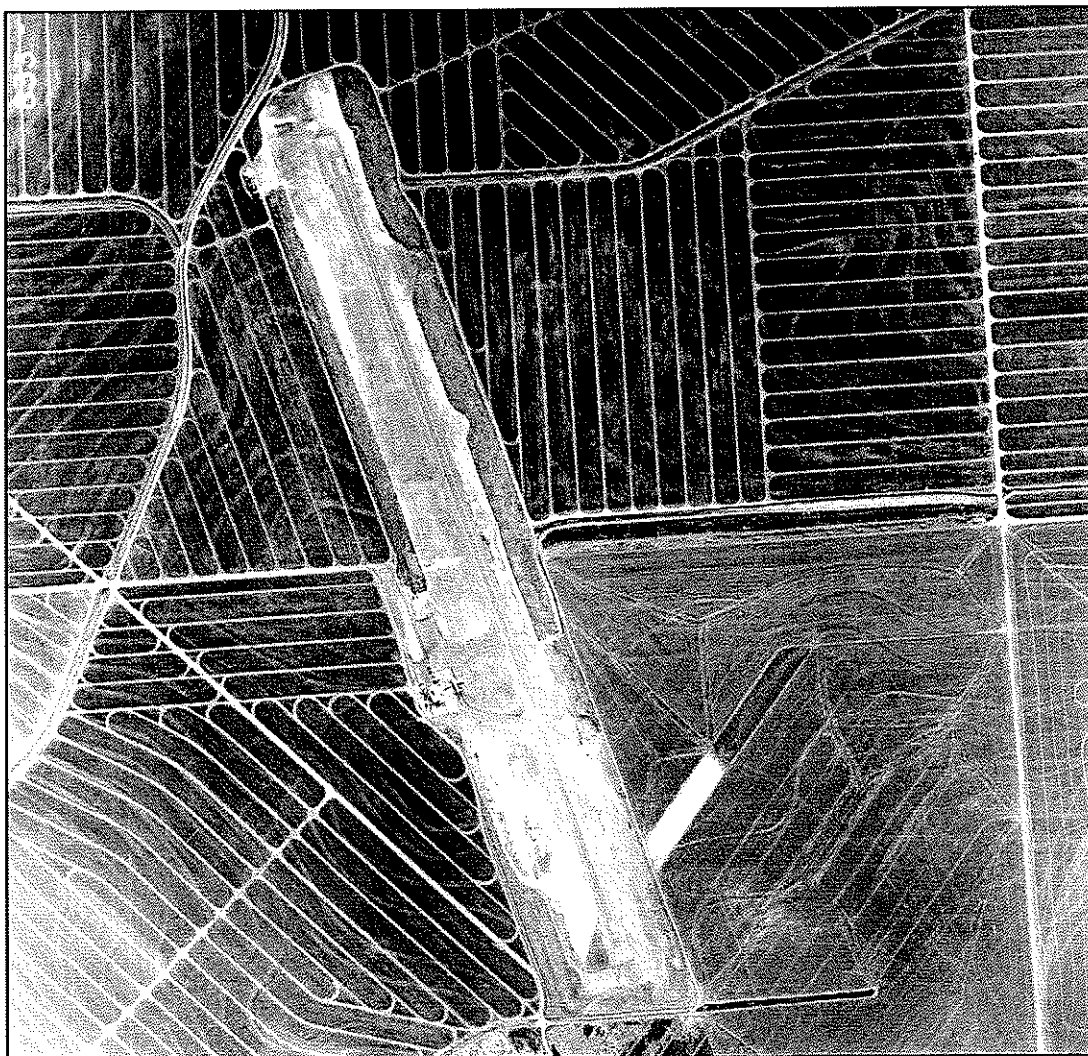


Figure 12. 1953 aerial showing runway for the Lāna'i Airport and surrounding pineapple fields (photo courtesy of the Lāna'i Culture & Heritage Center)

3.2 Previous Archaeological Research

The major archaeological studies pertaining to the *ahupua'a* of Kamoku, Kalulu, Kaunolu and surrounding central basin area were initiated in early work conducted by Emory (1924a and b) and the general survey of Hawai'i State sites by Hommon, (1974). With the exception of the archaeological inventory survey conducted for the Lāna'i Airport (Borthwick et al. 1990), smaller scale studies also occurred within the basin (Ahlo 1985; Dagan 2006; Nagata 1987; Walker and Haun 1987).

The earliest known archaeological work with reference to the project area and central plateau was Kenneth P. Emory's island-wide survey during the 1920's (1924a). Emory identified approximately 74 scattered house sites along the Plateau region, including the rims of both Miki

and Pālawai basins along the same elevation contour as the airport property, as well as describing in detail the sites associated with the abandoned Kaunolu fishing village that was located south on the coast at Kaunolu Bay (Emory 1924a) (Figure 13).

More recent archaeological studies in the vicinity of the Lāna'i Airport was conducted at the then proposed landfill site approximately 1000 feet west of the Lāna'i Airport (Ahlo 1985, Nagata 1987, Walker and Haun 1987) at the head of Kaumalapau Gulch. These studies located eight sites that included four agricultural complexes, three temporary habitation shelters, and a trail marker. Artifacts from test excavations were limited to 17 artifacts which included basalt flakes, midden and shell scrapers. Radiocarbon dates from two of the shelters clustered around 300+/-50 years (Walker and Haun 1987).

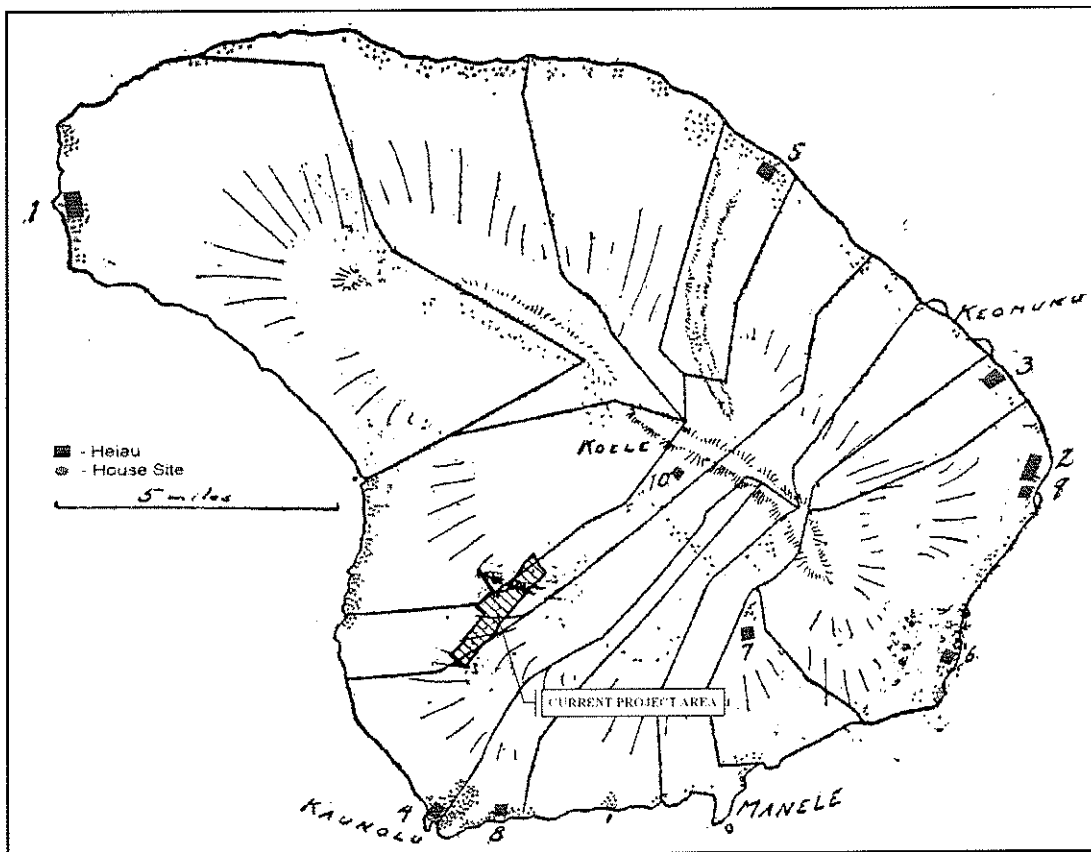


Figure 13. Map of Lāna'i showing *ahupua'a* and the distribution of house sites and *heiau* known to Kenneth Emory in 1921 in relation to the current project area (green dots represent visible house sites, rectangles correspond to *heiau* locations, and the numeric reference ranks the *heiau* [brown rectangles] according to size). (Emory 1924:49)

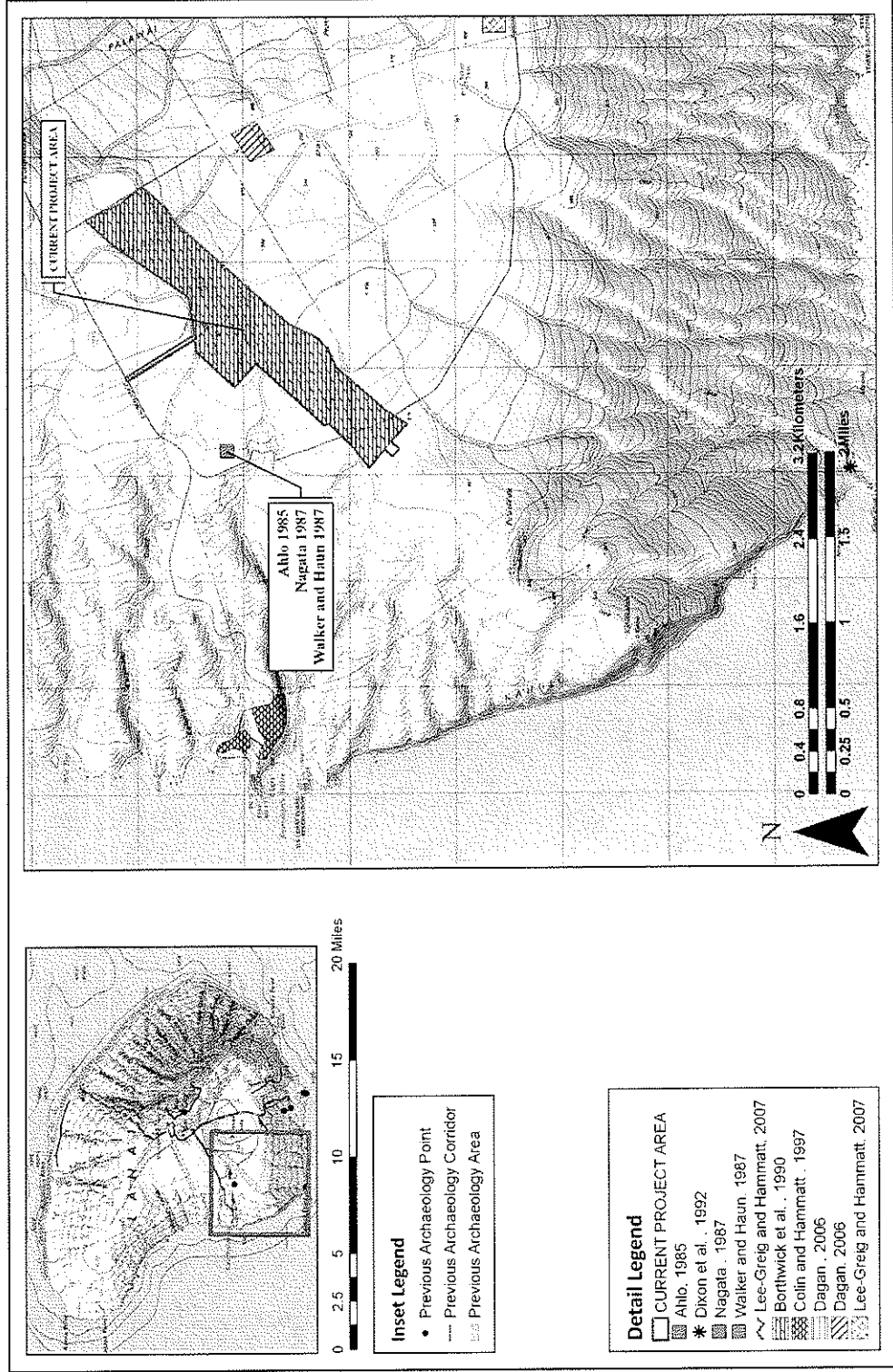


Figure 14. portion of the South Lanai USGS topographic quadrangle showing previous archaeological studies in the vicinity of the project area

An inventory survey was conducted by Colin and Hammatt (1996) north of Kaunalapau Harbor. This study discovered three new historic properties consisting of five structural features. State Site #50-40-98-1938, a terrace, State Site #-1939, a mound, and State Site #-1940, a complex of cement foundations and an enclosure, all believed to be related to harbor activities. No further archaeological investigations were recommended.

Cultural Surveys Hawai'i, Inc. conducted an archaeological inventory survey along the southern rim of Miki Basin in the *ahupua'a* of Keāliaaupuni (Lee-Greig and Hammatt 2008). The survey findings concluded that the area had been continuously modified by pineapple cultivation from 1927 through the end of the pineapple cultivation in 1993. While a single section of cobble stone road was identified and documented within the road access to the project parcel (SIHP 50-40-98-2000), a pedestrian survey and examination of 1,236 bore holes resulted in no significant pre-contact historic properties identified.

Dr. Boyd Dixon and others performed an inventory survey and mapping of State Site #50-40-98-25 an archaeological complex initially recorded by Emory in 1924 and located in the *ahupua'a* of Kaunolū and Kealiakapu. A total of 503 archaeological features were discovered and documented. This area was found to be a fishing village common to others on Lanai with the exception that it appears to have possibly “served as an elite residential community of Maui and perhaps Big Island *ali'i* (royalty), a refuge for local residents, and a possible scene of Makahiki (harvest) festivals” (Dixon et al 1992). The entire complex is in preservation as an interpretive archaeological park.

3.2.1 Archaeological Studies Specific to the Lāna'i Airport

A preliminary on-site assessment was conducted for the Lāna'i Airport Master Plan by the Bishop Museum (Sinoto 1990). This study identified formal artifacts on the surface at two discreet locations (Locality 1 and Locality 2, Sinoto 1990: 4). Surface artifacts included two basalt flakes, a small rectangular adze blank, and basalt fragments; as well as midden and other historic items with recommendations of “further surface collection and test excavations” (Sinoto 1990).

Borthwick and others (1990) performed the follow up archaeological inventory survey and test excavations. Following the recommendation of Sinoto (1990), Borthwick and others located and identified seven locations, including the two that were previously identified by the Bishop Museum, where indigenous Hawaiian artifacts were visible on the surface. Subsequent subsurface testing at these locations encountered a well developed plow zone, a result of mechanical alteration that extended from the surface to a depth of 45cmbs with no significant subsurface archaeological features identified. As a result of the negative findings, the study concluded that any original archaeological context was likely destroyed by decades of commercial agriculture. Lack of findings notwithstanding “on call monitoring,” whereby “(a) qualified archaeological monitor shall be retained on an on-call basis to evaluate any inadvertent archaeological finds, to consult with the State Historic Preservation Office on these finds and any needed mitigation, and to carry-out any approved mitigation scope” was recommended in the event that subsurface features were identified during construction (Borthwick et al. 1990:27; SHPD LOG NO:25657, DOC NO:0007CD35 [Appendix A]).

3.3 Background Summary and Predictive Model

The above review of the cultural historical background and previous archaeological studies illustrates that the pre- and post-contact Hawaiian settlement pattern of this portion of Lāna'i Island likely followed the traditional *mauka-makai* habitation and subsistence distribution model. It is fairly clear that both the coastal environs and upland environs were a focus of habitation with fishing and marine resource exploitation being the primary economy of the former and dryland agricultural pursuits focused on sweet potato cultivation being the primary economy of the latter (see Section 3.1.2 Traditional Hawaiian Habitation and Subsistence). The intermediate or transitional zone of the areas at mid-elevation was likely used for transit between the two areas.

As the current project area is located along the rim of Miki Basin within the upland habitation area that borders the transitional zone, pre-contact Hawaiian features that may be located within the project area may have included remnant structures (e.g. agricultural terraces, house platforms, or agricultural mounds) as observed by Ahlo (1985), Emory (1924a), Nagata (1987), and Walker and Haun (1987) and/or other cultural materials reflective of habitation and/or sweet potato agriculture as observed by Sinoto (1990) (See Section 3.2 Previous Archaeological Research). Later historic-era activities and intensive pineapple cultivation (see Section 3.1.5), however, may have cleared the ground surface of standing architecture, leaving only scattered cultural materials on the surface and/or sub-surface cultural deposits, rather than surface architectural features, as evidence of the pre-contact occupation of the basin. Other types of historic properties within the project area may include facilities and/or features associated with historic-era ranching (e.g. fencelines, corrals, watering areas) or early pineapple cultivation (e.g. irrigation features).

Section 4 Field Inspection Results

On June 12, 2009 Colleen Medeiros Dagan, B.S., escorted by Mr. Alboro – Airport Superintendent, conducted a general field inspection of the proposed locations for the new hangar, driveway extension, Airport Rescue Fire Fighting Station (ARFF), and fuel storage area (see Section 1.1 Project Background for project details). The location of the hangar and fire station will be situated adjacent to new ramp (Figure 15), between the existing roadway and water tank (Figure 16). All of the planned structures for the proposed improvements are located very close to the existing airport.

Overall, the ground surface visibility was excellent. The general surface soils can be characterized as red, silt clay loam with the ubiquitous presence of the black plastic mulch that is typical of pineapple fields throughout. Through the course of the field inspection it became clearly evident that the lands considered for the airport improvements are completely located in former pineapple fields have been completely altered by both intensive pineapple cultivation and the development of the Lāna'i Airport (). No significant intact and/or remnant cultural materials from the precontact or historic era were observed on the surface.

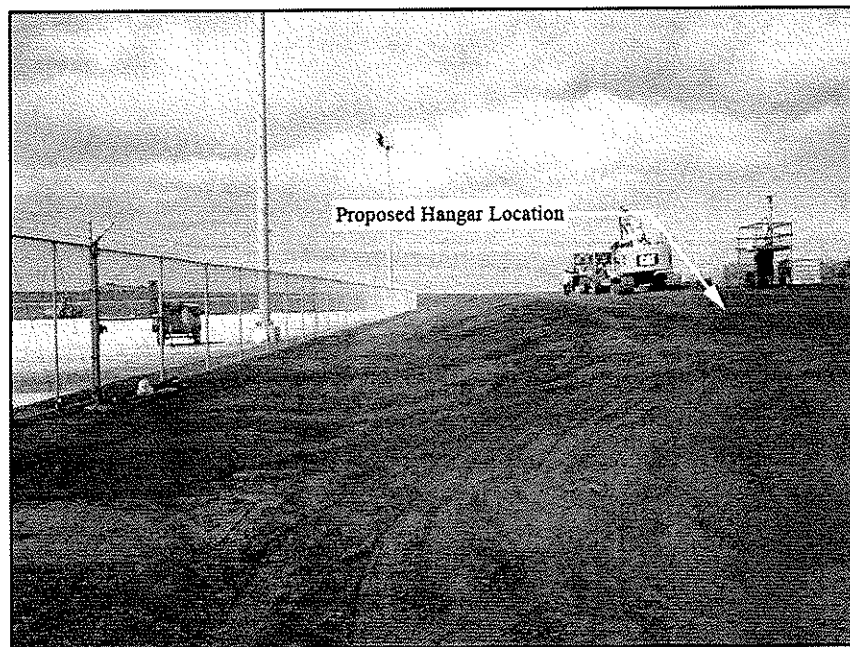


Figure 15. Northwest edge of ramp (left of frame) showing the location for the proposed new hangar (right of frame), view to southwest.

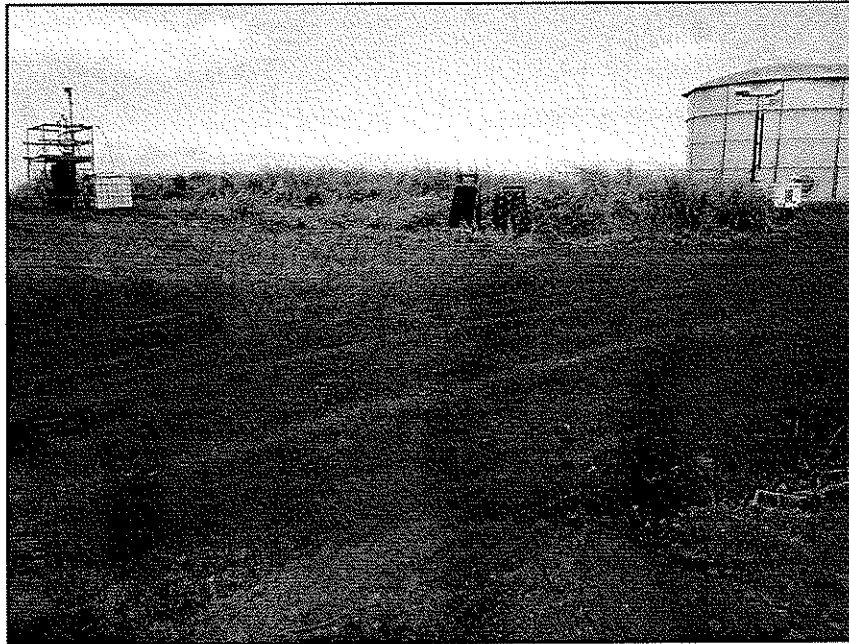


Figure 16. Proposed location for the new ARFF, view to west.



Figure 17. Remnant asphalt foundation from the original airport structure, view to southeast.

Section 5 Summary and Recommendations

It is clear that area in which the Lāna'i Airport property is situated was indeed used for traditional Hawaiian cultivation of sweet potato, gourd and sugarcane during pre-contact times (see Section 3.1.2 Traditional Hawaiian Habitation and Subsistence of the Pālawai and Miki Basin Area). Historical observations by Emory (1924) and LCA information shows that agriculture and habitation settlements occurred on the rim of Miki and Pālawai basins up until the time of the Great Mahele and somewhat sporadically into the early 1920s.

Following the arrival of the pineapple industry on Lāna'i island and the intensification of cultivation across the central plateau and basin area, it appears that commercial agricultural practices have destroyed most of the surface features associated with traditional agriculture and settlement. Additionally, it is apparent that continued improvements to the Lāna'i Airport Operations Area have also significantly altered the ground surface in the immediate area of impact (see Section 4 Field Inspection Results). Extensive ground surface alteration aside, the former presence of the Ili o Lono Heiau within the overall airport property (see Section 3.1.2 and Figure 10) and the presence of former pre-contact habitation along the basin rim may present some potential for encountering subsurface cultural materials. As a result, the following measures are recommended (Table 2):

Table 2. Summary of Potential Effect and Recommendations for the Proposed Actions

Action	Potential Impact	Recommendation
Construction of new above ground fuel tank storage.	No historic properties affected	No further work
Construction of new hangar	No surface historic properties affected, Low potential for encountering intact subsurface cultural deposits	On-call monitoring consistent with recommendations put forth during the development of the Airport Master Plan (Borthwick et al. 1990; Appendix A)
Construction of the new ARFF with related improvements	No surface historic properties affected, Low potential for encountering intact subsurface cultural deposits	On-call monitoring consistent with recommendations put forth during the development of the Airport Master Plan (Borthwick et al. 1990; Appendix A)

Section 6 References Cited

Ahlo, Hamilton M., Jr.

- 1985 *An Archaeological Survey of the Proposed Lāna'i Sanitary Landfill Site, Lāna'i, Hawaii*. Report on file at the Department of Land and Natural Resources State Historic Preservation Division, Kapolei, HI.

Armstrong, Warwick, editor

- 1973 *Atlas of Hawai'i*, University of Hawaii Press, Honolulu, Hawaii.

Borthwick, Douglas F., Rodney Chiogioji, and Hallett H. Hammatt

- 1990 *Archaeological Survey And Testing For The Proposed Lāna'i Airport Expansion*. Prepared for Lanai Company, Inc. Cultural Surveys Hawaii, Inc., Kailua, HI.

Borthwick, Douglas F. and Hallett H. Hammatt

- 1989 Archaeological Reconnaissance Survey of the Proposed Waialua Multi-Family Housing Subdivision (TMK 2nd Div. 4-9-08:12, 13) Lāna'i Island, Hawai'i. Prepared for M and E Pacific. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Boyd, Lawrence W., Jr.

- 1996 The End of Hawaii's Plantations: Back to the Future? *Annals of the American Academy of Political and Social Science* 544:95-110.

Brown, J.F., and M.D. Monsarrat

- 1878 *Lanai Government Survey* [map]. Scale = 1:3000. Hawaiian Government Survey. On file at the State of Hawai'i Survey Office, Honolulu, HI.

Buke Mahele

- 1848 *Buke Kakau Paa no ka mahele aina i Hooholoia iwaena o Kamheameha III a me Na Lii a me Na Konohiki ana*. Hale Alii, Honolulu. Ianuari 1848. On file at the Archives of Hawaii, Honolulu, HI.

Colin, Brian, Hallett H. Hammatt, Ph.D.

- 1996 *Archaeological Inventory Survey and Limited Subsurface Testing of 36 acres, near Kaunalapau Harbor, Kamoku, Lāna'i*. Cultural Surveys Hawaii, Inc., Kailua, HI.

Conley-Kapoi, André and Hallett H. Hammatt

- 2005 *An Archaeological Assessment for a 7.673-Acre Parcel in Kamoku Ahupua'a, Lahaina District, Island of Lāna'i*. Prepared for Castle & Cooke Resorts, LLC. Cultural Surveys Hawai'i, Inc. Wailuku, HI.

Creed, Victoria, Jared Hammatt, and Hallett H. Hammatt

- 2000 *Archaeological Inventory Survey of a 50-acre Hawaiian Home Lands Parcel, Lāna'i Island, Hawai'i*. Prepared for the Townscape, Inc. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Dagan, Colleen

- 2006 *An Archaeological Literature Review & Field Inspection for the Miki Basin Project, Kaunolu Ahupua'a, Lahaina District, Lāna'i Island TMK: (2) 4-9-002:por 001*. Cultural Surveys Hawai'i, Inc. Wailuku, HI.

Dixon, Boyd, Maurice Major, and Darin Lazzaro

- 1992 *Kaunolu: An Archaeological Inventory Survey And Mapping Of State Site 50-40-98-25, Kaunolū And Keāliakapu Ahupua'a, Lāna'i, Hawai'i*. Bernice Pauahi Bishop Museum, Public Archaeology Section Applied Research Group. Honolulu, HI.

Dockall, John, Holly Formolo, and Hallett H. Hammatt

- 2004 *An Archaeological Assessment Survey for a Proposed 2 Million Gallon Water Tank and Access Road, Kamoku, Lāna'i Island, Hawai'i*. Prepared for Castle & Cooke Resorts, LLC. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Ellis, William

- 1963 *Journal of William Ellis*. Advertiser Publishing Company, Honolulu.
- 1969 [1785] *An Authentic Narrative Of A Voyage Performed by Captain Cook and Captain Clerke In His Majesty's Ships Resolution And Discovery During the Years 1776, 1777, 1778, 1779, and 1780; In Search Of A North-West Passage Between the Continents of Asia and America. Including a faithful Account of all their Discoveries, and the unfortunate Death of Captain Cook*. Volume I. Reprint, published by N. Isreal/ Keizersgracht 539/ Amsterdam C. & Da Capo Press, New York.

Emory, Kenneth P.

- 1924a *Island of Lana'i, A Survey of Native Culture*. B.P. Bishop Museum, Bulletin 12, Honolulu.
- 1924b *Village and House Sites Elsewhere than at Kaunolu, Lanai. Notes taken during field work – 1921-1922*. On file at the Bernice Pauahi Bishop Museum, Honolulu, HI.

Foote, Donald E., E. L. Hill, S. Nakamura and F. Stephens

- 1972 *Soil Survey of the Islands of Kaua'i, Oahu, Maui, Moloka'i and Lana'i, State of Hawaii*. U.S. Dept. of Agriculture. U.S. Government Printing Office, Washington D.C.

Fornander, Abraham

- 1919 *The Fornander Collection of Hawaiian Antiquities and Folk-Lore, Volume V: Parts I, II, and III, The Hawaiians' Account of the Formation of their Islands and Origin of their Race, with the Traditions of their Migrations, Etc., Gathered from Original Sources*. Bishop Museum Press, Honolulu.

Freeman, Otis Willard

- 1927 *The Economic Geography of Hawaii*, University of Hawai'i, Research Publications, No. 2, Honolulu.

Giambelluca, T. W., Nullet, D., and T. A. Shroeder

- 1996 *Hawai'i Rainfall Atlas*. Report R76, Hawai'i Division of Water and Land Development. Department of Land and Natural Resources. Honolulu.

Graf, William, and Lyman Nichols Jr.

- 1966 The Axis Deer in Hawaii, article, *Journal of Bombay Natural History Society*, 63:629-734.

Hammatt, Hallett H. and Rodney Chiogioji

1992 *Archaeological Investigations at the Waialua Single-Family Housing Project Area* Lāna'i City, Lahaina District, Lāna'i. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Hammatt, Hallett H. and Douglas F. Borthwick

1988 *Archaeological Investigations at Lālākoa*, Kamoku, Lāna'i (Lālākoa III Subdivision). Prepared for Lanai Co., Inc. Cultural Surveys Hawai'i, Kailua, Hawai'i.

1989 Archaeological Reconnaissance Survey of the Proposed Kō'ele Golf Course, Kō'ele Single Family Housing, Queens Multi-Family, and Waialua Annex Subdivision, Lāna'i Island, Hawai'i. Cultural Surveys Hawai'i, Kailua, Hawai'i.

1993 *Archaeological Inventory Survey for a Proposed Kō'ele Waste Water Treatment Project*, Kamoku, Lāna'i. Prepared for Lanai Company. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Hammatt, Hallett H., Douglas F. Borthwick, David Shideler and Kirstie Nakamura

1988 *Archaeological Investigations of the Ranching Era at Koele*, Lāna'i, Report prepared for M and E Pacific. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Hammatt, Hallett H., and David Shideler

2004 *Archaeological Inventory Survey of the Lower West Slope of Niniwai Hill*, Lāna'i. Prepared for Castle & Cooke Resorts, LLC. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Handy, E.S. Craighill, Elizabeth G. Handy, and Mary K. Pukui

1991 *Native Planters in Old Hawaii Their Life, Lore, and Environment*. Bernice P. Bishop Museum Bulletin 233, Revised Edition. Bishop Museum Presses, Honolulu, HI.

Hawaii Department of Survey – Bureau of Government Surveying

1903 Report of the Survey to the Governor of the Territory of Hawaii for the Year Ending June 30, 1902. The Hawaiian Gazette Co. Honolulu, HI.

Hawaiian Pineapple Company, Limited

1929 *Supplementary Map Plans and Descriptions of Exclusions-Land Court Application No 862 (amended), Island of Lanai, T.H.* [map]. Scale = 1:2000. On file at the State of Hawaii Survey Office, Honolulu, HI.

Kalākaua, King David

1888 *Hawaii. The Fables and Folk-lore of a Strange People*. Charles L. Webster & Company, New York.

Kamakau, Samuel Manaiakalani

1992 *Ruling Chiefs of Hawai'i*. Revised. Kamehameha Schools/ Bishop Estate. Honolulu, HI.

Kuykendall, Ralph Simpson

1938 *The Hawaiian Kingdom, Volume 1, 1778-1854, Foundation and Transformation*. University of Hawai'i Press. Honolulu, HI.

Lāna'i Culture & Heritage Center

2009 Lāna'i Māhele Documents, accessed through the Lāna'i Culture and Heritage Center website, with translations by executive director Kepā Maly, at www.LanaiCHC.org.

Lee-Greig, Tanya, and Hallett H. Hammatt

2008 *An Archaeological Inventory Survey for the Lāna'i Photovoltaic Project Keāliaaupuni and Pawili Ahupua'a, Lāhaina District, Lāna'i Island TMK: (2) 4-9-002:001 por.* Prepared for Castle & Cooke Resorts, LLC. Cultural Surveys Hawaii, Inc., Wailuku, HI.

Macdonald, Gordon A., Agatin T. Abbott and Frank L. Peterson

1983 *Volcanoes in the Sea The Geology of Hawaii*. Second Edition. University of Hawaii Press, Honolulu, HI.

Mackie, Marshall

1939 "Lanai, the Hawaiian Pineapple Island", article, *Paradise of the Pacific, Hawaii's Illustrated Monthly Magazine*, Vol. 51, No. 12.

Maly, Kepa and Onaona Maly

2009 *Island of Lāna'i: Surveys and Proceedings of the Boundary Commission in the Years 1876 to 1891*. Kumu Pono Associates LLC., Lāna'i City, HI.

McClellan, Edwin North

1939 "Fruit of All Fruits the First", article, *Paradise of the Pacific, Hawaii's Illustrated Monthly Magazine*, Vol. 51, No. 12.

Moffat, Riley M. and Gary L. Fitzpatrick

1995 *Surveying the Mahele, Mapping the Hawaiian Land Revolution*. Palapala'aina, Volume 2. Editions Limited, Honolulu, HI.

Munro, George C.

2007 *The Story of Lāna'i*. Native Books, Honolulu, HI.

Nagata, R. H.

1987 *Inspection Report and Recommendations, Proposed Lāna'i Sanitary Landfill, Kaumalapau, Lahaina, Island of Lāna'i, TMK: 4-9-02: portion of 1*. DLNR, Division of State Parks, Honolulu.

Park Engineering, Aries Consultants Ltd. And Y. Ebisu & Associates, Inc.

1991 Final Environmental Impact Statement: Lanai Airport Master Plan Improvements, Lanai Airport, Lanai, Hawaii. Prepared for the State of Hawaii Department of Transportation Airports Division and the Federal Aviation Administration. Document online at the State of Hawaii Office of Environmental Quality Control. (http://oeqc.doh.hawaii.gov/default.aspx?RootFolder=/Shared%20Documents/EA_and_EIS_Online_Library&View={F4E3E6A9-2607-49FC-B7A5-2928B79F10B4})

Paulding, Hiram

1831 *Journal of a Cruise of the United States Schooner Dolphin Among the Islands of the Pacific Ocean*. G&C&H, Carvill, New York.

Pratt, Linda W and Samuel M. Gon III

1998 Terrestrial Ecosystems. In *Atlas of Hawaii*, Third Edition edited by Sonia P. Juvik and James O. Juvik, pp. 121-129. University of Hawai'i Press, Honolulu.

Pukui, Mary Kawena, Samuel H. Elbert and Esther Mookini

1974 *Place Names of Hawaii*, University of Hawai'i Press, Honolulu, HI.

Richards, Reverend William

1831 *Letter from William Richards Dated October 2, 1830, as published in the Missionary Herald, Vol. XXVII (27), For The Year 1831, by the American Board of Commissioners for Foreign Missions*. Crocker and Brewster, Boston.

Sinoto, Aki

1989 *Lanai Airport Surface Assessment Report*. Bernice Pauahi Bishop Museum, Public Archaeology Section Applied Research Group. Honolulu, HI.

Tabrah, Ruth

1976 *Lanai*. The Hawaiian Bicentennial Library, published by Island Heritage Limited, Norfolk Island, Australia.

U.S. Department of Agriculture, Natural Resources Conservation Service

2000 *Soil Survey Geographic (SSURGO) database for Island of Maui, Hawaii (hi980)*. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. <<http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/>> (last accessed September 2005)

U.S. Senate Committee on Pacific Islands and Porto Rico

1903 *Hawaiian Investigation Part 3: Exhibits, Memorials, Petitions, and Letters*. To accompany Senate Resolution No. 260, First Session Fifty-Seventh Congress, of Date June 28, 1902, Authorizing and Directing the Committee on Pacific Islands and Porto Rico to Investigate the General Conditions of the Islands of Hawaii, and the Administration of the Affairs Thereof. Government Printing Office. Washington D.C.

Walker, Alan T. and Alan E. Haun

1987 *Archaeological Reconnaissance Survey and Limited Data Recovery Excavations Proposed Sanitary Landfill Site. Land of Kamoku, Lahaina District, Island of Lanai (TMK: 4-9-02: por. 1)*. Paul H. Rosendahl Ph. D. Hilo, Hawaii

Appendix A SHPD Section 106 Review for the Lāna'i Airport Master Plan

LOG NO: 25957; DOC NO: 0007CD35

BENJAMIN J. CAYetano
GOVERNOR OF HAWAII



2057
TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JANET E. KANELO

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kaeulihewa Building, Room 555
401 Kamohiwi Boulevard
Honolulu, Hawaii 96813

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES
ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

August 8, 2000

Mr. Jerry M. Matsuda, P.E.
Airports Administrator
Department of Transportation, Airports Division
Honolulu International Airport
400 Rodgers Boulevard, Suite 700
Honolulu, Hawaii 96819-1880

LOG NO: 25957 ✓
DOC NO: 0007CD35

Dear Mr. Matsuda,

**SUBJECT: National Historic Preservation Act Section 106 Review of the
Draft Environmental Assessment for Lana'i Airport Master Plan
(State Project No. AM4011-02)
Kalulu Ahupua'a, Lahaina District, Island of Lana'i
TMK: 4-9-02:001, 041, 055, & 056**

Thank you for the opportunity to review the Draft Environmental Assessment (EA) for the Lana'i Airport Master Plan.

From the submitted Draft EA, we understand the proposed undertaking consists of the following:
The extension of Runway 21 to the northeast 2000ft (to a total of 7000ft);
Construction of a 1000 x 500ft Runway Safety Area (RSA) beyond both ends of the extended runway, as well as a 1000 x 800ft Runway Obstacle Free Area (ROFA);
Construction of a parallel taxiway;
Construction of two new holding aprons at both ends of the runway;
Construction of 25ft wide paved stabilized shoulders will be provided for the runway;
Construction of 20ft wide paved stabilized shoulders will be provided for the parallel and entry/exit taxiways;
Navigational aids and upgrades to the water and sewage systems
Expansion of the passenger terminal building and automobile parking facilities.

We have previously commented on a proposed undertaking which involves the subject parcels (SHPD DOC NO: 1320a/1703). At that time we stated an archaeological inventory survey had

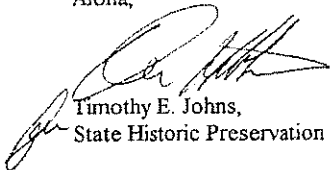
Mr. Matsuda
Page Two

been completed of the subject property by Cultural Surveys Hawaii. The report documenting the findings of the survey (Borthwick et al. 1990) had been reviewed and accepted by this office. No significant historic sites were identified during this survey. Therefore, we believe "no historic properties will be affected" by the proposed undertaking.

However, the consulting archaeologists recommended "on-call" monitoring if historic sites were encountered during construction activities. We concur with this recommendation. Therefore we recommend the following condition be attached to all permits associated with the proposed undertaking, should they be approved:

- 1) A qualified archaeological monitor shall be retained on an on-call basis to evaluate any inadvertent archaeological finds, to consult with the State Historic Preservation Office on these finds and any needed mitigation, and to carry-out any approved mitigation scope.

Aloha,



Timothy E. Johns,
State Historic Preservation Officer

CD:an

APPENDIX D.

Cultural Impact Assessment

Cultural Impact Assessment
**For the Lāna‘i Airport Improvements Project in Kamoku,
Kalulu and Kaunolu Ahupua‘a, Lahaina**
District, Island of Lāna‘i
TMK: (2) 4-9-002:041

Prepared for
Munekiyo & Hiraga, Inc.

DRAFT

Prepared by
Colleen P. Medeiros Dagan, B.S.
Tanya Lee-Greig, M.A.
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.
Wailuku, Hawai‘i
(Kamoku 2)
August 2009

O‘ahu Office
P.O. Box 1114
Kailua, Hawai‘i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
16 S. Market Street, Suite 2N
Wailuku, Hawai‘i 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Acknowledgments

Cultural Surveys Hawai'i (CSH) would like to extend our thanks and gratitude to the people who have contributed their time and personal knowledge to this study. Without the assistance of many people, this study would not have been possible. Many thanks go out to Mrs. Maggie Masicampo and Mrs. Yvonne Alboro who run the Lāna'i Senior Center. In addition to shuttling CSH researchers to and from the small boat harbor, both ladies were instrumental in referring the researchers to knowledgeable *kūpuna* and organizing formal interviews. Aloha to Mr. Kepa Maly of the Lāna'i Culture and Heritage Center. Mr. Maly's compilation of a tremendous amount of research and literature specifically about Lāna'i, was heavily utilized and is referenced throughout this report. Mahalo to the Maui County Cultural Resource Commission for their continued support of the CIA process. CSH would like to extend a very special *mahalo* to each *kūpuna* who participated in this study: Aunty Pua Paoa, Mr. Gary Onuma, Mr. Robert Hera, Aunty Irene Perry, Aunty Lei Kanipai and Mr. Noboru "Squeaky" Oyama have the researcher's greatest respect and abundant gratitude for sharing her memories and *kōkua* with CSH and the public, *mahalo nui*.

Management Summary

Reference	Cultural Impact Assessment for the Lāna'i Airport Improvements Project, Kamoku, Kalulu, and Kaunolu Ahupua'a, Lahaina District, Lāna'i Island, TMK: (2) 4-9-002:041 (Dagan, Lee-Greig and Hammatt 2009)
Date	August 2009 (DRAFT)
Project Number (s)	CSH Job Code: KAMOKU 2
Project Location	Lāna'i Island, Lāhainā District, Kamoku, Kalulu, and Kaunolu Ahupua'a, Lahaina District, Lāna'i Island, TMK: (2) 4-9-002:04, as depicted on the South Lāna'i USGS 7.5-minute topographic quadrangle (1998).
Land Jurisdiction	<p>Land Owner: Government – State of Hawai'i Department of Transportation – Airports Division (HDOT-A)</p> <p>Project Proponent: Government – State of Hawai'i Department of Transportation – Airports Division (HDOT-A) Private – Castle & Cooke Resorts, LLC. (C&C Resorts, LLC)</p>
Agencies	<p>State of Hawai'i Department of Transportation – Airports Division (HDOT)</p> <p>State of Hawaii, Office of Environmental Quality Control</p>
Project Description	<p>The proposed project will involve two separate actions:</p> <ol style="list-style-type: none"> 1. HDOT-A is proposing to construction a new single story, 74'4" by 82' Airport Rescue Fire Fighting Station with related improvements (driveway extension for access and utility extension) located to the southeast of the existing cargo building. 2. C&C Resorts, LLC is proposing an approximate 25,200 sq.ft. hangar and the installation of two above ground 15,000 gal. Jet A fuel tanks and a single above ground 3,000 gal aviation gas tank.

Area of Potential Effect (APE)	<p>While the Lāna'i Airport encompasses an approximate area of 93 acres total, the APE includes the footprint of the proposed actions above and comprises four discreet locations (see):</p> <ol style="list-style-type: none"> 1. The proposed location for the new approximate 25,200 sq. ft. hangar 2. The proposed driveway extension to located between the new hangar and the new ARFF 3. The proposed location for the new approximate 6,100 sq. ft. ARFF 4. The proposed location for the new fuel storage area <p>In this study, the APE will be referred to as the "project area".</p>
The region of influence (ROI), hereafter referred to as the "study area".	<p>The study area will focus on the <i>ahupua'a</i> of Kalulu and pertinent research of Kamoku and Kaunolu Ahupua'a has been included. Discussions referencing settlements in Pālāwai and Miki basins are included.</p>
Document Purpose	<p>This cultural impact assessment (CIA) study has been prepared to support the project's Hawai'i state environmental review, per the guidelines of the Hawai'i State Department of Health's Office of Environmental Quality Control "<i>Guidelines for Assessing Cultural Impacts</i>", further evaluates the project's potential impacts to cultural resources.</p>
Fieldwork Effort	<p>Site visit conducted by Colleen Medeiros Dagan, B.S. on June 12, 2009.</p>
Recommendation	<p>While no known traditional cultural practices currently take place in the project area, traditional cultural practices took place in the area prior to 1920. For that reason, potential cultural concerns should be considered in the event that there is an effort to revive such practices.</p> <p>It is recommended that the project implement the precautionary measures and archaeological monitoring procedure outlined in the companion archaeological field inspection and literature review report prepared by Cultural Surveys Hawai'i for the Lāna'i Airport Improvements project.</p>

Table of Contents

Acknowledgments	i
Management Summary	ii
Section 1 Introduction	1
1.1 PROJECT BACKGROUND	1
1.2 SCOPE OF WORK	5
1.3 ENVIRONMENTAL SETTING	5
1.3.1 Natural Environment.....	5
1.3.2 Built Environment	6
Section 2 Methods	8
2.1 DOCUMENT REVIEW AND RESEARCH	8
2.2 SCOPING AND COMMUNITY OUTREACH	8
2.2.1 Government Agencies, Advisory Councils and Local Community Organizations	8
Section 3 Background Research	10
3.1 TRADITIONAL HISTORICAL BACKGROUND.....	10
3.1.1 Mythological and Traditional Accounts	10
3.1.2 Traditional Hawaiian Habitation and Subsistence of the Pālawai and Miki Basin Area	13
3.1.3 Early Historic Period	17
3.1.4 Mid- to late-1800s.....	18
3.1.5 1900s.....	19
3.1.6 Late Historic to Modern Land Use	20
Section 4 Archaeological Research	23
4.1.1 Archaeological Studies Specific to the Lāna'i Airport	26
Section 5 Community Consultations	27
Section 6 Summaries of Kama'āina Interviews.....	29
6.1 INFORMAL INTERVIEWS AND CONSULTATION.....	29
6.1.1 Mr. Gary Onuma.....	29
6.1.2 Mr. Robert Hera.....	29
6.1.3 Mr. Kepa Maly.....	30
6.2 FORMAL MEETING ATTENDED.....	30
6.2.1 Maui County Cultural Resource Commission (CCRC), June 4, 2009.....	30
6.3 FORMAL INTERVIEW	31
6.3.1 Aunty Irene (Cockett) Perry	31
Section 7 Traditional Cultural Practices.....	33
7.1 AGRICULTURAL PRACTICES	33
7.2 ILI O LONO HEIAU	34
7.3 TRAILS AND TRADITIONAL ACCESS ROUTES.....	35
7.4 SUBSISTENCE HUNTING PRACTICES	35

Section 8 Summary and Recommendations	36
8.1 RECOMMENDATIONS.....	36
Section 9 References.....	37
Appendix A Guidelines for Assessing Cultural Impacts from the State of Hawaii Office of Environmental Quality Control	43
Appendix B Formal Letters of Response	50
Appendix C Authorization and Release Form	55
Appendix D Formal Interview Transcription	57

List of Figures

Figure 1. A portion of TMK (2) 4-09-002 showing location of project area (delineated with red diagonal hatching).....	2
Figure 2. A portion of the 1998 South Lānaʻi 7.5-minute USGS topographic quadrangle with project location in black cross-hatch.....	3
Figure 3. Overall site plan for the proposed improvements to the Lānaʻi Airport (courtesy of Munekiyo & Hiraga, Inc. – red shading added).....	4
Figure 4. Existing ARFF at the Lānaʻi Airport, view to north	6
Figure 5. Eastern end of cargo bay at Lānaʻi Airport, view to north.....	7
Figure 6. Runway apron extension from east corner, view to west.....	7
Figure 7. A portion of the J. F. Brown and M. D. Monsarrat map (1878) showing Kamoku, Kalulu, and Kaunolu Ahupuaʻa, as a traditional land division of the island of Lānaʻi, current project area in black cross-hatch, area noted as potato patch circled in red.....	11
Figure 8. A portion of the Map of Lānaʻi showing <i>ahupuaʻa</i> divisions and place names with numbered locations as gathered by Kenneth Emory (Emory 1924a: Plate 1), highlighted place name locations near the project area indicate areas of settlement noted along the rim of the “great basin”.	15
Figure 9. Hawaiian Pineapple Company, Ltd. (1929) survey map showing, place names, areas of Land Commission Awards relative to the current project area.....	17
Figure 10. Original Lānaʻi Airport circa 1947 (photo courtesy of the Lānaʻi Culture & Heritage Center).....	21
Figure 11. 1953 aerial showing runway for the Lānaʻi Airport and surrounding pineapple fields (photo courtesy of the Lānaʻi Culture & Heritage Center).....	22
Figure 12. Map of Lānaʻi showing <i>ahupuaʻa</i> and the distribution of house sites and <i>heiau</i> known to Kenneth Emory in 1921 in relation to the current project area (green dots represent visible house sites, rectangles correspond to <i>heiau</i> locations, and the numeric reference ranks the <i>heiau</i> [brown rectangles] according to size). (Emory 1924a:49).....	24
Figure 13. A Portion of the South Lānaʻi 7.5-minute U.S.G.S. topographic quadrangle showing the locations of archaeological investigations and current project area.	25

List of Tables

Table 1. Place Names Near Study Area.....12

Table 2 Summary of Land Commission Awards (LCAs) identified within the upland areas of
 Kamoku, Kalulu, and Kaunolū Ahupua‘a (Lāna‘i Culture and Heritage Center 2009)...16

Table 3. Community Contacts27

Section 1 Introduction

1.1 Project Background

At the request of Munekiyo & Hiraga, Inc., Cultural Surveys Hawai'i, Inc. (CSH) conducted a cultural impact assessment for the proposed airport improvements located in Kamoku, Kalulu, and Kaunolu Ahupua'a, Lahaina District, Lāna'i Island, TMK: (2) 4-9-002:041 (Figure 1 and Figure 2).

The State of Hawai'i Department of Transportation – Airports Division (HDOT-A) and Castle & Cooke Resorts, LLC. (C&C Resorts, LLC) are proposing the following improvements at the Lāna'i Airport (Figure 3):

1. HDOT-A is proposing to construction a new single story, 74'4" by 82' Airport Rescue Fire Fighting Station with related improvements (driveway extension for access and utility extension) located to the southeast of the existing cargo building.
2. C&C Resorts, LLC is proposing an approximate 25,200 sq.ft. hangar and the installation of two above ground 15,000 gal. Jet A fuel tanks and a single above ground 3,000 gal aviation gas tank.

While the Lāna'i Airport encompasses an approximate area of 93 acres total, this cultural impact assessment focused on traditional cultural practices of the *ahupua'a* airport property touches, focusing on Kalulu Ahupua'a. This far reaching study area is considered appropriate due to the interconnected settlement and use of these upland areas. Throughout the consultation process, contacts referred to settlements at Pālāwai Basin and Miki Basin. Although outside of the actual *ahupua'a* that the airport property touches, in current memories, these are the closest settlements individuals can recall. The cultural impact assessment has been conducted per the State of Hawai'i Environmental Regulations.

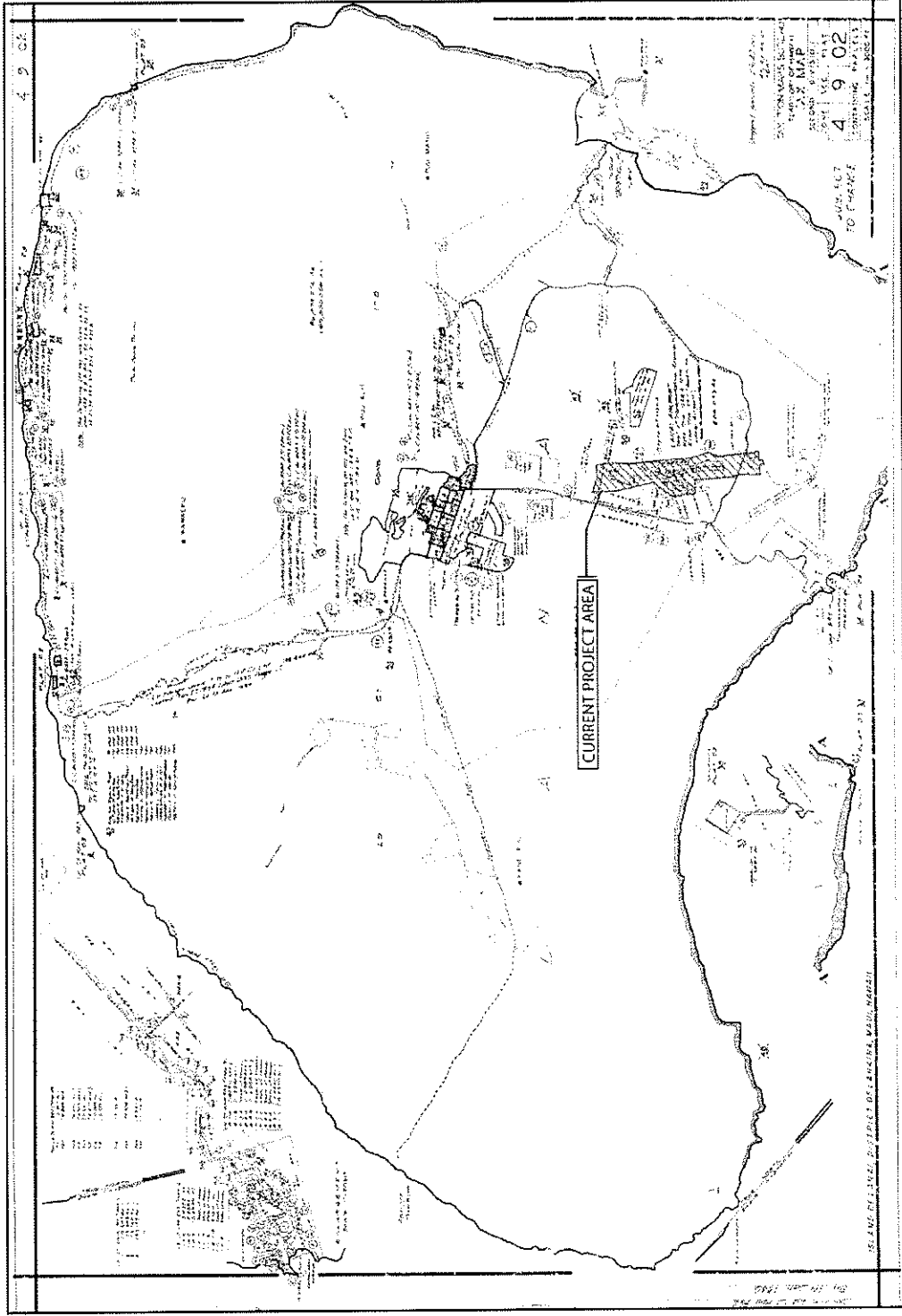


Figure 1. A portion of TMK (2) 4-09-002 showing location of project area (delineated with red diagonal hatching)

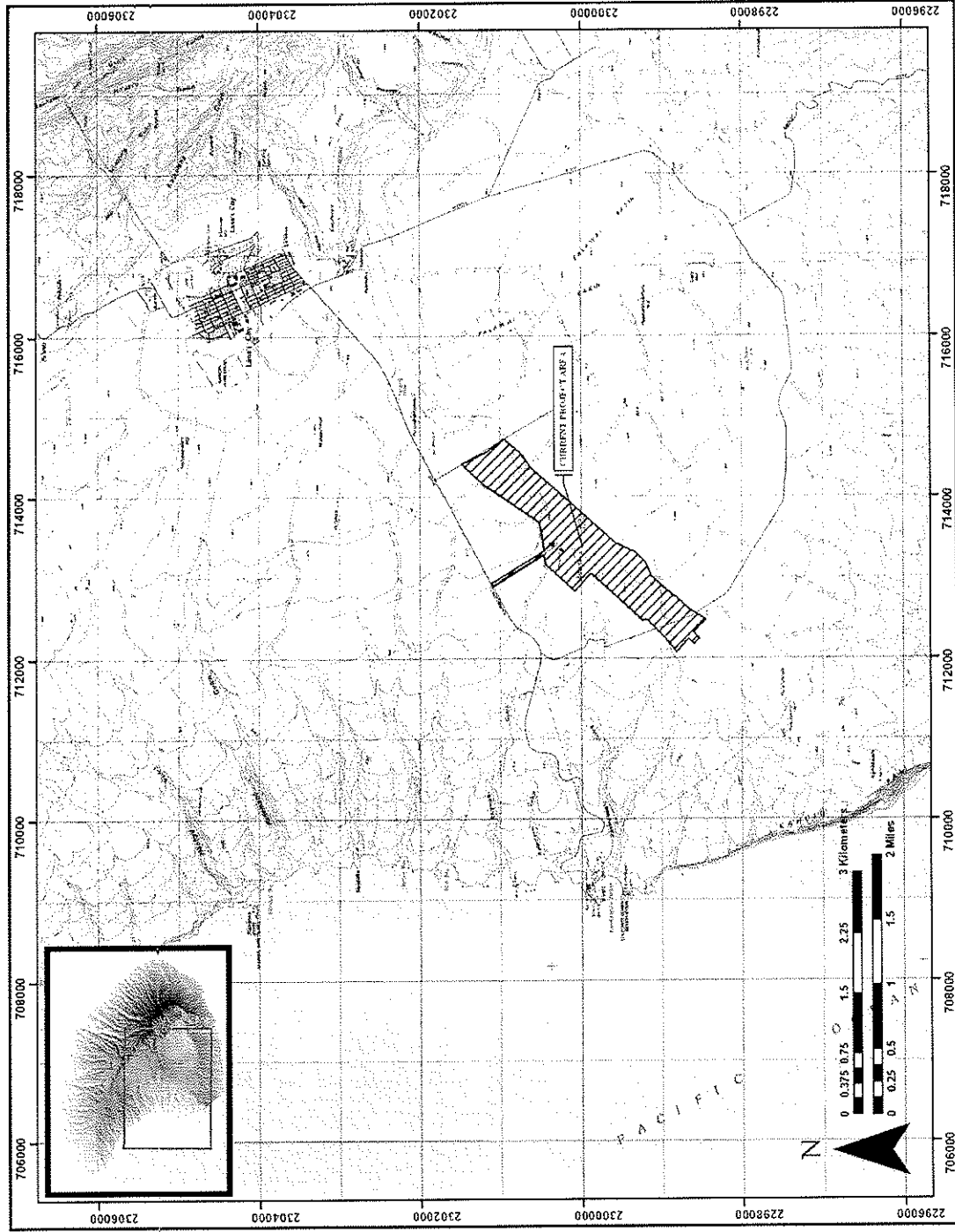


Figure 2. A portion of the 1998 South Lāna 7.5-minute USGS topographic quadrangle with project location in black cross-hatch

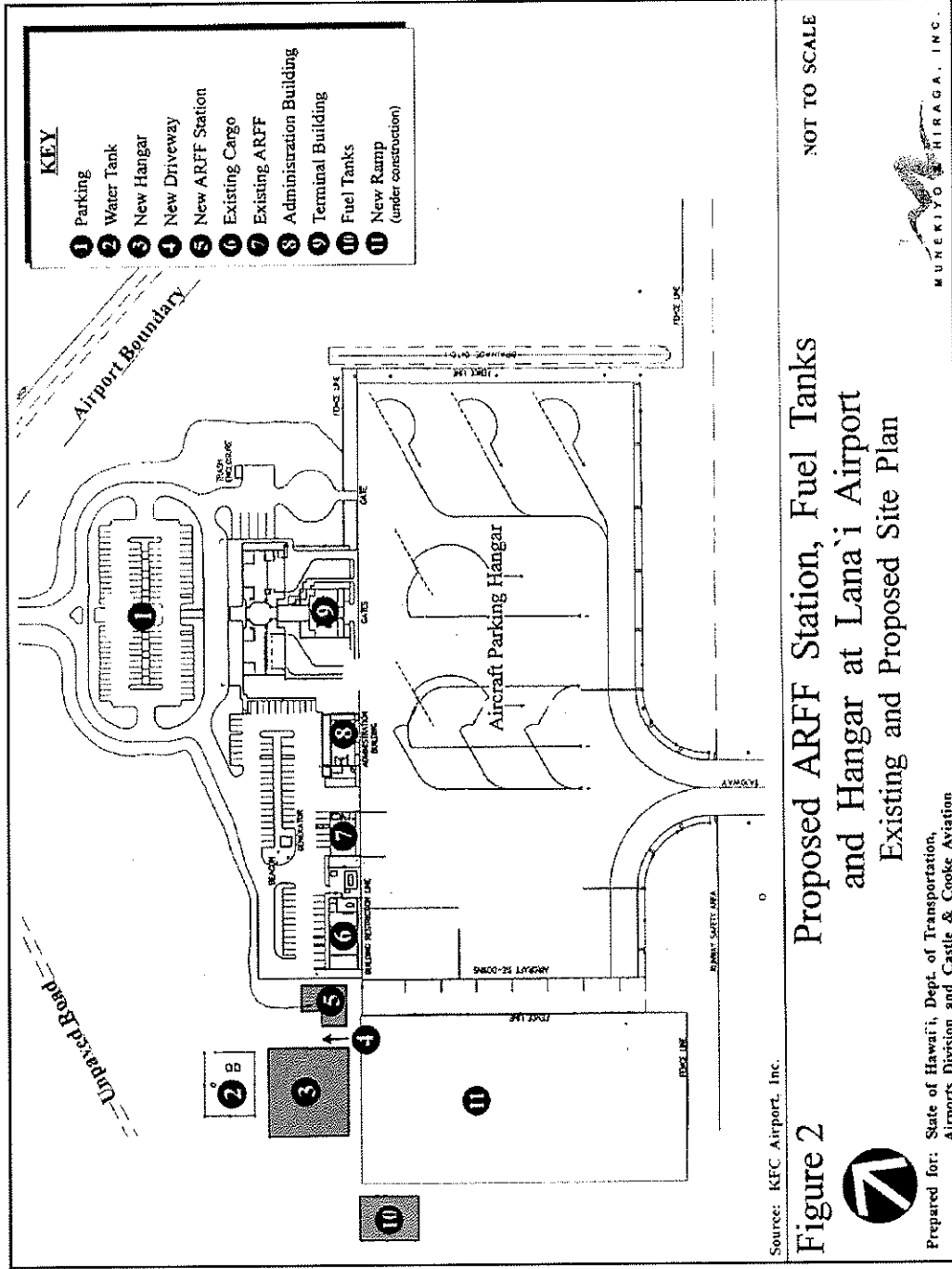


Figure 3. Overall site plan for the proposed improvements to the Lana'i Airport (courtesy of Munekiyo & Hiraga, Inc. - red shading added)

1.2 Scope of Work

The scope for the cultural impact assessment is summarized as follows:

1. Examination of historical documents, Land Commission Awards, historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plants, animal and other resources or agricultural pursuits as may be indicated in the historic record.
2. A review of the existing archaeological information pertaining to archaeological sited within the study area to reconstruct traditional land use activities and to identify and describe the cultural resources, practices, and beliefs associated with the parcel and identify present uses, if appropriate.
3. Interviews with persons knowledgeable about the past and present cultural practices in the project area and its surrounding area. We anticipate both formal and informal interviews.
4. Preparation of a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed undertaking on the cultural practices and features identified.

1.3 Environmental Setting

1.3.1 Natural Environment

At an elevation between approximately 350 meters to 400 meters (1148 ft to 1312 ft) above mean sea level (AMSL), the lands that comprise the Lāna'i Airport are located along the edge and within the nearly filled pit crater of Miki Basin (Macdonald et al. 1983:405) on fairly flat to gently sloping topography. The general soils for this locality are of the Molokai-Lahaina association and consist of deep, nearly level to moderately steep, well drained soils on uplands (Foote et al. 1972: General Soil Map). More specifically, the soils within the project area are classified as Molokai Silty Clay Loam 0-3% slopes (MuA), Molokai Silty Clay Loam 3-7% slopes (MuB), and Uwala Silty Clay Loam (UwB). MuA soils are found on smooth slopes and have a moderate permeability rate with a slow runoff and slight erosion hazard (Foote et al. 1972:96). At the time of the 1972 USDA soil survey, MuA soils were used entirely for pineapple on the island of Lāna'i. MuB are generally similar to that of MuA soils with a slow to medium runoff rate and slight to moderate erosion hazard (Foote et al. 1972:96) being the primary difference. UwB have smooth slopes with moderate permeability and a slow to medium runoff rate that results in a slight to moderate erosion hazard (Foote et al. 1972:123). Found only on the island of Lāna'i, soils that fall under the UwB classification were primarily used for pineapple cultivation (Foote et al. 1972:124).

Rainfall accumulation within the project area averages between 15 and 23 inches per year with the heaviest rainfall occurring during the winter months (Giambelluca et al. 1996). This level of precipitation with the soils described above would have supported a lowland dry and mesic forest, woodland, and shrubland native ecosystem (Pratt and Gon 1998: 122). Naturally occurring native vegetation within the project area would have likely consisted of *pili* (*Heteropogon contortus*) grasslands and dry or mesic shrublands of 'a'ali'i (*Dodonaea viscosa*), 'ākia (*Wikistroemia* sp.), ko'oko'olau (*Bidens* species), 'ūlei (*Osteomeles anthyllidifolia*), and

other shrubs (Pratt and Gon 1998:127). The lands within and surrounding the project area, however, have been plowed over and intensively cultivated in pineapple for approximately 70 years from 1922 until 1992. Current vegetation consists of sparse and very low lying alien grasses with over 50% of the project area revealing bare ground.

1.3.2 Built Environment

The built environment of the project area is limited to the facilities and roads associated with the daily operations of the Lāna'i Airport (Figure 4, Figure 5, and Figure 6) with the surrounding lands consisting of fallow pineapple fields.



Figure 4. Existing ARFF at the Lāna'i Airport, view to north



Figure 5. Eastern end of cargo bay at Lāna'i Airport, view to north.



Figure 6. Runway apron extension from east corner, view to west.

Section 2 Methods

This section details the methods used by CSH personnel during the fieldwork and preparation of this cultural impact assessment. Interviews and consultation was conducted by lead researcher, Colleen Dagan, B.S. and contributing researcher Tanya L. Lee-Greig, M.A. under the overall guidance of Hallett H. Hammatt, Ph.D. Field inspection was performed June 12, 2009 and consultation was accomplished over a three month period from May 2009 to August 2009. Document research was conducted by the researchers named above with contributions from Robert H. Hill, B.A.

2.1 Document Review and Research

Numerous published and unpublished accounts, surveys, reports, maps and photographs found in public and private collections pertaining to Lāna'i City and the study area were investigated by Cultural Surveys Hawai'i Inc. English language historical documents, maps, and archaeological studies were researched at the Department of Land and Natural Resources/State Historic Preservation Division (DLNR/SHPD) library, the Survey Office of the Department of Accounting and General Services (DAGS), the Maui County Planning Department, and the Cultural Surveys Hawai'i (CSH) library, in addition to private collections held by others in the community. Research regarding the history of the Hawaiian Pineapple Company was conducted using the services of the Bailey House Museum, in Wailuku, Maui. Online research regarding the past and present cultural landscape of Lāna'i Island by Kepā Maly and the online resources of the Lāna'i Culture and Heritage Center (Maly 2009) were utilized for current information regarding the traditional history of the island. In addition, all relevant Land Commission Awards (LCA) and Royal Patents were researched using resources associated with the Waihona 'Aina online database (Waihona 'Aina Corp. 2002) and the Lāna'i Culture and Heritage Center (Maly 2009).

2.2 Scoping and Community Outreach

2.2.1 Government Agencies, Advisory Councils and Local Community Organizations

In order to identify individuals with knowledge of the traditional cultural practices of the study area of the proposed project, CSH initiated contact with government agencies, advisory councils, and local community organizations (See Section 5 Community Consultations). Letters and project area maps showing the location of the Lāna'i Airport Improvements project were mailed out with the following accompanying text:

Aloha, Cultural Surveys Hawai'i Inc. (CSH), is conducting a Cultural Impact Assessment (CIA) for the Lāna'i Airport Improvements Project. The subject project site is located on Lāna'i where the majority of the Airport is positioned within Kalulu Ahupua'a while a small portion extends into Kamoku and Kaunolu Ahupua'a. The Airport is situated approximately 3.0 miles southwest of Lāna'i City and 1.0 mile northwest of Miki Basin. The Lāna'i Airport parcel is approximately 505 acres. The airport improvements project will include the construction of an approximate 25,200 square foot private hangar for Castle &

Cooke Resorts, LLC and two associated 15,000 gallon fuel tanks and a single 3,000 gallon fuel tank. The fuel tanks will be located above ground on a concrete slab measuring 50 feet by 100 feet and double walled for spill control. In addition, existing water and wastewater systems will be upgraded.

Furthermore, the State of Hawai'i Department of Transportation, Airports Division is proposing a new Airport Rescue fire station. The fire station will be a one-story building measuring approximately 74 feet by 82 feet including an improved driveway extension. The proposed Fire Station will house two 1,500 gallon fire trucks.

The region of influence (ROI), hereafter referred to as the "study area", will include the *ahupua'a* of Kalulu and a portion of both Kamoku and Kaunolu Ahupua'a surrounding the airport. The study area incorporates the airport project site.

The purpose of the cultural impact assessment is to identify and evaluate any potential impacts to traditional cultural practices occurring within the ROI that may result from the proposed project.

We are seeking your *kōkua* or help and guidance regarding the following aspects of our study:

General history and present and past land use of the study area.

Knowledge of cultural resources within the project area which may be impacted, including traditional plant gathering sites, historic sites, archaeological sites, and burials.

Knowledge of traditional gathering practices in the area – both past and ongoing.

Cultural associations of the project area, such as legends and traditional uses.

Referrals of *kūpuna* or elders who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua'a* lands.

Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the Kalulu, Kaunolu or Kamoku Ahupua'a.

I invite you to contact me, Colleen Medeiros Dagan B.S., at 1-808-242-9882. You may also contact me by e-mail at cdagan@culturalsurveys.com if you have any information or *mana'o* that you are willing to share.

Mahalo, Colleen Medeiros Dagan, Archaeologist

Section 3 Background Research

The division of Lāna'i's lands into political districts may have occurred under the direction of the chiefs of Maui, as Lāna'i historically appeared to be "subject or tributary to Maui" during the times of Kamalalawalu (about 1550-1600 AD) (Fornander 1919 Part I: 206-8). The island was apportioned into the following thirteen *ahupua'a* land divisions that were established during traditional times: Ka'ā, Kamoku, Kalulu, Kaunolū, Keāliakapu, Keāliaaupuni, Pālāwai, Kāma'o, Ka'ohai, Pawili, Maunalei, Mahana, and Paoma'i. Unlike *ahupua'a* divisions of the other seven major islands of the Hawaiian Chain, some of the *ahupua'a* divisions on Lāna'i Island have the unique characteristic of traversing across the island from one coastline to the other (Figure 7). The current project area is located on the north-northwestern edge of Miki Basin and crosses Kamoku, Kalulu, and Kaunolu Ahupua'a, within the *mokupuni* of Lāna'i (Moffat and Fitzpatrick 1995:23). While Kamoku Ahupua'a retains the common "pie-shaped" *mauka-makai* boundary configuration, both Kalulu and Kaunolu Ahupua'a are of the unique bi-coastal boundary configuration whereby the two *ahupua'a* extend from one end of the island to the other.

3.1 Traditional Historical Background

The most comprehensive summary of traditional accounts pertaining to the "formation of Lāna'i, first habitation, general traditions, early history and place names" appears in Kenneth P. Emory's *The Island of Lāna'i: A Survey of Native Culture* (1924a). Emory suggests through "genealogies and traditions" that Lāna'i "began to be populated by important numbers about 1400 A.D." (Emory 1924a:123). Based on the number of house sites he observed and approximately five persons per household, Emory estimated the pre-1778 population of the island at around 3,000 (1924a:122). The traditional life style focused on subsistence farming and fishing within the context of the *ahupua'a* or traditional land unit.

3.1.1 Mythological and Traditional Accounts

3.1.1.1 *The Ghosts of Lāna'i*

The northern coastal place name of Laewahie refers to the point on Lāna'i where Kaululā'au built a signal fire to the people of Lahaina. Fornander (1919:542) recorded the story of Kaka'alaneo, the chief of all of West Maui. His son, Kaululā'au, grew up as a boy involved in great mischief. Because he uprooted the sacred breadfruit grove of Lahaina, his father had no choice but to banish his son to the uninhabited island of Lāna'i. At that time, Lāna'i was the abode of ghosts, and Kaululā'au was sent there to be killed by them. Tabrah (1976) notes the many tricks the ghosts tried to use to murder Kaululā'au, and her account notes the location of the signal fire to the people of Lahaina after he had defeated all of the ghosts of the island as Naha, located in the *ahupua'a* of Kaohai. (The literal translation of Kaohai is "firebrand.") Kalākaua (1888:212, 230) records the legend of Kaululā'au conquering the ghosts of Lāna'i in two separate stories, one of which details his fight with the *Mo'oaleo*, a lizard god of the island as the most difficult of the ghosts to overcome. He does not give the location of the signal fire used by Kaululā'au. (There is a village named Kaululā'au on the coast of Pawili Ahupua'a.) The legend ends with Kaululā'au being reunited with his father, mending his mischievous ways, and opening the island of Lāna'i for settlement.

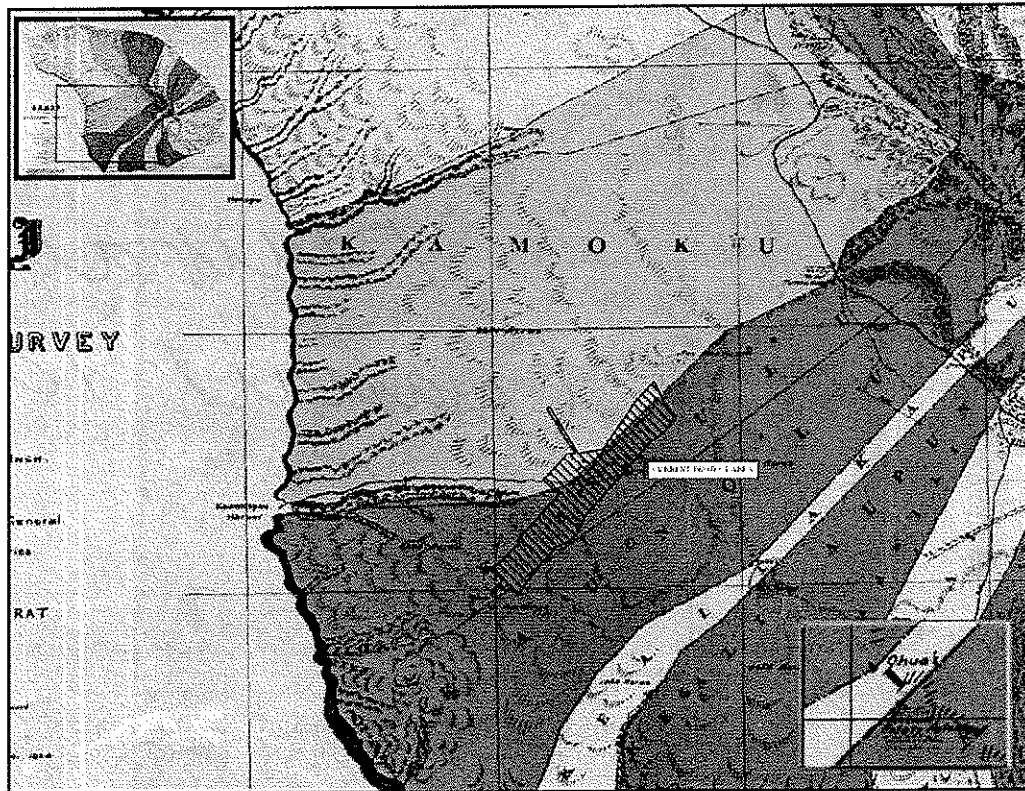


Figure 7. A portion of the J. F. Brown and M. D. Monsarrat map (1878) showing Kamoku, Kalulu, and Kaunolu Ahupua'a, as a traditional land division of the island of Lāna'i, current project area in black cross-hatch, area noted as potato patch circled in red.

3.1.1.2 The Story of the 'Ōhelo

The “Story of the ‘Ōhelo”, as translated from the original Hawaiian by Abraham Fornander (1919), describes the origin of the sacred offering of ‘ōhelo to the goddess Pele, and the importance of Lāna'i Island in the telling of the story. According to Fornander, the many sisters of Pele followed her east from Tahiti across the Pacific Ocean. As Malulani, Kaohelo, Hi'iaka, and Pele arrived at the Hawaiian Islands, Malulani choose Lāna'i to dwell on, while Pele, Kaohelo, and her younger sisters traveled on to the island of Hawai'i.

Kaohelo had a son named Kiha, who was given instructions by Kaohelo as she neared death where she should be buried. “Take my body to the very navel of your grandmother, right on top of Kīlauea; then bury me there.” This her son did. The flesh of Kaohelo became the creeping vine and her bones became the bush-plant of the ‘ōhelo. Her head was treasured by Pele as the smoldering fire of Kīlauea. The remainder of her body brought volcanic fire to Haleakalā on Maui, Keālia on Oahu, and also to Kaua'i.

When Malulani, living on Lāna'i, heard of the death of their youngest sister, she went to Hawai'i to retrieve her body, but found that small pieces of her body were strewn across the landscape sprouting into vines and bushes of the ‘ōhelo. She gathered as much of her sister's

remains as she could, but upon returning to Lāna'i, was surprised to find the pieces of Kaohelo's body had been strung as leis and worn as adornment. Saddened by this, Malulani died.

Hi'iaka then came to Lāna'i to recover the body of Malulani, whereupon small bundles containing her remains were scattered across the island of Hawai'i, causing small hills and islets to remain to this day. In this way, the island of Lāna'i is part of the legend of how the *'ōhelo* came to be spread across the islands of Hawai'i, and why the *'ōhelo* is the special sacred offering to Pele (Fornander 1919, V, III: 576-580).

While the mythological and traditional accounts specific to this section of Kamoku, Kalulu, and Kaunolu are relatively scarce, an analysis of the place name meanings and characteristics or features for the region surrounding the project area may yield some insight into the patterns of life in an area (Table 1). Literal translations of several of the place names and /or characteristics and features for land areas and divisions near to the project area are listed below:

Table 1. Place Names Near Study Area

Hii o Lono (Ka 'Hii o Lono)	Land section of Lono (personal); plateau land (Emory 1924a:30); site of an ancient <i>heiau</i> near the former house site of Papalua, situated on the boundary between Kalulu and Kamoku Ahupua'a (Maly and Maly 2009:Table 1 and p17)
Kaapela	Rolling over soft grass; plateau land; site of a school house; old name of place close by is Mauipapahu (Emory 1924a:30)
Kalulu	The calm; a district; an ahupua'a (Emory 194a:31); the shelter (Pukui et al. 1974:79)
Kamoku	Lit., the district or the cut-off portion (Pukui et al. 1976:82); the piece cut off (Emory 1924a:31); one of three ahupua'a that crosses from the leeward to windward side of the Lāna'i (Maly and Maly 2009: Table 1)
Kanaenaē	An offering to the gods (Emory 1924a:31)
Kaunolū	To give property on a wager secretly, the <i>akua</i> of Molokai; bay and district; spelling Kaūnōlū (Emory 1924a:32); site of deserted Hawaiian village (Pukui et al. 1974:95); noted for the "Heiau Kaulana o Kaunolu) near the boundary of Kealia Kapu and Kaunolu, one of three ahupua'a that crosses from the leeward to windward side of the Lāna'i (Maly and Maly 2009: Table 1)
Keahialoa	The fire at Loa; hill; highest point on the island as seen from Kaena point (Emory 1924a:32); the long fire burning
Kilauea	Place name translation not given, noted simply as plateau land (Emory 1924a:33); spewing, much spreading (referring to volcanic eruptions) (Pukui et al. 1974:111)
Koulii	The little <i>kou</i> tree (Emory 1924a:33);
Miki	Place name translation not given, noted simply as a basin on the plateau (Emory 1924a:34)
Nihokela	Projecting tooth (Emory 1924a:35)

Pakiki	Unyielding (Emory 1924a:35)
Paoole	Digging without a digging stick (Emory 1924a:35)
Pulehuloa (Pu'uulehuloa)	Big roasting (Emory 1924a:36)
Puu Nanai Hawaii (Pu'u Nānā i Hawai'i)	Hill to view Hawai'i (Emory 1924a:36)
Puu o Miki	Hill of Miki (Emory 1924a:36)
Puu Ulaula	Red crater (Emory 1924a:36); red hill (Pukui et al. 1974:206)
Puukauila	Kauila (tree) hill (Emory 1924a:36)

The above place names describe an area consistent with what one might expect of a leeward environment that was likely covered in *pili* (Kaapela) with some reference to woodland plant species that may have been stunted due to seasonal water availability (Koulii), and while the lands and water limitations may have seemed unyielding at times (Pakiki) it was also an environment suitable for agricultural endeavors (Ili o Lono and Paoole).

3.1.2 Traditional Hawaiian Habitation and Subsistence of the Pālawai and Miki Basin Area

Traditional or pre-contact habitation along the rim of both Pālawai Basin and Miki Basin was likely sporadic with agricultural activities focused on the cultivation of dry-land crops. The following excerpts from the metes and bounds descriptions for Kamoku, Kalulu, and Kaunolū Ahupua'a contained within Boundary Commission documents that were generated during the Mahele note the presence of scattered house sites, with some making specific reference to the crater or rim of the basin (Maly and Maly 2009):

Kamoku

4. N 72° 43' E true 2080 feet along Kalulu to a cross cut in a stone amongst a lot of stones at the former site of an old *Heiau* called "Ili o Lono."

6. N 65° 44' E true 4939 feet along Kalulu along North edge of crater to a red wood post on the North wall of the crater at a place called Pulehuloa near Keliihananui's house.

11. S 74° 8' W true 6258 feet along Paomai passing to the North of a couple of *Hala* clumps to two Triangular pits at an old house site. [Maly and Maly 2009:40-41]

Kalulu

3. N 54° 17' E true 6694.5 feet along Kaunolu passing between Maakuia's house and his sheep pen to a point 14 feet East of a rock with a cross cut on it.

5. N 53° 14' E true 13359 feet along Kaunolu across Crater passing West of school house to a point on terrace marked by a *Mamane* post.

16. Thence along Kamoku down the N.W. edge of the Kapano valley to the Government road, passing near Kawaonahale's house keeping straight on across a side ravine coming in from the North (called Keaaku) to a red wood post at the top of the North wall of the Palawai Crater at a place called "Pulehulua," near Kealiihananui's house, which red wood post bears [page 112] S 44° 53' W true 8052 feet from last mentioned point on ridge 18. South 28° 32' West true 11633 feet along Palawai (Passing around the east side of the above mention Grant [Grant 2971 to Kapahoa]) and across Palawai crater to a rock marked with a cross on the South edge of crater at an old house site near a large straw house owned by Puupai

18. S 46° 19' W true 10141.4 feet along Kamoku down road to a cross cut in a stone amongst a lot of stones at the former site of an old *Heiau* called "Ili o Lono." [Maly and Maly 2009:38-39]

Kaunolu

3. N 54° 17' E true 6694.5 feet along Kalulu passing between Maakuia's house & his sheep pen to a point 14 feet East of a rock with a cross cut in it. [Maly and Maly 2009:48]

During his island wide survey of the archaeology of Lāna'i, Kenneth Emory (1924b:28) also postulated that the basin area was a scene of early settlement based on the remains of pre-contact settlements identified below Puulehulua (80¹) and Kanaenae (27) along the west rim at Paoole (137) and Puukauila (74) (Figure 8). Within the basin, however, Emory (1924b:28) noted only an occasional enclosure or platform but no trace of house remains on level ground. Evidence of only scattered settlements around the basin, as opposed to evidence of intensive habitation found along the coastline and within Maunalei Gulch, may be a factor of limited or seasonal water availability along the rim and potentially marshy conditions within the basin during the winter months. The seasonality of water availability and scarcity of resources during certain times of the year was noted by M.D. Monsarrat in a letter dated June 2, 1877 to W.D. Alexander during the Boundary Commission survey of the Kaunolu Ahupua'a boundaries:

It is beginning to get very dry here and water scarce. Potatoes are also very scarce and expensive. *Pai ai* are a dollar apiece in Lahaina now having jumped from seventy five cents since I came over. (M.D. Monsarrat in Maly and Maly 2009:12)

¹ Numbers following placenames correspond to numbered locations illustrated in Plate I of Emory's *The Island of Lana'i. A Survey of Native Culture* (1924a).

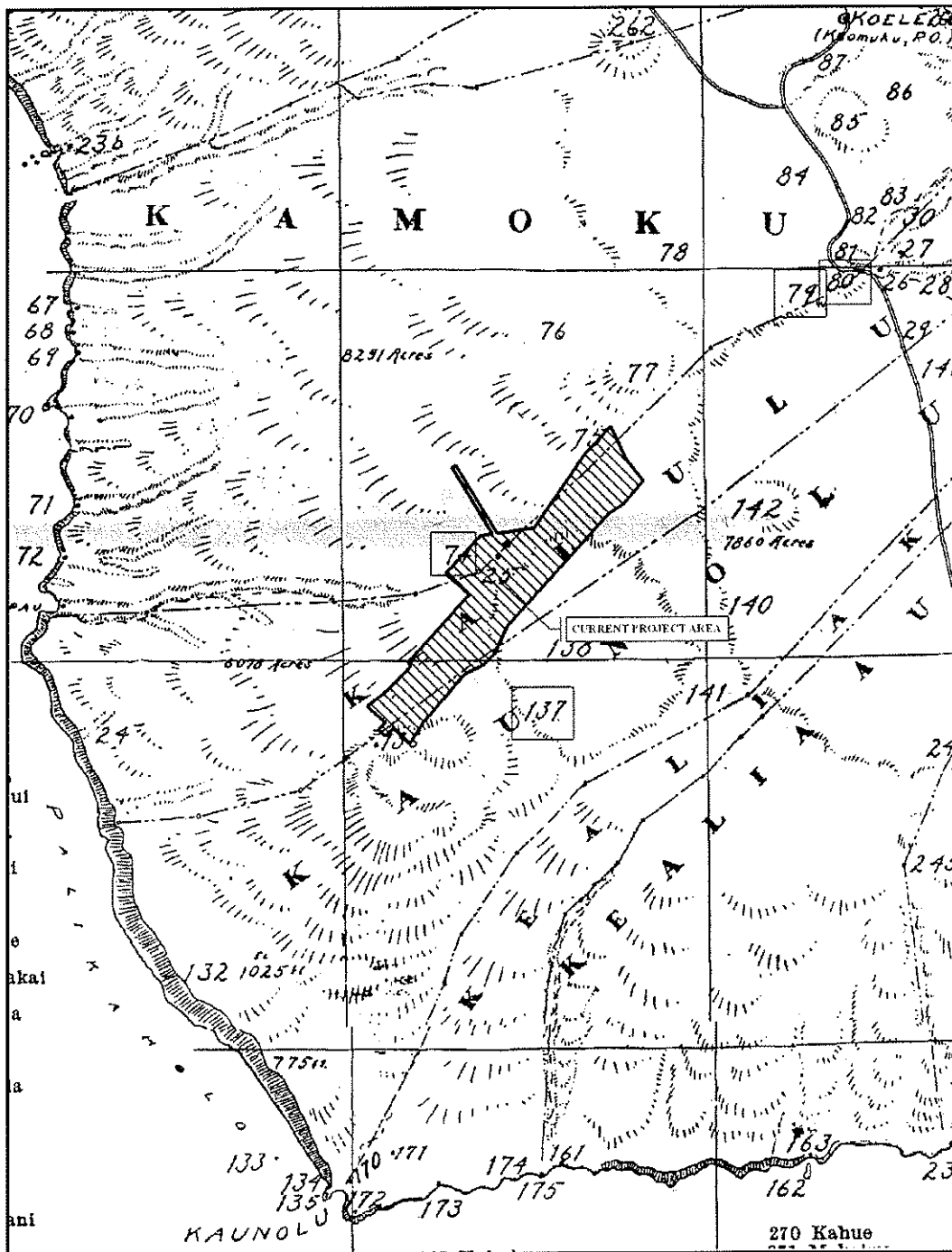


Figure 8. A portion of the Map of Lāna'i showing *ahupua'a* divisions and place names with numbered locations as gathered by Kenneth Emory (Emory 1924a: Plate I), highlighted place name locations near the project area indicate areas of settlement noted along the rim of the “great basin”.

Because the island of Lānaʻi lies in the rain shadow of the West Maui mountain range, the landscape of the entire island is reflective of a leeward environment where water is a precious commodity. Fresh and brackish water wells dotted the coast, with one or two on the western coast of the island providing an ample water supply for the then permanent residents at Kaunolu (Emory 1924a:46). Mountain springs were numerous with a permanent water supply found at Maunalei Gulch where the only perennial stream could be found (Emory 1924a:47). Water collection on the plateau lands and presumably basin area, however, was different and unique. The following description of gathering water in the uplands is taken from Emory (1924a:46):

(i)n the days before sheep, goats, cattle and horses were grazing on the plateau lands, dew could be collected from the thick shrubbery by whipping the moisture into large bowls or squeezing the dripping bush-tops into the vessels. Oiled tapa was also spread on the ground to collect the dew. Water accumulating in natural depressions in rock or in cup marks was husbanded carefully.

Even with the seasonal nature of water availability common in leeward environments in general, and along the plateau lands of Lānaʻi in particular, *ʻuala* (sweet potato) and possibly other dry-land crops (e.g. dryland *kalo*, gourd crops) were successfully cultivated (Emory 1924a; Handy et al. 1991; Munro 2007). An indication of this is the name of the hill, or rise, west of Miki Road that is identified as *ʻUala Hill* on the South Lanai USGS Quadrangle (see Figure 1), and known as Puʻu o *ʻUala* by the Kaupiki family of Lānaʻi. In oral testimony gathered by Mr. Kepa Maly (Executive Director, Lānaʻi Culture and Heritage Center) and shared with the authors, the Kaupiki family recalled that the sweet potato that grew there were reported to be tasty and reach lengths of one foot or more. Testimony presented before the Board of Land Commissioners for *kuleana* claims in the plateau and basin area show very clearly that dryland agriculture along the rims of Pālāwai and Miki Basins was ongoing during the time of the Mahele. At Kaunolū, Kalulu, and Kamoku there are a total of seven claims, some with multiple *apana* (parcels), that mention sweet potato gardens and pasture lands, with testimony for LCA 6815 Parcel 2 indicating both a sweet potato garden and a gourd garden (Table 2 and Figure 9).

Table 2 Summary of Land Commission Awards (LCAs) identified within the upland areas of Kamoku, Kalulu, and Kaunolū Ahupuaʻa (Lānaʻi Culture and Heritage Center 2009)..

LCA #	Claimant	Ahupuaʻa	Land Use
06815:3	Kaiwi	Kaunolū	1 <i>mala uala</i> (sweet potato patch) at Paoole
6818:1 and 2	Haole	Kaunolū	1 <i>mala uala</i> and 1 <i>moku mauu</i> (grass land/pasture section) respectively
6822	Kahuikilani	Kamoku and Kalulu	1 <i>pahale</i> (house lot) and <i>mala uala</i>
8556:2 and 3	Kaauwaeaina	Kamoku and Kalulu, <i>ili</i> of Pueo	1 <i>moku mauu</i> and 1 <i>pauku</i> respectively
6820	Kanohookahi	Kaunolū	1 <i>pahale</i> and <i>moku mauu</i>
6816:1	Naholowaa	Kaunolū	6 <i>mala uala</i>
6814:2 and 3	Pakele	Kaunolū	1 <i>moku mauu</i> in each <i>apana</i>

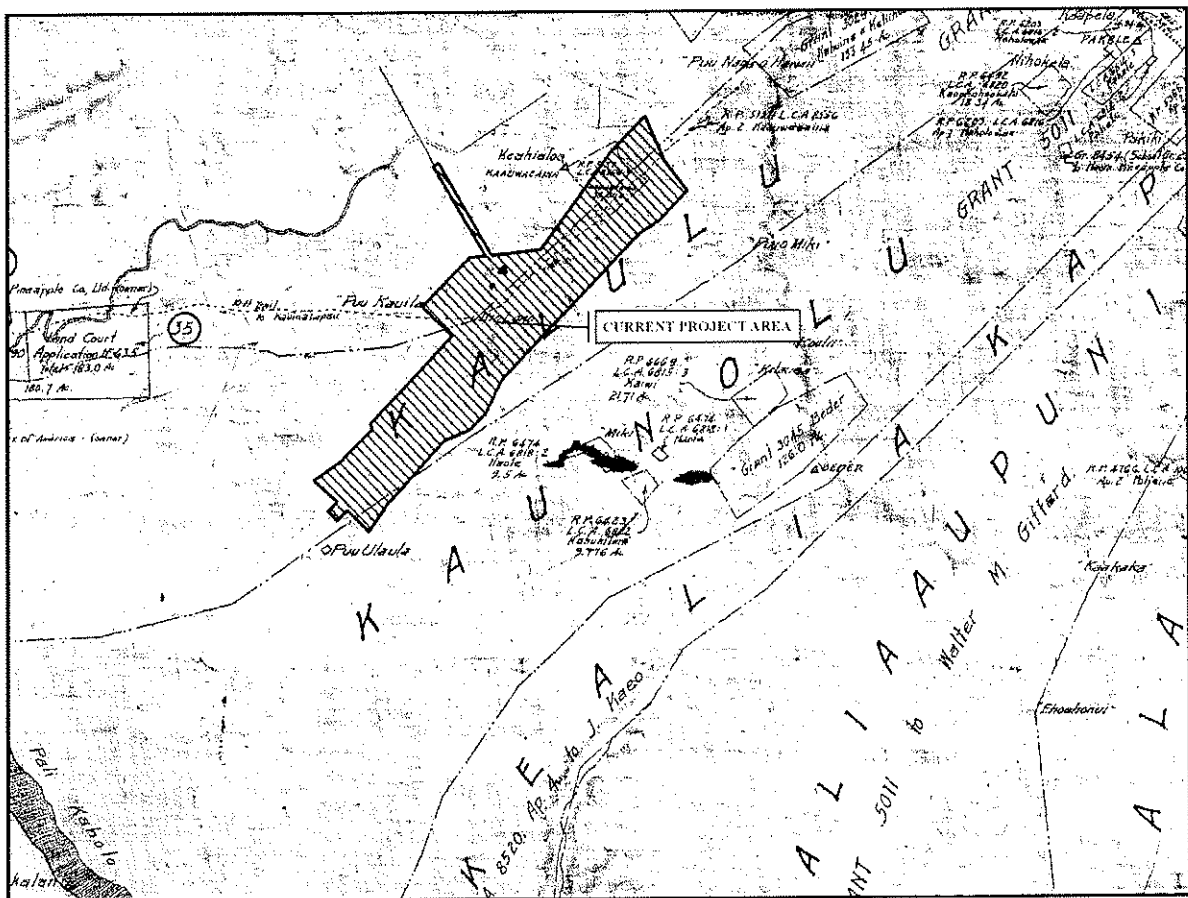


Figure 9. Hawaiian Pineapple Company, Ltd. (1929) survey map showing, place names, areas of Land Commission Awards relative to the current project area.

3.1.3 Early Historic Period

Lānaʻi was first seen by Captain James Cook during his voyage to the Sandwich Islands in January and February of 1779. The expedition had returned to the Hawaiian Islands in order to re-supply following many months of mapping the west coast of America (Ellis 1969). William Ellis, Assistant Surgeon to the expedition, noted the first time that the ships *HMS Resolution* and *Discovery* sighted “Aranni” [Lānaʻi], as the ships made their way past “Kaoorʻvee [Kahoʻolawe] nearly adjoining to Mowʻwheel” in 1779. It was during this voyage that Ellis went on to describe Lānaʻi as an island under the dominion of the king of Maui (Ellis 1969: Vol. 2, 187). An account of a shipwreck on the reef of Lānaʻi in the late 1820ʻs was detailed by an American Navy Lieutenant, Hiram Paulding, when his ship, the U.S.S. *Dolphin*, arrived to aid the survivors of the “Loudon”, a ship out of New York. Paulding’s description of the events stated that the chief of Lānaʻi was “encouraging the natives of the island to plunder the Loudon, which carried a large amount of specie and bullion.” The account continued with the Captain of

the U.S.S. *Dolphin*, John Percival, chartering a vessel and saving the treasure with the intervention and aid of Boki, the governor of Oʻahu (Paulding 1831).

During the early and middle 1800s, the Hawaiian demography was affected by two dramatic factors: radical depopulation resulting from Western disease; and nucleation around the developing port towns. The traditional Hawaiian population was largely dispersed and, although there were royal centers and areas of more concentrated population, these areas never came close to rivaling the populations of the historic port towns that developed on Hawai'i's shorelines during the 1800s. In this regard, Kuykendall (1938:313) notes that in the period from 1830 to 1854:

The commercial development during this period, by magnifying the importance of a few ports, gave momentum and direction to a townward drift of population; the population of the kingdom as a whole was steadily going down, but the population of Honolulu, Lahaina and Hilo was growing.

By the 1830's, protestant missionaries sent to the Sandwich Islands from the east coast of America were reporting having established a thriving congregation on Lāna'i. Letters written in 1830 listed 10 schools on Lāna'i Island attended by 506 students. Of these students, the missionaries reported that 206 could read, and 42 could write (Richards 1831).

3.1.4 Mid- to late-1800s

In 1848, the Mahele initiated extreme social, economic, and political changes within traditional Hawaiian culture on all of the islands. The Mahele resulted in the division of lands according to a system of private ownership based on Western legal concepts. In the first phase of this process, Kamehameha III subdivided his lands among the highest *ali'i* (royalty) *konohiki* (chiefs), and some favored *haole* (foreigners). This process of redistribution severed the political and social relationships of the traditional system of land use (Moffatt and Fitzpatrick 1995:11). Following this change, *maka'āinana* (commoners) were then permitted to pursue legal title and ownership to land they had cultivated and inhabited through a Land Commission Award, in addition to the outright purchase of other government lands. At the end of the Mahele, naturalized foreign citizens were given the right to purchase land in Hawai'i. The ultimate result of this decision placed more land in the hands of non-Hawaiians than native Hawaiians between the years of 1850 and 1865 (Moffat and Fitzpatrick 1995:51). In many cases, the purchases or leases to non-Hawaiians included entire *'ili* (a subdivision of an *ahupua'a*) or *ahupua'a* (land division usually extending from mountain to sea).

The *ahupua'a* of Kamoku, while depicted as Crown Lands on the available maps, was "omitted" (Interior Department Memos 1860-70s) at the time of the Mahele (1848) and subsequently leased as government lands (ca. 1860) (Hammatt et al. 1988:20). According to the *Buke Kakau Paa* (Buke Mahele 1848), the ledger that contained the recorded division of lands between Kamehameha III, the *ali'i*, and the *konohiki*, the *ahupua'a* of Kalulu and Kaunolū were set aside as government lands (see also Figure 7). By the mid-1800s much of the upper plateau lands of Kamoku and adjacent *ahupua'a* had been become open *pili* grasslands. This is indicated in the native and foreign testimonies given during the mid-1800s as part of the Mahele and Kuleana Acts (see also Table 2). At a total of seven, there appear to be relatively few LCA records for lands across the uplands of Kamoku, Kalulu, and Kaunolū *Ahupua'a* near the current project area (see discussion in Section 3.1.2 Traditional Hawaiian Habitation and Subsistence).

As previously stated, an additional aspect of the Mahele was the sale of land to naturalized foreigners. These changes in land tenure had a significant impact across the Hawaiian Islands, in particular Lāna'i. As a representative of the Mormon Church in Hawai'i, Walter Murray Gibson leased "Crown Lands" (lands reserved by the Royal Family of Hawaii during the Great Māhele of 1848) from King Kamehameha III, for the raising of sheep and for other agricultural purposes, beginning in 1861. By 1867, the island of Lāna'i, almost in its entirety, was controlled by Walter Murray Gibson through either fee simple title or government lease. The authorities of the Mormon faith, from their Salt Lake, Utah Church, pressed Mr. Gibson to deed his property interests on Lāna'i to the Church, and in 1864, Mr. Gibson was cut off from the Mormon Church for his refusal to comply. His interests in real property involving the *ahupua'a* of Pālāwai, Keālia Aupuni, Keālia Kapu, Pawili, Kamao, Ka'a, and Kaohai were inherited by his daughter, Talula Lucy Hayselden, in 1888 (Tabrah 1976).

3.1.5 1900s

In 1907, 48,460 acres of *ahupua'a* land held by the government, including Kaunolū and Kalulu Ahupua'a, were ceded to Walter M. Giffard (Grant 5011), acting for W.G. Irwin (Munro 2007:21). The lands acquired through W.M. Giffard were exclusive of *kuleana* lands that were within the boundaries of the government lands and the three Royal Patent Grants described above. A portion of the 1929 Wright, Harvey and Wright survey map (Figure 9) of Lāna'i shows that the area in which the current project area lies is a portion of the large grant awarded to Walter M. Giffard (Grant 5011). Soon after, Charles Gay, following the acquisition of the Neuman and Payne land interests on Lāna'i in 1902 and the remaining Hayselden interests in 1903, set his sights on and acquired the Irwin land interests following the transfer of lands in 1907. With the exception of *kuleana* lands, Charles Gay owned nearly all of Lāna'i Island after 1907. From 1907 to 1922, the lands that were consolidated under Gay passed hands and economic ventures several times, finally settling with the Hawaiian Pineapple Company, Limited in 1922 (Munro 2007:24).

A legal battle and a three-year drought forced Charles Gay to sell all of his property on Lāna'i to a consortium of ranchers from Honolulu (Tabrah 1976). Ranching on the island was barely profitable. The Baldwin family, Maui's most famous ranchers, could not find a way to gain a profit from the island. In 1920, the Baldwin-owned Lanai Ranch Company brought 12 Asian chital deer (*Axis axis*) to Lāna'i from Moloka'i, where good hunting ranges had been established for sportsmen (Graf and Nichols 1966). Despite these efforts, ranching was abandoned.

By 1922, with faltering demand for cattle, sheep and deer, the Baldwins sold their holdings on Lāna'i Island to the Hawaiian Pineapple Company. The construction of office buildings, warehouses, shops and dwellings for 250 workers and their families began immediately. By 1927, three thousand acres of the Pālāwai Basin, including the current project area, had been planted in pineapple, the first construction phase to establish Lāna'i City had been finished, and a roadway linking the new piers at Kaumalapau with Lāna'i City had been paved (Freeman 1927). The cultivation of pineapple on Lāna'i had become integral in Hawai'i supplying more than 90 percent of the world output of canned pineapple.

By 1939, the population of Lāna'i was reported at four thousand, with virtually all of the residents working to maintain the fifteen thousand acres of pineapple fields (Mackie 1939). The

expansion of the market to accommodate Hawaiian pineapples occurred so rapidly, with so much success, that new machinery was quickly developed to take advantage of the gentle topography of Lāna'i. The long, flat fields (Figure 10 and Figure 11) could accommodate mechanical harvesters, which operated by straddling rows of pineapple plants, and moving slowly behind men who broke the ripe fruit off their stalks. With this technology, pineapples picked in the morning on Lāna'i, about sixty miles from Honolulu, were canned and ready for shipment by nightfall the same day (McClellan 1939).

3.1.6 Late Historic to Modern Land Use

In 1961, James D. Dole's pineapple lands on the island of Lāna'i was merged with the assets of Castle & Cooke, a prominent Hawai'i-based corporation. World-wide prices for pineapple continued to drop throughout the 1970's as competing countries, most notably Cuba and the Philippines, supplied the market with cheaper pineapple.

At its formation in 1919 the Lāna'i airport began as an emergency landing strip. The air field was sod and owned by the Hawaiian Pineapple Company. In 1930 Hawaiian Airlines, then known as Inter-Island Airways, began flight operations using Sikorsky S-38 amphibious planes. When the Sikorsky was replaced by the Douglas DC-3 in 1941, without airport improvements, the new DC-3's were too large and the existing runway could not accommodate them. Flights to Lāna'i soon ceased with the onset of World War II. In 1946 the Hawaiian Pineapple Company donated land to the Territory for a new airport location and in 1948 due to the unstable condition of the sod landing strip during rain, the runway was paved. Between the years 1952 and 1994 several airport improvements took place. Improvements included the construction of an air freight building, new passenger terminal, extension of the runway, construction of a cargo building and finally, the construction of a new passenger terminal (State of Hawaii, Department of Transportation, Airports Division website 2007-2009).

During the 1980's, Castle & Cooke began a long-term program to phase the island out of pineapple cultivation, and expand tourism on Lāna'i. In 1988, David Murdock, Chairman of Castle & Cooke, Inc., opened a resort hotel and companion championship golf course at Mānele Bay. A second resort hotel and golf course in the uplands of Kō'ele was opened in 1990. The final pineapple harvest and phasing out of all pineapple operations in 1993 (Boyd 1996) marked the end of an era for Lāna'i Island leaving much of the lands that were once in pineapple, including the current project area, open and fallow.



Figure 10. Original Lāna'i Airport circa 1947 (photo courtesy of the Lāna'i Culture & Heritage Center).

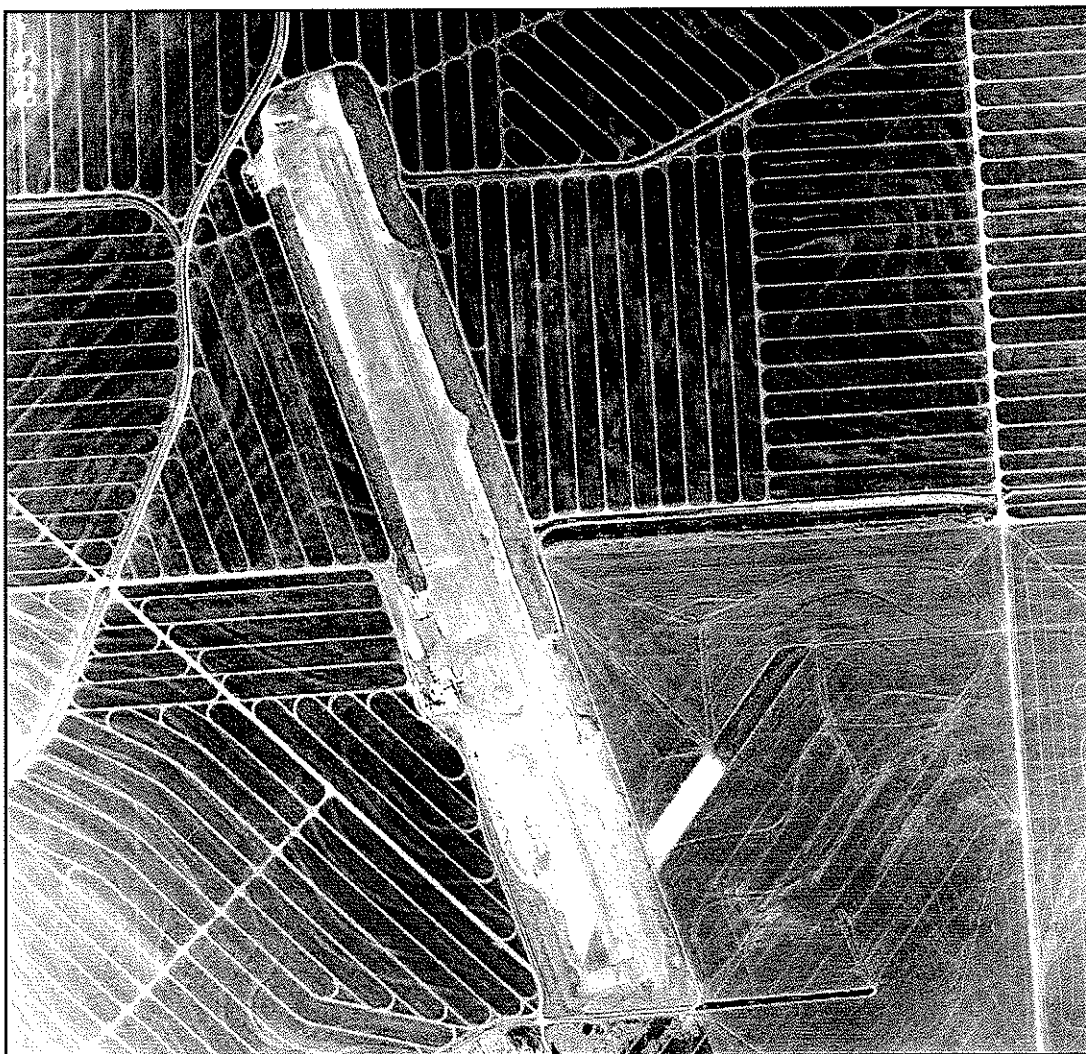


Figure 11. 1953 aerial showing runway for the Lānaʻi Airport and surrounding pineapple fields (photo courtesy of the Lānaʻi Culture & Heritage Center)

Section 4 Archaeological Research

The major archaeological studies pertaining to the *ahupua'a* of Kamoku, Kalulu, Kaunolu and surrounding central basin area were initiated in early work conducted by Emory (1924a and b) and the general survey of Hawai'i State sites by Hommon, (1974). With the exception of the archaeological inventory survey conducted for the Lāna'i Airport (Borthwick et al. 1990), smaller scale studies also occurred within the basin (Ahlo 1985; Dagan 2006; Nagata 1987; Walker and Haun 1987).

The earliest known archaeological work with reference to the project area and central plateau was Kenneth P. Emory's island-wide survey during the 1920's (1924a). Emory identified approximately 74 scattered house sites along the Plateau region, including the rims of both Miki and Pālawai basins along the same elevation contour as the airport property, as well as describing in detail the sites associated with the abandoned Kaunolu fishing village that was located south on the coast at Kaunolu Bay (Emory 1924a) (Figure 12).

More recent archaeological studies in the vicinity of the Lāna'i Airport were conducted at the then proposed landfill site approximately 1000 feet west of the Lāna'i Airport (Ahlo 1985, Nagata 1987, Walker and Haun 1987) at the head of Kaumalapau Gulch. These studies located eight historic properties that included four agricultural complexes, three temporary habitation shelters, and a trail marker. Artifacts from test excavations were limited to 17 artifacts which included basalt flakes, midden and shell scrapers. Radiocarbon dates from two of the shelters clustered around 300+-50 years (Walker and Haun 1987) (Figure 13).

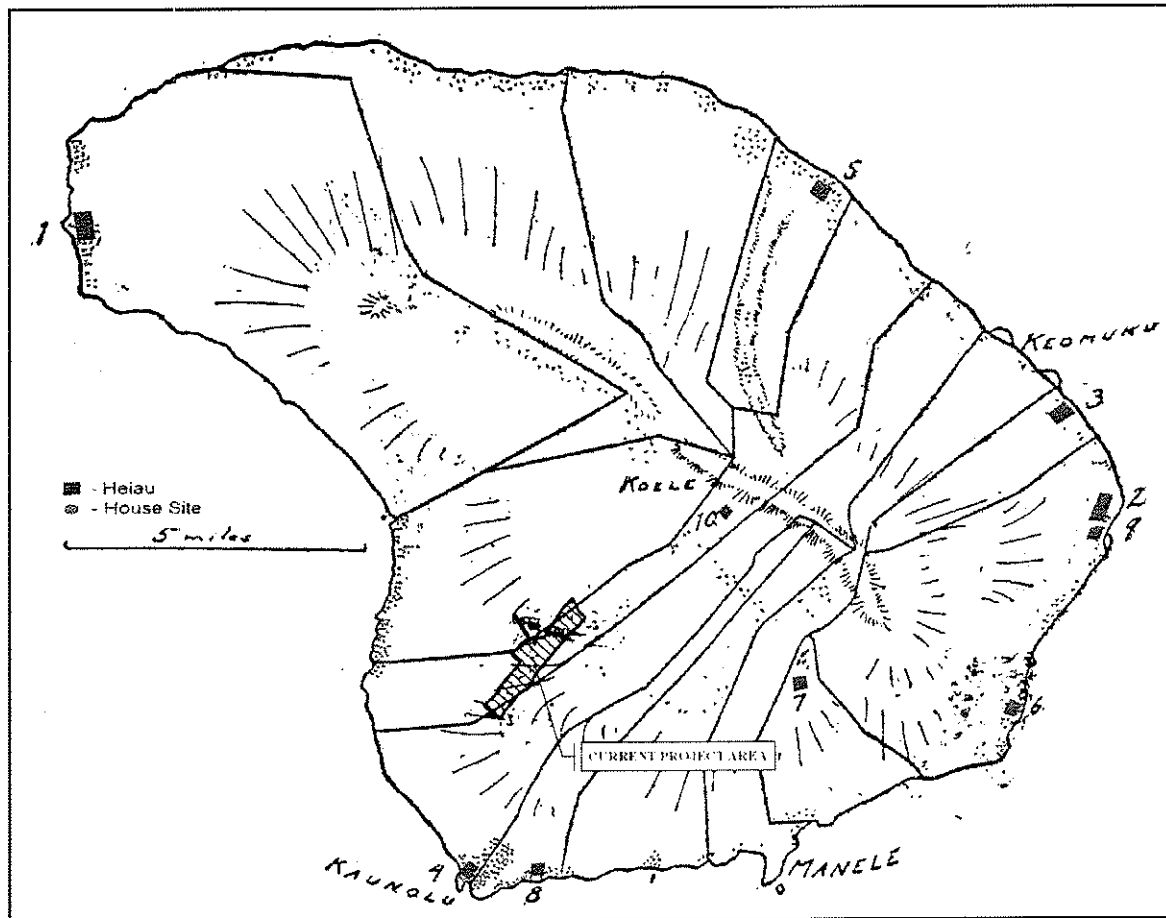


Figure 12. Map of Lāna'i showing *ahupua'a* and the distribution of house sites and *heiau* known to Kenneth Emory in 1921 in relation to the current project area (green dots represent visible house sites, rectangles correspond to *heiau* locations, and the numeric reference ranks the *heiau* [brown rectangles] according to size). (Emory 1924a:49)

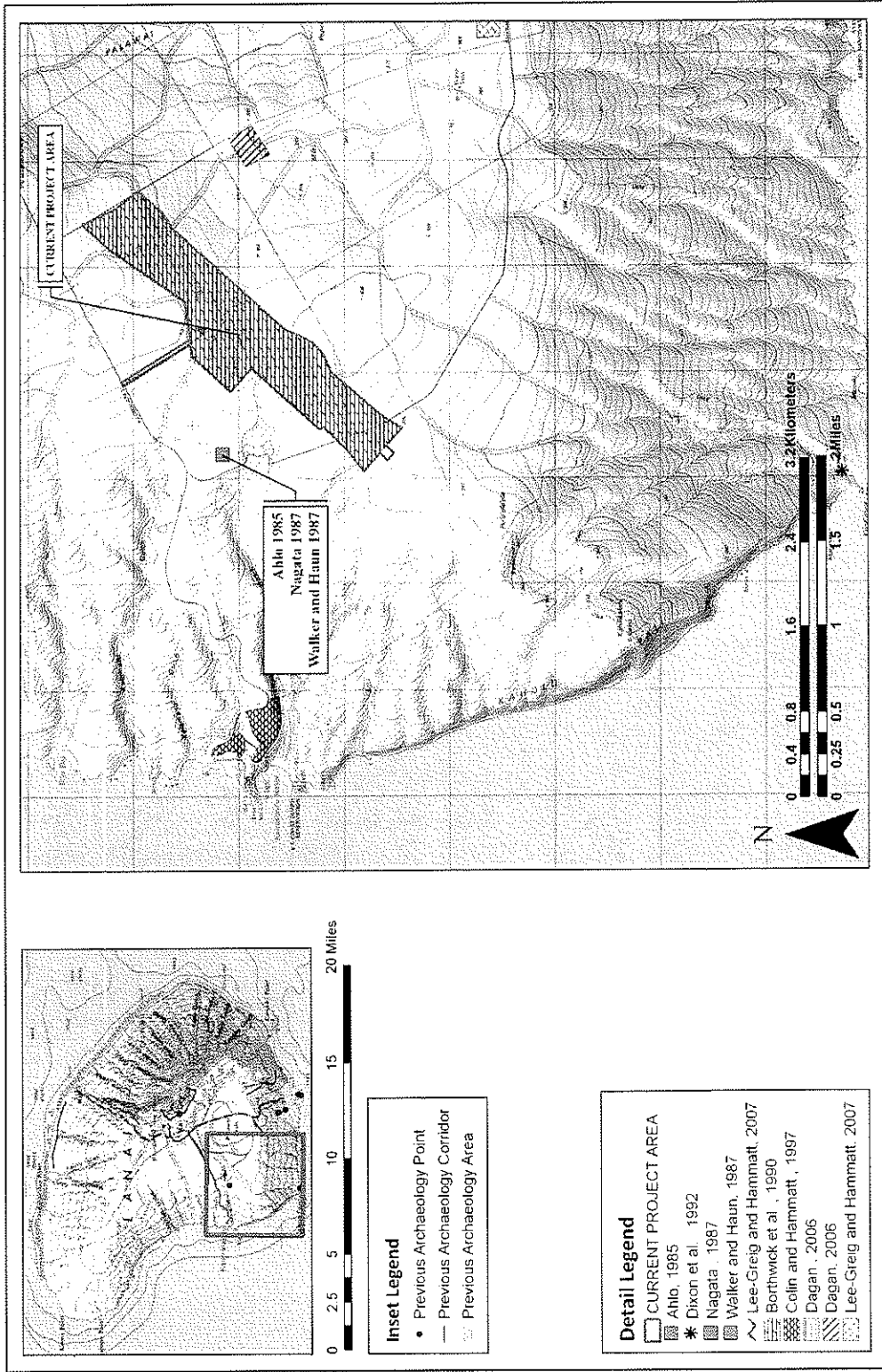


Figure 13. A Portion of the South Lānaʻi 7.5-minute U.S.G.S. topographic quadrangle showing the locations of archaeological investigations and current project area

An inventory survey was conducted by Colin and Hammatt (1996) north of Kaumalapau Harbor. This study discovered three new historic properties consisting of five structural features. SIHP #50-40-98-1938, a terrace, SIHP #-1939, a mound, and SIHP #1940, a complex of cement foundations and an enclosure, all believed to be related to harbor activities. No further archaeological investigations were recommended.

Cultural Surveys Hawai'i, Inc. conducted an archaeological inventory survey along the southern rim of Miki Basin in the *ahupua'a* of Keāliaaupuni (Lee-Greig and Hammatt 2008). The survey findings concluded that the area had been continuously modified by pineapple cultivation from 1927 through 1993. While a single section of cobble stone road was identified and documented within the road access to the project parcel (SIHP 50-40-98-2000), a pedestrian survey and examination of 1,236 bore holes resulted in no significant pre-contact historic properties identified.

Dr. Boyd Dixon and others performed an inventory survey and mapping of SIHP #50-40-98-25, an archaeological complex initially recorded by Emory in 1924 and located in the *ahupua'a* of Kaunolū and Kealiakapu. A total of 503 archaeological features were discovered and documented. This area was found to be a fishing village similar to others on Lāna'i with the exception that it appears to have possibly "served as an elite residential community of Maui and perhaps Big Island *ali'i* (royalty), a refuge for local residents, and a possible scene of Makahiki (harvest) festivals" (Dixon et al 1992). The entire complex is in preservation as an interpretive archaeological park.

4.1.1 Archaeological Studies Specific to the Lāna'i Airport

A preliminary on-site assessment was conducted for the Lāna'i Airport Master Plan by the Bishop Museum (Sinoto 1990). This study identified formal artifacts on the surface at two discreet locations (Locality 1 and Locality 2, Sinoto 1990: 4). Surface artifacts included two basalt flakes, a small rectangular adze blank, and basalt fragments; as well as midden and other historic items with recommendations of "further surface collection and test excavations" (Sinoto 1990).

Borthwick and others (1990) performed the follow up archaeological inventory survey and test excavations. Following the recommendation of Sinoto (1990), Borthwick and others located and identified seven locations, including the two that were previously identified by the Bishop Museum, where indigenous Hawaiian artifacts were visible on the surface. Subsequent subsurface testing at these locations encountered a well developed plow zone, a result of mechanical alteration that extended from the surface to a depth of 45cmbs with no significant subsurface archaeological features identified. As a result of the negative findings, the study concluded that any original archaeological context was likely destroyed by decades of commercial agriculture. Lack of findings notwithstanding "on call monitoring," whereby "(a) qualified archaeological monitor shall be retained on an on-call basis to evaluate any inadvertent archaeological finds, to consult with the State Historic Preservation Office on these finds and any needed mitigation, and to carry-out any approved mitigation scope" was recommended in the event that subsurface features were identified during construction (Borthwick et al. 1990:27).

Section 5 Community Consultations

Cultural Surveys Hawai'i Inc. contacted the following individuals and Hawaiian organizations between May and August 2009 requesting their *kōkua* and guidance regarding knowledge of traditional cultural practices and cultural resources of Kamoku *ahupua'a*. The following table presents these organizations and individuals. Individuals who expressed personal knowledge of the study area and gave their consent to share their *mana'o* for this study, both formally and informally, are presented in Section 6 Summaries of *Kama'āina* Interviews. Formal letters of response to the scoping letter sent out by CSH (see Section 2 Scoping and Community Outreach) have been appended to this study (Appendix B).

Table 3. Community Contacts

Name	Affiliation	Contacted ²	Personal Knowledge (Y/N/S)	Comments
Mrs. Yvonne Alboro	Lāna'i Senior Center Employee	Y	N	Provided referrals to <i>kupuna</i>
Ms. Phyllis "Coochie" Cayan	DLNR-State Historic Preservation Division, History and Culture Branch Chief (Former Lāna'i resident)	Y	S	CSH sent letter of inquiry. Mrs. Cayan suggested contacting Mr. Kepa Maly and utilizing the research he has compiled, Mr. Albert Morita, Aunty Irene Perry, Uncle Sol Kaopuiki and Alberta Morita DeJetley She explains that the area was in heavy pineapple cultivation from the 1920's to the 1980's. Mrs. Cayan requests precautionary measures be taken during ground disturbing construction activities due to the potential for burials or other cultural material as there are known historic sites in the vicinity and greater Kamoku <i>ahupua'a</i> (see SHPD Response Letter)

² Key:

Y=Yes

N=No

A=Attempted (at least 3 attempts were made to contact individual, with no response)

S=Some knowledge of project area

DC=Declined to comment

DP=Declined to participate

U=Unable to contact, i.e., no phone or forwarding address, phone number unknown

Name	Affiliation	Contacted ²	Personal Knowledge (Y/N/S)	Comments
Mrs. Maggie Masicampo	Lāna'i Senior Center Manager	Y	N	Provided referrals to <i>kupuna</i>
Mrs. Martha Evans	Lanaians for Sensible Growth, Lāna'i High and Elementary School Vice Principal	Y	N	CSH sent letter of inquiry. Mrs. Evans made referral to Mr. Kepa Maly
Mr. Robert Hera	Held several positions with Dole Company over thirty plus year career, including the title of Superintendent of the company.	Y	Y	CSH sent letter of inquiry.. See 6.1.2 below.
Aunty Lei Kanipae	<i>Kupuna</i>	Y	S	Referred researcher to Mr. Kepa Maly.
Mr. Kepa Maly	Executive Director, Lāna'i Culture and Heritage Center	Y	Y	CSH mailed letter of inquiry.
Mr. Clyde Namu'o	OHA-Administrator, Native Hawaiian Historic Preservation Council	Y	N	CSH sent letter of inquiry.
Mr. Gary Onuma	<i>Kupuna</i> , Castle & Cooke Game Manager, <i>Kama'āina</i>	Y	Y	See 6.1.1. CSH sent letter of inquiry.
Mr. Noboru "Squeaky" Oyama	<i>Kupuna</i>	Y	S	Mr. Oyama speaks of Miki Camp, a plantation camp located south of the project area in Miki basin.
Ms. Pua Paoa	Maui/ Lāna'i Islands Burial Council, Lāna'i Island Representative	Y	S	CSH sent letter of inquiry. In her brief response, Mrs. Paoa wondered if the community wants a private hangar for exclusive use. Mrs. Paoa believes that cultural stone items may exist in the project area.
Aunty Irene Perry	<i>Kupuna</i>	Y	Y	See below. Received permission from Mrs. Perry to utilize information from a formal interview conducted previously.
Maui County Cultural Resources Commission		Y	Y	See below
Mrs. Momi Suzuki	<i>Kama'āina</i> , Mrs. Suzuki is the daughter of Aunty Irene Perry.	N	A	CSH sent letter of inquiry.

Section 6 Summaries of Kama'āina Interviews

6.1 Informal Interviews and Consultation

The following are summaries of informal interviews conducted over the phone between May and August 2009. Cultural information from a formal interview with Aunty Irene Perry on April 9, 2009 was utilized with her permission for this study (Dagan *et al* 2009b).

6.1.1 Mr. Gary Onuma

Mr. Gary Onuma worked as a Game Manager for Castle & Cooke and is familiar with the project area. He shared his knowledge of a traditional Hawaiian trail that existed in the area that went from Kō'ele to Kaumālapa'u. This trail can be seen on historic maps (**Error! Reference source not found.**). He explains that it no longer exists due to the heavy pineapple cultivation that took place in the area beginning in the 1920's. Mr. Onuma also said that this area was cultivated in sweet potatoes in traditional times, some of which continued into the late 1800's. He referred the researcher to the 1873 Montsarrat map, explaining that this map shows some remaining sweet potato fields (Figure 7). Mr. Onuma knows of several remnant stone platforms and *heiau* have been located along the rim of Pālāwai Basin, which spans Kaunolū and Keālia Kapu Ahupua'a. He believes these structures are located in such areas because they were good viewing vantage points. He goes on to describe a large number of Hawaiian stone artifacts that have been found down slope from Pulehuloa. He describes this area as a depression in the geography that spills from Pulehuloa at the rim of Pālāwai Basin, into the basin itself. Mr. Onuma has no concerns regarding the proposed airport improvements and does not know of any cultural practices taking place in the study area today.

6.1.2 Mr. Robert Hera

Mr. Robert Hera moved to Lāna'i from Kona in 1936. His family had been working on the coffee farms in Kona before venturing to Lāna'i on the S.S. Humuula, a steam freight ship. Both he and his parents worked for Dole Company upon arrival in Lāna'i. Throughout his thirty-year career with Dole, Mr. Hera held a variety of positions outside of actual pineapple field work, they included positions in agriculture and engineering, water systems and utilities departments. In addition to the utilities maintenance, Mr. Hera helped with the general upkeep of the city, eventually becoming a superintendent with the company. Mr. Hera is currently the state chairman for Na Ala Hele, a state trail and access program.

Mr. Hera described a traditional Hawaiian trail that existed and traversed the project area prior to pineapple cultivation. Its path extended from Kō'ele to Kaumālapa'u. He also noted sewer and water lines that cross the project area. The nearest settlements, he explained, were Miki Camp located at Miki Basin in Kaunolu Ahupua'a and the Mormon settlement at Pālāwai Basin. He recalls historic World War II military barracks which were located near the current day veterinarian office at the intersection of Kaumālapa'u highway and highway 1388, as well as a military shooting range located near Pali Kaholo, along the coast of Kalulu and Kaunolu Ahupua'a. Mr. Hera does not know of any traditional sites or cultural practices that exist or take place in or near the airport property.

6.1.3 Mr. Kepa Maly

Mr. Kepa Maly, the executive director of the Lāna'i Culture and Heritage Center, explained that the airport location (approximately mid-runway) used to be the site of the Ili o Lono *heiau*. This *heiau* was the areas chief dryland agricultural *heiau*. Its name sometimes referred to as Ka 'ili o Lono, remains on historic and modern day maps, but the *heiau* itself does not exist today. Its destruction possibly coincides with the beginning of pineapple cultivation, as this area was cultivated from the 1920's to the 1930's when area first was utilized for aircraft. Mr. Maly explains that the *heiau* was described as being located on the Kamoku-Kalulu Ahupua'a boundary line. In his research of *ahupua'a* boundary surveys, Mr. Maly translates the *heiau* name to mean "the land division of the god Lono" and describes it as being near Papalua's former house site (Maly 2009). The upland regions of the study area were known dry land agricultural lands, where crops such as sweet potato were cultivated. Near Ili o Lono there is a place called Pu'u kauila. Mr. Maly explains the place name Pu'u kauila, may translate to describe a stand of *kauila* (*Alphitonia ponderosa*) trees that possibly existed at this place, or it may mean "lightning hill".

A traditional *mauka-makai* trail was described by Mr. Maly. This trail would be evidence of travel between coastal and upland settlements and resources. The trail nearly follows the Kamoku-Kalulu ahupua'a boundary through what is now the northeastern portion of the airport property. Near the current day airport parking lot, this trail would have cut west and headed *makai* to Kaumālapa'u, again following the *ahupua'a* boundary. This trail does not exist today.

Mr. Maly also describes some archaeological ruins that exist today off Kaupili Road, an unimproved roadway that skirts the airport, Miki Basin and Pālāwai Basin.

6.2 Formal Meeting Attended

6.2.1 Maui County Cultural Resource Commission (CCRC), June 4, 2009

Mrs. Colleen Medeiros Dagan and Mrs. Tanya Lee-Grieg of Cultural Surveys Hawai'i attended this meeting to gather information on traditional and cultural practices in the upland areas of Kamoku. Commissioners in attendance included Mr. Eric Fredericksen, Mr. Raymond Hutaff, Mrs. Veronica Marquez, Mr. Kalei Moikeha and Mrs. Nani Watanabe.

Mr. Kepa Maly shared some of his knowledge about the area in a written statement which includes land claim awards for Kamoku as well as the land survey meets and bounds description *ahupua'a* boundaries. Mr. Raymond Hutaff stated his feelings regarding the *ahupua'a* name and the purpose of the *ahupua'a* itself as being a significant cultural land tradition.

Mr. Steve Bumbar, Vice President of Castle & Cooke Resorts LLC, explained that his company has produced a DVD of *kūpuna* interviews called "Aka Aina". He explained that interviews were of *kūpuna* of various ethnicities.

The commissioners discussed discoveries of stone artifacts such as *ulu maika* and sling stones in pineapple fields in the Kamoku and Kalulu ahupua'a. Mr. Eric Fredericksen and former Lāna'i resident, Mrs. Watanabe, were both familiar with these discoveries. Mr. Fredericksen explained that it is understood that these finds have all been taken out of context due to pineapple cultivation.

6.3 Formal Interview

A formal interviews was conducted on April 9, 2009. The formal interview was conducted using an Olympus Digital Voice Recorder and transcribed using Sony Digital Voice Editor by Mrs. Sarah Wilkinson B.A. and Mrs. Colleen Dagan B.S.

6.3.1 Aunty Irene (Cockett) Perry

Aunty Irene Perry was born in Keōmoku in 1917. Her father was Robert Cockett from Maui. Aunty Irene said that she lived on Maui briefly before returning to Keōmoku. Sometime around 1928 her family moved up to Kō'e'e and her father worked for the ranch. They lived in a house next to the main ranch house. She spent her childhood playing, fishing and traveling via horseback to her tutu's home at Pālāwai Basin.

As a child living in Keōmoku, Aunty Irene used to ride on horseback up to Lāna'i City. From Keōmoku, she explained, they traveled up through Lāna'ihale to get to Kō'e'e, "all over and through the mountain and down". Aunty Irene also describes frequent trips to Pālāwai Basin. Her tutu, whose surname was Keli'ihananui, live here. This was her mother's family. Aunty Irene said that her eldest sister, Annie, was raised by this tutu. She said that her tutu's family was one of the last Hawaiian families that lived in Pālāwai.

Aunty Irene said that her tutu had a large sweet potato patch where she grew orange sweet potatoes. She explains that they might have been yams, but that they all referred to them as sweet potato. She remembers helping weed the patch and harvest the potatoes. Aunty Irene said they also washed their laundry at her tutu's place. From what she recalls, this was before Lāna'i City was built. She describes washing the laundry in those days and also mentions the *panini* cactus plant (prickly pear cactus or *Opuntia ficus-indica*), she said that she loved eating the *panini* fruit:

...we help tutu do laundry, so they used to have trough, get the kettle, get water, and they, so we'd take all our clothes, and we'd go to...down Pālāwai, further over from Tutu's place and look for a nice boulder, rocks that are [inaudible] that was to wash clothes on it. Take water, you know...wash your—or the umm, the umm, dirt off. And, never had, umm, washing board, so, we'd find nice stone and then we'd wash. Wash by hand, take water, rinse off the clothes, put the line over there, take a rope and put the line from tree to tree, hang all our clothes, and then, while the clothes was drying, and while they were—mom was washing, the kids would be playing around. And there were a lot of cactus, down there, big cactus plants. *pānini*, you know what *pānini* is?

Aunty Irene then goes on to describe eating dried *noni* fruit:

Well we had—they had lots of *noni* plants out there. So we used to take that, and we'd take the ripe fruit, and we hit it on the rock, and splash it, and then we'd leave them there to dry. So then Mom takes the washing, and ready to go home. Gather all the clothes up, dry from on the line, and then we'd go out we'd and peel the umm, the *noni* that we had smashed on the rocks, like candy when they're dried. And so we peeled 'em all off and it tasted like candy.

Aunty Irene describes the monument located in Dole Park as being a tribute to the remaining Hawaiian families that lived on Lāna'i around the time the pineapple plantation began. She says that these families were eventually forced from their *kuleana* lands by the plantation company. Aunty Irene is unclear about how the loss of her tutu's land happened.

Section 7 Traditional Cultural Practices

The identification of traditional cultural practices for a cultural impact assessment takes into account, past, current and potential future cultural practices. Traditional cultural practices include those practices of any ethnic group who has influenced the culture of the study area, subsistence hunting practices as well as traditional Hawaiian gathering practices.

7.1 Agricultural Practices

The current study area was known for dry land agricultural crops such as *'uala* (sweet potato). Other dry land crops such as gourd, sugarcane and dry land *kalo* were grown here. Mr. Kepa Maly described the Kamoku portion of the study area as being extensively cultivated with dry-land crops. In his research, Mr. Maly relays information gathered in oral testimonies from the Kaupiki family regarding the prominence of the sweet potato crops of the area. Individuals from the Kaupiki family recalled that the sweet potato that grew here were reported to be tasty and reach lengths of one foot and larger. Another indication of the traditional agricultural practices of the area can be evidenced by the place names in the area. An example of this is *'Uala Hill*, the name given to a hill approximately two miles southeast of the project area, near Miki Basin. Variations of this place name include Pu'u o *'Uala*, as the Kaupiki family recalls it, and Pu'u *'uwala*, as seen on Robert Hobdy's map (Munro 2007). Aunty Irene Perry recollects her own family's (Keliihanui) sweet potato patch located in Pālāwai Basin.

Historic maps showing sweet potato patches (Figure 7) and Land Commission Award (LCA) claims for lands near the current project area (**Error! Reference source not found.**) further substantiate traditional agricultural practices of the study area. A total of seven LCA claims, some with multiple parcels, were made near the airport property. These claims included *'uala*, gourd and sugarcane patches, as well as pasture lands and a house lot. It is important to note that not all claims made were granted, and therefore are not represented in Table 2 (Summary of Land Commission Awards (LCAs) identified within the upland areas of Kamoku, Kalulu, and Kaunolū Ahupua'a), nonetheless, these crops were described in testimonies given during the Boundary Commission's survey (Maly 2009).

Mr. George Munro acknowledged that dry-land taro, sweet potato and yams were successfully cultivated in these upland regions of the study area stating that the Hawaiian inhabitants were skilled at farming in the drier climate. He notes that sugarcane was typically grown in lower elevations although it does show up in the LCA claims mentioned above (2007: 48). Mr. Munro recalls a member of Aunty Irene's family, Keliihanui, as being the only native Hawaiian in Pālāwai Basin living and farming his *kuleana* land. Mr. Munro said that he was raising sweet potato and pineapples at the time (2007: 53).

The ancient Hawaiian's who cultivated the lands of the study area also left behind remnants of their house sites, their tools and food remains. Traditional habitation sites were documented by Emory (1924a) and totaled approximately 74 house sites scattered throughout the Plateau region and along the rims of Miki and Pālāwai basins. Archaeological studies located eight historic properties that included four agricultural complexes, three temporary habitation shelters, and a trail marker. Artifacts from test excavations were limited to 17 artifacts which included basalt

flakes, midden and shell scrapers. Radiocarbon dates from two of the shelters clustered around 300+-50 years (Walker and Haun 1987).

7.2 Ili o Lono Heiau

Mr. Kepa Maly shared his knowledge concerning the Ili o Lono *heiau* describing the *heiau* as being the areas major dry-land agricultural *heiau* named for the god Lono. Although this *heiau* does not exist today, its name can be found on several historic and modern day maps. It was thought to have been located very near, if not on the boundary line between Kamoku and Kalulu ahupua'a. In Mr. Maly's translations of the Boundary Commissions ahupua'a boundary surveys performed between the years 1876 to 1891, the *heiau* is mentioned. A member of Aunty Irene Perry's family, Keliihananui, is also mentioned and reference made to the approximate location of Keliihananui's house. This description gives several landmarks that were mentioned by individuals consulted for this study. The following description of the Kamoku-Kalulu ahupua'a boundary is as follows:

April 3rd. 76. Monday.

Keliihue widow of Nahuina, was born on Kalulu, & testifies that the boundary between Kalulu and Kamoku comes down from a hill known as Puunene down the North bank of the Kapano valley to the Govt. road, passing near Kawaonahale's house, keeping straight on across a side ravine coming in from the north, called Keaakū, to the top of the north wall of the Palawai crater at a place called Pulehulua, near Keliihananui's house. [page 22]

Kamoku

Thence it skirts to the northwestern slope of the crater till it meets the old road to the sea, which it follows down to Kaumalapau Harbor.

Papalua another old resident agrees with the above in the main, but declares that from Pulehulua the boundary runs to a rocky eminence called Puu Nanaihawaii, where he says that Makalena set up his compass.

From thence he says it runs to the site of an old heiau called Ka Ili o Lono, near which Papalua's house formerly stood, near the present road. Kaaiai, an old kamaaina, insane however, points out a pile of rocks nearly on a line between these two points called Kuanaipu, to which he says he guided Makalena.

From the Ili o Lono the line follows the old road to the... [page 23]

...neighborhood of Kaumalapau Harbor. The whole of the harbor belongs to Kamoku. Starting from the edge of the pali on the south side of the harbor, the line follows the ridge on the south side of Kaumalapau ravine till it meets the old road (Maly 2009).

This ancient *heiau* could have also acted as a landmark for the ahupua'a boundary. Today, its location would be approximately mid-runway. It is important to note that Emory did not mention Ili o Lono during his survey of Lāna'i in the 1920's. This factor points to the possibility that Ili o Lono had already been altered beyond recognition by the time Emory performed his survey. Aunty Irene Perry, the only individual consulted for this study who might have actually seen Ili o Lono does not recall any structure in this area.

7.3 Trails and Traditional Access Routes

In the traditional Hawaiian land tenure system, or the ahupua'a system, land was typically divided into pie-shaped segments that include lands from the mountainous regions down to the coastal regions. This division of land ensured that all people would have access to ocean and mountain resources. An essential part of this system would include access routes and trails. Access routes were vital to Hawaiians living in traditional times as trails enabled them to access all resources necessary for survival.

A traditional Hawaiian trail once existed in the current study area and traversed the project area. Mr. Maly, Mr. Onuma and Mr. Hera all described the trail that went from Kō'ele to Kaumālapa'u in traditional times. Mr. Maly explained that this trail may have been heavily utilized for access between *mauka* and *makai* settlements and resources. This trail can be seen on historic maps and is also described in the Boundary Commission survey of the Kamoku-Kalulu ahupua'a boundary as the "old road" (quote above in 7.2).

This trail does not exist today and no one consulted for this study had ever actually utilized or seen the trail. It is unknown if remnants of the trail existed around the time pineapple cultivation began in the 1920's.

7.4 Subsistence Hunting Practices

As discussed in the document titled *Cultural Impact Assessment for the Lāna'i High and Elementary School Expansion Project in Kamoku Ahupua'a, Lahaina District, Island of Lāna'i* TMK: (2) 4-9-002:058 (por) and (2) 4-9-014:002 (Dagan et al 2009a), State of Hawai'i Hunting Units 1 and 3 (public hunting areas) are located north northwest of the airport property. Although hunting practices were not discussed during the consultation process, previous research confirms that Lāna'i residents, as well as other residents of the state, hunt in these areas as a subsistence practice. Game mammals and game birds that populate these areas include axis deer, mouflon sheep, *kolohala* or the Chinese ring-necked pheasant, wild turkeys, gray francolin, gambles quail, erckel francolin and doves. It is believed that these public hunting areas are the most popular game mammal hunting areas in the state contributing significantly to the Lāna'i lifestyle and economy.

Subsistence hunting practices have become a strong tradition on Lāna'i. While many Lanaians might agree with the above statement explaining that food supplied from hunting deer is a significant part of their diet, others would make clear that sport hunting is not a traditional Hawaiian practice, but rather an introduced recreational sport.

Section 8 Summary and Recommendations

From mythological times, Lāna'i has always been unique. First inhabited by spirits and eventually made habitable for mortals by the trickster Kaululā'au, Lāna'i today retains a distinctive culture. The island's natural resources have traditionally kept its population small. Regardless, the Hawaiians that populated Lāna'i in ancient times lived well given the resources available. They utilized the forest's resources and developed dry land agriculture on the western plateau lands near the project area. Their most extensive *lo'i* were located in the Maunalei Gulch and along the northeastern side of the island. Historic literature shows that ancient Lanaians lived with a strong connection to Maui and as subjects of the Maui chiefs. But crucial changes would take place beginning with the devastating raid by Kalani'ōpu'u known as Kamokuhi'. This was a war that is said to have left a scar on this island in the form of denuded soils and barren lands (Section 3). From the time of the Kamokuhi' raid in 1778 until the arrival of the first missionaries, it is said that the study area was left largely uncultivated (Munro 2007; 47). Then, with the *Mahele aina* came the division and privatization of lands on Lāna'i. Vast acreages were transferred from Kamehemaha III and the *kanaka maoli* through several different property owners including; Walter Murray Gibson, Charles Gay, W. M. Giffard, James Dole and now David Murdock of Castle & Cooke Resorts. These different owners saw the island through very different phases of its history; from the Mormon colonist settlement at Pālāwai, to the ranching era of Lanai Ranch, from the Hawaiian Pineapple Company plantation to a five-star resort vacation destination.

Historic maps show a traditional trail that roughly followed the ahupua'a boundary between Kamoku and Kalulu. This trail would have crossed the airport property on its northwestern boundary then cut west approximately where the airport parking lot is today. The Ili o lono *heiau* was said to have been located about mid-runway. Due to extensive pineapple cultivation that took place prior to the original airport construction, it would be unlikely that remnants of the Ili o lono *heiau* and traditional trail would be uncovered during airport improvement construction; however, historic maps clearly depict this trail. Although no individual consulted for this study had ever utilized the trail or viewed the *heiau*, those consulted did share their knowledge of both the trail and the *heiau*. In addition, remnant structures from traditional agricultural practices as well as other cultural material (stone tools and food midden) exist in the greater study area.

8.1 Recommendations

As stated in the *Guidelines for Assessing Cultural Impacts*, "...although traditional practices may have been interrupted for many years, these customary practices cannot be denied in the future" (Appendix A). While no known traditional cultural practices currently take place in the project area, traditional cultural practices took place in the area prior to 1920. For that reason, potential cultural concerns should be considered in the event that there is an effort to revive such practices.

It is recommended that the project implement the precautionary measures and archaeological monitoring procedure outlined in the companion archaeological field inspection and literature review report prepared by Cultural Surveys Hawai'i for the Lāna'i Airport Improvements project.

Section 9 References

- Ahlo, Hamilton M., Jr.**
1985 An Archaeological Survey of the Proposed Lāna'i Sanitary Landfill Site, Lāna'i, Hawaii
- Ashford, Marquette K.**
1974 *Lāna'i: A Narrative History*. Stanford University Department of History, Stanford, California.
- Abbott, Isabella Aiona**
1992 *Lā'au Hawai'i Traditional Hawaiian Uses of Plants*. Bishop Museum Press, Honolulu, Hawai'i.
- Borthwick, Douglas F., Rodney Chiogioji, and Hallett H. Hammatt**
1990 Archaeological Survey And Testing For The Proposed Lāna'i Airport Expansion.
- Borthwick, Douglas F. and Hallett H. Hammatt**
1989 Archaeological Reconnaissance Survey of the Proposed Waialua Multi-Family Housing Subdivision (TMK 2nd Div. 4-9-08:12, 13) Lāna'i Island, Hawai'i. Prepared for M and E Pacific. Cultural Surveys Hawai'i, Kailua, Hawai'i.
- Boyd, Lawrence W., Jr.**
1996 The End of Hawaii's Plantations: Back to the Future? *Annals of the American Academy of Political and Social Science* 544:95-110.
- Brown, J.F. and M.D. Monsarrat**
1878 *Lanai Government Survey 1878* [map]. Surveyed by J.F. Brown and M.D. Monsarrat. Scale 1:24000, surveyor general W.D. Alexander. On file at the State of Hawaii Survey Office, Honolulu, HI.
- Colin, Brian, Hallett H. Hammatt, Ph.D.**
1996 Archaeological Inventory Survey and Limited Subsurface Testing of 36 acres, near Kaumalapau Harbor, Kamoku, Lāna'i
- Conley-Kapoi, Andreè and Hallett H. Hammatt**
2005 *An Archaeological Assessment for a 7.673-Acre Parcel in Kamoku Ahupua'a, Lahaina District, Island of Lāna'i*. Prepared for Castle & Cooke Resorts, LLC. Cultural Surveys Hawai'i, Inc. Wailuku, HI.
- Creed, Victoria, Jared Hammatt, and Hallett H. Hammatt**
2000 *Archaeological Inventory Survey of a 50-acre Hawaiian Home Lands Parcel, Lāna'i Island, Hawai'i*. Prepared for the Townscape, Inc. Cultural Surveys Hawai'i, Kailua, Hawai'i.
- Dagan, Colleen**
2006 *An Archaeological Literature Review & Field Inspection for the Miki Basin Project, Kaunolu Ahupua'a, Lahaina District, Lāna'i Island TMK: (2) 4-9-002:por 001*. Cultural Surveys Hawai'i, Inc. Wailuku, HI.
- Dagan, Colleen, Tanya Lee-Greig, Robert Hill and Hallett Hammatt**

- 2009a Cultural Impact Assessment for the Lāna'i High and Elementary School Expansion Project, Kamoku Ahupua'a, Lahaina District, Lāna'i Island [TMK: (2) 4-9-002: 058 (por.) and TMK (2) 4-9-014: 002]

Dagan, Colleen, Robert Hill Tanya Lee-Greig, and Hallett Hammatt

- 2009b Cultural Impact Assessment for the Lāna'i Senior Center Project:, Demolition of Existing Structure and Construction of a New Facility, Kamoku Ahupua'a, Lahaina District, Lāna'i Island TMK: (2) 4-9-06: 6

Dixon, Boyd, Maurice Major, and Darin Lazzaro

- 1992 Kaunolu: An Archaeological Inventory Survey And Mapping Of State Site 50-40-98-25, Kaunolū And Keāliakapu Ahupua'a, Lāna'i, Hawai'i. Prepared for Lanai Company and Castle and Cooke, Ltd. Bernice Pauahi Bishop Museum, Public Archaeology Section Applied Research Group. Honolulu, HI.

Dockall, John, Holly Formolo, and Hallett H. Hammatt

- 2004 *An Archaeological Assessment Survey for a Proposed 2 Million Gallon Water Tank and Access Road*, Kamoku, Lāna'i Island, Hawai'i. Prepared for Castle & Cooke Resorts, LLC. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Ellis, William

- 1963 *Journal of William Ellis*. Advertiser Publishing Company, Honolulu.
- 1969 [1785] *An Authentic Narrative Of A Voyage Performed by Captain Cook and Captain Clerke In His Majesty's Ships Resolution And Discovery During the Years 1776, 1777, 1778, 1779, and 1780; In Search Of A North-West Passage Between the Continents of Asia and America. Including a faithful Account of all their Discoveries, and the unfortunate Death of Captain Cook*. Volume I. Reprint, published by N. Isreal/ Keizersgracht 539/ Amsterdam C. & Da Capo Press, New York.

Emory, Kenneth P.

- 1924a *Island of Lana'i, A Survey of Native Culture*. B.P. Bishop Museum, Bulletin 12, Honolulu.
- 1924b *Village and House Sites Elsewhere than at Kaunolu*. Bernice Pauahi Bishop Museum. Honolulu, HI.

Foote, Donald E., E. L. Hill, S. Nakamura and F. Stephens

- 1972 *Soil Survey of the Islands of Kaua'i, Oahu, Maui, Moloka'i and Lana'i*, State of Hawaii. U.S. Dept. of Agriculture, U.S. Government Printing Office, Washington, D.C.

Fornader, Abraham

- 1919 *The Fornander Collection of Hawaiian Antiquities and Folk-Lore*, Volume V: Parts I, II, and III, The Hawaiians' Account of the Formation of their Islands and Origin of their Race, with the Traditions of their Migrations, Etc., Gathered from Original Sources. Bishop Museum Press, Honolulu.
- 1996 *Ancient History of the Hawaiian People*. Mutual Publishing. Honolulu.

Freeman, Otis Willard

- 1927 *The Economic Geography of Hawaii*, University of Hawai'i, Research Publications, No. 2, Honolulu.
- Giambelluca, T. W., Nullet, D., and T. A. Schroeder**
1996 *Hawai'i Rainfall Atlas*. Report R76, Hawai'i Division of Water and Land Development. Department of Land and Natural Resources. Honolulu.
- Gay, Lawrence K.**
1965 *True Stories of the Island of Lanai*. Mission Press, Honolulu.
- Graf, William, and Lyman Nichols Jr.**
1966 The Axis Deer in Hawaii, article, *Journal of Bombay Natural History Society*, 63:629-734.
- Guinther, Eric**
2008 Botanical survey for proposed public school facilities expansion at Lāna'i City, Island of Lāna'i. AECOS Consultants. Kane'ohe, HI.
- Hammatt, Hallett H. and Rodney Chiogioji**
1992 *Archaeological Investigations at the Waialua Single-Family Housing Project Area* Lāna'i City, Lahaina District, Lāna'i. Cultural Surveys Hawai'i, Kailua, Hawai'i.
- Hammatt, Hallett H. and Douglas F. Borthwick**
1988 *Archaeological Investigations at Lālākoa*, Kamoku, Lāna'i (Lālākoa III Subdivision). Prepared for Lanai Co., Inc. Cultural Surveys Hawai'i, Kailua, Hawai'i.
1989 Archaeological Reconnaissance Survey of the Proposed Kō'ele Golf Course, Kō'ele Single Family Housing, Queens Multi-Family, and Waialua Annex Subdivision, Lāna'i Island, Hawai'i. Cultural Surveys Hawai'i, Kailua, Hawai'i.
1993 *Archaeological Inventory Survey for a Proposed Kō'ele Waste Water Treatment Project*, Kamoku, Lāna'i. Prepared for Lanai Company. Cultural Surveys Hawai'i, Kailua, Hawai'i.
- Hammatt, Hallett H., Douglas F. Borthwick, David Shideler and Kirstie Nakamura**
1988 *Archaeological Investigations of the Ranching Era at Koele, Lāna'i*, Report prepared for M and E Pacific. Cultural Surveys Hawai'i, Kailua, Hawai'i.
- Hammatt, Hallett H., and David Shideler**
2004 *Archaeological Inventory Survey of the Lower West Slope of Niniwai Hill, Lāna'i*. Prepared for Castle & Cooke Resorts, LLC. Cultural Surveys Hawai'i, Kailua, Hawai'i.
- Handy, E.S. Craighill, Elizabeth G. Handy, and Mary K. Pukui**
1991 *Native Planters in Old Hawaii Their Life, Lore, and Environment*. Bernice P. Bishop Museum Bulletin 233, Revised Edition. Bishop Museum Presss, Honolulu, HI.
- Hawaii Department of Survey – Bureau of Government Surveying**
1903 Report of the Survey to the Governor of the Territory of Hawaii for the Year Ending June 30, 1902. The Hawaiian Gazette Co. Honolulu, HI.

Hawaiian Pineapple Company, Limited

- 1929 *Supplementary Map Plans and Descriptions of Exclusions-Land Court Application No 862 (amended)*, Island of Lanai, T.H. [map]. Scale = 1:2000. On file at the State of Hawaii Survey Office, Honolulu, HI.

Hommon, Robert J.

- 1974 An Archaeological Inventory Survey: Kō'ele nominated as a historic district and assigned state site number 50-40-1004 which included three houses and one church. Island of Lanai. Science Management Inc.

Kalakaua, David

- 1888 *The Legends and Myths of Hawaii. The Fables and Folk-Lore of a Strange People*, edited by the Honorable R. M. Daggett, Charles L. Webster & Co., New York.

Kamakau, Samuel Manaiakalani

- 1992 *Ruling Chiefs of Hawai'i*. Revised. Kamehameha Schools/ Bishop Estate. Honolulu, HI.

Kaschko, Michael W. and J. Stephen Athens

- 1987 Archaeological Inventory Survey of the Hulopoe Bay and Mānele Bay Areas, Island of Lāna'i, Hawai'i. Prepared for M & E Pacific, Inc.. International Archaeological Research Institute, Inc.. Honolulu, HI

Kingdom of Hawaii Legislative Assembly

- 1890 *Laws of His Majesty Kalakaua I King of the Hawaiian Islands, Passed by the Legislative Assembly at its Session 1890*. Gazette Publishing Company. Honolulu, HI.

Kuykendall, Ralph Simpson

- 1938 *The Hawaiian Kingdom, Volume 1, 1778-1854, Foundation and Transformation*, University of Hawai'i Press, Honolulu.

Lee-Greig, Tanya and Hallett H. Hammatt

- 2005 *Field Inspection Letter Report for the Court Housing Project in Lāna'i City*, Island of Lāna'i, Hawai'i. Prepared for Castle & Cooke Resorts, LLC. Cultural Surveys Hawai'i, Kailua, Hawai'i.
- 2008 An Archaeological Inventory Survey for the Lāna'i Photovoltaic Project Keāliaaupuni and Pawili Ahupua'a, Lāhaina District, Lāna'i Island TMK: (2) 4-9-002:001 por.

Macdonald, Gordon A., Agatin T. Abbott and Frank L. Peterson

- 1983 *Volcanoes in the Sea The Geology of Hawaii*. Second Edition. University of Hawaii Press, Honolulu, HI.

Mackie, Marshall

- 1939 "Lanai, the Hawaiian Pineapple Island", article, *Paradise of the Pacific, Hawaii's Illustrated Monthly Magazine*, Vol. 51, No. 12, December 1939.

McClellan, Edwin North

- 1939 "Fruit of All Fruits the First", article, *Paradise of the Pacific, Hawaii's Illustrated Monthly Magazine*, Vol. 51, No. 12, December 1939.

Maly, Kepa and Onaona Maly

- 2009 *Lanai Culture and Heritage Center*. Electronic Document, <http://lanaiche.org>.
(last accessed June 2009)

Maui County Council

- 1996 *Lāna'i Community Plan*. Community Resources, Inc.
1998 *Lāna'i Community Plan*. Community Resources, Inc.
2009 Cultural Resource Commission Meeting. Community Resources, Inc.

Menzies, A.

- 1920 *Hawaii nei 128 Years Ago*. W.F. Wilson. Honolulu.

Moffat, Riley M. and Gary L. Fitzpatrick

- 1995 *Surveying the Mahele, Mapping the Hawaiian Land Revolution*. Palapala'aina,
Volume 2. Editions Limited, Honolulu, HI.

Munro, George C.

- 2007 *The Story of Lāna'i*. Native Books, Honolulu, HI.

Nagata, R. H.

- 1987 *Inspection Report and Recommendations, Proposed Lāna'i Sanitary Landfill, Kaumalapau, Lahaina, Island of Lāna'i, TMK: 4-9-02: portion of 1*. DLNR,
Division of State Parks, Honolulu

Orr, Maria E.K.

- 2001 Preliminary Study of Selected Areas of East Lāna'i: Cultural and Historical
Review and Limited Ethnographic Survey. Prepared for the Lāna'i Company, Inc.

Paulding, Hiram

- 1831 *Journal of a Cruise of the United States Schooner Dolphin Among the Islands of
the Pacific Ocean*, G&C&H, Carvill, New York.

Pratt, Linda W and Samuel M. Gon III

- 1998 Terrestrial Ecosystems. In *Atlas of Hawaii*, Third Edition edited by Sonia P. Juvik
and James O. Juvik, pp. 121-129. University of Hawai'i Press, Honolulu.

Pukui, Mary Kawena and Samuel H. Elbert

- 1986 *Hawaiian Dictionary: Hawaiian-English, English-Hawaiian*. Revised and
Enlarged Edition. University of Hawaii Press. Honolulu, HI.

Pukui, Mary Kawena, Samuel H. Elbert and Esther Mookini

- 1974 *Place Names of Hawaii*, University of Hawai'i Press, Honolulu, HI.

Raymond, Anan

- 2003 *Lāna'i Summit Fence, Phase 1, Lāna'i Island*. U.S. Fish and Wildlife Service.

Richards, Reverend William

- 1831 Letter from William Richards Dated October 2, 1830, as published in the
Missionary Herald, Vol. XXVII (27), For The Year 1831, by the American Board
of Commissioners for Foreign Missions. Crocker and Brewster, Boston.

Savrann, Arnold

- 1989 *Lāna'i, Hawai'i*, Photography and Text by Arnold Savrann, Arnold Savrann and
Castle and Cooke Inc., Honolulu.

Schmitt, Robert C.

1973 The Missionary Censuses of Hawai'i. Pacific Anthropological Records No. 20. Department of Anthropology, Bernice P. Bishop Museum. Honolulu.

Sinoto, Aki

1990 *Lana'i Airport Surface Assessment Report*. Bishop Museum, Honolulu, Hawaii

State of Hawaii, Department of Transportation, Airports Division

2007-2009 Lanai Airport, Airport History, www.hawaii.gov/lny/airport-information/airport-history

Tabrah, Ruth M.

1976 *Lāna'i, Island*. Heritage, Norfolk Island, Australia.

Tomonari-Tuggle, M.H., H. David Tuggle, and J. Stephen Athens

2000 *Archaeology on a South Coast Landscape: Hulopo'e Lāna'i, Hawai'i*. International Archaeological Research Institute, Inc. Honolulu.

U.S. Department of Agriculture, Natural Resources Conservation Service

2000 *Soil Survey Geographic (SSURGO) database for Island of Maui, Hawaii (hi980)*. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. <<http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/>> (last accessed September 2005)

U.S. Senate Committee on Pacific Islands and Porto Rico

1903 *Hawaiian Investigation Part 3: Exhibits, Memorials, Petitions, and Letters*. To accompany Senate Resolution No. 260, First Session Fifty-Seventh Congress, of Date June 28, 1902, Authorizing and Directing the Committee on Pacific Islands and Porto Rico to Investigate the General Conditions of the Islands of Hawaii, and the Administration of the Affairs Thereof. Government Printing Office. Washington D.C.

Waihona 'Aina

2000 *The Māhele Database*. Electronic document, <http://waihona.com>, (last accessed September 2005)

2002 *The Māhele Database*. Electronic document, <http://waihona.com>, (last accessed September 2005)

Walker, Alen T. and Alan E. Haun

1987 Archaeological Reconnaissance Survey And Limited Data Recovery Excavations Proposed Sanitary Landfill Site. Land of Kamoku, Lahaina District, Island of Lanai (TMK: 4-9-02: por. 1), Paul H. Rosendahl Ph. D. Hilo, Hawaii

Williams, Kenne

2009 "Lana'i Treasures: Auntie Irene Perry, A childhood of adventure, a lifetime of happiness." *The Lana'i Times* Apr. 2009: 8-10.

Appendix A Guidelines for Assessing Cultural Impacts from the State of Hawaii Office of Environmental Quality Control

Guidelines for Assessing Cultural Impacts

Adopted by the Environmental Council, State of Hawaii November 19, 1997

I. INTRODUCTION

It is the policy of the State of Hawaii under Chapter 343, HRS, to alert decision makers, through the environmental assessment process, about significant environmental effects which may result from the implementation of certain actions. An environmental assessment of cultural impacts gathers information about cultural practices and cultural features that may be affected by actions subject to Chapter 343, and promotes responsible decision making.

Articles IX and XII of the State Constitution, other state laws, and the courts of the state require government agencies to promote and preserve cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups. Chapter 343 also requires environmental assessment of cultural resources, in determining the significance of a proposed project.

The Environmental Council encourages preparers of environmental assessments and environmental impact statements to analyze the impact of a proposed action on cultural practices and features associated with the project area. The Council provides the following methodology and content protocol as guidance for any assessment of a project that may significantly affect cultural resources.

Background

Prior to the arrival of westerners and the ideas of private land ownership, Hawaiians freely accessed and gathered resources of the land and seas to fulfill their community responsibilities. During the Mahele of 1848, large tracts of land were divided and control was given to private individuals. When King Kamehameha the III was forced to set up this new system of land ownership, he reserved the right of access to privately owned lands for Native Hawaiian ahupua'a tenants. However, with the later emergence of the western concept of land ownership, many Hawaiians were denied access to previously available traditional resources.

In 1978, the Hawaii constitution was amended to protect and preserve traditional and customary rights of Native Hawaiians. Then in 1995 the Hawaii Supreme Court confirmed that Native Hawaiians have rights to access undeveloped and under-developed private lands. Recently, state lawmakers clarified that government agencies and private developers must assess the impacts of their development on the traditional practices of Native Hawaiians as well as the cultural resources of all people of Hawaii. These Hawaii laws, and the National Historic Preservation Act, clearly mandate federal agencies in Hawaii, including the military, to evaluate the impacts of their actions on traditional practices and cultural resources.

If you own or control undeveloped or under-developed lands in Hawaii, here are some hints as to whether traditional practices are occurring or may have occurred on your lands. If there is a trail on your property, that may be an indication of traditional practices or customary usage. Other clues include streams, caves and native plants. Another important point to remember is that, although traditional practices may have been interrupted for many years, these customary practices cannot be denied in the future.

These traditional practices of Native Hawaiians were primarily for subsistence, medicinal, religious, and cultural purposes. Examples of traditional subsistence practices include fishing,

picking opihi and collecting limu or seaweed. The collection of herbs to cure the sick is an example of a traditional medicinal practice. The underlying purpose for conducting these traditional practices is to fulfill one's community responsibilities, such as feeding people or healing the sick.

As it is the responsibility of Native Hawaiians to conduct these traditional practices, government agencies and private developers also have a responsibility to follow the law and assess the impacts of their actions on traditional and cultural resources.

The State Environmental Council has prepared guidelines for assessing cultural resources and has compiled a directory of cultural consultants who can conduct such studies. The State Historic Preservation Division has drafted guidelines on how to conduct ethnographic inventory surveys. And the Office of Planning has recently completed a case study on traditional gathering rights on Kaua'i.

The most important element of preparing Cultural Impact Assessments is consulting with community groups, especially with expert and responsible cultural practitioners within the ahupua'a of the project site. Conducting the appropriate documentary research should then follow the interviews with the experts. Documentary research should include analysis of mahele and land records and review of transcripts of previous ethnographic interviews. Once all the information has been collected, and verified by the community experts, the assessment can then be used to protect and preserve these valuable traditional practices.

Native Hawaiians performed these traditional and customary practices out of a sense of responsibility to feed their families, cure the sick, nurture the land, and honor their ancestors. As stewards of this sacred land, we too have a responsibility to preserve, protect and restore these cultural resources for future generations.

TEXT OF ACT 50, SLH 2000

A BILL FOR AN ACT RELATING TO ENVIRONMENTAL IMPACT STATEMENTS

UNOFFICIAL VERSION

HOUSE OF REPRESENTATIVES H.B. NO. 2895 H.D.1

TWENTIETH LEGISLATURE, 2000

STATE OF HAWAII

A BILL FOR AN ACT

RELATING TO ENVIRONMENTAL IMPACT STATEMENTS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

SECTION 1. The legislature finds that there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights.

The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit" in Hawaii. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a

duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

Moreover, the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture. The legislature further finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture.

The purpose of this Act is to: (1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amend the definition of "significant effect" to include adverse effects on cultural practices.

SECTION 2. Section 343-2, Hawai'i Revised Statutes, is amended by amending the definitions of "environmental impact statement" or "statement" and "significant effect", to read as follows:

"Environmental impact statement" or "statement" means an informational document prepared in compliance with the rules adopted under section 343-6 and which discloses the environmental effects of a proposed action, effects of a proposed action on the economic [and] welfare, social welfare, and cultural practices of the community and State, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects.

The initial statement filed for public review shall be referred to as the draft statement and shall be distinguished from the final statement which is the document that has incorporated the public's comments and the responses to those comments. The final statement is the document that shall be evaluated for acceptability by the respective accepting authority.

"Significant effect" means the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of the environment, are contrary to the State's environmental policies or long-term environmental goals as established by law, or adversely affect the economic [or] welfare, social welfare[.], or cultural practices of the community and State."

SECTION 3. Statutory material to be repealed is bracketed. New statutory material is underscored.

SECTION 4. This Act shall take effect upon its approval.

Approved by the Governor as Act 50 on April 26, 2000

2. CULTURAL IMPACT ASSESSMENT METHODOLOGY

Cultural impacts differ from other types of impacts assessed in environmental assessments or environmental impact statements. A cultural impact assessment includes information relating to the practices and beliefs of a particular cultural or ethnic group or groups.

Such information may be obtained through scoping, community meetings, ethnographic interviews and oral histories. Information provided by knowledgeable informants, including traditional cultural practitioners, can be applied to the analysis of cultural impacts in conjunction

with information concerning cultural practices and features obtained through consultation and from documentary research.

In scoping the cultural portion of an environmental assessment, the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment. Thus, for example, a proposed action that may not physically alter gathering practices, but may affect access to gathering areas would be included in the assessment. An ahupua'a is usually the appropriate geographical unit to begin an assessment of cultural impacts of a proposed action, particularly if it includes all of the types of cultural practices associated with the project area. In some cases, cultural practices are likely to extend beyond the ahupua'a and the geographical extent of the study area should take into account those cultural practices.

The historical period studied in a cultural impact assessment should commence with the initial presence in the area of the particular group whose cultural practices and features are being assessed. The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs.

The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural, including submerged cultural resources, which support such cultural practices and beliefs.

The Environmental Council recommends that preparers of assessments analyzing cultural impacts adopt the following protocol:

1. identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices and beliefs found within the broad geographical area, e.g., district or ahupua'a;
2. identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action;
3. receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;
4. conduct ethnographic, historical, anthropological, sociological, and other culturally related documentary research;
5. identify and describe the cultural resources, practices and beliefs located within the potentially affected area; and
6. assess the impact of the proposed action, alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified.

Interviews and oral histories with knowledgeable individuals may be recorded, if consent is given, and field visits by preparers accompanied by informants are encouraged. Persons interviewed should be afforded an opportunity to review the record of the interview, and consent to publish the record should be obtained whenever possible. For example, the precise location of human burials are likely to be withheld from a cultural impact assessment, but it is important that

the document identify the impact a project would have on the burials. At times an informant may provide information only on the condition that it remain in confidence. The wishes of the informant should be respected.

Primary source materials reviewed and analyzed may include, as appropriate: Mahele, land court, census and tax records, including testimonies; vital statistics records; family histories and genealogies; previously published or recorded ethnographic interviews and oral histories; community studies, old maps and photographs; and other archival documents, including correspondence, newspaper or almanac articles, and visitor journals. Secondary source materials such as historical, sociological, and anthropological texts, manuscripts, and similar materials, published and unpublished, should also be consulted. Other materials which should be examined include prior land use proposals, decisions, and rulings which pertain to the study area.

3. CULTURAL IMPACT ASSESSMENT CONTENTS

In addition to the content requirements for environmental assessments and environmental impact statements, which are set out in HAR §§ 11-200-10 and 16 through 18, the portion of the assessment concerning cultural impacts should address, but not necessarily be limited to, the following matters:

1. A discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained.
2. A description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken.
3. Ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained.
4. Biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area.
5. A discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations or biases.
6. A discussion concerning the cultural resources, practices and beliefs identified, and, for resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site.
7. A discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project.

8. An explanation of confidential information that has been withheld from public disclosure in the assessment.

9. A discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs.

10. An analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.

11. A bibliography of references, and attached records of interviews which were allowed to be disclosed.

The inclusion of this information will help make environmental assessments and environmental impact statements complete and meet the requirements of Chapter 343, HRS. If you have any questions, please call 586-4185.

Appendix B Formal Letters of Response

Mr. Kepa Maly – Lāna'i Culture and Heritage Center

KAMOKU Ahupua'a (literally, "the district") contains 8,291 acres, and is situated on the *kona* (leeward) side of Lāna'i. It is bounded on the north by Ka'ā Ahupua'a, and on the south by Kalulu Ahupua'a. Kamoku was noted for its upland forests and springs with areas which the Hawaiians developed into an extensive forested dry-land agricultural system in the Kō'ele, Kaiholena and Nininiwai region. Temporary and long-term residences, from which the rich fisheries fronting the ahupua'a were accessed, spotted the sheltered coves along the shore. Pali was the *Konohiki* of Kamoku under the Kamehamehas, and at the time of the *Māhele*, Kamehameha III retained the ahupua'a as a Crown Land. *Uhu* (parrot fish) was the *kapu* fish, and *koko* (*Euphorbia* spp.) was the *kapu* wood. Oleloa, a woman of chiefly lineage, claimed the important spring-watered bay of Kaumālapa'u (an *'ili* of Kamoku), but relinquished it to the government during the *Māhele*.

Native tenants of Kamoku Ahupua'a who filed claims for kuleana (fee-simple property rights) in 1847-1855

L.C.A.	Helu	Claimant	Ahupua'a	'Ili
6814		Pakele	Kamoku	Haupu, Kuapohaku, Lelehaka
6833		Kaai'ai	Kamoku	—
8556		Kaauwaeaina	Kamoku	Pueo
10630		Pali	Kamoku	—


**Kamoku Ahupuaa
District of Lahaina, Island of Lanai
Boundary Commission, Maui,
Volume No. 1, pages 114-115**

**No. 37—A. Survey of the Crown Land
of "Kamoku" Lanai
(See Figures 3 & 4)**

Commencing at a pile of stones over a cross cut in a large stone on South side of Kaumālapau Harbor on edge of gulch. The boundary runs:

1. N 86° 27' E true 3254 feet along Kalulu up South edge of gulch to a stone marked with a cross on edge of gulch a little above a branch that comes into the main gulch from the South. Thence:
2. N 88° 46' E true 5225.9 feet along Kalulu, up South edge of gulch to a cross cut in a stone on South edge of same. Thence:
3. N 84° 40' E true 2594 feet along Kalulu to head of gulch. Thence:
4. N 72° 43' E true 2080 feet along Kalulu to a cross cut in a stone amongst a lot of stones at the former site of an old *Heiau* called "Ili o Lono." Thence:
5. N 46° 19' E true 10144.4 feet along Kalulu up road to a point a little North of a cactus clump marked by two triangular pits.
6. N 65° 44' E true 4939 feet along Kalulu along North edge of crater to



a red wood post on the North wall of the crater at a place called Pulehuloa near Kelihananui's house.

7. Thence along Kalulu down across a small ravine (coming in from the North called Keaaku) to Government Road and up the N.W. edge of the Kapano valley, passing near Kawaonahale's house to a point on ridge marked with four triangular pits and ditch thus ; said point being a little east of Puu Nene and bearing N 44° 53' E true 8052 feet from above mentioned red wood post. Thence:
8. N 45° 49' E true 1087.9 feet along Kalulu across valley passing to the S. E. of a water hole called Kaihofena to a red wood post on ridge that comes down from the central mountain range. Thence:
9. N 62° 37' W true 6742.5 feet along Paomai down above mentioned ridge and across valley into a small ridge and down said ridge to a red wood post at end of same.
10. S 84° 37' W true 1316.8 feet along Paomai to a cross cut in a stone.
11. S 74° 8' W true 6258 feet along Paomai passing to the North of a couple of *Hala* clumps to two Triangular pits at an old house site.
12. S 74° 07' W true 3045 feet along Paomai to a cross cut on a stone at head of gulch.
13. N 86° 6' W true 1368 feet along Paomai down South side of gulch.
14. S 83° 45' W true 1455 feet along Paomai to a cross cut in a stone.
15. S 74° 9' W true 920 feet along Paomai.
16. N 55° 12' W true 898 feet Paomai across gulch to a red wood post a little West of a cactus clump; here ends the Crown land of Paomai. Thence:
17. S 65° 58' W true 1617 feet along Kaa down North side of gulch to a cross on a stone.
18. S 64° 57' W true 2040 feet along Kaa down North side of gulch to a cross on a stone. Thence: [page 114]
19. S 70° 33' W true 3590 feet along Kaa to a point 10 feet East of a large rock with cross cut on it. Thence:
20. S 68° 53' W true 1664 feet along Kaa to Sea Shore. Thence:
21. S 1° 55' W true 13460 feet along sea shore to point of Commencement. Area 8291.09 Acres.

Surveyed by M.D. Monsarrat, Assistant
Hawaiian Government Survey

Lanai. June 1877. [page 115]

Mrs. Phyllis Cayan – State Historic Preservation Division

 <p>LINDA LINGLE GOVERNOR OF HAWAII</p>	 <p>STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES STATE HISTORIC PRESERVATION DIVISION 601 KAMOKILA BOULEVARD, ROOM 555 KAPOLEI, HAWAII 96707</p>	<p>LAURA H. THIELEN CHIEF, OFFICE OF HISTORIC PRESERVATION COMMISSIONER OF WATER RESOURCES & MANAGEMENT</p> <p>RUSSELL Y. TSUI DIRECTOR</p> <p>KEN C. KAWAHARA DIRECTOR OF WATER</p> <p>AGUAER, RESOURCES BOARD OF WATER RESOURCES PUNAHOU CAMPUS COMMISSIONER OF WATER RESOURCES & MANAGEMENT CONSERVATION AND RECREATION DIVISION 1000 KEELE STREET HONOLULU, HAWAII 96813 LAND AND NATURAL RESOURCES DIVISION 1000 KEELE STREET HONOLULU, HAWAII 96813</p>
May 26, 2009		LOG NO: 2009.2405 DOC. NO: 0905PC007
MEMORANDUM		
TO:	Colleen Medeiros Dagan, Archaeologist Cultural Surveys Hawai'i, 1993 Main Street, Wailuku, Hawai'i 96793	
FROM:	Phyllis Coochie Cayan, History and Culture Branch Chief <i>Phyllis Coochie Cayan</i>	
SUBJECT:	KAMOKU 2: Cultural Impact Assessment (CIA) Community Contact Letter for the Lana'i Airport Improvement Project, Kamoku Ahupua'a, Lahaina District, Lana'i Island. [TMK: (2) 4-9-002:041]	
<p>Mahalo for the opportunity to comment on this CIA regarding the Lana'i Airport improvements to include a private hangar for Castle & Cooke Resorts, LLC and three associated fuel tanks (above ground concrete slab) and upgrades to the existing water and wastewater systems. Also, a new Airport rescue fire station (one-story building) which will house two 1,500 gallon fire trucks.</p> <p>The department notes that the project area was previously in heavy pineapple agricultural cultivation from the 1920s through 1980s. Also, the proposed region of influence (ROI) has been part of the current airport area of development. However, the department requests that this project be mindful that any ground disturbance has a degree of risk and may encounter inadvertent burials or other significant items as there are historic sites in the general vicinity of the Kamoku Ahupua'a (i.e., Miki Basin, early Lana'i mythology).</p> <p>SHPD further recommends that you all consult with the following Lana'i folks to hear more mana'o for your cultural impact assessment report:</p> <ol style="list-style-type: none"> 1. Mr. Kepa Maly, Executive Director, Lana'i Culture and History Center. Phone: 808-565-7177 2. Mr. Albert Morita, Retired DOCARE officer, LCHC board of director member. amorita@aioha.net 3. Auntie Irene Cockett Perry, Kupuna (arrange with Kepa to see her) 4. Uncle Sol Kaopuiki, Kupuna (arrange with Kepa to see him) 5. Na Kupuna at the Lana'i Seniors Center – daily until noon, weekdays only. 6. Alberta Morita DeJetley, Commercial Farmer/Editor. Phone: 808-649-0808 <p>Any questions, please call me at 808-692-8025 or via email at Phyllis.L.Cayan@hawaii.gov</p>		
C:	Mr. Hinano Rodrigues, SHPD Maui Cultural Historian	

Mr. Clyde Namu'o – Office of Hawaiian Affairs

PHONE (808) 594-1888

FAX (808) 584-1865



STATE OF HAWAII
 OFFICE OF HAWAIIAN AFFAIRS
 711 KAPI'OLANI BOULEVARD, SUITE 500
 HONOLULU, HAWAII 96813

HRD09/3882B

June 8, 2009

Colleen Medeiros Dagan, Archaeologist
 Cultural Surveys Hawai'i
 1993 Main Street
 Wailuku, Hawai'i 96793

**RE: Cultural Impact Assessment consultation
 Lāna'i Airport Improvements Project
 Kamoku, Kalulu and Kaunolu Ahupua'a, Lahaina District, Lāna'i Island**

Aloha e Colleen Medeiros Dagan,

The Office of Hawaiian Affairs (OHA) is in receipt of your May 7, 2009 letter initiating consultation and seeking comments ahead of a cultural impact assessment (assessment) for the proposed improvements at the Lāna'i Airport. Based on the information contained within your letter, the proposed improvements would include construction of a private hanger and three associated fuel tanks, upgrades to existing water and wastewater systems and construction of a new Airport Rescue Fire Station.

OHA has no comments on the assessment at this time. Thank you for initiating consultation at this early stage and we look forward to the opportunity to review the draft assessment and provide additional comments at that time. Should you have any questions, please contact Keola Lindsey, Lead Advocate-Culture at (808) 594-1904 or keolal@oha.org.

'O wau iho nō me ka 'oia'i'o.

 A handwritten signature in black ink, appearing to read "Clyde W. Namu'o".

* Clyde W. Namu'o
 Administrator

C: OHA Lāna'i CRC office

Appendix C Authorization and Release Form

Aunty Irene Perry

Cultural Surveys Hawai'i Inc.

Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President



Providing Excellence in Cultural Resource Management

O'ahu	P.O. Box 1114 Kailua, HI 96734 Ph. : (808) 262-9972 Fax. : (808) 262-4950
MauI	16 S. Market St., #2N Wailuku, HI 96793 Ph. : (808) 242-9882 Fax. : (808) 244-1994
Kaua'i	P.O. Box 498 Lawai, HI 96765 Ph. : (808) 245-4883

Authorization and Release Form

Cultural Surveys Hawai'i (CSH) is grateful for the generosity of the Kūpuna and Kama'aina who have willingly shared their knowledge and experiences for the preparation of a cultural impact assessment for the Lāna'i Airport Improvements Project.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our assessment. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcription of our interview with you. At that time, you may make any additions, deletions, or corrections you wish.
2. You will be given a copy of the interview transcript you have approved for your records.

For our records and yours, we humbly request your confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You consent to the interview being made available to the public.

I, Irene Perry, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Irene Perry
(Signature)

8/5/09
(Date)

Appendix D Formal Interview Transcription

Aunty Irene Perry

File Name(s)	Aunty Irene Perry and Uncle Sol.wav
Job Code	Kamoku 2
Recording Date	April 9, 2009
Transcription Date	April 16, 2009 to April 20, 2009
Participants	Irene Perry (IP); Colleen Dagan (CD); Iwao "Turkey" Kawakami (TK)

Aunty Irene Perry, daughter of Robert Cockett, former manager of Ko'ele Ranch and Uncle Sol Kaopuiki are kūpuna and descendants of two Hawaiian families from Keōmoku, Lāna'i.

Irene Perry (IP): I don't know, Sol, I think he didn't, or maybe he knew because he's outside talking to people yeah?

Colleen Dagan (CD): *Well, you know what, we're just interested in learning what you're interested in sharing. But that's the affordable housing project. And they're gonna—*

(IP): That's going to be?

(CD): *They're planning it, yes. So, it's gonna be there and then they're gonna improve this road. I think that's Ninth Street? So it's,—that's all pineapple fields. Here's a picture. This is the school expansion.*

(IP): See the guy you should have gotten was Scavendys boy?.

(CD): *Who?*

(IP): -He knows a lot of these things.

(CD): *Well, so you grew up down at Keōmoku?*

(IP) I was born in Keōmoku, and we came up to the Lāna'i, Kō'ele, in 1928, I think it was.

(CD): *Oh, 1928.*

(IP): Yeah.

(CD): *Oh.*

(IP): And when we got up here, I don't remember all the roads, you know... the streets and all that.

(CD): *That's what you remember?*

(IP): I just remember the highway, the main highway.

(CD): *Did you ever come up here before it was a city?*

(IP): No.

(CD): *When you were a small—*

(IP): —To come up to get our groceries, to come up, because we cannot, we had no stores down Keokmoku. You know, there was nothing just the families that stayed there. We had [a] boat that—boats to go over to Maui and get our supplies. It's the Kaopuiki family, they had that one boat of theirs, and it goes, I think it's just about every—just about once a month or twice a month. They take their orders from the family, and what they need, you know, they take 'em.

And then they go to Maui and then they give it to the grocery store manager, and then they would fill their orders and then take them down to the boat, and that's how we would get our supplies.

(CD): Oh. So, what was it like up here before the city? Do you remember what it looked like, before the city was here?

(IP): No, no, no. Well, I just remember one of the first things, that had the homes, I think it was the theater, and then they had, right where the theater is, they built housing there, was about first homes that I remember here. And then there was some down at Miki camp, which was by the airport somewhere, and ah, they had homes,, I don't know when they built those. It's when we came up to get our supplies, you know when went to the butcher.

(CD): So, the butcher—

(IP): Like, we'd need water. We didn't have any fresh water, we had brackish water. So, we used to come up on horseback and fill up some gallons of water and go back home, down Keōmoku. So, that's about all I remember. And then my sister, my oldest sister, was living in one of these homes over here that was first built. And, that's all about I remember, and, I guess they had the store then, they had one store then, and a rubbish yard, a jewelry store, yeah. Just about [inaudible]. And, in fact they had the post office right over here in back of the, in the housing area.

(CD): Did you say you were born in 1915?

(IP): '17.

(CD): 1917. And what's your maiden name?

(IP): Cockett.

(CD): Cockett, oh, okay.

(IP): Robert Cockett was my father.

(CD): Oh. Robin?

(IP): Robert Cockett.

(CD): Robert, oh.

(IP): Robert. He's from Maui.

(CD): Yeah, I know a few Cocketts over on Maui.

(IP): Cockett's a big family. We have so much that I don't know which is my cousin. [laughter]

(CD): Yeah!

(IP): You know and then they didn't know, I guess their parents tell them they have family on Lāna'i, and when we'd go there then we'd talk and visit, oh you're from Lāna'i, yeah, we Cockett. Oh, I'm a Cockett, you know! And my father is, oh my parents, and that's how we'd get to know them. The whole family, yeah.

(CD): So, what did you guys do down at Keōmoku like, as kids?

(IP): Play. We'd play and that would be, which chores not til we're through with it, there's nothing to do but for to play.

(CD): *What were your chores?*

(IP): We had, well, we had wood stove, you know, that—I don't know what you'd call them, we'd call them wood stove. And ah, so we'd have to go out and cut your, you have to find the twigs, the young ones, you know, the good ones to start the fire. And we'd get a—pick all of those up, make a good bundle of them, and then we'd get the larger size, and then we'd get the big ones, where you, after you get 'em going and then you use the larger size. We used to do that and, we used to go help my mom fish, you know, with, what you call it, the *hukilau*.

(CD): *Oh!*

(IP): On Saturdays.

(CD): *Down there, on Saturdays.*

(IP): Yeah, on Saturdays. We'd go out and *hukilau*, when the weather is nice. It was all, all the kids. You know, we get the kids—the family down there, we'd all get together.

(CD): *So, all the different families?*

(IP): Yeah, and there's about only twenty of 'em, maybe, we get, Kahaliau.

(CD): *Kahaniau?*

(IP): Kahalianu?

(CD): *Oh, Kahalianu..*

(IP): And then there was the Kawila and we had a Japanese family but they came later, but they were with us anyway, the Miratas used to be—

(CD): *Were you still doing the hukilau with the Miratas?*

(IP): Yeah, with the kids, and then they, my mom used to—we used to go with my mom and help her, with my mom and my older brother, used to get, surround the nets, you know.

(CD): *Who made the nets?*

(IP): I don't know, I guess they—somebody made it, I don't know who. But they know how to make it, though. My mom knew how to make nets, she threw the nets, and my brothers knew how. And they used to patch it when, you know, it get *puka* in it, you patch it up, you'd have to do it. And I think I know how to do it too. With the knot stitch you know, you going around and you knot the loop, then you—like crocheting. Yeah, yeah. You make loops and you keep on going.

(CD): *Oh. So you would help patch the nets too?*

(IP): Not all the time.

(CD): *Oh, so your brothers and your mom?*

(IP): My brother and mom would do stitches, yeah. We were in the way when they were doing that [inaudible].

(CD): *You were still—*

(IP): [Inaudible]we watch it, when they don't come we'd try go and do it and then we, we'd step so we'd stay around away from it [laughter].

(CD): *So, what about—did you guys gather limu down there?*

(IP): Hmm?

(CD): *Did you gather limu?*

(IP): *Limu?* Yes but they didn't have too much *limu*. But they had the *limu* that they, called—you know *limu 'ele 'ele*?

(CD): *Yes.*

(IP): And I understand that it only comes down after a big rain, 'cause it likes the—

(CD): *Brackish water?*

(IP): There's something about it, yeah. And then after the, sludge. And I love that *limu*, it's oh my—you know what kind that that is? [inaudible].

(CD): *Yeah.*

(IP): I love that.

(CD): *Oh yeah?*

(IP): And we used go to gather some of that.

(CD): *Oh yeah?*

(IP): And then, like fishing, we used to go with bamboo, 'cause our house is like, say, my house is here, our house, and we'd cross the street to the—'cause over there is the ocean. We were right close to the beach [inaudible].

(CD): *Yeah! What kind of fish do you remember catching?*

(IP): We get—we used to catch mullet, and, oh what's the other kind of fish? Sometimes [inaudible, sounds like jaymoons] more. We'd catch crabs in the net. They'd get caught in the net. You know, swimming crabs they called it. It was those reds ones and the tail fins with the flappers like on it?

(CD): *What color are they?*

(IP): Red.

(CD): *Red?*

(IP): Yeah, reddish color.

(CD): *Oh.*

(IP): And that would get caught in the net, when we'd go *hukilau*.

(CD): *Did you eat that too, the crab?*

(IP): Oh yeah.

(CD): *How'd you guys eat it? Did you cook it, or was it-*

(IP): We'd cook it. Boil it, in hot water and dump the crabs inside. Poor guys, was still alive and get dumped in the hot water. [inaudible], you know! Yeah, then when we'd catch fish, if we'd get enough, for dinner, you know, then we'd dry some of them. We'd clean it up, and salt it and dry it. 'Cause we had to, because we need to— when the weather is bad the boat can't go to Maui. Because it's a small boat, not a big one.

(CD): *Yeah.*

(IP): Small little sampan.

(CD): *So, how did you guys salt it?*

(IP): Hmm?

(CD): *How did you cut it up and salt it?*

(IP): Well, just scale it and cut 'em in half and salt it and put 'em out in the sun to dry.

(CD): *Oh. How long did it last like that?*

(IP): You mean the-

(CD): *The fish.*

(IP): The fish? It would last a long time. When you dry it you can keep it for a long time. And we'd save 'em up, that's a good size, you know, for, that are like, in the bad weather time, we'd start with the fish are dried, and then you, go and catch the fresh one fish whatever we'd have and eat it, but we'd have to store some for winter time, otherwise we'd-

(CD): *Yeah. So that's a lot. Did you have like, a big store house, or-*

(IP): No, no, we have [inaudible]. We'd just dry it and put it in - we get the kerosene can, remember those big—

(CD): *Kerosene cans?*

(IP): We'd get the kerosene cans, we'd just wash all of that out, we'd get 'em all cleaned up and get 'em dried and then we cut the top off and we'd put the fish and store it, you can cover it with cloth. And, well, we have, they have different ways to clean it and but that's how we used to do it.

(CD): *Oh, wow.*

(IP): And we stored it so when winter comes the boat can't go we have something to rely on.

(CD): *So you needed to get your supplies from Maui, before Lāna'i City was built. Before the city was built?*

(IP): What about the city?

(CD): *After the city was built, did you still go to Maui to get your supplies, or did you start coming up here?*

(IP): No, we still went to Maui.

(CD): *Oh yeah?*

(IP): 'Cause up here, we'd have to travel far, from Keōmoku.

(CD): *To come up here?*

(IP): Keōmoku, we used to come on horseback.

(CD): *On horseback?*

(IP): Hours.

(CD): *An hour?*

(IP): Maybe more I think. Have you ever been to Keōmoku?

(CD): *No.*

(IP): It's far. When are you going home?

(CD): *This afternoon sometime.*

[Break from interview]

(IP): This guy knows something about the place too.

(CD): *I have a recorder on, just so you know.*

(IP): That's okay. Tape recorder.

[irrelevant conversation]

(IP): He was down with, where I was staying too, you know, Keōmoku backcountry.

(CD): *Oh you live down at Keōmoku too?*

(Iwao "Turkey" Kawakami): Well, yeah I had been down there when I was young boy.

(CD): *Wow.*

(IP): Yeah. [inaudible].

(TK): [inaudible] the hard way in the old days.

(CD): *Yeah, I was just getting some details on building the wood fire, the wood stove.*

(TK): Wood stove.

(CD): *Fire.*

(IP): Even up here we had.

(TK): I think so.: I have to get a cup of coffee.

(IP): If you have spare time we can just drive down to Keōmoku.

(CD): *If I have spare time, that would be fantastic.*

(IP): Yeah, we can drive down to Keōmoku, and, we went yesterday, we were down there, we took our lunch and we sat on the beach, my daughter and I. And we sat at the beach and we

stayed there and had our sandwich and then we drove home. It was nice, but it was cold. It was windy yesterday, it was windy, it was cold.

(CD): *Oh yeah?*

(IP): But, it was nice. It would be nice, you could just go see what it's like and we could come back.

(CD): *Okay, we'll see. So did you come up to, when you were a young girl, did you guys come up to Kō'ele?*

(IP): Did we what?

(CD): *Did you know any of the families that lived up at Kō'ele?*

(IP): Uh yeah, my, I have a Tutu down in Pālāwai Basin. You know where that is?

(CD): *I do.*

(IP): I had a tutu over there, that we used to come up from Keōmoku. My my mom's family. And my eldest sister Annie was brought up by her.

(CD): *By your tutu?*

(IP): She stayed with Tutu to help them, I guess. But anyway, Tutu was a—

(CD): *What was your tutu's name?*

(IP): Keliihananui. They were one of the last ones down there, in Palawai.

(CD): *Oh wow. I have this map. This has some of the old Hawaiian, some name, of some of the people that were living around the city. Or that used to. Can you read that?*

(IP): What's this red one for?

(CD): *That's the High School.*

(IP): Oh, the High School.

(CD): *That's gonna be the High School expansion. This is the city, and if—it's kinda hard to see this is kind of small, but, there's these names, like these were the kuleana lands. And this says, Pali. Here's a family, or a person called Pali who claimed LCA 10630. And there's Kaa, I, K-A-A-I-A-E-I? Kaa, I, Kaaiai?*

(IP): That's a family—is that a name?

(CD): *Yeah, that's a family's name, or a person's name. Kaaiai. Looks like they had some property right here, on the far side of the city. What else.*

(IP): Oh I—Ai'kalae, I think? Does it sound like Ai'kalae?

(CD): *This name?*

(IP): Yeah. no?

(CD): *No. Kaa-i-a-i-a-i, ai-ai, I think it's Kaaiai. K-A-A-*

(IP): Oh, I don't know.

(CD): *Doesn't sound familiar? What's this? Ka'auwaeaina?*

(IP): [laughter] I don't know.

(CD): *Doesn't sound familiar? Here's Naholowai. Kanohohoukahi?*

(IP): Gee-

(CD): *You guys have long names over here!*

(IP): I should say, I was saying [inaudible]. I don't know these ones.

(CD): *Can you see those? It's these names that are underneath—the names that are underneath these, these little things with the numbers. The LCA number and then the name under it. That's the person who owned that property at the time of the Mahele.*

(IP): Keliihanahui? Keliihanahui, now that's my tutu that's down in Palawai.

(CD): *Do you see that name?*

(IP): But I don't see it.

(CD): *You don't—oh yeah, this isn't Palawai. This is right around the city.*

(IP): The city here, yeah, I don't know.

(CD): *Did you know the families around here very much? Just you're aunt, and [to another person] Hi.*

(TK): What you folks looking at?

(IP): At the, map.

(CD): *We're looking at—*

(TK): [inaudible] Lāna'i?

(CD): *Yeah. One tha,-*

(TK): You'd better look good someday you get lost.

(IP): What date you been in Lāna'i?

(TK): Huh?

(IP): How long you been in Lāna'i? When you came to Lāna'i? You were born here?

(TK): Ah, when I was three years old.

(IP): You came, oh-: Maybe he know, look at this. This is the Lāna'i City. You was here when the city was built?

(TK): Yeah, my partner guys first ones over here.

(CD): *Oh yeah?*

(TK): Yeah.

(IP): Ichimura.

(CD): Right around the city.

(TK): Never had the trees yet. That's all, that's it.

(CD): What was your name?

(TK): Turkey.

(CD): *How do you spell it?*

(IP): What's your last name?

(TK): Kawakami.

(IP): Kawakami.

(CD): *And your first name.*

(TK): Iwao. But they call me Turkey, I don't know for what. [laughter] I hate eat turkey even [inaudible].

(CD): *Toka? T-O-K-A?*

(TK): T—Turkey.

(CD): *How do you spell, your nickname?*

(TK): T-U-R-K-E-Y.

(CD): *Oh, Turkey!*

(TK): Yeah. I have nickname, but I don't know even my letters all coming apart-

(CD): *Turkey?!*

(IP): Turkey!

(TK): And I hate turkey! It's an ingredient for soup, you know that one?

(IP): Sit down! Sit down, Turkey! Over here! Sit over here! Yeah, that's an old timer over here. I think he knows more than I do, but I think he forgets now.

(TK): [inaudible].

(CD): *No, you're not! The more the merrier!*

(IP): I didn't recognize him, he didn't look like he was Turkey, because he used to be a bit bigger, and I haven't—he live down that end of the city, and I don't see him often. But he has his sister is a good friend of mine. We went to school together and we still correspond. She lives right in Maui. And so, that's how I knew him. So whenever he sees me he says, oh, my sister's doing well, and oh, you know, he communicates with her, you know Turkey. Lāna'i has people that get the nicknames that.

(CD): *[laughter] Yeah, I'm noticing! So you moved up to the city—your family moved up to the city-*

(IP): 1928.

(CD): *1928.*

(IP): We stayed at Kō'ele.

(CD): *And you lived at Kō'ele.*

(IP): Yeah, Kō'ele. Do you know where the big hotel is now?

(CD): *Yeah.*

(IP): Well that was where it used to be, it was like the house over there and then the company had an office there, a house there, for the manager. They used to have cattle before pineapple.

(CD): *Yes..*

(IP): So they used to have an office there. And then, my dad—Keōmoku, after 1928 they got him to come up here, and, to the City here, and we stayed in Kō'ele and he took care of the ranch.

(CD): *What was his name?*

(IP): Robert Cockett, my dad.

(CD): *Robin?*

(IP): Robert.

(CD): *Robert.*

(IP): Robert Cockett. He took care of the ranch and when they still had ranch. But, when they did away with the ranch and then my dad moved down into the city here and then we lived in one of the homes there and he worked in the storeroom.

(CD): *Storeroom?*

(IP): Storeroom, for the pineapple company.

(CD): *Oh.*

(IP): And that's what he did until he retired.

(CD): *Oh. So down at Keōmoku, was he doing ranching down there?*

(IP): Yeah, he helped take care of the ranch, I guess you would say for the ranch, because dealing with the cattle, yeah? He had to service the water troughs, and if they had enough water.

(CD): *Down at Keōmoku?*

(IP): Keōmoku, yeah.

(CD): *Oh, okay. Did they run the cattle from here to there?*

(IP): Well, they had cattle up here at Kō'ele and they had cattle down Keōmoku. And then when they did away with the ranch there, before that they didn't have any cattle, I think they drove all the cattles up to Kō'ele instead of, you know, so I don't know but anyway they had him come up to Kō'ele and then take care of their ranching and all that until they dissolved the ranch and then he came down to the city and worked in the storeroom.

(CD): *Oh. Until he retired. What did your mom do?*

(IP): My mom was just a plain housewife.

(CD): *Did she still make it down to Keōmoku to fish-*

(IP): When we would go down to Keōmoku we did a lot of fishing, and I'd get a chance to, we used to—when we used to come up to see the family, see Tutu, we'd call her Tutu, we had to go by horseback, and we'd go all over, and through the mountains and down.

(CD): *You'd go away which way?*

(IP): From Keōmoku, we'd have to come up, we call it *Lāna'ihale*, yeah.

(CD): *Oh, okay.*

(IP): Yes, we'd come around that way. [inaudible]. So when we come up that side, to Tutu's place we had to come by horseback. So my mom was—

(CD): *Wow.*

(IP): What was I going to tell you, I forgot?

(CD): *Just that! Oh yeah, that's what I was asking.*

(IP): I was going to tell you about my mom fishing.

(CD): *Oh yeah, that's right.*

(IP): We used to come, when the tide is low, when we coming up to see Tutu, she had this horse, and I'd sit in the back of her.

(CD): *She has a what?*

(IP): The horse. We'd get the horse—

(CD): *Oh, a horse.*

(IP): —And we'd come on horseback. And we'd come, I forgot the name of the place, anyway, the tide is low, my mom goes with the horse right into the ocean, and they have that reef, you know, there, they go out to where the reef is, and she looks for squid, and we'd go around there, and when she sees the squid, she has the gunny sack bag with her, big enough so she can come back and she had the spear, with the long handle.

(CD): *What's her—what's her spear made out of?*

(IP): I think steel, with a sharp point.

(CD): *Steel, okay.*

(IP): I think it's steel. Anyway, she held that, and I'm in the back of her, sitting, and so—and she say, and she tap the squid, and then she'd take the bag that she had, she'd lower it down in the water, the sea, and then the squid would try for and the tentacles are—

(CD): *Yeah.*

(IP): Then they grab on and come up to her hand came back and looked all scared 'cause pull my leg up [laughter] But she'd stick the—and then she'd put the bag in the water, you know, [inaudible] and she would bring up that squid in the bag and the squid would let go and then she [inaudible] the bag.

(CD): *Oh! Wow.*

(IP): It was scary! [inaudible]. And sometimes we used to get to two or three, sometimes we'd get one.

(CD): *How did she see them?*

(IP): I don't—-that's what I keep saying, how does she know where the squids are? But they can tell, you know, I guess—

(CD): *Experience?*

(IP): It's experience, they can see, you know. And I'd look and I wouldn't see anything, but she goes in all and shoots it and

(CD): *Wow!*

(IP): And then, yeah, she was just a good fisherman—fisherwoman.

(CD): *Wow.*

(IP): Get, when we go Keōmoku sometimes we get, if we lucky, she gets about three, or sometimes nothing. Depends.

(CD): *Wow. Where'd she learn how to fish? Who'd she learn to fish from?*

(IP): I don't know, I guess she had to, maybe with her grandparents. I don't know. I never asked her. All I know is she can fish, she can even use a shotgun.

(CD): *A shotgun?*

(IP): Yeah, she goes, not fishing with shotgun but goes hunting for birds.

(CD): *Oh.*

(IP): In Keōmoku get plenty *kiawe* trees, there was a lot of doves.

(CD): *Oh.*

(IP): And, we would take the shotgun. And we'd go to places and we'd look around and look out for the doves, and see a big bunch of the doves, they all get together, yeah? And, okay, and we'd see the—and then, she'd, bang! The doves fall.

(CD): *What would she make with the doves?*

(IP): We'd take the doves home, and we'd have to take out the feathers, and then *pulehu*. And we'd put 'em over the fire, and we'd eat it! Oh, they was good!

(CD): *Wow, she was a handy woman, huh?*

(IP): My mom was all around and she could just do anything, I think. You tell her and she'll do it.

(CD): *Wow.*

(IP): Yeah, she'd fish, she can cook fish good, she can, garden, and everything.

(CD): *Garden? Did you guys have a garden down there too?*

(IP): We never had vegetables. We never had the vegetables the garden was only, oh no, yeah, we had sweet potatoes.

(CD): *Sweet potatoes.*

(IP): Yeah, but the [inaudible] was Tutu, we had Tutu lived she would come up to help harvest the sweet potatoes, when we were kids. They was sweet potatoes, they were orange colored.

(CD): *Orange? Oh.*

(IP): Maybe it's not sweet potatoes, maybe I forgot the name for it.

(CD): *Yams?*

(IP): Maybe it was yams, but even then we'd call it sweet potatoes.

(CD): *There's orange, there's orange sweet potatoes.*

(IP): There's orange ones.

(CD): *Yeah. So your Tutu grew those?*

(IP): My tutu grew-

(CD:) *In Palawai?*

(IP): Yeah, so we, they were good. They were.

(CD): *Sounds good.*

(IP): My mom used to do that, and [inaudible]. And well when we were up here too we have to go do laundry.

(CD): *Up here?*

(IP): Yeah.

(CD): *In the city?*

(IP): No, up, not the city, my Tutu, way back. The city wasn't even here then I think.

(CD): *Oh, before the city.*

(IP): This was before the city.

(CD): *You did laundry at your Tutu's?*

(IP): When we'd go down we'd come up to help Tutu, and we help Tutu do laundry, so they used to have trough, get the kettle, get water, and they, so we'd take all our clothes, and we'd go to down Palawai, further over from Tutu's place and look for a nice boulder, rocks that are [inaudible] that was to wash clothes on it. Take water, you know wash your—or the dirt off. And, never had washing board, so, we'd find nice stone and then we'd wash. Wash by hand, take water, rinse off the clothes, put the line over there, take a rope and put the line from tree to tree, hang all our clothes, and then, while the clothes was drying, mom was washing, the kids would be playing around. And there were a lot of cactus, down there, big cactus plants. *Pānini*, you know what *pānini* is?

(CD): *Yeah.*

(IP): Big ones, like that.

(CD): *The fruit?*

(IP): Was the fruit, pick *pānini*.

(CD): *Oh, you'd go pick it?*

(IP): Yeah, and then we'd take it back and we'd go out to those huge boulders out there, we'd put water on 'em, wash up the boulders, you know, sort of clean 'em up, and we'd take them, the *noni*, you know what *noni* plant is?

(CD): *Yes.*

(IP): Well we had lots of *noni* plants out there. So we used to take that, and we'd take the ripe fruit, and we hit it on the rock, and splash it, and then we'd leave them there to dry. So then Mom takes the washing, and ready to go home. Gather all the clothes up, dry from on the line, and then we'd go out we'd and peel the m, the *noni* that we had smashed on the rocks, like candy when they're dried. And so we peeled 'em all off and it tasted like candy.

(CD): *Really? It was sweet? Was it sweet?*

(IP): It was good. It tasted good to us!

(CD): *And it was just dried?*

(IP): It was dry. It taste good to us. I can't stand how it tastes now, but that time was good we used to have for candy.

(CD): *Noni's supposed to be real good for you.*

(IP): Yeah, it is.

(CD): *Did you guys ever get sick?*

(IP): Nope.

(CD): *You guys never had colds?*

(IP): I don't remember getting sick. But I got sick after when I was older, was when I—the kids playing down there. See like I tell my daughters there [inaudible] said oh, that's a big deal and I said we didn't have water, we're playing, and then maybe they said how come you're strong and all, I said I think maybe when we were young we ate dirt.

(CD): *[laughter]*

(IP): Ate dirt? I said yeah, eat dirt, it's good for you, plenty iron! [laughter]

(CD): *Oh my goodness!*

(IP): Yeah, 'cause when we were kids, you don't have water [inaudible], we cannot, we had brackish—we were lucky we had brackish water, 'cause my dad—

(CD): *So what did you drink?*

(IP): We boiled the water.

(CD): *You boiled it.*

(IP): Yeah, and then, when we can get water from Maui, or we come up to the city to get water, in the meantime we get it from Maui in gallons, you know, and get—we'd use that for drinking,

and then we'd, the well—water from the well we'd use for cooking. And it's good. I drank the brackish water. It's good.

(CD): *After boiling it.*

(IP): When we were kids we don't even have time to go in and boil it, we'd stay out and play we'd get water and drink it. I'm still alive [laughter]

(CD): *Did you said that down there you didn't have a garden. You'd come up to your Tutu's and—*

(IP): Yeah, we never had garden. The only time we had a garden like is when we had planted watermelon.

(CD): *Oh, you planted watermelons?*

(IP): We had melons.

(CD): *Every now and then?*

(IP): With Sol's [Kaopuiki] family, they lived further up the way, about three miles away from where we used to be,

(CD): *Sol's?*

(IP): Sol Kaopuiki, the one that was supposed to talk with you.

(CD): *Sol, oh Sol's family.*

(IP): Yeah, they have, they have, they would plant watermelon. So, when the watermelons would pick, and then the—when they'd grow the vines, the watermelon, yeah, we'd have to go and take something, take sticks and hold up the vines this way and then, you know, they'd [inaudible] melons they'd put 'em, so we take 'em somewhere.

(CD): *You brought 'em—and you brought that down to your guys' house? Or you did it up at Sol's house?*

(IP): We did it at Sol's place up the hill, and then we didn't have it, we went to [inaudible] kids get together help them, you know, let's get together, everybody gonna help 'em and [inaudible] this time.

(CD): *That must have been nice, when they were ripe.*

(IP) So one time we picked, It was down at our place I think, yeah, it was, we had a little patch too, a watermelon patch, a little patch. And you know, we had to make some kind of fence, we just [inaudible] fence, in like the *kahawai*? And then had fence over there so the cattle won't go down into the beach area. Anyway, we got this watermelon, and it was a big watermelon, real nice, big watermelon. And we would take that and take it—take it to the beach and put 'em on the boat and take it to Maui and sell it. And...but, like my Tutu say, I never know how much we got for the watermelons, the kids, they don't tell you, but yeah...so we don't know, but anyway, but when we'd get the money back [inaudible]. Anyway I saw this big watermelon. I said that one's mine! I said I'm going to take that! And my mom said no, that's too big, you know, let my uncle take it. I said, no uncle's gonna take it. I am. So, I took the watermelon, and I'm going down, it was okay I had took it, but I got to the fence—

(CD): *You carried it?*

(IP): Yeah, I carried it, and I got to the fence. So, we had to go through the fence, and there wasn't no gate, so I go down and I didn't put the watermelon down, I had to go through the fence with the watermelon, and, you, know, they wide, eh, the wire fence, and I—so I thought I could get through there. So, [inaudible] the watermelon, I put my feet over there, and I stepped over to get under, and the watermelon fell, and, crack, crack, just went open, just cracked. And oh it was just red, and sweet, you know you look inside and it's just like little grains of, red, oh the kids went back, everybody [inaudible] ran over and we all [inaudible] and dugged in to the watermelon.

(CD): *Oh good, so everybody ate it.*

(IP): Yeah, we cannot take on the barge, my mom, my mother was so angry, I did get scolded but I didn't get a spanking because all the kids were there. She said, I told you not to take that! Oh, well, too late!

(CD): *How old do you think you were?*

(IP): Oh, I must have been about six or seven. [laughter]

(CD): *Oh wow, I bet it was—*

(IP): I always think of that, it tasted perfect, sweetest watermelon ever. It was red, red inside, just like you know, vegetables inside there [inaudible].

(CD): *Everybody just came and ate it.*

(IP): Dirty hands. That's why I tell my girls, we eat dirt when we're young, our hands were dirty and we didn't wash it all [inaudible] but our [inaudible] we dig in. [laughter].

(CD): *Oh wow.*

(IP): So like this, I don't—I cannot help you with that.

(CD): *Here let me see if I can read a—let me see if I can read a couple more name. Maawe?*

(IP): No.

(CD): *Maawe? Yeah, Naholo—oh I read that already.*

(IP): I guess you know this stone down in the park here?

(CD): *The stone?*

(IP): There's that—Yeah, there's that monument? Have you seen it in the park?

(CD): *Yeah.*

(IP): It got names on 'em. All the Hawaiians that used to be here before, have their names on them. We can go see it in the park, right over there.

(CD): *You wanna go out there—you wanna—can you walk around?*

(IP): Yeah! Sure!

(CD): *Maybe we can take a little walk around, and go out in the park. Okay, let me pause this.*

[Recorder paused]

(IP): -build a, what you call, monument, for the people that used to live down in Pālāwai.

(CD): *Oh! Yeah! Alright, okay, now I'm walking around the town with Aunty Irene.*

(IP): Let's go over here.

(CD): *Oh, that stone, right there?*

(IP): Yeah. That's where—

(CD): *But there's another one, what's that? Oh this is.*

(IP): They're here. Now that one is [inaudible]—this one.

(CD): *There's another one.*

(IP): When the company took over the place down there, they uh, made this monument for the people that used to live down there.

(CD): *Oh.*

(IP): But the company took over my Tutu's place—

(CD): *Oh, they took it over?*

(IP): Yeah, yeah, they took it over. Because the Hawaiians were gone already, but they-

(CD): *Did—did they buy her property?*

(IP): Yeah, I think so, I think they bought it—I don't know what, but my Tutu's place, my sister had it, and when my sister had the place there. And, she had her, her brother I think one time, I don't know what he did, something, but, he must have done something wrong, and they, the company, they sent him away from Lāna'i, for some reason.

(CD): *Oh, that's World War II.*

(IP): Oh, well then that one down there, but—

(CD): *Vietnam, okay, so that's for the service in the—*

(IP): -And so they make these stones, you know [inaudible]. So the property, the company, wanted the pineapple, so they wanted to place to just - but it was for us, for my sister, but what they did to my father, and so, the company want it, so they asked my father that, if I can, my father said, no, you know, he isn't gonna sell it, and he said well, if you sell it I can't pass to them, they won't—they're not gonna let him, we cannot go there the property. So anyway, my dad and my sister, her husband was working for the company, and they, her brother, I don't know what he did, company said, the company said, you cannot get any job over here. So, they moved to Moloka'i. And then he didn't find a job, so he went come back home, and the company wouldn't give him a job, and that's when he—

(CD): *Sold.*

(IP): Sold the place. If my dad would let them have the place, they could have the place and they can come back. That's the only way, so my dad had to let go of the property. Because my sister's husband couldn't find a job, and they had their kids-

(CD): *And that was the Palawai property? Palawai, where your Tutu lived?*

(IP): Yes. So they took the property, because what if we kept it, we couldn't go, make a house or anything, whatever they want. They said they won't let us get in there, or they gonna, you know-

(CD): *Wow.*

(IP): That's, chicken, yeah? So these are the people that had their homes down there, that they, the company took all the Hawaiians used to live, a lot of Hawaiians.

(CD): *Hauhiwahine.*

(IP): And I don't know them, the only one I know is Keliihananui.

(CD): *Keliihananui. Is that, was that your Tutu?*

(IP): Yeah, my Tutu was—

(CD): *Keliihananui.*

(IP): Keliihananui, yeah.

(CD): *Oh, okay. Kauhane. Akiki?*

(IP): Kauhane, yeah.

(CD): *Puupai... Kukololoua?*

(IP): Yeah, Kukololoua, I think they was related to us, I'm not sure. But, anyway that's why take the place and then just leave them a name like this, don't do any good, yeah?

(CD): *Yeah.*

(IP): Why don't they give 'em money? So, anyways.

(CD): *They didn't give 'em money?*

(IP): Yeah.

(CD): *They didn't give 'em any money?*

(IP): I don't think so.

(CD): *Wanna sit under that\ that shelter? Are you cold?*

(IP): No.

(CD): *You're not cold?*

(IP): You wanna go under the shelter?

(CD): *Just for a little bit.*

(IP): I—I'm not cold. Yeah, but-

(CD): *Where do you live now?*

(IP): Me?

(CD): *Yeah.*

(IP): Over here. Hey, what do you wanna do now? We can go take a ride.

(CD): *Do you have a car?*

(IP): Yeah.

(CD): *You do?*

(IP): Yeah.

(CD): *Okay.*

(IP): Okay, if no have you cannot do anything though.

[laughter]

(IP): Well I wish I could talk to you more with the town but like I said, by the time I come up here, the only time I know is about the theater there, is one of the first building they had, and then the city, I don't remember if it's—

(CD): *Did you guys ever go to the mountains for anything?*

(IP): Yeah, to Lāna'ihale.

(CD): *What did you do over there?*

(IP): Oh, just for fun, go get *lilikois*, and we still had plenty *lilikoi*—you know what *lilikoi* is?

(CD): *Uh huh, yep.*

(IP): Oh, used to have lots. And *lilikoi* and *maile*.

(CD): *Maile?*

(IP): *Maile*. Used to have plenty and *lilikoi*. You know we don't have that purple one anymore.

(CD): *Purple lilikoi?*

(IP): Yeah. When they have, uh...you know, things going on, they go pull *lilikoi* vine, and make decorations, and now we don't have any *lilikoi*, I haven't seen any.

(CD): *Oh...what about the maile? Does maile still grow up there?*

(IP): The *maile*, they have some, I think. They said that they have some, but, I don't know [inaudible].

(CD): *Did ah, when you were a kid living in the city, what kinds of things did you kids do for fun?*

(IP): I never lived in the city.

(CD): *Oh, you lived up at Kō'ele.*

(IP): Over at Kō'ele. Here, this is my car.

(CD): *This Jeep?*

(IP): Yeah.

(CD): *Oh okay. Do you want me to drive? Do you think Uncle Sol's at home?*

(IP): I think, I don't know, but we'll go and see.

(CD): *Are you related to him?*

(IP): Yeah, his mother is my mom's, not sister, oh I don't know, but yeah, she's related.

(CD): *Oh. Maybe we can go by where you lived when you came up to this part of the island.*

(IP): Yeah.

(CD): *I mean, everybody calls it Lāna'i City now, but, did you guys call it Kō'ele before?*

(IP): Kō'ele is up there.

(CD): *What did—what did people call this part, before it was Lāna'i City?*

(IP): Lāna'i City, is just Lāna'i I guess. What do you mean?

(CD): *Before the city was built, what did everybody call this area?*

(IP): Just Lāna'i.

[laughter]

(IP): It was Lāna'i, just Lāna'i. This area is...this is our theater, but the, the bank.

(CD): *Yeah. Did—did you like—*

(IP): And this area here is the first, I think, ones of the city.

(CD): *Oh, the first part—*

(IP): This is where remember, right, because my older sister was living up here, and she lived over there...when we were up in Kō'ele.

(CD): *Oh. So what street was that?*

(IP): What?

(CD): *What street was that we just passed?*

(IP): Fourth.

(CD): *So that was Fourth.*

(IP): Yeah. And then we used to live in this house when we moved-

(CD): *Sixth, that was Sixth. Which house?*

(IP): That first house there. We moved up to Kō'ele, and then, m, when my dad retired we moved down here, to the town I was telling you. But m, I wasn't living there, I was already out of the house.

(CD): *Oh, excuse me, I think I have allergies.*

(IP): This is the golf course.

(CD): *Oh, okay.*

(IP): Yeah.

(CD): *That's the golf course.*

(IP): [inaudible] when we come back we go see if Sol is, at the house. He's kind forgetful, too, now.

(CD): *What was your favorite thing about living up here?*

(IP): I like the weather up here. You know, in 1934, in all the Lāna'i City, it used to be cold, cold, we get a hail storm one night.

(CD): *A hail storm?*

(IP): Yeah! But, we were playing in the—in the house, and then we heard this boom, boom, boom, you know and then, we came up and all this, about that big—

(CD): *Oh wow, like golf ball size?*

(IP): Yeah. And we were all excited, what was it you know, so my dad showed us. But never no more. That was the only time. It used to be so cold. This is the Lodge.

(CD): *So it's not as—it's not as—No, I've never been here! I wanted to stay here tonight! [laughter] But I can't. Wow.*

(IP): You wanna go in and see?

(CD): *Ahh, that's okay, no, we can drive. Yeah that's okay, I can see this another time. So you lived at a house, on this property?*

(IP): No. Over here, this is where the, the Kō'ele—

(CD): *Ranch.*

(IP): Ranch was. The slaughterhouse down there, and over here the manager's house, and Mr. Munro's house was over here, he was the manager at that time, Munro. And his house was here and then our house was here.

(CD): *Where did you guys live?*

(IP): Me?

(CD): *Yeah.*

(IP): We lived over here. There was a house over here. [Where the existing Ko'ele Lodge is now]

(CD): *Oh, okay.*

(IP): When we came from Keōmoku.

(CD): *So this, this structure was the hotel?*

(IP): —hotel was a house before.

(CD): *This very same structure.*

(IP): No, no. This one's all new.

(CD): *That's all new. What was here before?*

(IP): Yeah, way before was old house. A nice house. A bigger house, yeah? And then, by that big—that's the oldest pine tree you know! This is our church.

(CD): *That's a church—that's the church?*

(IP): That's our church, yeah.

(CD): *Oh, what's it called?*

(IP): Kalanaki—Kalana—Kalanakila (*sic*) O ka Malamalama. And this is the oldest pine tree in Lāna'i. See how... It's old, I don't know how long, more than 100 feet, yeah?

(CD): *Yes. Yeah, that's big.*

(IP): Mr. Munro's house used to be there, we used to live here, and then, right next to here, had one, store, an old house which was the ranch store and where the cowboys used to get their foods, and canned goods, and, when they'd ship 'em in so but then they moved, and we had a church right back up here, this one, they moved it over here when they built the hotel.

(CD): *Oh.*

(IP): So, this was moved, this was in the back. This is Kō'ele.

(CD): *Yeah, it's beautiful!*

(IP): Kō'ele. And then the slaughterhouse used to be down in here.

(CD): *Over there?*

(IP): Yeah, you know, see where that-

(CD): *Truck?*

(IP): Yeah, right in that area used to be the slaughterhouse. And our school used to be up on that hill over there, on this side. And that's where the school I went to.

(CD): *Yeah.*

(IP): Yeah, this road's gonna take you down to Keōmoku.

(CD): *Oh.*

(IP): We'll go see if Sol is home.

(CD): *And so this was all cattle, part of the cattle ranch.*

(IP): This one never used to be cattle, it was just when, the ranch, company gave up pineapple, then they started having cattle over here.

[Cut portion here, unrelated conversation]

(IP): Anyway, these big homes, these used to be-

(CD): *The big homes?*

(IP): Boarding houses. The big, big house over there. You know, for the pineapple workers that come and live here.

(CD): *The boarding houses?*

(IP): The boarding house, yeah.

(CD): *Like the dormitory?*

(IP): Cinderella's house.

(CD): *Yeah, who's house is that?*

(IP): I don't know!

(CD): *That's fancy!*

(IP): I don't know, they made a fancy house, we call 'em Cinderella's house, and I don't know.

(CD): *Woah, look at that one!*

(IP): But it's just—they're still working on it.

(CD): *Wow, yeah.*

(IP): Yeah, but it's 'cause I'd sure like to know. And this is the Purple Church, we call this the Purple Church.

(CD): *The Purple Church, has that been around since you were a kid?*

(IP): Hmm?

(CD): *Have these houses all been here since you were a kid?*

(IP): Yeah. That used to be a boarding house there, the Purple Church, though.

(CD): *Oh. A boarding—which one? Which boarding house was it? Was it the Filipino, or Japanese? Do you remember?*

(IP): Filipino.

(CD): *Filipino? What about the one above it that you pointed out first? Which one was that?*

(IP): I guess, well whatever—whoever lives there. I mean, the boys that come here and live and work, so they'd go over there and eat. It's the one's from outside the island, yeah? It's only for the boys—the people that come to Lāna'i to work, and that's where they go and eat. These are all this is where Sol lives. Guess I go see if he's home.

(CD): *Do you think he'd mind?*

(IP): I don't think so. Let me go see if he's home.

(CD): *Does he live with anybody? Does he live with anybody?*

(IP): No, his grandchildren is all away. Uh, his wife passed away long ago. So, he's home alone. We can go and see if he's home. [inaudible] myself.

(IP): He's got grandchildren. He has a son that lives in the mainland. He's something, big shot with the Hawaiian airline. He should be home.

(CD): *Feels warmer here.*

(IP): That grass needs water. That house is neglected.

(CD): *Yeah, it's for sale.*

(IP): [inaudible]. Sol! He's hard of hearing, too. Sol!

(IP): Do you hear somebody walking?

(IP): Sol! I have someone here to meet you!

[Cut interview here, Uncle Sol joins in but did not sign authorization form]

APPENDIX E.

Preliminary Wastewater Flow Calculations Report

Project: Lanai Airport Existing Utilities Evaluation
 Location: Lanai Airport, Lanai, Hawaii
 Prepared By: MHO
 Date: 9/28/07
 JN: 302671-0E

1. Purpose:

To determine the improvements required to the existing wastewater system in order to accommodate the proposed Castle and Cooke Resort's (CCR) Hangar improvements and the State of Hawaii, Department of Transportation, Airports Division (SDOTA) ARFF projects.

2. References:

- A. Hawaii Administrative Rules, Chapter 11-62, State of Hawaii Department of Health.
- B. Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, U.S. Department of Agriculture, Soil Conservation Service, August 1972.
- C. Manual of Septic Tank Practice, U.S. Department of Health, 1972.

3. Calculations:

A. Design Flow

	Unit	Flow rate (gpd)	Flow (gal)
Airport Employees	40	20	800
Airport Passengers			
Island Air (8 ft. x 30)	240	5	1200
Pacific Wings (2 ft. x 10)	20	5	100
CCR	5	5	25
Total			2125

B. Septic Tank Size

$$V = 1125 + .75Q$$

V = Volume of tank in gallons
 Q = Daily sewage flow in gallons

$$V = 1125 + .75(2125)$$

$$V = 2361$$

C. Absorption Bed (Leach Field)

Soil Permeability: 0.63 - 2.0 inch/hr. (95 - 30 min./inch)
 Rate of sewage application: 0.6 - 0.9 gal/sf

$2125 \text{ (gal/day)} / 0.6 \text{ (gal/sf/day)} = 3542 \text{ sf area required (approx. 2740 sf existing)}$

4. **Conclusion:**

The existing septic tank appears to be sized properly. Based on the existing soil permeability characteristics, the existing leach field area may not be able to accommodate the existing or proposed sewer flow.



Department of Defense

DATE: 08/11/99
 DRAWN BY: GSKV
 PROJECT NO.: 4M4011-02

KEY PLAN / NOTES:
 THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS NOT INTENDED FOR CONSTRUCTION OR MEASUREMENT PURPOSES.
 THE INFORMATION ON THIS DRAWING WAS PROVIDED BY THE AIRPORT AUTHORITY AND THE AIRPORT AUTHORITY HAS REVIEWED THE PROJECT TO VERIFY THE ACCURACY AND RELEVANCE OF THE INFORMATION AND HAS APPROVED THE PROJECT FOR THE AIRPORT AUTHORITY AND AIRPORT AUTHORITY AS OF 1999.

- LEGEND:
- COMMUNICATION
 - GAS
 - DRAIN
 - ELECTRIC
 - FIRE HYDRANT
 - FORCE MAIN
 - SEWER
 - WATER
 - TELEPHONE

PREPARED BY:
 KEC AIRPORT, INC.
 PROJECT MANAGER: [Name]

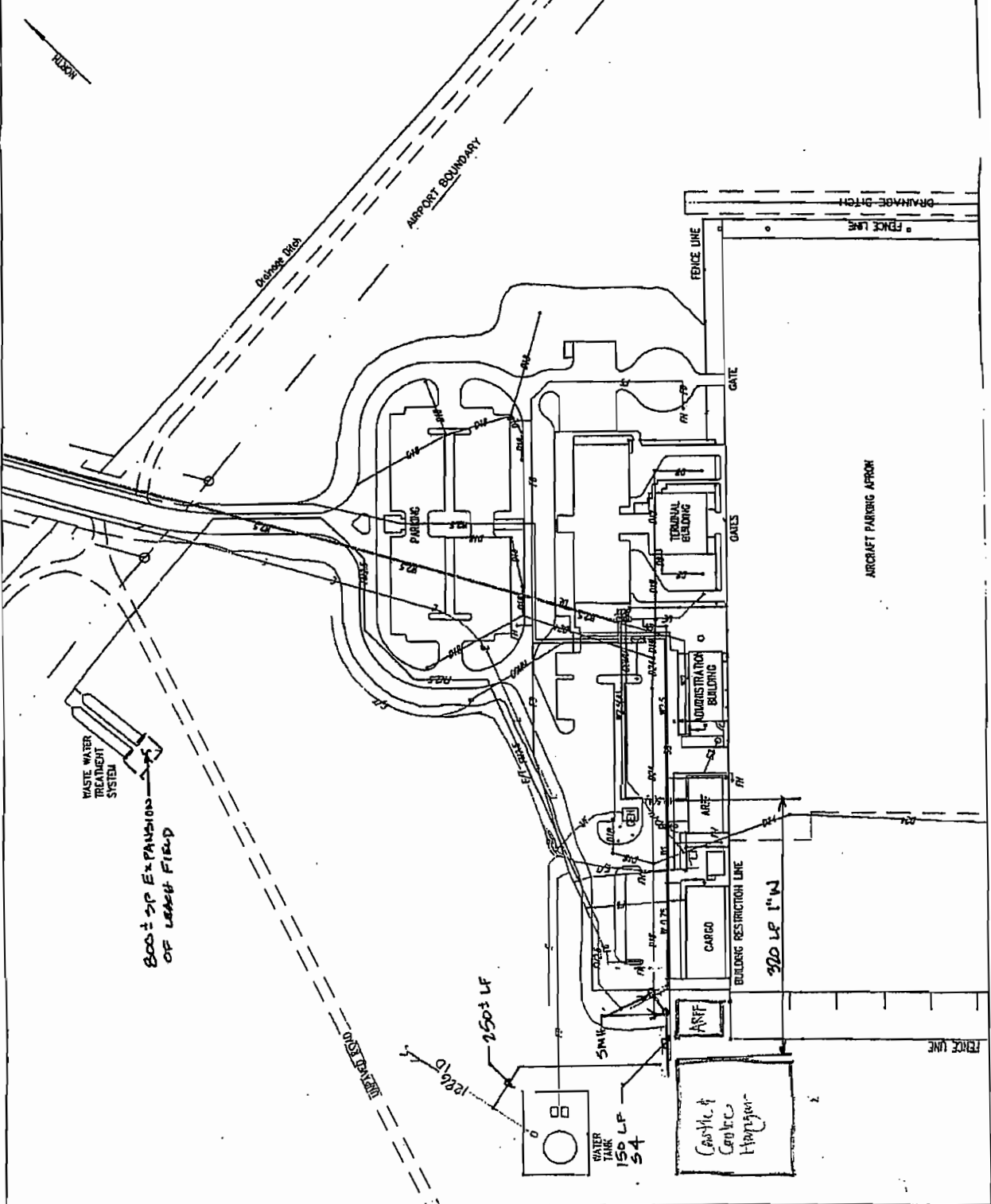
GRAPHIC SCALE IN FEET:
 0 10 20 30 40 50 60 70 80 90 100

PROJECT TITLE:
 LANAI AIRPORT
 MASTER PLAN
 UPDATE

PROJECT NO.:
 4M4011-02

SHEET TITLE:
 EXISTING TERMINAL
 AREA UTILITIES

DATE:
 08/11/99
 DRAWN BY:
 GSKV
 PROJECT NO.:
 4M4011-02
 SHEET NO.:
 2-160
 FIGURE:
 2-3



WASTE WATER TREATMENT SYSTEM
 250± LF EXPANSION OF LEAST FIELD

Lanai Airport					
Fixture	WSFU	Building A	Building B	Building C	FU
LAV	1.0	5	4	0	9
WC	8.0	2	5	0	56
UR	5.0	3	0	0	15
EDF	0.5	1	1	2	2
RHB	1.0	2	2	2	6
MS-1	3.0	0	1	0	3
TP	2.0	1	2	0	6
				Total	97

CCR Hangar				
Fixture	WSFU	Men	Women	FU
LAV	1.0	1	1	2
WC	5.0	1	1	10
UR	4.0	1		4
Shower	2.0	1	1	4
			Total	20

ARFF				
Fixture	WSFU	Men	Women	FU
LAV	1.0	1	1	2
WC	5.0	1	1	10
UR	4.0	1		4
Shower	2.0	1	1	4
			Total	20

CHART A-3
Enlarged Scale Demand Load

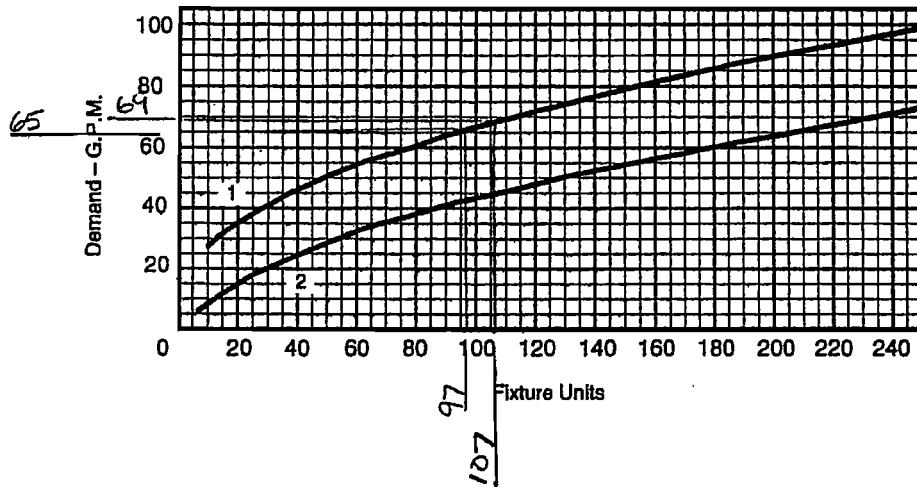
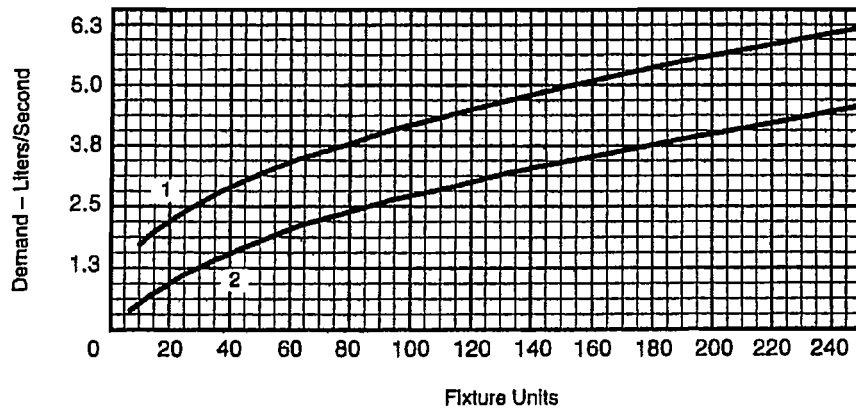


CHART A-3 (Metric)
Enlarged Scale Demand Load



APPENDIX F.

Preliminary Drainage Report

PRELIMINARY DRAINAGE REPORT

PROJECT NAME: Aircraft Rescue and Firefighting Station Improvements - Lanai Airport
State Project No. AM4031-17

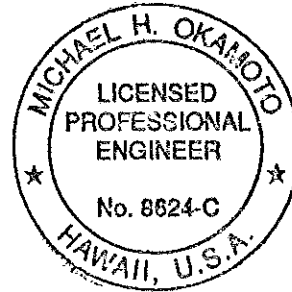
LOCATION: Lanai Airport
Island of Lanai, Hawaii

AREA: 1.9 Ac
Acres to be graded

CLIENT: Architects Pacific, Inc.
938-C Kapahulu Avenue
Honolulu, Hawaii 96816

PREPARED BY: R.M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaii 96819-3494
Phone: (808) 842-1133

DATE: October 16, 2009



This work was prepared by me
or under my supervision.

Michael H. Okamoto

10/21/09

Signature

Date
Exp 04/2010

SECTION 1 INTRODUCTION

1.1 PURPOSE

The purpose of this report is to analyze the existing and developed drainage conditions for the proposed Aircraft Rescue and Firefighting (ARFF) Station Improvements. The results of the analysis will be used to identify the potential impacts of the proposed project on the existing improvements and to determine if the proposed drainage concept can accommodate the design flood.

1.2 REFERENCES

Rules for Design of Storm Drainage Facilities in the County of Maui, Department of Public Works and Waste Management, County of Maui

SECTION 2 - TECHNICAL CRITERIA AND METHODOLOGY

2.1 HYDROLOGIC CRITERIA

2.2 RUNOFF QUANTITIES

- A. A recurrence interval of $T_m = 10$ year based on a 1 hour storm will be used to determine the peak runoff.
- B. The Rational Method will be utilized to determine the runoff quantities for the existing and developed conditions.
- C. Runoff Coefficient (C): The "C" value will be determined by table 1 or 2, whichever is greater.
- D. Rainfall Intensity (I): The appropriate 1-hour rainfall value was selected from Plate 6. The design rainfall intensity in inches per hour was determined from Plate 2 using the 1-hour rainfall value and time of concentration.

2.2 DRAINAGE MAP

A drainage map was prepared to delineate the drainage areas for both the existing and proposed (developed) conditions. The topographic information used to map the drainage areas was comprised of ground survey from the State Department of Transportation's General Aviation Apron project (Project No. AM 4022-13) and ground survey for the Lanai ARFF Station project.

SECTION 3 - EXISTING SITE CONDITIONS

3.1 LOCATION

The study area is located west of the existing cargo facility at the Lanai Airport. The study area is bordered by an asphalt concrete paved access road and parking lot to the east, a concrete apron to the south and an existing water tank to the north.

3.2 DRAINAGE CHARACTERISTICS

The study area comprises of a drainage area of approximately 1.9 acres which sheet flows in an easterly direction towards the existing cargo facility and concrete apron. The study area consists mainly of undeveloped, grassed land which is relatively flat with an average slope of approximately 3%.

A cut slope of 2(H):1(V) is located along the southern and eastern border of the study area. An unlined, grassed swale located at the bottom of the cut slope directs runoff towards an existing grated drain inlet located west of the cargo facility. The drain inlet also collects runoff from the existing paved parking lot east of the study area. Runoff is conveyed through an underground drainage system consisting of drain inlets, manholes and drainage pipe. The drainage system flows in an easterly direction towards the airport terminal building and cuts across the existing apron between the cargo facility and existing ARFF station before discharging at the southern side of the runway.

SECTION 4 - DEVELOPED CONDITION

4.1 PROPOSED IMPROVEMENTS

The proposed project will consists of a excavation and embankment, new building structure, asphalt concrete and Portland Cement Concrete pavement, drainage system, sewer system, potable water system, fire protection system, fuel tanks, concrete sidewalks, retaining walls and security fencing and gates.

4.2 DRAINAGE CHARACTERISTICS

The proposed drainage system will consist of drain inlets, drain manholes and drain pipe that will be directed to the existing drain inlet located west of the cargo facility and also to the existing 24-inch drain pipe located across the existing concrete apron on the south side of the study area.

SECTION 5 - CALCULATIONS

Drainage Area (Existing Condition)

A. Flow Rate, Q (cfs)

Using Rational Method, $Q = C i A$, where

Q = flow rate, cfs.

C = runoff coefficient

i = rainfall intensity, in/hr, for a 10-year, 1-hour rainfall

A = drainage area, Ac

Total Area, A = 83,423 Sq. Ft. or 1.9 Ac
Area 1 (Pervious) = 1.54 Ac
Area 2 (Impervious) = .36 Ac

Runoff Coefficient, C = 0.30 for Pervious, C= 0.95 Impervious (Table 2)
Area of Pervious surface is 81% of total area
Area of Impervious surface is 19% of total area
Using composite value,
 $C = (0.30)(0.81) + (0.95)(0.19)$
= 0.42

Rainfall Intensity, i = 2 in/hr for 1-hour rainfall
Tm = 10-yr, Plate 6, Ref 1.1

Time of Concentration, Tc
450' @ 2.65% = 17 min.
using Plate 1, Ref. 1.1

Design i = 3.7 using Plate 2, Ref. 1.1

Solving for: Q = C i A
 $Q = (0.42)(3.7)(1.9) = 2.95$ cfs, say 3 cfs

5.2 Drainage Area (Developed Condition)

A. Flow Rate, Q (cfs)
Using Rational Method, $Q = C i A$, where
Q = flow rate, cfs.
C = runoff coefficient
i = rainfall intensity, in/hr, for a 10-year, 1-hour rainfall
A = drainage area, Ac

Total Area, A = 63,085 Sq. Ft. or 1.5 Ac
Area 1 (Pervious) = 0.30 Ac
Area 2 (Impervious) = 0.70 Ac

Runoff Coefficient, C = 0.30 for Pervious, C= 0.95 Impervious (Table 2)
Area of Pervious surface is 30% of total area
Area of Impervious surface is 70% of total area
Using composite value,
 $C = (0.30)(0.30) + (0.95)(0.70)$
= 0.76

Rainfall Intensity, $i = 2$ in/hr for 1-hour rainfall
 $T_m = 10$ -yr, Plate 6, Ref 1.1

Time of Concentration, T_c
 $210'$ @ $2.4\% = 12.5$ min.
using Plate 1, Ref. 1.1

Design $i = 3.9$ using Plate 2, Ref. 1.1

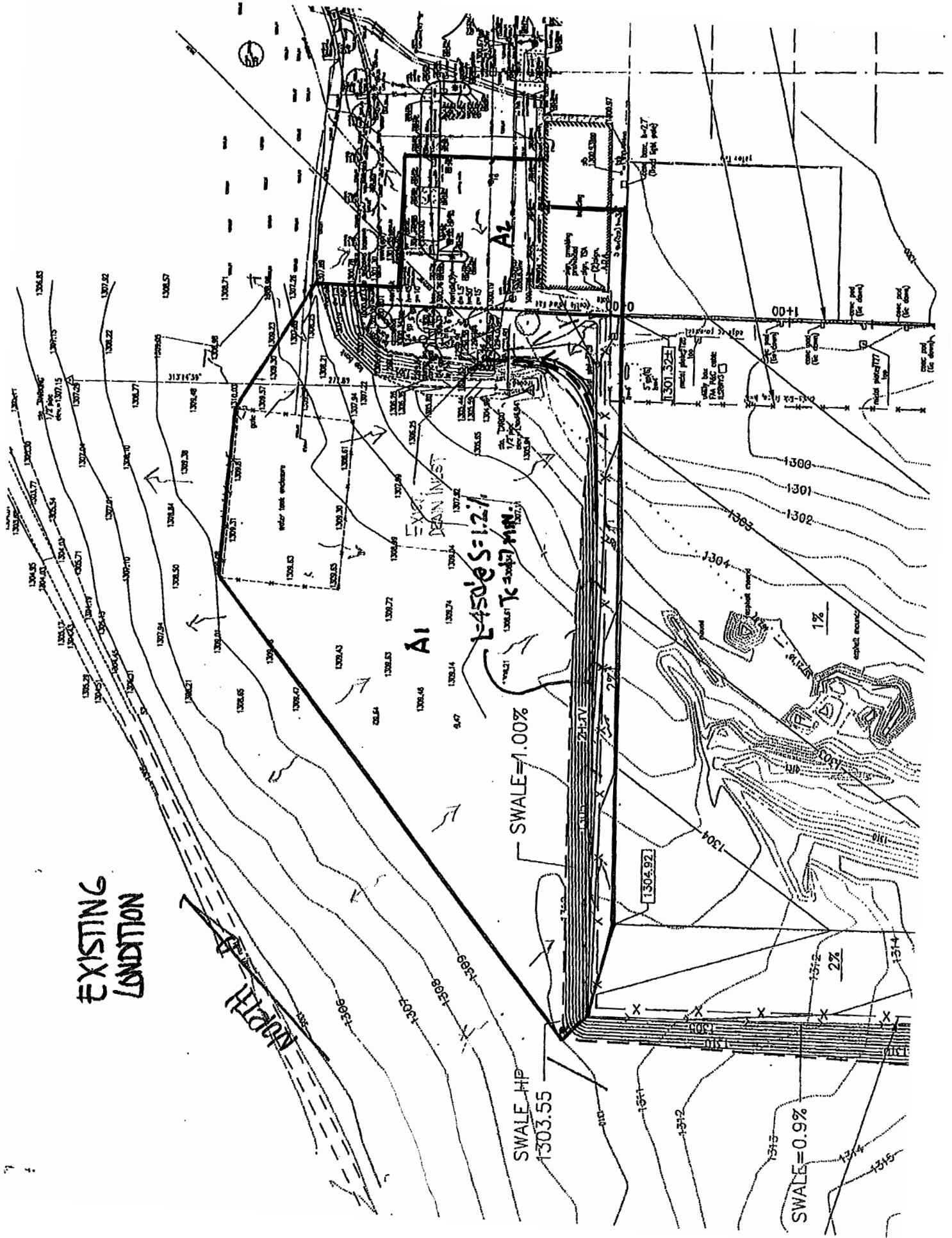
Solving for: $Q = C i A$
 $Q = (0.76) (3.9) (1.5) = 4.45$ cfs, say 4.5 cfs

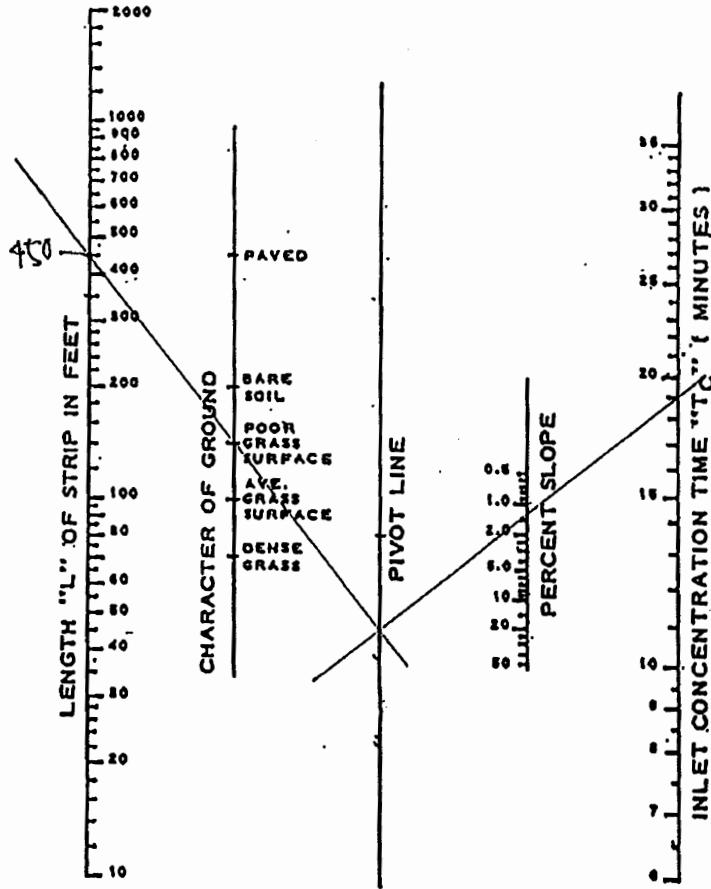
SECTION 6 - CONCLUSION

The existing drainage pattern will not be adversely affected by this project. The difference in runoff between the existing and proposed conditions is 1.5 cfs. This project will construct new swales and pipe drainage system to convey the additional runoff. Therefore, there will be minimal drainage impact to the surrounding existing development.

EXISTING
CONDITION

NORTH



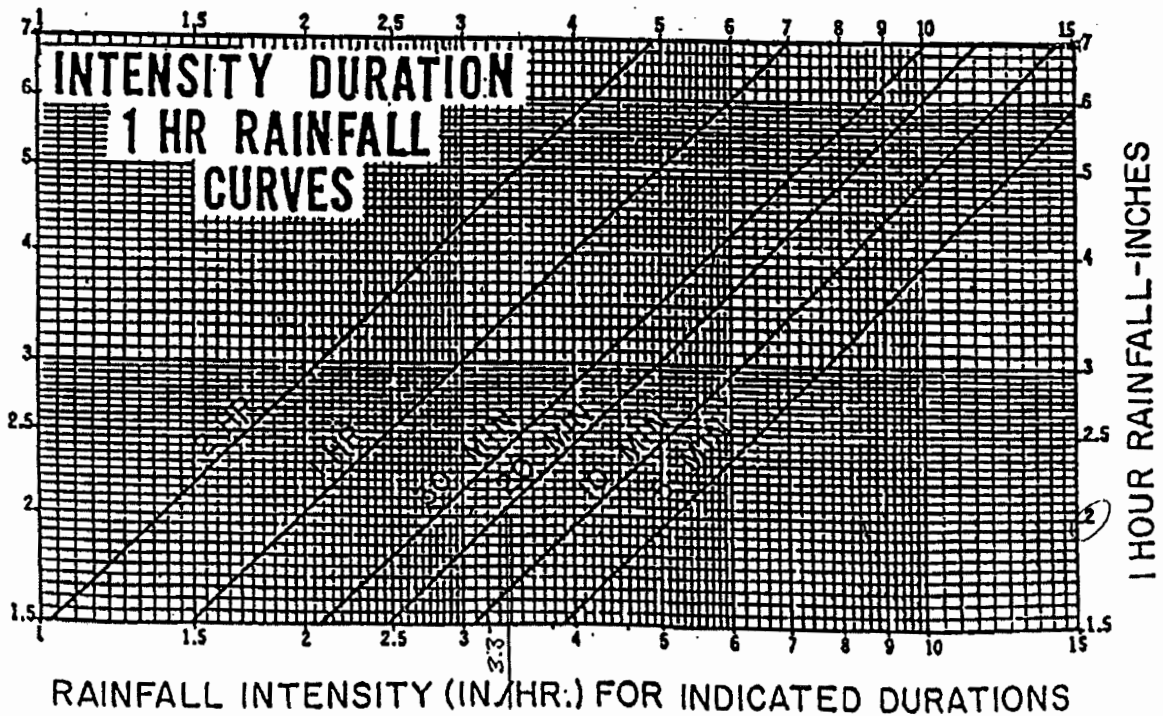


EXISTING CONDITION

Plate 1

Overland
Flow
Chart

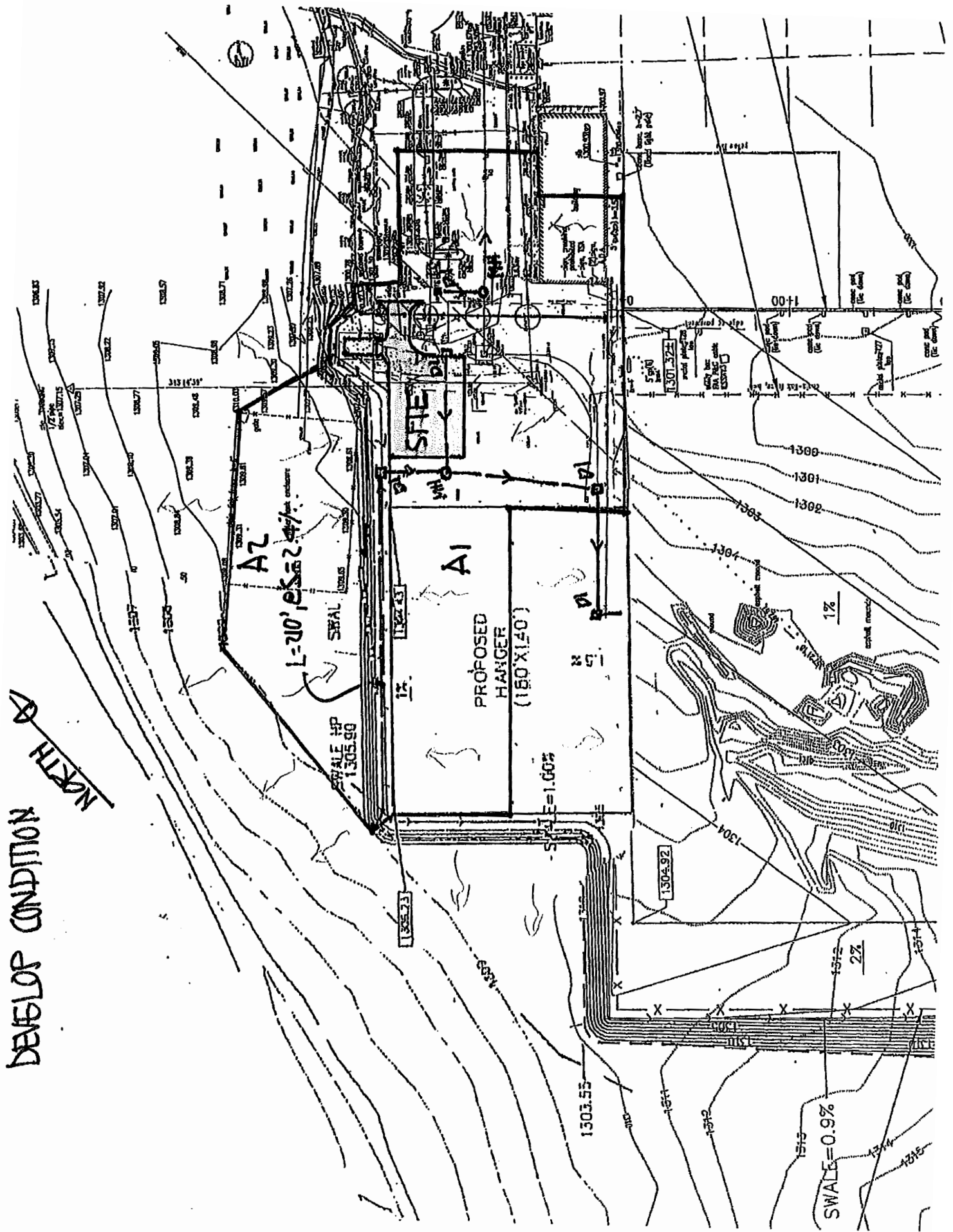
Plate 2

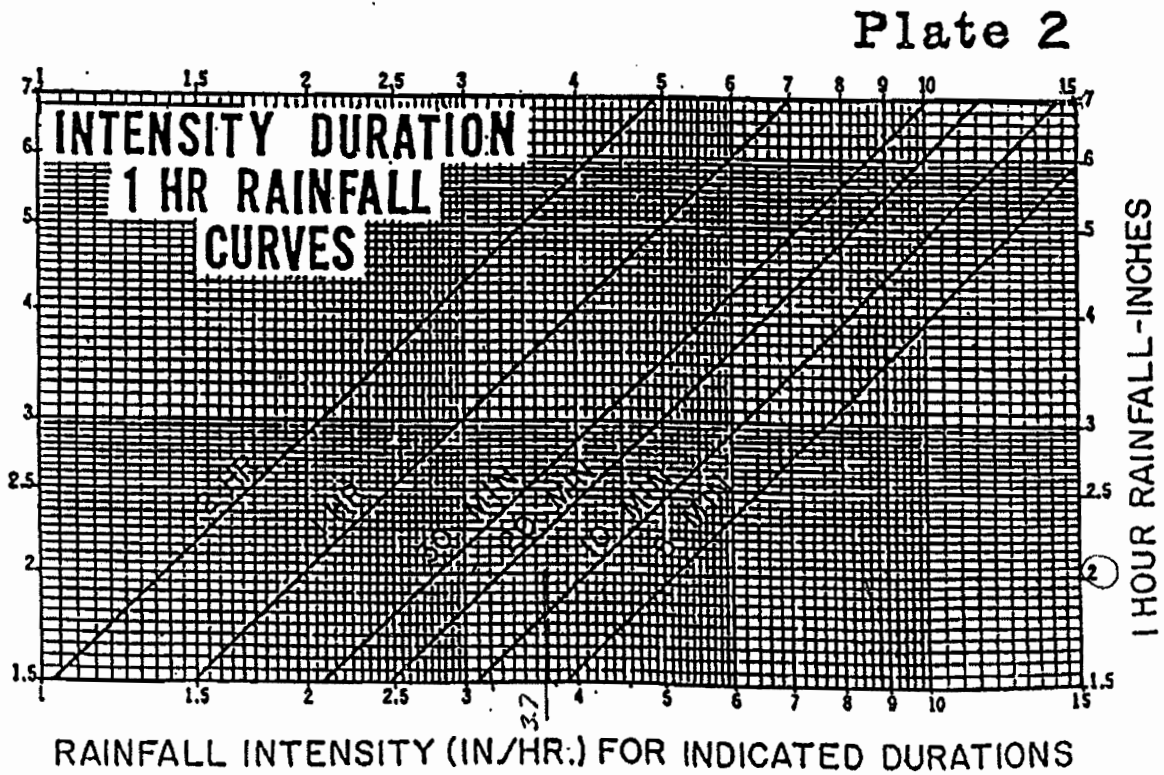
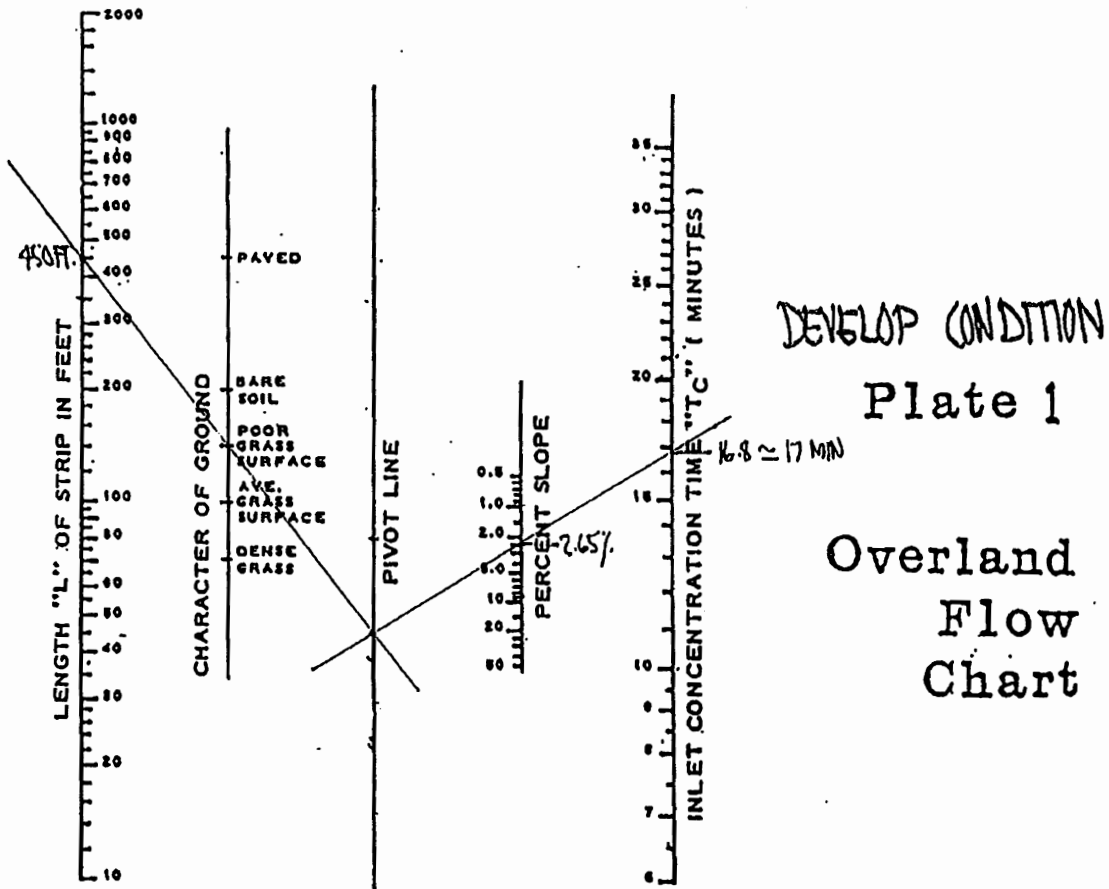


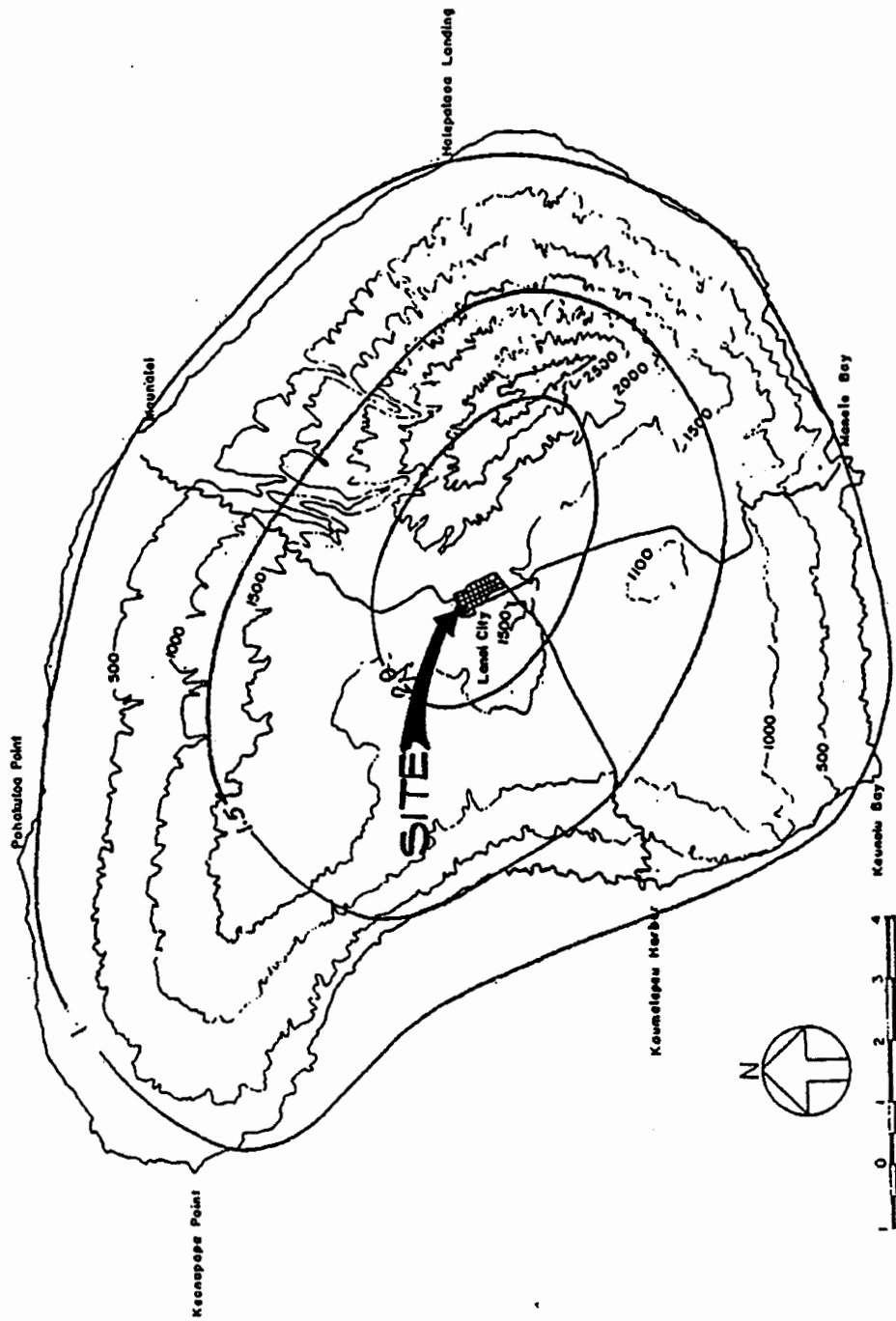
RAINFALL INTENSITY (IN./HR.) FOR INDICATED DURATIONS

DEVELOP CONDITION

NORTH 





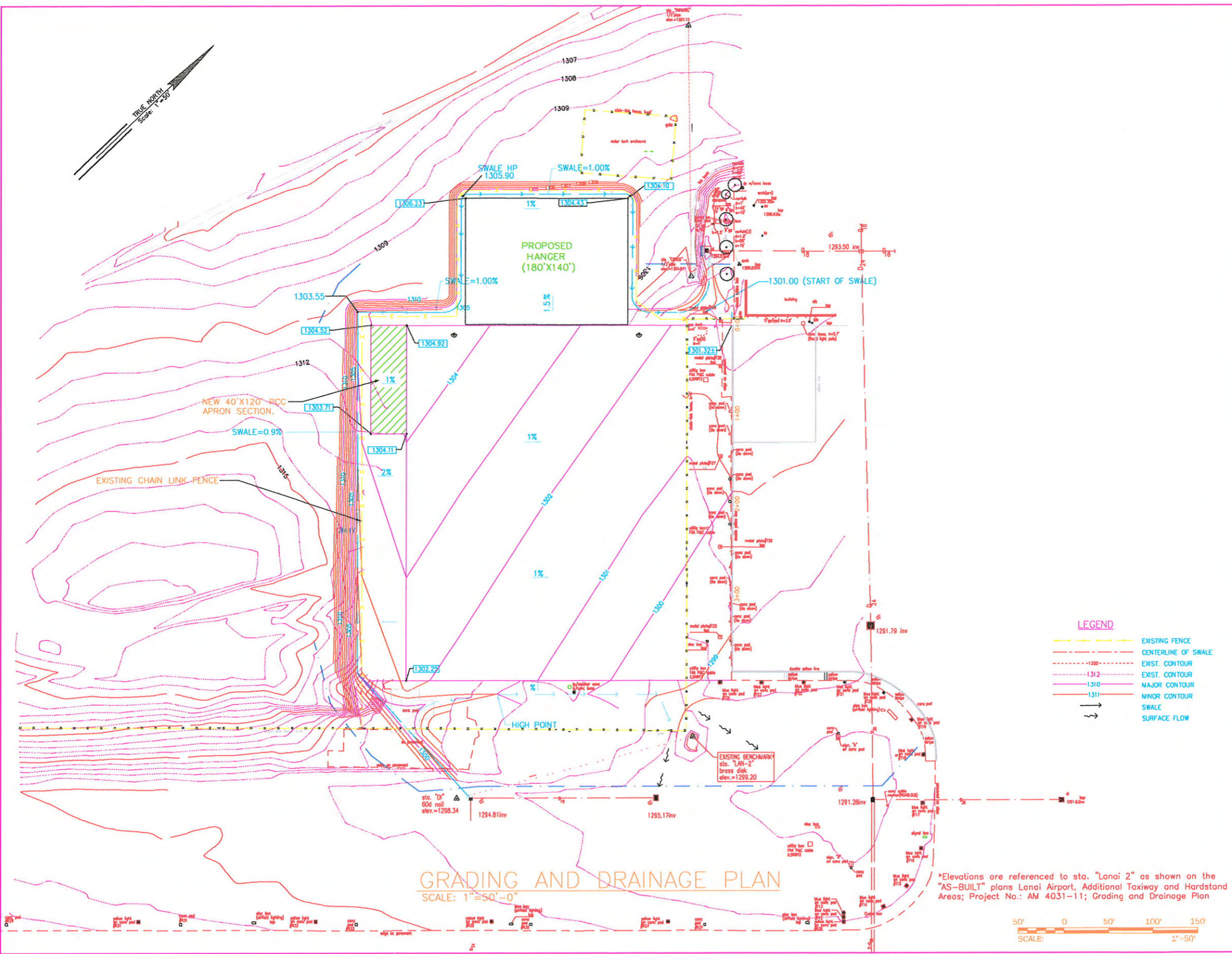
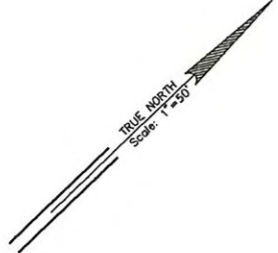


ISLAND OF LANAI

COUNTY OF MAUI
DRAINAGE MASTER PLAN
10 YEAR-1 HOUR-RAINFALL
R. M. TOWILL CORPORATION
CIVIL ENGINEERS - SURVEYORS

APPENDIX G.

Hangar and Fuel Facility Grading and Drainage Plans



GRADING AND DRAINAGE PLAN
SCALE: 1"=50'-0"

*Elevations are referenced to sta. "Lanai 2" as shown on the "AS-BUILT" plans Lanai Airport, Additional Taxiway and Hardstand Areas; Project No.: AM 4031-11; Grading and Drainage Plan



Airports Division
DEPARTMENT OF TRANSPORTATION
HONOLULU HAWAII

DSGN.	DRWN.	CHK'D.	APPD.
MM	MM	BB	BB

KEY PLAN / NOTES :

NO.	DATE	REVISIONS

PROJECT TITLE :

GENERAL AVIATION
LANAI AIRPORT

STATE PROJECT NO.:

AIP PROJECT NO.:

SHEET TITLE :

GRADING AND DRAINAGE PLAN

DATE :	
DWG. NO. :	

APPENDIX H.

**Electrical Utility Evaluation
by Ronald N.S. Ho &
Associates, Inc.**



ELECTRICAL, TELEPHONE AND CATV UTILITY EVALUATION

EXISTING CONDITIONS:

Maui Electric Company's (MECO) underground primary electrical service enters the property from the access road into the airport and is distributed throughout the airport. A MECO transformer provides electric service to the terminal building and is distributed throughout. This service is metered by MECO and is billed to the State.

In addition to the electrical service, telephone and CATV service is routed in the same underground ductline. Telephone and CATV cables belong to the respective utility.

NEW SERVICES:

New electrical, telephone and CATV services from the nearest connection point will be routed underground through a concrete encased ductline to the new facility. Electric handholes, telephone pullboxes and CATV pullboxes will be provided to accommodate pulling of the underground cables. The primary electrical service will be routed into a MECO transformer. The secondary electrical service from the transformer will be routed to the new facility and be metered by MECO. MECO will provide all primary electrical cables in State installed ducts. The electric meter will monitor electric usage for the new facility and will be billed to the State.

The new telephone and CATV service cables will be provided by the respective utility company through the underground ductline.

A utility easement will be required from the DOT-A for the utility ductline routed through the airport.

Sean K. Sugai, P.E.