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GLENN M. OKIMOTO
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JADINE URASAKI

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OFC. OF ENVIRONMENTAL QUALITY CONTROL

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

IN REPLY REFER TO:
HWY-H 11-2.0390

November 2, 2011

Gary Hooser, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

Dear Mr. Hooser:

Subject: Draft Environmental Assessment for Mamalahoa Highway Drainage Improvements at Kawa Flats, District of Kau, Island of Hawai'i

The Hawai'i State Department of Transportation, Highway Division, has prepared the draft environmental assessment for the subject project, and anticipates a Finding of No Significant Impact (FONSI) determination. Please publish notice of availability for this project in the next available edition of the Environmental Notice. We have enclosed the following:

- One paper copy of the Draft EA and a hardcopy of the OEQC Form
- A CD containing the .pdf file for the EA and a WORD file with the OEQC Environmental Notice Publication Form,

Please contact Roy Shioji of the Department of Transportation, Highways Division, Hawai'i District Office at (808) 933-2755 or email roy.shioji@hawaii.gov if you have any questions.

Very truly yours,

GLENN M. OKIMOTO, Ph.D.
Director of Transportation

Enc.

cc: Ron Terry, Ph.D. Geometrician Assoc., LLC

OEQC Publication Form
The Environmental Notice

Name of Project:	Mamalahoa Highway Drainage Improvements at Kāwā Flats
Applicable Law:	Chapter 343, HRS and NEPA
Type of Document:	Draft EA
Island:	Hawai`i
District:	Ka'ū
TMK:	(3rd) 9-5-016:006, 022, 025 & 026
Permits Required:	Historic Sites Review (Section 106 of NHPA and Chapter 6e, HRS, completed; State Highways Permit; Conservation District Use Permit (CDUP); National Pollutant Discharge Elimination System (NPDES); Subdivision Approval; Special Management Area (SMA) Permit; Grading, Grubbing, Excavating and Stockpiling Permits.
Name of Proposing/ Approving Agency:	Hawai`i Department of Transportation, Highways Division, Hawai`i District
Address	50 Makaala Street
City, State, Zip	Hilo HI 96720
Contact and Phone	Roy Shioji: 808-933-2755
Consultant	Geometrician Associates
Address	PO Box 396
City, State, Zip	Hilo HI 96721
Contact and Phone	Ron Terry 808-969-7090

Project Summary: The Hawai'i State Department of Transportation, in consultation with the Federal Highway Administration, proposes to construct drainage improvements along an approximately 3,700-foot section of the Mamalahoa Highway (State Route 11) located at Kāwā Flats. The highway was constructed over 50 years ago with no drainage facilities for this low-lying section. Flood waters from an intermittent stream frequently overtop the highway and completely close this round-the-island highway – the only route connecting the two main towns of Ka'ū. The flooding is a hazard to motorists, prevents the passage of emergency vehicles, and damages the roadway structure. Erosion and sedimentation impacts will be mitigated through Best Management Practices, and impacts to archaeological sites will be mitigated through data recovery. Threatened or endangered species, important farmland, wetlands or other waters of the U.S., or other sensitive resources are not present at the project site and will not be affected directly or indirectly. No adverse cumulative impacts will occur.

MAMALAHOA HIGHWAY DRAINAGE IMPROVEMENTS AT KĀWĀ FLATS

Federal Aid Project No. STP-011-2(36)

ENVIRONMENTAL ASSESSMENT

TMKs (3rd): 9-5-016:006, 022, 025 & 026
Kāʻu District, County of Hawaiʻi, State of Hawaiʻi

Submitted Pursuant to the National Environmental Policy Act (NEPA), 42 U.S.C 4332 (2)(c), 49 U.S.C. 303, and Chapter 343, Hawaiʻi Revised Statutes (HRS)

U.S. Department of Transportation, Federal Highway Administration (FHWA)
State of Hawaiʻi, Department of Transportation State of Hawaiʻi
Department of Transportation, Highways Division
County of Hawaiʻi, Department of Public Works

November 2011

MAMALAHOA HIGHWAY
DRAINAGE IMPROVEMENTS AT KĀWĀ FLATS
ENVIRONMENTAL ASSESSMENT

KĀʻU DISTRICT, COUNTY OF HAWAIʻI, STATE OF HAWAIʻI

Federal Aid Project No. STP-011-2(36)

Submitted Pursuant to the National Environmental Policy Act (NEPA),
42 U.S.C. 4332 (2)(c), 49 U.S.C. 303, and Chapter 343, Hawaiʻi Revised Statutes (HRS)

U.S. Department of Transportation, Federal Highway Administration (FHWA)
State of Hawaiʻi, Department of Transportation, Highways Division
County of Hawaiʻi, Department of Public Works

Date of Approval	**Glenn M. Okimoto, Ph.D., Director** **Hawaiʻi State Department of Transportation**
Date of Approval	**Abraham Y. Wong, Division Administrator** **Federal Highway Administration**

The following persons may be contacted for additional information concerning this document:

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Federal Highway Administration
P.O. Box 50206
300 Ala Moana Boulevard
Honolulu, Hawaiʻi 96850
(808) 541-2700

Dr. Glenn M. Okimoto, Director
State Department of Transportation
869 Punchbowl Street
Honolulu, Hawaiʻi 96813
(808) 587-2150

The Hawaiʻi State Department of Transportation (HDOT), in consultation with the Federal Highway Administration (FHWA), proposes to construct drainage improvements along an approximately 3,700-foot section of the Mamalahoa Highway (State Route 11) located at Kāwā Flats. The highway was constructed over 50 years ago with no drainage facilities for this low-lying section. Flood waters from an intermittent stream frequently overtop the highway and completely close this round-the-island highway – the only route connecting the two main towns of Kaʻū. The flooding is a hazard to motorists, prevents the passage of emergency vehicles, and damages the roadway structure. Erosion and sedimentation impacts will be mitigated through Best Management Practices, and impacts to archaeological sites will be mitigated through data recovery. Threatened or endangered species, important farmland, wetlands or other waters of the U.S., or other sensitive resources are not present at the project site and will not be affected directly or indirectly. No adverse cumulative impacts will occur.

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SUMMARY OF THE PROPOSED ACTION, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The State of Hawai‘i Department of Transportation Highways Division (HDOT) proposes to construct drainage improvements along an approximately 3,700-foot section of the Mamalahoa Highway (State Route 11) located at Kāwā Flats. The highway was constructed over 50 years ago with no drainage facilities for this low-lying section. Flood waters from an intermittent stream frequently overtop the highway and completely close this round-the-island highway – the only route connecting the two main towns of Ka‘ū. The flooding is a hazard to motorists, prevents the passage of emergency vehicles, and damages the roadway structure.

The highway's surface would be raised a maximum of about 10 feet, to an elevation of 46 feet above mean sea level. This would place the road surface approximately two feet above the 50-year flood level. A reinforced concrete box culvert measuring 84 feet wide by 8 feet high would be emplaced beneath the highway to convey the full design flow. This concrete structure would be divided into 6 cells, each 12 wide and 8 feet high. This culvert would drain runoff directly from the north drainage basin located upstream of the culvert. This culvert would also be connected via a 260-foot long, 20-foot wide unlined rock channel to another drainage basin that lies to the south and that also contributes to highway flooding at the project site. This culvert and channel would provide proper drainage capacity that would essentially maintain the current runoff patterns and flow depths but allows the runoff to pass under, rather than over, the highway. An additional smaller culvert would be placed under the highway south of the main culverts to maximize drainage efficiency. A 10-foot wide channel along the *makai* side of the highway would convey runoff from this feature to the outlet of the main culverts to the north.

In order to allow traffic to move unimpeded during construction, which would occur over the course of about one year, a temporary paved, two-lane bypass roadway would be built on the *makai* (toward the sea) side of the highway. A portion of this bypass road will be retained to provide permanent access to an existing four-wheel drive road towards the shoreline.

Construction of the temporary bypass would alleviate construction-phase impacts to traffic flow. The drainage improvements would produce a long-term benefit for traffic flow during flood emergencies and would also remove potential obstructions to emergency vehicles. Impacts to water quality during construction would be mitigated by Best Management Practices that prevent erosion and sedimentation from occurring and reduce or eliminate pollution from construction vehicles and equipment. The design has sought to minimize activity outside the road right of way, but up to five agricultural archaeological sites, all of which have been determined to be significant for data recovery only and not for preservation in place, would be disturbed by the project. The flora of the area is composed of predominantly non-native plants. No rare, threatened, or endangered plant or animal species was identified in the area and none would be affected directly or indirectly. Operationally, the culverts would duplicate existing hydrological conditions and no measurable change in downstream sediment delivery is expected. The duplication of existing hydrology would result in a continuance of surface and groundwater conditions for the coastal ponds located about 0.4 miles away, which are formed by outflow of groundwater and occasional influxes of ocean water during high waves.

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

1.1 Project Location, Purpose and Need and Description

The State of Hawaiʻi Department of Transportation, Highways Division (HDOT), proposes to construct drainage improvements along an approximately 3,700-foot section of the Mamalahoa Highway (State Route 11) located at Kāwā Flats in the Kaʻū District of the Island of Hawaiʻi (Figures 1-3). The highway was constructed over 50 years ago with no drainage facilities for this low-lying section. Flood waters from an intermittent stream frequently overtop the highway and completely close this round-the-island highway – the only route connecting the two main towns of Kaʻū.

Local newspaper and National Weather Service reports indicate that Kāwā Flats has been closed due to flooding at least six times since 2002, including closures of several hours in February 2002, May 2006, and February 2008 (see Figure 4 for typical flooding incident). This flooding is a hazard to motorists and also creates a potential hazard to area communities, as it prevents the passage of emergency vehicles and other critical services. Additionally, this situation is undesirable because flooding can damage the roadway structure and necessitate a longer-term road closure for substantial road repair in the future. For these reasons HDOT consider the current situation unacceptable, and there is a need to design drainage structures that allow floodwaters to pass under rather than over the highway.

The project involves a 3,700-foot section of Mamalahoa Highway (see Figures 5a-5b). The highway's surface would be raised a maximum of about 10 feet, to an elevation of 46 feet above mean sea level. This would place the road surface approximately two feet above the 50-year flood level. A reinforced concrete box culvert measuring 84 feet wide by 8 feet tall would be emplaced beneath the highway to convey the full design flow. This concrete structure would be divided into 6 cells, each 12 wide and 8 feet high. This culvert would drain runoff directly from the north drainage basin located upstream of the culvert. This culvert would also be connected via a 260-foot long, 20-foot wide unlined rock channel to another drainage basin that lies to the south and that also contributes to highway flooding at the project site. This culvert and channel would provide proper drainage capacity that would essentially maintain the current runoff patterns and flow depths but allows the runoff to pass under, rather than over, the highway. The new highway embankment would block local flows from lands located *mauka* (uphill) of the highway. A second smaller culvert would be installed beneath the highway south of the main culvert. This second culvert would facilitate local drainage and avoid the creation of semi-permanent ponds. The size of the smaller culvert would be determined during final design of the project.

In order to allow traffic to move unimpeded during construction, which would occur over the course of about one year, a temporary paved, two-lane bypass roadway would be built on the *makai* (toward the sea) side of the highway. A portion of this bypass road will remain after construction is completed to provide permanent access to an existing four-wheel drive road towards the shoreline.

Figure 1: Project Location

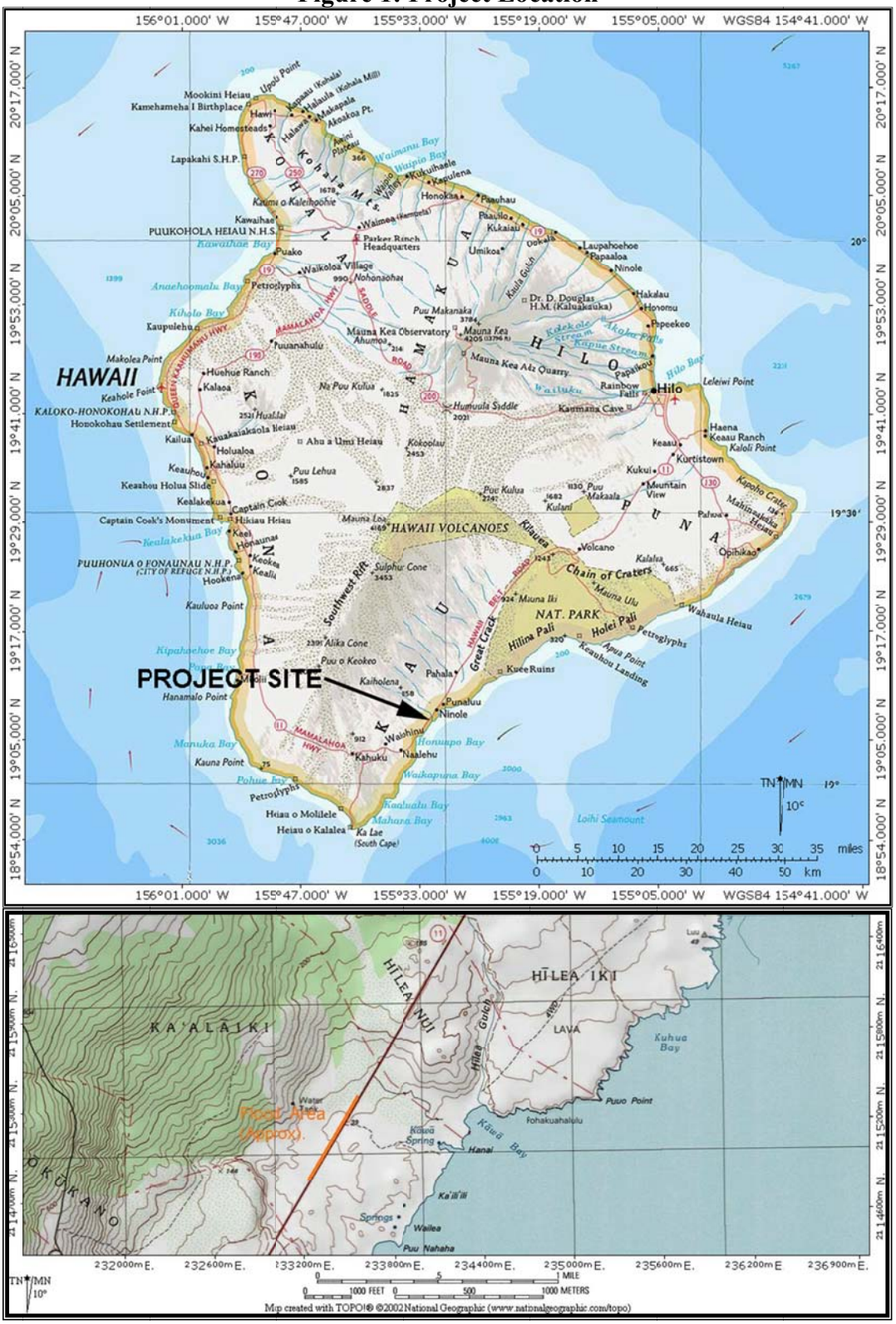


Figure 2: TMK Map

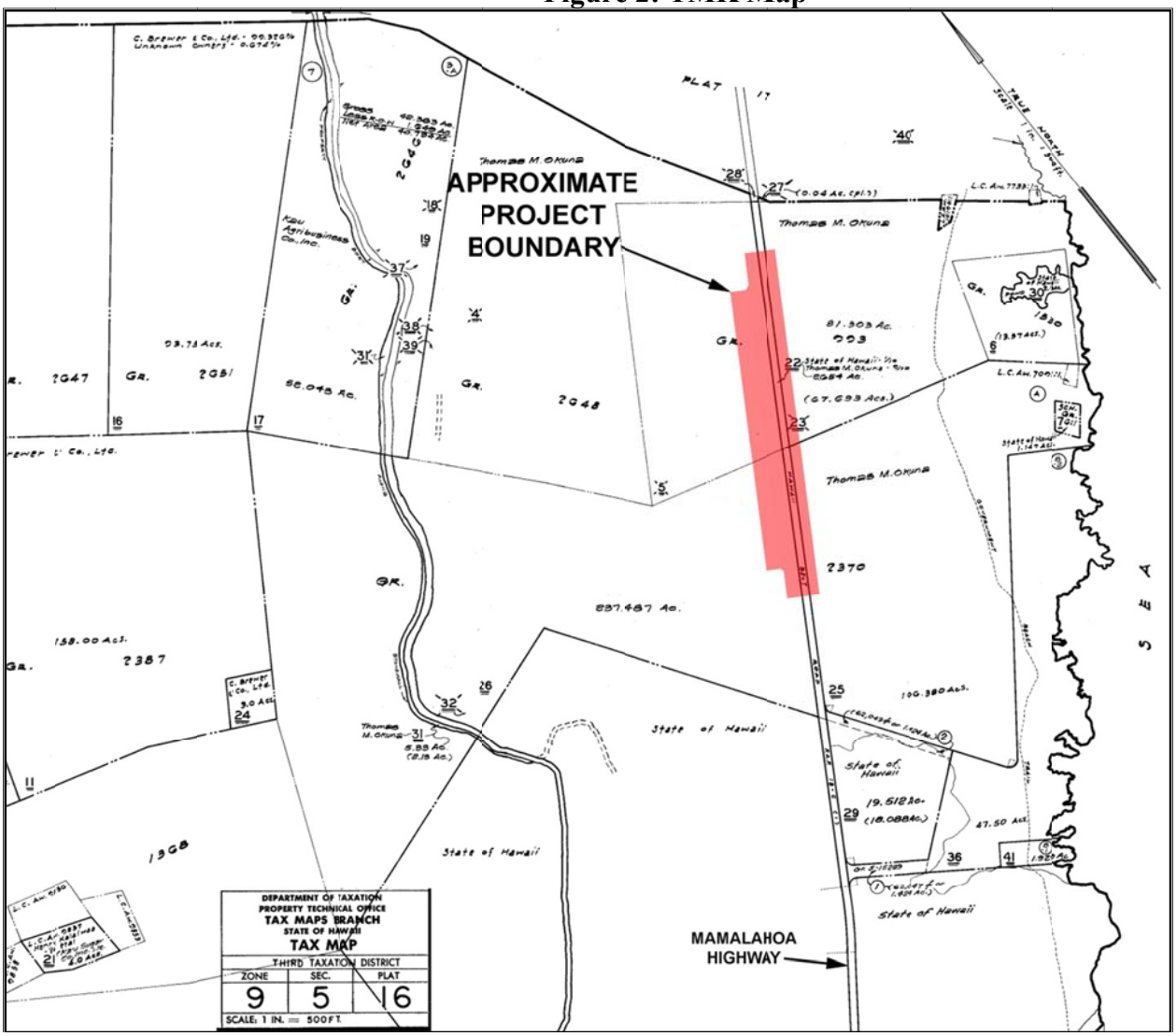


Figure 3: Aerial Image

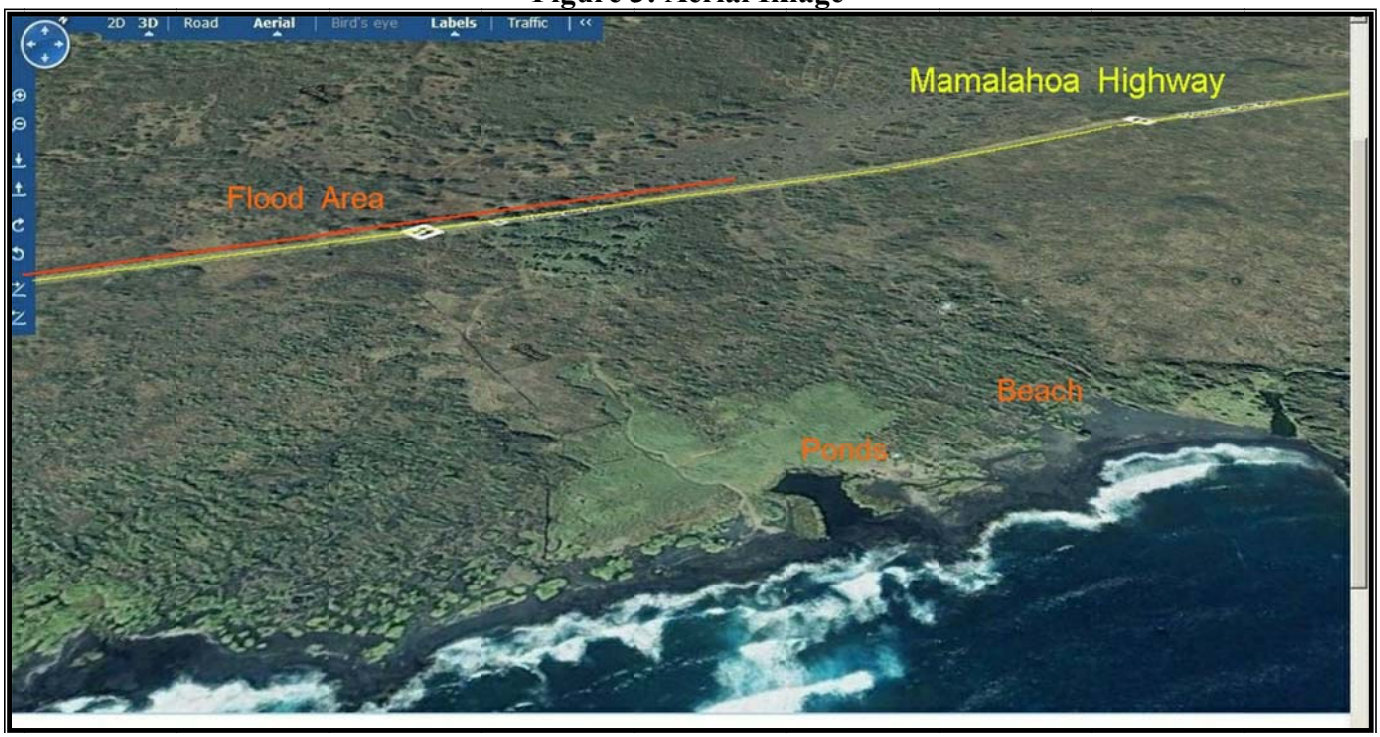
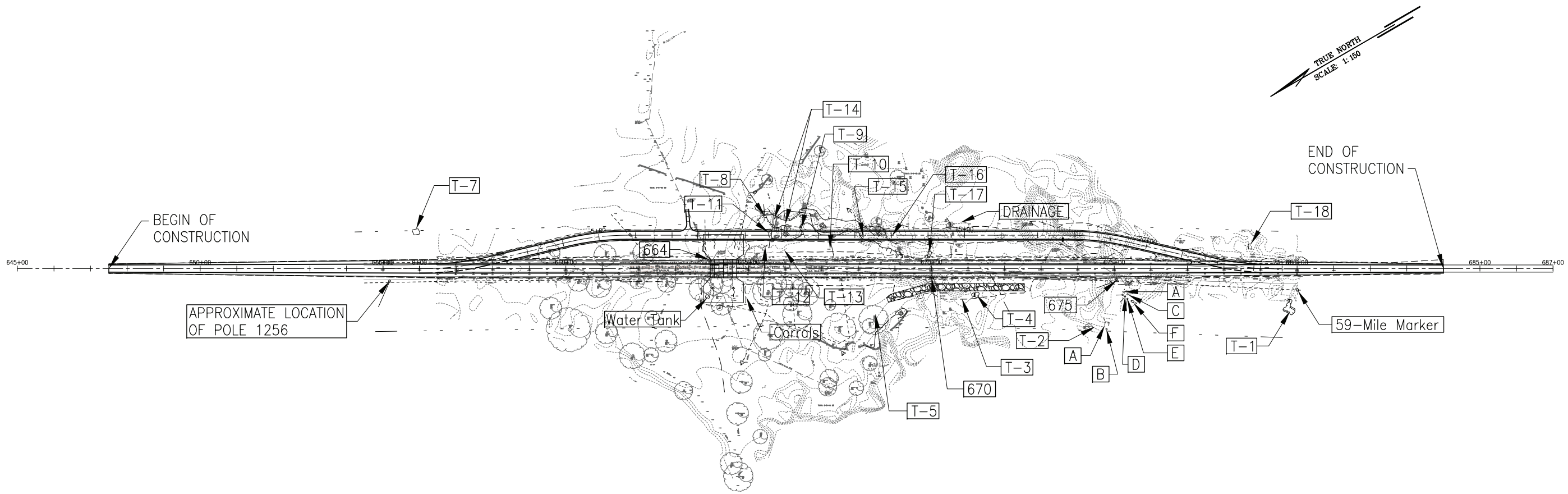


Figure 4: Flooding in 2004

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-011-2(36)	----	2	23

FIGURE 5A



OVERALL SITE PLAN

SCALE: 1" = 150'

GRAPHICAL SCALES:

150' 75' 0 150' 300'

SCALE: 1" = 150'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OVERALL SITE PLAN

MAMALAHOA HIGHWAY
DRAINAGE IMPROVEMENTS
VICINITY OF KAWA

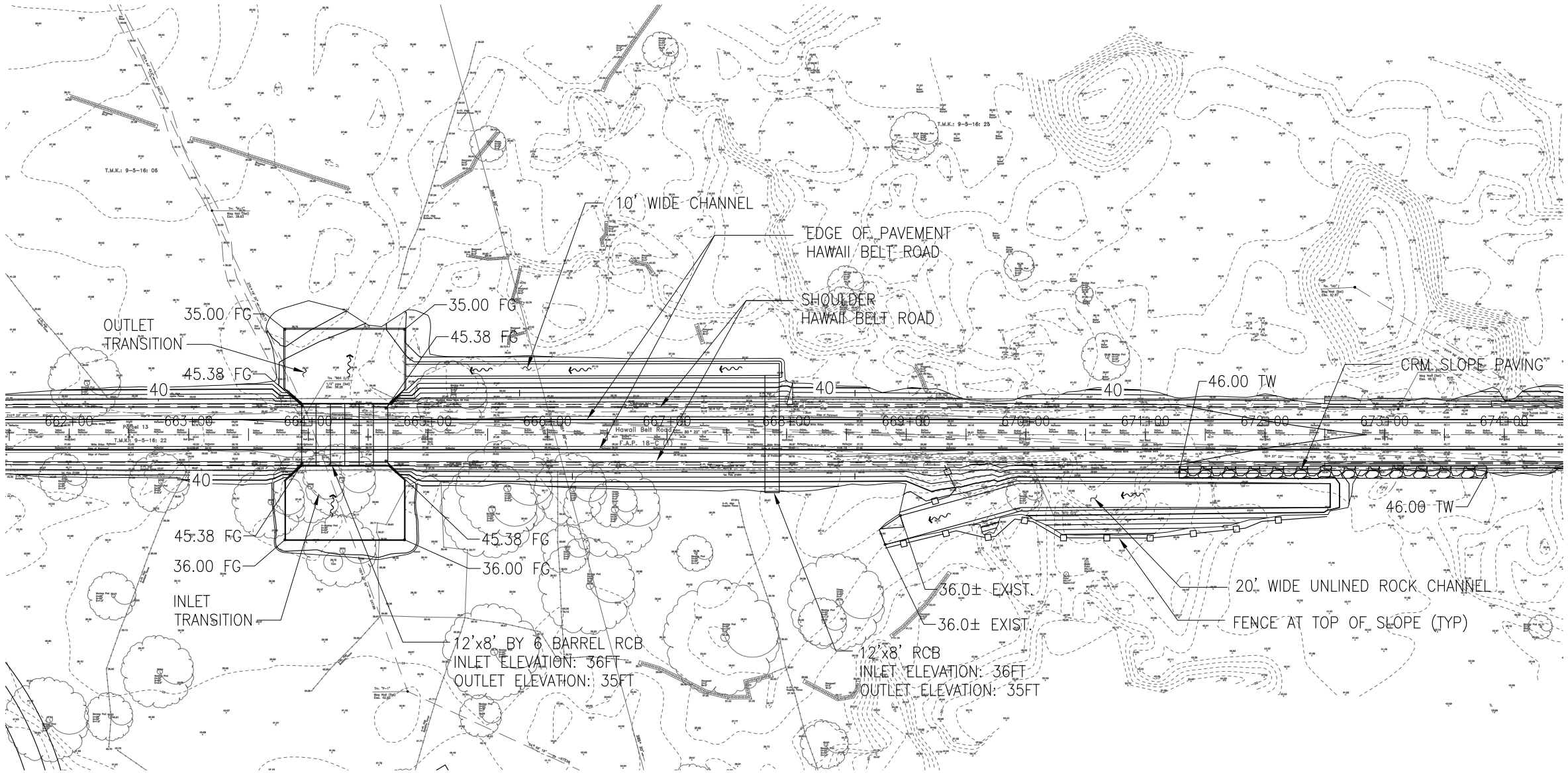
Federal Aid Project No. STP-011-2(36)

Scale: AS NOTED Date: DEC. 2008

SHEET No. 1 OF 1 SHEETS

ORIGINAL PLAN		SURVEY PLOTTED BY	DATE
		DRAWN BY	
		TRACED BY	
NOTE BOOK		DESIGNED BY	
		QUANTITIES BY	
No.		CHECKED BY	

FIGURE 5B



NORTH STREAM – OPTION 1

OPTION N1 – WITH ADDITIVE MAKAI CHANNEL AND
BOX CULVERT IN LOW-LYING AREA STA. 668+00

TRUE NORTH
SCALE: 1"100

ADDITVE OPTION 4 WITH OPTION N1

SCALE: 1" = 100'

100' 50' 0 100' 200'

SCALE: 1" = 100'

SSFM INTERNATIONAL

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 502
Honolulu, Hawaii 96817

KAWA FLATS DRAINAGE IMPROVEMENTS
REVIEW OF CULVERT CROSSING OPTIONS

SCALE:	1" = 100'	DATE:	FEB, 2010

The culverts would require periodic maintenance after very heavy rains and/or several years with more moderate storms to clear debris and sediment.

Land ownership and key land use designations are listed below. The project involves working outside the right-of-way on adjacent properties on both sides of the highway. On the *makai* side, this includes land within the Conservation District and the Special Management Area. State DOT is consulting with the Department of Land and Natural Resources as part of the EA process to determine whether a Conservation District Use Permit from the Hawai‘i State Department of Land and Natural Resources will be necessary, and will prepare an SMA Assessment Application to determine whether an SMA Permit from the Hawai‘i County Planning Commission will be required.

Table 1
Land Ownership and Land Use Designations

Property TMK	Owner	State Land Use District	Zoning	Special Management Area?
9-5-016:006	Edmund C. Olson Trust #2	Conservation	Open	Yes
9-5-016:022 (Hwy. ROW)	Edmund C. Olson Trust #2 & State of Hawai‘i	Conservation	Open	No
9-5-016:025	Edmund C. Olson Trust #2	Conservation	Open	Yes
9-5-016:026	Edmund C. Olson Trust #2	Agricultural	Agriculture (A-20a)	No

1.2 Environmental Assessment Process

The Federal Highway Administration (FHWA) and the Hawai‘i State Department of Transportation (HDOT) are serving as joint lead agencies to prepare an Environmental Assessment (EA). The EA is meant to comply with federal requirements under the National Environmental Policy Act of 1969 as amended (NEPA) and State of Hawai‘i requirements under Chapter 343, HRS. The approving authorities for the EA are the Hawai‘i Division Administrator of FHWA and the Director of HDOT.

NEPA was enacted by the U.S. Congress to require Federal agencies to consider the environmental impacts of Federal actions as part of the decision-making process. The Council on Environmental Quality (CEQ) developed regulations that specify how Federal agencies must implement NEPA. These CEQ Regulations for Implementing the Procedural Provisions of NEPA are codified in Title 40 of the Code of Federal Regulations (CFR) Parts 1500 through 1508. The CEQ regulations require Federal agencies to conduct an investigation and evaluation of alternatives as part of the environmental impact analysis process, prior to making decisions that may impact the environment. The regulations of the Federal Highway Administration for implementing NEPA are promulgated at 23 CFR 771.

This Environmental Assessment (EA) process was conducted in accordance with NEPA, as well as CEQ's and FHWA's implementing regulations. According to NEPA and its implementing regulations, an EA is prepared to documents the consequences of a proposed action and determine whether the action would produce significant impacts. When an EA supports a Finding of No Significant Impact (FONSI), the EA and its associated FONSI satisfies the proponent's need to comply with NEPA. When the EA does not support a FONSI, a Notice of Intent is prepared and the EA facilitates preparation of an Environmental Impact Statement (EIS). Therefore, if the Accepting Authority concludes that no significant impacts would occur from implementation of the proposed action, a FONSI will be prepared and the action will be permitted to occur. If the Accepting Authority finds that significant impacts are expected to occur as a result of the proposed action, then an EIS will be prepared.

Chapter 343 of the Hawai‘i Revised Statutes (HRS) is the basis for the environmental impact process in the State of Hawai‘i. The content requirements and procedures of Chapter 343, HRS, and its implementing regulations, Title 11, Chapter 200, of the Hawai`i Administrative Rules (HAR), are similar to NEPA and its implementing regulations. A major additional requirement is the need to explicitly evaluate whether impacts are significant according to thirteen specific criteria. Part 5 of this EA lists these criteria and HDOT's findings regarding significance.

This joint Federal-state EA documents the environmental impacts resulting from the proposed project.

1.3 Public Involvement and Agency Coordination

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

Federal:

U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers

State:

Department of Land and Natural Resources, Division of Forestry and Wildlife
Department of Land and Natural Resources, Office of the Chairperson
Department of Land and Natural Resources, Land Division, Hawai‘i Island Office
Office of Hawaiian Affairs

County:

Planning Department
Department of Public Works
Fire Department
Police Department
County Council
Civil Defense

Private:

Sierra Club
Ocean View Community Association
Pahala Community Association
Na‘alehu Main Street
Hawai‘i Island Chamber of Commerce
Abel Lui
John Cross, Edmund C. Olson Trust

Copies of written communications received during early consultation are contained in Appendix 1a. In addition, HDOT's consultants have met or attempted to meet on several occasions with a group of individuals who claim title and occupy land to the east of the proposed improvements to discuss their concerns. A public meeting will be held during the comment period for the Draft EA, the reports of which will be reported on as part of the Final EA.

PART 2: ALTERNATIVES

2.1 No Action

The No Action Alternative is the baseline against which build alternatives are compared. Under the No Action Alternative, the drainage improvements would not be constructed. This alternative is considered unacceptable by HDOT as it would not alleviate flooding and consequent hazards to motorists or potential hazards to nearby communities.

2.2 Alternative Locations and Strategies

Because the project is required due to flooding that recurs at a specific location along the Mamalahoa Highway, the project could not be constructed in a different location. Alternatives involving moving the entire road upslope or downslope would involve extraordinary costs, much larger right-of-way impacts and would still require crossing the drainage basins, which caused HDOT to dismiss them from further consideration.

2.3 Build Alternative

Alleviation of flooding over the Mamalahoa Highway at Kāwā Flats requires that both (1) the roadway grade be raised and (2) adequately-sized culverts be emplaced beneath the roadway, as described in Section 1.1 and depicted in Figure 5, above. Emplacement of culverts requires elevating the roadway due to space requirements for the new culvert. The size of these culverts and height of the re-designed roadway are constrained by the need to convey flood waters beneath the highway. The project also includes a small culvert midway between the north and south drainage basins.

2.4 Alternatives and Design Options Evaluated and Dismissed

HDOT initially evaluated several other designs for addressing the problem of occasional flooding overtopping the road. One alternative concept was to provide two roughly similar sets of culverts corresponding to places where the north and south drainage basins intersect the roadway. This alternative would have allowed fewer culverts at any one location but more culverts overall. Much of the facility work would have been redundant and thus considerably more costly, with no increased drainage benefit. This design would also have necessitated raising the entire roadway about one foot, considerably increasing project costs .Therefore, the single-crossing point alternative was the only alterative advanced for full consideration in the EA.

Also considered was a design option to grade out the drainage basins on the *mauka* (uphill) side to provide a greater volume for floodwater to settle prior to being carried in the culverts across the highway. Hydraulic modeling determined grading out the northern basin did not materially affect the size or performance of the culverts, and considering the number of trees that would need to be cut and the size of the easement required, this option was not cost-effective or necessary.

Another design option was to remove trees on the *makai* (towards the sea) side of the highway within the floodway to provide less of an obstacle to the flow of flood waters. After analysis of the potential benefit, the increase in hydraulic efficiency and reliability did not appear to be worth the extra expense in modifying the terrain/vegetation, acquiring land/easements and keeping the area permanently free of trees.

Finally, a design option locating the temporary bypass road on the *mauka* side of the road was evaluated. This was rejected because a portion of this road will be required to remain open in order to preserve access to an existing four-wheel drive road that accesses the shoreline at Kāwā from the *makai* side of the road. Without the bypass road, the rise in elevation of the highway would have precluded any access off the *makai* side of the highway in this area. This design would also have removed more large monkeypod trees than the *makai* bypass option.

PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Basic Geographic Setting

The area upon which the drainage improvements would be constructed is referred to throughout this EA as the project site. The term project area is used flexibly to describe the general environs of Kāwā Flats, and in some cases, the entire Kaʻū District.

The project site is located along the Mamalahoa Highway (State Route 11, see Fig. 1), a two-lane State Highway that serves as the sole route through the Kaʻū District and as a link between East Hawaiʻi and the South Kona District. The landscape of the project area reflects a long history of grazing and the related spread of non-native plants that now dominate the vegetation. Adjacent lands *makai* (towards the sea) of the highway within this part of Kaʻū are within the Conservation District and are generally vacant and unused except for recreational purposes and camping, while those located *mauka* of the highway are generally used as pasture. The average maximum daily temperature is approximately 83 degrees F., with an average minimum of 67 degrees, and annual rainfall averages approximately 40 inches (U.H. Hilo-Geography 1998:57).

3.1 Physical Environment

3.1.1 Geology, Soils and Geologic Hazards

Environmental Setting

Geologically, the project site is located on the lower flank of Mauna Loa volcano. The surface consists of lava flows of the Kaʻū Basalt series of ages 750 to 1,500 years old and 3,000 to 5,000 years old (Wolfe and Morris 1996). The surface is underlain by thin layers of basalt lava flows. The lava flows, with their porous rock structure, numerous cracks, lava tubes and interbedded ʻaʻa (clinker lava) flows, are highly permeable. Slopes range from 1 to 4 degrees, and local relief across this generally uniform slope is minor. Although there are possibly several deep lava tube caves that pass under the highway, no caves with openings or accessible passages within the affected area around the road were detected.

The project site soil is classified by the U.S. Natural Resources Conservation Service (formerly Soil Conservation Service) as both raw pahoehoe (rLW) lava flows with no developed soils and rock land (rRO), which has a thin (i.e., 6 to 8-inch deep) soil covering in places between rock outcrops (U.S. Soil Conservation Service 1973). The project corridor is located approximately 2,000 feet *mauka* (i.e., inland, in this case northwest) of the shoreline at between 40 and 50 feet above mean sea level.

The entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the United States Geological Survey in this area of Kaʻū is 3 on a scale of ascending risk 9 to 1 (Heliker 1990:23). The high hazard risk is based on the fact that Mauna Loa is an active volcano, having last erupted in 1984. Volcanic hazard Zone 3 areas have had about 15 to 20% of land area covered by lava or ash flows in the last 750 years, and are at lower risk than Zone 2 areas because of their greater distances from the southwest and northeast rift zones.

In terms of seismic risk, the entire Island of Hawai‘i is rated Zone 4 Seismic Hazard (Uniform Building Code, 1997 Edition, Figure 16-2). Zone 4 areas are at risk from major earthquake damage, especially to structures that are poorly designed or built. The project site does not appear to be subject to subsidence, landslides or other forms of mass wasting.

The Detailed Land Classification – Island Of Hawai‘i prepared by the University of Hawai‘i Land Study Bureau (LSB), evaluates the quality or productive capacity of certain lands on the Island for selected crops and overall suitability in agricultural use. A five-class productivity rating system was established with “A representing the highest productivity and “E” the lowest. The site is classified as “C” (i.e., “Fair”) and “D” (i.e., “Poor”) (Land Study Bureau 1967).

The Agricultural Lands of Importance in the State of Hawai‘i (ALISH), prepared by the State Department of Agriculture, classifies lands into three categories: 1) Prime Agricultural Land, (2) Unique Agricultural Land, and (3) Other Important Agricultural Land. The project site has not been identified as Important Agricultural Land of any category under the ALISH system (see Figure 8).

Impacts and Mitigation Measures

Project design would take soil properties into account, and all structures will be built in conformance with the Uniform Building Code’s seismic standards. Special Contract Requirements that will be incorporated into the construction contract documents will stipulate that in the event that a previously undetected lava tube is breached during construction, HDOT will notify the State Historic Preservation Division and immediately cease work in the vicinity. It is recognized the much of the surface of Hawai‘i Island is subject to eventual lava inundation, and facilities in places such as Ka‘ū face this risk. However, there are no alternative routes or other options that avoid these risks, and, the project will help the community to respond to and properly manage these risks. As much of the project area has a similar hazard, geologic hazards impose no particular constraints on the proposed action, and the proposed drainage improvement is not imprudent to construct.

The No Action Alternative would not avoid geologic hazards and risks and potential loss or damage to the highway, and therefore offers no particular advantage relative to the build alternative.

3.1.2 Drainage, Water Features and Water Quality

Existing Environment: Overland Drainage

The project site is located approximately 2,000 feet *mauka* of the shoreline on the foothills of Mauna Loa. One named ephemeral stream, Hilea Gulch, as well as a number of mapped and unmapped ephemeral drainages, drain the steep uplands of the Ninole Hills, Hilea and Honuʻapo. Hilea Gulch is located on the north end of Kāwā Bay and does not cross or approach the area of flood concern at the project site. It is the unnamed and unmapped ephemeral streams that lie to the south of Hilea Stream that flood the highway as often as annually or even several times per year. Site reconnaissance identified a layer of sediment deposited in low areas *mauka* of the highway. This material has apparently settled out during periods of flooding, as flow is restricted by the highway itself.

The Flood Insurance Rate Map (FIRM) for the project area, Map 1551661850C, indicates that the entirety of the project site is designated Zone X, located outside of the 100- or 500-year flood plain (Figure 6). This is likely because the area has not been the subject of a flood study. The FIRM indicates a small region designated Flood Zone X near the project site within a Zone X region. This area is the only portion of this region that has had its flood area demarcated. The shoreline area southeast of the project site is subject to shoreline flooding (i.e., Flood Zones AE and VE).

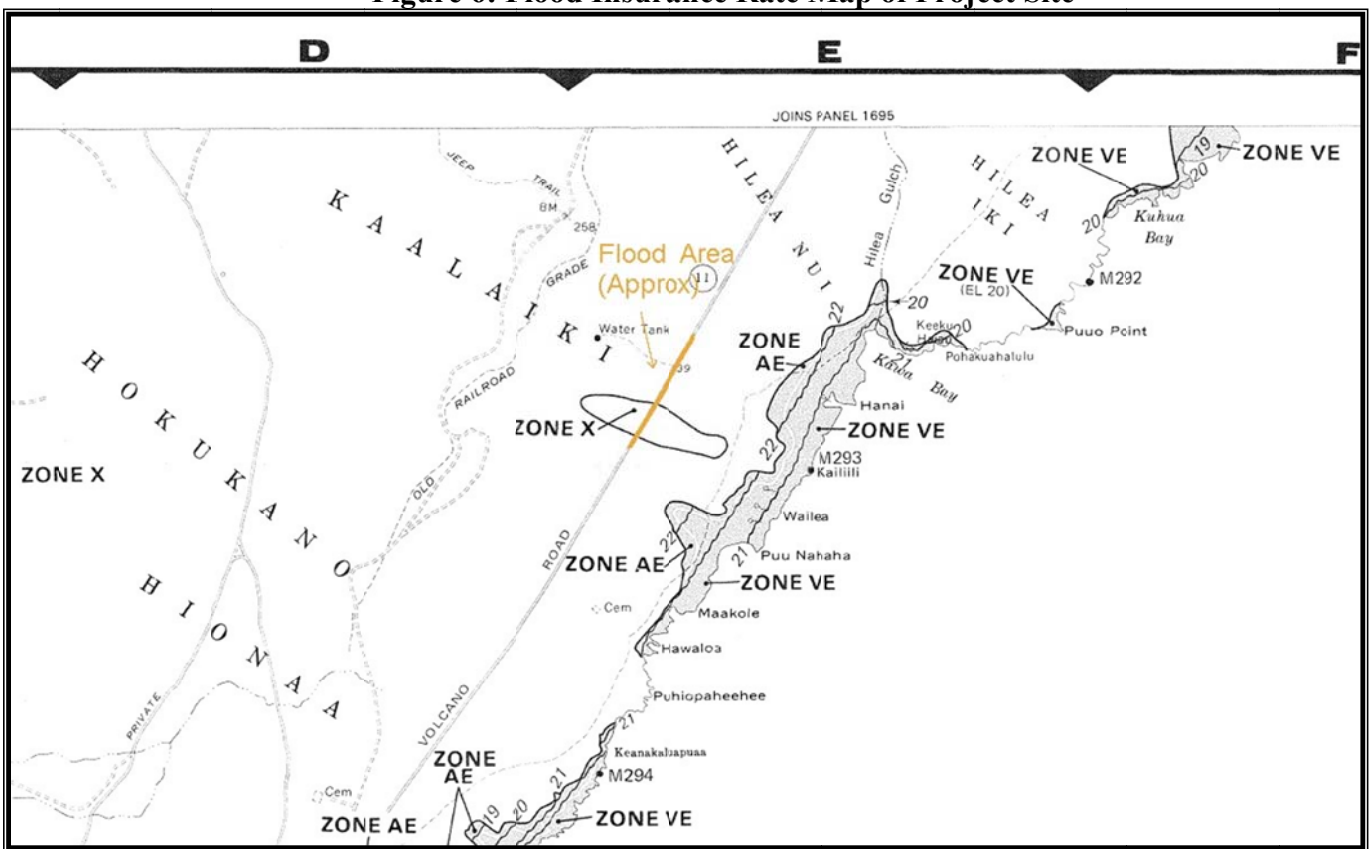
Most rainfall that falls on this part of Kaʻū and does not evapotranspire reaches the sea as groundwater rather than runoff. Groundwater is contained in both perched and basal forms in Kaʻū. The project area in general is underlain by several distinct rock formations built by lava flows from Mauna Loa. A thick blanket of ash separates the older basalts from younger flows. The earliest flows are called the Ninole formation, which became profoundly eroded and weathered. This was eventually covered by the Kahuku formation, which contains numerous ash strata which include perched groundwater. The thick layer of ash that was produced at the end of the Kahuku formation is known as Pahala ash. The deposition of the Pahala ash was followed by lavas from the Kaʻū volcanic series.

Existing Environment: Groundwater

The basal aquifer in the project area consists of a low water table in the Kaʻū volcanic series. Fresh water discharges as coastal springs, which are particularly abundant along the stretch of coastline between Honuʻapo and Punaluʻu – which latter translates as "diving spring. The system stretches from Ninole Springs through Kāwā and south to Honuʻapo and consists of wetlands fed by basal springs and intermittent streams that support a broad range of native fauna.

The Kāwā area also contains what has been described as the second-largest freshwater spring system on the Big Island. Springs at Honuʻapo and Kaʻālaiki-Hilea were productive enough, at least in the past, to support cultivation of wetland taro and mullet.

Figure 6: Flood Insurance Rate Map of Project Site



Source: FEMA Flood Insurance Rate Map (FIRM 1551661850C)

Anchialine ponds contain brackish waters and exhibit tidal fluctuations without a surface connection to the ocean, occur throughout the area. They include open pools near the shore as well as undisturbed pools in collapsed lava tubes, cracks and caves.

Impacts and Mitigation Measures: Construction-Phase

It has been determined through fieldwork and confirmed through consultation with the U.S. Army Corps of Engineers (see letter of April 16, 2010 in Appendix 1a) that implementation of the project would not involve the discharge of dredged or fill materials into waters of the United States. However, construction phase impacts in any location have the potential to produce uncontrolled excess sediment from soil erosion during and after excavation and construction that may impact natural watercourses, water quality and flooding. Contaminants associated with heavy equipment and other sources during construction have the potential to impact surface water and groundwater if not mitigated effectively, although such potential in this site is limited because of the small scale of the project. Design has taken into account the potential discharge of sediment-laden storm water runoff towards the ocean. In order to minimize the potential for sedimentation and erosion, the contractor shall perform all earthwork and grading in conformance with Chapter 10, Erosion and Sediment Control, Hawai‘i County Code. Because the project will disturb more than one acre of surface, a National Pollutant Discharge

Elimination System (NPDES) permit must be obtained by the State before the project commences. This permit requires the completion of a Storm Water Pollution Prevention Plan (SWPPP). In order to properly manage storm water runoff, the SWPPP will describe the emplacement of a number of best management practices (BMPs) for the project. These BMPs may include, but will not be limited to, the following:

- Minimization of soil loss and erosion by revegetation and stabilization of slopes and disturbed areas of soil, possibly using hydromulch, geotextiles, or binding substances, as soon as possible after working;
- Minimization of sediment loss by emplacement of structural controls possibly including silt fences, gravel bags, sediment ponds, check dams, and other barriers in order to retard and prevent the loss of sediment from the site;
- Minimizing disturbance of soil during periods of heavy rain;
- Phasing to disturb the minimum necessary area of soil at any particular time;
- Application of protective covers to soil and material stockpiles;
- Construction and use of a stabilized construction vehicle entrance, with designated vehicle wash area that discharges to a sediment pond;
- Washing of vehicles in the designated wash area before they egress the project site;
- Use of drip pans beneath vehicles not in use in order to trap vehicle fluids;
- Routine maintenance of BMPs by adequately trained personnel; and
- Significant leaks or spills, if they occur, shall be properly cleaned up and disposed of at an approved site.

The No Action alternative would avoid potential impacts to water quality during construction.

Impacts and Mitigation Measures: Operational

The project will essentially reproduce the existing hydrology of the intermittent drainage, passing the flow under, rather than over, the highway. No measurable change in downstream sediment delivery or water quality is expected. The duplication of existing hydrology will result in a continuance of surface and groundwater conditions for the coastal ponds located about 0.4 miles *makai* (towards the sea) which are derived from outflow of groundwater and occasional influxes of ocean water during high waves.

3.1.3 Flora, Fauna and Ecosystems

Existing Environment: Terrestrial Flora

A botanical survey of the project site was performed by botanist Layne Yoshida of Geometrician Associates on February 1, 2008. Table 2 is a list of the plant species detected. Of the 83 different plant species found, ten (12%) are recognized as being native to the Hawaiian Island, and only one of these, a fern, is endemic (found in Hawai‘i and nowhere else).

Table 2: Project Site Plant Species List

Scientific Name	Family	Common Name	Life Form	Status
Abutilon grandifolium	Malvaceae	Hairy Abutilon	Herb	A
Acacia farnesiana	Fabaceae	Klu	Shrub	A
Ageratum conyzoides	Asteraceae	Ageratum	Herb	A
Amaranthus spinosa	Amaranthaceae	Spiny Amaranth	Herb	A
Amaranthus spinosus	Amaranthaceae	Spiny Amaranth	Herb	A
Amaranthus viridis	Amaranthaceae	Slender Amaranth	Herb	A
Amaranthus viridis	Amaranthaceae	Amaranthus	Herb	A
Ambrosia artemisiifolia	Asteraceae	Ragweed	Herb	A
Ananas comosus	Bromeliaceae	Pineapple	Herb	A
Bidens cynapiifolia	Asteraceae	Bidens	Herb	A
Caesalpinia bonduc	Fabaceae	Kakalaioa	Vine	I?
Catharanthus roseus	Apocynaceae	Madagascar Periwinkle	Herb	A
Chamaecrista nictitans	Fabaceae	Partridge Pea	Herb	A
Chamaesyce hirta	Euphorbiaceae	Hairy Spurge	Herb	A
Chamaesyce hypericifolia	Euphorbiaceae	Graceful Spurge	Herb	A
Chloris barbata	Poaceae	Swollen Fingergrass	Herb	A
Chloris sp.	Poaceae	Chloris	Herb	A
Crotalaria incana	Fabaceae	Fuzzy Rattlepod	Herb	A
Crotalaria sp.	Fabaceae	Crotalaria	Herb	A
Cynodon dactylon	Poaceae	Bermuda Grass	Herb	A
Dactyloctenium aegyptium	Poaceae	Beach Wiregrass	Herb	A
Desmanthus virgatus	Fabaceae	Slender Mimosa	Herb	A
Digitaria insularis	Poaceae	Sourgrass	Herb	A
Doryopteris decora	Pteridaceae	Doryopteris	Fern	E
Eleusine indica	Poaceae	Wiregrass	Herb	A
Emilia sonchifolia	Asteraceae	Emilia	Herb	A
Eragrostis tenella	Poaceae	Love Grass	Herb	A
Erechtites hieracifolia	Asteraceae	Erechtites	Herb	A
Ficus microcarpa	Moraceae	Chinese Banyan	Tree	A
Galinsoga parviflora	Asteraceae	Galinsoga	Herb	A
Glycine wightii	Fabaceae	Glycine	Vine	A
Hedyotis corymbosa	Rubiaceae	Hedyotis	Herb	A
Heteropogon contortus	Poaceae	Pili Grass	Herb	I
Hyptis pectinata	Lamiaceae	Comb Hyptis	Herb	A
Indigofera suffruticosa	Fabaceae	Indigofera	Shrub	A
Ipomoea indica	Convolvulaceae	Morning Glory	Vine	I
Ipomoea obscura	Convolvulaceae	Ipomoea	Vine	A
Ipomoea sp.	Convolvulaceae	Ipomoea	Vine	A
Jatropha curcas	Euphorbiaceae	Physic Nut	Tree	A
Kalanchoe pinnata	Crassulaceae	Air Plant	Herb	A
Kyllinga sp.	Cyperaceae	Kyllinga	Herb	A

Table 1, continued				
Scientific Name	**Family**	**Common Name**	**Life Form**	**Status**
Lantana camara	Verbenaceae	Lantana	Shrub	A
Leonotis nepetifolia	Lamiaceae	Lion's Ear	Herb	A
Leucaena leucocephala	Fabaceae	Haole Koa	Shrub	A
Malvastrum coromandelianum	Malvaceae	False Mallow	Herb	A
Merremia aegyptia	Convolvulaceae	Wood Rose	Vine	A
Mimosa pudica	Fabaceae	Sleeping Grass	Herb	A
Momordica charantia	Cucurbitaceae	Balsam Pear	Vine	A
Morinda citrifolia	Rubiaceae	Noni	Shrub	A
Nephrolepis multiflora	Nephrolepidaceae	Sword Fern	Fern	A
Opuntia ficus-indica	Cactaceae	Panini	Shrub	A
Osteomeles anthyllidifolia	Rosaceae	Ulei	Shrub	I
Paederia foetida	Rubiaceae	Maile Pilau	Vine	A
Panicum maximum	Poaceae	Guinea Grass	Herb	A
Passiflora edulis	Passifloraceae	Lilikoi	Vine	A
Pennisetum setaceum	Poaceae	Fountain Grass	Herb	A
Peperomia leptostachya	Piperaceae	Peperomia	Herb	I
Pithecellobium dulce	Fabaceae	Opiuma	Tree	A
Plectranthus parviflorus	Lamiaceae	Spurflower	Herb	I
Pluchea symphytifolia	Asteraceae	Sourbush	Shrub	A
Plumbago zeylanica	Plumbaginaceae	Plumbago	Vine	I
Polygala paniculata	Polygalaceae	Milkwort	Herb	A
Portulaca pilosa	Portulacaceae	Portulaca	Herb	A
Prosopis pallida	Fabaceae	Kiawe	Tree	A
Psidium guajava	Myrtaceae	Guava	Tree	A
Psydrax odoratum	Rubiaceae	Alahe‘e	Shrub	I
Pycreus polystachyos	Cyperaceae	Cyperus	Herb	A
Rhynchelytrum repens	Poaceae	Natal Redtop	Herb	A
Ricinus communis	Euphorbiaceae	Castor Bean	Shrub	A
Samanea saman	Fabaceae	Monkey Pod	Tree	A
Schinus terebinthifolius	Anacardiaceae	Christmas Berry	Shrub	A
Senna occidentalis	Fabaceae	Coffee Senna	Herb	A
Sida rhombifolia	Malvaceae	Sida	Herb	A
Sida spinosa	Malvaceae	Prickly Sida	Herb	A
Solanum linnaeanum	Solanaceae	Apple of Sodom	Herb	A
Spermacoce assurgens	Rubiaceae	Buttonweed	Herb	A
Synedrella nodiflora	Asteraceae	Nodeweed	Herb	A
Thunbergia fragrans	Acanthaceae	White Thunbergia	Vine	A
Tithonia diversifolia	Asteraceae	Tithonia	Herb	A
Triumfetta sp.	Tiliaceae	Sacramento Bur	Shrub	A
Verbena litoralis	Verbenaceae	Owi	Herb	A
Verbesina encelioides	Asteraceae	Verbesina	Herb	A
Waltheria indica	Sterculiaceae	Uhaloa	Herb	I

A = alien, E = endemic, I = indigenous, End = Federal and State listed Endangered Species

The natural vegetation of this part of Ka‘ū was most likely a lowland dry grassland community (Gagne and Cuddihy 1990) dominated by *ohe makai* (*Reynoldsia sandwichensis*), *alahe‘e* (*Psydrax odorata*), *naio* (*Myporum sandwicense*), and *lama* (*Diospyros sandwicensis*), with species such as *maiapilo* (*Capparis sandwichiana*), *‘ilima* (*Sida fallax*), and *huehue* (*Cocculus orbiculatus*) also present. These original communities, however, have been heavily degraded by cattle grazing and colonization and competition by invasive species that now dominate the site.

Existing Environment: Terrestrial Fauna

The majority of bird species present in this part of Ka‘ū are non-native, including Common Myna (*Acridotheres tristis*), Japanese White-Eye (*Zosterops japonicus*), Northern Cardinal (*Cardinalis cardinalis*), House Finch (*Carpodacus mexicanus*), Nutmeg Mannikin (*Lonchura punctulata*), Common Barn Owl (*Tyto alba*), Spotted Dove (*Streptopelia chinensis*) and Zebra Dove (*Geopelia striata*). Endangered land birds include the Hawaiian Hawk (*Buteo solitarius*), which hunts throughout forested areas of the island of Hawaii and nests in large trees, and the *Nene* or Hawaiian Goose (*Nesochen sandwicensis*), which may also soon find the Ka‘u coast hospitable, as it is expanding its range.

Near the shoreline in most areas of Ka‘ū, indigenous or migratory waterbirds are common, including the Pacific Golden-Plover (*Pluvialis fulva*), Wandering Tattler (*Heteroscelus incanus*), Ruddy Turnstone (*Arenaria interpres*), Bristle-thighed Curlew (*Numenius tahitiensis*) and Sanderling (*Calidris alba*). The springs southeast of the highway at Kāwā and elsewhere support native and migratory waterbirds, including the indigenous resident Black-crowned Night-heron or *Auku‘u* (*Nycticorax nycticorax hoactli*). Other migratory waterfowl that may utilize the area include Northern Pintails (*Anas acuta*), Northern Shovelors (*Anas clypeata*), and less common migrants such as American Wigeons (*Anas americana*).

Of particular concern are endangered waterbirds. According to the Hawai‘i Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) (DOFAW 2006, 2007), the endangered Hawaiian Coot (*Fulica alai*), also known as the *‘Alae Ke‘oke‘o*, and Hawaiian Black-necked Stilt, or *Ae‘o* (*Himantopus mexicanus knudensi*), are also present at Kāwā.

The seabird Black Noddy or *Noio* (*Anous minutus melanogenys*) is frequently seen flying in and out of refuges in the rocky coastal cliffs, and the White-tailed Tropic Bird (*Phaethon lepturus dorotheae*) is often observed at Honu‘apo (NPS 2006). The seabirds Wedge-tailed Shearwater (*Puffinus pacifica*), Red-tailed Tropic Bird (*Phaethon rubricauda rothschildi*), Frigate Bird (*Fregata minor palmerstoni*), Bulwer’s Petrel (*Bulweria bulwerii*) and Booby (*Sula* spp.) are also likely to make use of the airspace over the project area at least occasionally.

Three species of rare seabirds, the federally endangered Hawaiian Petrel or *‘Ua‘u* (*Pterodroma phaeopygia sandwichensis*), the federally threatened Newell’s Shearwater or *‘A‘o* (*Puffinus auricularis newelli*) and the Band-rumped Storm-petrel (*Oceanodroma castro*), have potential to use high-elevation parts of Ka‘ū areas and to overfly the project area. The Hawaiian Petrel is a pelagic seabird that reportedly nested in large numbers on the slopes of Mauna Loa, among other places. Within recent historic times it has been reduced to relict breeding colonies located at high elevations on Mauna Loa and possibly Hualālai. Newell’s Shearwaters breed on Kaua‘i,

Hawai‘i and Moloka‘i in extremely small numbers. Newell’s Shearwater populations have dropped precipitously since the 1880s. This pelagic species nests high in the mountains in burrows excavated under thick vegetation, especially uluhe fern. There is no suitable nesting habitat within the planning area for these birds but they may overfly the area. Biologists believe that the leading cause of death for both these species in Hawai‘i is predation by alien mammals at the nesting colonies, followed by collision with man-made structures. Exterior lighting disorients these night-flying seabirds, especially fledglings, as they make their way from land to sea during the summer and fall. When disoriented, seabirds often collide with manmade structures and, if not killed outright, the dazed or injured birds are easy targets for feral mammals.

Most mammals in Hawai‘i are non-native. Although detrimental to native plant and animal species, it is important to note the presence of numerous species of introduced animals including feral dogs (*Canis familiaris*), cats (*Felis sylvestris catus*), pigs (*Sus scrofa*), goats (*Capra aegagrus hircus*), rats (*Rattus rattus*), mice (*Mus musculus*) and mongooses (*Herpestes auropunctatus*).

The only native terrestrial mammal is the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), which is frequently seen flying in Punalu‘u and likely forages throughout the project area, including on vegetation near the highway.

A recent survey of insects at Sea Mountain in Punalu‘u to the north found only one rare species, the orange-black Hawaiian damselfly (*Megalagrion xanthomelas*), which is a candidate for listing under the Endangered Species Act (Group 70 International, Inc. 2006.). This damselfly has also been seen at Honu‘apo, and DOFAW reports that some of the highest densities of the species are found at Kāwā Springs and at the mouth of Hilea and Ninole Streams in the project area (DOFAW 2007).

Existing Environment: Wetlands and Marine Biota

No wetlands are present at or near the highway or in any area affected by the proposed construction. In the broader project area, wetlands area consisting of small marshes in salty or brackish water in the backshore of pahoehoe areas are present near the shoreline, about 2,000 feet from the highway. They are dominated by the indigenous *‘aki‘aki* grass (*Sporobolus virginicus*). At Kāwā Springs, a two-acre marsh dominated by the indigenous sedge *makaloa* (*Cyperus laevigatus*) is also present. The freshwater margins also contain numerous alien species, including California grass (*Urochloa mutica*). A small patch of invasive alien red mangrove (*Rhizopora mangle*) was also observed south of Kāwā Springs.

The rugged shoreline in the project area offers an array of habitats. In several places headlands or points enclose small coves or bays where the coastal plain broadens. These flatter areas sustain tidepools. Several streams feed the coast, and lava tubes discharge fresh water into the nearshore zone all along the shoreline. There are sand and cobble beaches, intertidal benches and pools, basalt benches and cliffs, spring-fed ponds, wetlands, and coastal strand vegetation communities over a range of exposure and disturbance conditions.

This variety of environments produces a great diversity of biology that has only begun to be explored. Many species of algae are present in the intertidal zone. Limited survey by the National Park Service in this part of the Kaʻū coast found no alien algae and a healthy balance of algae and benthic invertebrates, which is indicative of minimal nutrient input from land and no overexploitation of fish and invertebrate herbivores (NPS 2006).

The corals present are generally encrusting, mound or robust branched corals that can thrive in on high-energy exposed outer coasts. The range of species is greatest in protected embayments. Coral growth in these areas reflects good water quality made possible by the lack of coastal development and resulting low levels of land runoff and sedimentation.

During a one-day survey, a National Park Service study team identified 28 species of non-coral macro-invertebrates including mollusks (cone shells, cowries, tube snails and a nudibranch or sea slug), echinoderms (sea urchins, sea cucumbers and sea stars), crustaceans (shrimps, barnacles and crabs), sponges and polychaete worms. Importantly for gatherers, the intertidal zone supports *ʻopihi* (*Cellana* spp.), shingle urchins (*Colobocentrotus atratus*) and *ʻaʻama* crabs (*Grapsus tenuicrustatus*) (NPS 2006).

There has been very little research within the open ocean off the planning area. As local fishermen know, there is a great diversity of reef and pelagic fish in Kaʻū. Marine mammals such as several species of dolphins and whales are present. Populations of the endangered humpback whale (*Megaptera novaeangliae*) winter in Hawaiian waters from December to April. Other endangered species are the omnipresent green sea turtle (*Chelonia mydas)*, as well as the Hawaiian monk seal (*Monachus schauinslandi*), which is an occasional visitor.

Of particular importance on this coast is the endangered the hawksbill sea turtle (*Eretomochelys imbricata*). Seven nesting sites – out of 13 known nesting areas on the island – are located between Kapaoʻo Point, at the southern coastal boundary of Hawaiʻi Volcanoes National Park, and Kahuku Point, located six miles south of Honuʻapo Bay. Those sites involve 40 individual female turtles, representing more than half of the known nesting population statewide.

In the project area, hawksbill turtles nest at Kaʻiliʻili Beach, located about three-tenths of a mile south of Kāwā Bay. The turtles have also been known to nest on the northern end of Kāwā Bay in the early 1990s, and tracks of hawksbills possibly seeking nesting sites have been observed in the past several years along the rocky beach at Kāwā Bay slightly further to the south. Wildlife managers are aware of current nesting ongoing at the bay but have been unable to document that because of a lack of manpower as well as interference from an individual claiming ownership of the land.

Endemic and native shrimp species live in anchialine pools and travel between them through underground cracks. As discussed above, the orange-black damselfly breeds in the anchialine pools, and native insects perch on nearby vegetation. Anchialine pools throughout the State of Hawai‘i are severely threatened by alien insects, habitat loss due to coastal development and other human impacts.

Impacts and Mitigation Measures: Terrestrial Biota

The biological effects of the project would be limited to the construction area in and directly adjacent to the highway. The area is dominated by non-native species, and no threatened or endangered plant species or rare plant communities are present.

As discussed above, several terrestrial vertebrates listed by the federal and State governments as threatened or endangered are present in this part of Ka‘ū and may overfly, roost, nest, or utilize resources of Kāwā Flats, including the endangered Hawaiian Hawk (*Buteo solitarius*), the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), the endangered Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened Newell's Shearwater (*Puffinus auricularis newelli*). No night work, temporary or permanent lighting or erect structures such as poles are planned, and therefore no impacts to listed seabirds are anticipated. Hawaiian Hawks may be disturbed by construction activities near their nesting sites, which are active from March through September. The vegetation at the project site is low and shrubby, and there are very few, if any, large trees that could serve as nesting sites for Hawaiian Hawks. However, the shrubby vegetation may serve as roosts for Hawaiian hoary bats, which are vulnerable during the bat birthing and pup-rearing seasons.

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened or endangered species. The U.S. Fish and Wildlife Service (USFWS) was notified of the project location and action by letter in 2008 per requirements of the Endangered Species Act and also the Migratory Bird Treaty Act and Migratory Bird Conservation Act (16 USC 701-715) and Fish and Wildlife Coordination Act, as Amended (16 USC 661 et seq.). In a letter of May 16, 2008 (see Appendix 4), USFWS stated:

> "There is no federally designated critical habitat in the vicinity of this proposed project. Based information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, and the Hawaii GAP Program, the endangered Hawaiian hoary bat *(Lasiurus cinereus semotus)* and Hawaiian hawk *(Buteo solitarius)* occur in the project vicinity. In preparing your environmental assessment, we recommend you address potential project impacts to these listed species and include the following recommended conservation measures to avoid potential adverse impacts."

The letter continued to list specific measures. These measures have been incorporated in the project, with an adjustment to the bat birthing and pup-rearing season per current (2011) USFWS policy:

- To minimize impacts to the endangered Hawaiian hoary bat, contract specifications will prohibit cutting, removing or trimming woody plants greater than 15 feet during the bat birthing and pup-rearing season (May 15 through August 15).
- To avoid impacts to Hawaiian Hawks, contract specifications will prohibit brush and tree clearing during the breeding season for Hawaiian hawks (March through September). If this time period cannot be avoided, a hawk nest search will be conducted by a qualified biologist, and if hawk nests are present in or near the corridor, all land clearing activity will cease.

In a letter of June 6, 2011 (see Appendix 4), the USFWS stated given the project mitigation measures, the project is not likely to adversely affect any listed species.

Impacts and Mitigation Measures: Wetlands and Marine Biota

The project will essentially reproduce the existing hydrology of the intermittent drainage, passing the flow under, rather than over, the highway, and will not change the quantity or sediment characteristics of the flood water as it makes its way overland or underground towards the sea. Therefore, no changes in wetlands or coastal or marine ecosystems that are 2,000 feet *makai* of the project site are expected.

3.1.4 Air Quality, Noise, and Scenic Resources

Environmental Setting

Air pollution in the Kaʻū District is variable and at times impaired by emissions from Kilauea Volcano. These emissions primarily containing sulfur dioxide (SO_2) and particulates originated from the active area in the east rift zone and a vent at Kilauea's summit area. Roughly coinciding with the opening of a new gas vent located in Halemaʻumaʻu Crater at Kilauea's summit in March 2008, total volcanic gas emissions from Kilauea Volcano have doubled. The SO_2 component of these emissions is converted into vog (i.e., volcanic smog) when it interacts chemically with sunlight, atmospheric oxygen, moisture, and dust. With certain wind conditions, this vog can form a persistent blanket over portions of Hawaiʻi Island, particularly the Kaʻū, Puna, and South Kona Districts. Vog presents a health hazard as it may aggravate preexisting respiratory ailments, particularly asthma. It can reduce visibility markedly and cause leaching of lead and zinc into rain-water catchment systems (USGS 2008). http://hvo.wr.usgs.gov/hazards/FAQ_SO2-Vog-Ash/P1.html#gases

Construction activities and off-road vehicles (particularly in the older, soil-covered lava flows) in this dry area can produce severe dust.

Noise on the project site is generally quite low, and is derived principally from motor vehicles.

Certain areas and viewplanes are noted in the Hawaiʻi County General Plan as being sites of particular natural beauty, including Kāwā Bay and Spring (TMK 9-5-15:20, 9-5-17:07, Ahupuaa of Kaʻalaiki and Hilea Nui), views of Mauna Loa from Volcano- Kaʻū Highway (various TMKs and *ahupuaʻa*) and views of *puʻu* (hills) located *mauka* of the project site (i.e., Enuhe, Makanau, Kaiholena, and One).

Impacts and Mitigation Measures

There is a potential for fugitive dust emissions during grading and construction. Short-term direct and indirect impacts on air quality could occur during construction, principally through fugitive dust from vehicle movement and soil excavation, and exhaust emissions from onsite construction equipment. The State of Hawai‘i Air Pollution Control Regulations (Chapter 11-60, HAR) prohibit visible emissions of fugitive dust from construction activities beyond the property line. Thus, an effective dust control plan for the project construction phase is essential.

Adequate fugitive dust control can usually be accomplished by a program of frequent watering to keep bare dirt surfaces in construction areas from becoming significant sources of dust. In dust prone or dust sensitive areas, other control measures such as limiting the area that can be disturbed at any given time, applying chemical soil stabilizers, mulching, and using wind screens may be necessary. Control regulations further stipulate that open-bodied trucks be covered at all times when in motion if they are transporting materials that could be blown away. Haul trucks tracking dirt onto paved streets from unpaved areas are often a significant source of dust in construction areas. Some means to alleviate this problem, such as road cleaning or tire washing, may be appropriate. Establishment of landscaping as early in the construction schedule as possible can also lower the potential for fugitive dust emissions. Dust control measures will be part of final project design and construction specifications.

Onsite mobile and stationary construction equipment also would emit air pollutants from engine exhaust. The largest of this equipment is usually diesel powered. Nitrogen oxide emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the standard for nitrogen dioxide is set on an annual basis and is not likely to be violated by short-term construction equipment emissions. Carbon monoxide emissions from diesel engines, on the other hand, are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

In addition, to avoid air quality impacts from slow-moving construction vehicles traveling to and from the site on major roadways, heavy construction equipment should be moved on-site during periods of low traffic volume.

The No Action Alternative would avoid the mostly mitigable potential air quality impacts described above.

The modest rise in the roadway would not have any effects on scenic resources or viewplanes, as there are no viewpoints in the cattle pastures and vacant land on either side of the roadway.

3.1.5 Hazardous Substances, Toxic Materials and Hazardous Conditions

Existing Environment and Impacts

No known hazardous substances are present on the project site, which, apart from cattle grazing and road construction and use, does not appear to have undergone any modern land use. The documented history of use of the site and its surroundings, confirmed by visual surveys of the project site and its surroundings, did not

reveal any structures, equipment, or storage containers that might be indicative of hazardous material use. Therefore, based upon prior and present use of the project site, no hazardous substances, toxic wastes, or hazardous conditions are expected to be present on the site.

3.2 Socioeconomic and Cultural

3.2.1 Socioeconomic Characteristics

Existing Environment

The project would affect and benefit all users of the Mamalahoa Highway in this area, but particularly residents of nearby communities including Waiohinu, Naʻalehu, Pahala, and Ocean View. Table 3 provides information on the socioeconomic characteristics of the Kaʻū District along with those of Hawaiʻi County as a whole for comparison from the United States 2000 census.

Impacts and Mitigation Measures

The project would benefit the public by alleviating road closures from flooding and maintaining highway access critical for accessing jobs, schools, medical care, social services, family, and social activities. The project would provide some short-term construction jobs which would almost certainly be filled by on-island residents, including some from Kaʻū, and would not induce in-migration.

3.2.2 Recreational Resources

Existing Environment, Impacts and Mitigation Measures

The shoreline at Kāwā and adjacent areas is accessed by Kaʻū residents and some visitors for surfing, fishing, gathering, hiking, horseback riding, and other purposes. Although there is a coastal trail that provides hiking access from the north and south, the principal accesses are two rough four-wheel drive roads that extend southeast towards the sea from Highway 11. The main access is located to the north of the project and will not be affected. The secondary access is within the project limits (see Figure 5b). Because the road will be raised in this area, the existing access will no longer be accessible. However, the temporary paved, two-lane bypass roadway that would be built on the *makai* (towards the sea) side of the highway will provide permanent access to this existing four-wheel drive road towards the shoreline once construction is finished. To the extent feasible, this access will also be open during the approximately one-year construction period.

Table 3
Selected Socioeconomic Characteristics

Characteristic	Hawai‘i County	Ka‘ū District	Characteristic	Hawai‘i County	Ka‘ū District
Total Population	148,677	5,827	21 to 64 Years, Disabled (%)	19.2	13.1
Median Age	38.6	41.5	Percent of Disabled Employed, 21 to 64 Years, (%)	51.8	37.4
Older Than 65 Years (%)	13.5	15.1	65 Years or Older, Disabled (%)	40.3	37.9
Race (%)			Employment in:		
White	31.5	34.9	Management and professional	30.2	26.2
Asian	26.7	23.8	Service	22.2	20.1
Hawaiian	9.7	10.4	Sales and offices	25.1	19.5
Other Pacific Islander	1.5	1.1	Construction	9.9	14.8
Two or More Races	28.4	27.0	Farming, Fishing and Forestry	3.8	10.5
Hispanic (Any Race)	9.5	7.0	Production and Transportation	8.9	9.0
Family Households (%)	69.6	65.1	Families Below Poverty Line (%)	11.0	16.8
Householder Lives Alone (%)	23.1	28.4	Individuals Below Poverty Line (%)	15.7	23.9
Average Household Size	2.75	2.63	65 and Over Below Poverty Line	7.2	14.9
Average Family Size	3.24	3.21	Median Household Income ($)	39,805	29,466
Over 25 Years Old With High School Diploma (%)	84.6	79.2	Housing Owner-Occupied (%)	64.5	74.1
Married Now (%)	52.0	53.2	Housing Rented (%)	35.5	25.9
Widowed (%)	6.3	6.3	Housing Vacant (%)	15.5	23.4
Divorced Now (%)	10.7	12.0	Median Home Value, 1999 ($)	153,700	86,700
Veterans (%)	14.5	17.0	Median Rent, 1999 ($)	645	431
Over 16 in Labor Market (%)	61.7	53.5	Rent is Greater Than 25% of Income (%)	46.0	40.6
Residence 5 Yrs Ago (%)			Poverty by Race:		
Same Home	57.7	61.2	White	14.5	22.9
Different Home, Same County	26.5	23.9	Asian	7.3	13.0
			Native Hawaiian/Pacific Islander	26.4	30.3
Different County in Hawai‘i	4.8	1.6	Two or More Races	20.4	32.2
Different State/Country	11.0	13.2			

Source: U.S. Bureau of the Census. May 2001. Profiles of General Demographic Characteristics, 2000 Census of Population and Housing, Hawai‘i. (U.S. Census Bureau Web Page).

3.2.3 Cultural Resources

A cultural impact assessment of the subject area was conducted by Rechtman & Associates. It is attached as Appendix 3 and summarized below. In the interest of readability, the summary below has eliminated most scholarly references; readers interested in sources may consult Appendix 3.

Cultural Historical Background

According to the model developed by Kirch (1985), the Settlement or Colonization period of Hawai‘i was between A.D. 300-600, with colonists possibly from the southern Marquesas Islands. Early Hawaiian farmers developed new subsistence strategies during this period, adapting familiar patterns and traditional tools for use

in their new environment. Order was kept through adherence to their ancient and ingrained philosophy of life and through the principle of genealogical seniority. According to Fornander (1969), Hawaiians brought from their homeland a variety of Polynesian customs including the major gods of Kane, Ku and Lono; the *kapu* system of law and order; *pu'uhonua* or places of refuge or asylum; the *'aumakua* concept of a family or ancestral spirit and the concept of *mana*, or spiritual power.

The Development Period, which lasted from A.D. 600-1100, brought changes that included an evolution of traditional tools as well as some distinctly Hawaiian inventions. The evolution of the adze was an example of the former, while the latter included the two-piece fishhook and the octopus-lure breadloaf sinker. Another invention was the *lei niho palaoa*, an item worn by those of high rank which represented a trend toward greater status differentiation.

The Expansion Period from A.D. 1100 to 1650 saw an increase in social stratification and major socioeconomic changes. It also was a time of expansive settling, with the development of the most favorable windward areas as well as more marginal areas on the island's leeward side. This was the time of the greatest population growth as large irrigated field systems were developed and expanded into more arid areas. *Loko* or fishpond aquaculture also flourished during this period. The second major migration to Hawai'i also occurred during the Expansion Period, with the settlers for this expansion coming from Tahiti in the Society Islands. According to Kamakau (1976) the *kahuna* Pā'ao settled in the islands during the 13th century.

The concept of the *ahupua'a* was established during the A.D. 1400s (Kirch 1985), adding another component to a then well-stratified society. This land unit became the equivalent of a local community, with its own social, economic, and political significance. *Ahupua'a* were ruled by *ali'i 'ai ahupua'a* or lesser chiefs; who, for the most part, had complete autonomy over this generally economically self-supporting piece of land, which was managed by a *konohiki*. *Ahupua'a* were usually wedge or pie-shaped, incorporating all of the ecozones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base.

In Ka'ū, where the land is dry and rugged, a few small communities were initially established along sheltered bays with access to fresh water and rich marine resources. The coastal area of Ka'alāiki along with a portion of the southern part of Hīlea Nui is generally referred to as Kāwā. The Kāwā springs are located within Ka'alāiki Ahupua'a, near the shore. The springs empty into an inlet that extends 500 feet inland. The spring fed pond acted as a fishpond and there is said to be a large red stone in the middle of the pond that is a *kū ula*, or fish god.

In the first part of the 18th century Kalaniopu'u (Kamehameha I's uncle) established himself as the high chief of Ka'ū. This following the death of the Ka'ū chief Nu'uanupa'ahu, who was an excellent surfer and was said to have practiced at Kāwā, which was famous for surfing. In 1754, after many bloody battles, Kalaniopu'u defeated Keaweopala in South Kona and declared himself ruler of the Island of Hawai'i. Kalaniopu'u went on to rule for nearly thirty years and was ruler during the first recorded visit to Hawai'i by European explorers.

Captain James Cook landed in the Hawaiian Islands on January 18, 1778. In January of 1779 he visited South Point for the first time on board his ships the *Resolution* and *Discovery*. Cook recorded a large village on the point and he met with some of the inhabitants, who brought supplies to his ships. Cook was not overly impressed with the size of the pigs, nor the amount of fruit and vegetables offered, and he noted that "the Country did not seem capable of producing many of either having been destroyed by a Volcano…" (Beaglehole 1967:486). Lieutenant King, who accompanied Cook on the voyage, wrote:

> It is not only by far the worst part of the Island but as barren waste looking a country as can be conceived to exist…we could discern black Streaks coming from the Mountain even down to the Seaside. But the [southern] neck seems to have undergone a total change from the Effect of Volcanoes, Earthquakes, etc…By the SE side were black honey combed rocks, …horrid & dismal as this part of the Island appears, yet there are many Villages interspersed, & it struck as being more populous than the part of Opoona [Puna] which joins Koa [Kaʻū]. There are houses built even on the ruins [lava flows] we have described (Beaglehole 1967:611).

Around 1781, after the *Resolution* and *Discovery* had come and gone, a rebel Puna chief named Imakakoloʻa led an uprising against Kalaniopuʻu. The rebel chief was defeated in Puna by Kalaniopuʻu's superior forces, but Imakakoloʻa managed to avoid capture and hide from detection for the better part of a year. While the rebel chief was sought, Kalaniopuʻu "went to Kaʻū and stayed first at Punaluʻu, then at Waiohinu, then at Kamaʻoa in the part of Kaʻu, and erected a *heiau* called Pakini, or Halauwailua, near Kamaʻoa" (Kamakau 1992:108). Imakakoloʻa was eventually captured and brought to the *heiau*, where Kiwalaʻo (Kalaniopuʻu's son) was to sacrifice him as an offering. "The routine of the sacrifice required that the presiding chief should first offer up the pigs prepared for the occasion, then bananas, fruit, and lastly the captive chief" (Fornander 1996:202). However, before Kiwalaʻo could finish the first offerings, Kamehameha, following the counsel of chiefs loyal to him, "grasped the body of Imakakoloʻa and offered it up to the god, and the freeing of the tabu for the heiau was completed" (Kamakau 1992:109). Upon observing this single act of insubordination, many of the chiefs believed that Kamehameha would eventually rule over all of Hawaiʻi.

By 1796 Kamehameha had indeed conquered all of the islands except Kauaʻi. It wasn't until 1810 when Kaumualiʻi of Kauai gave his allegiance to Kamehameha that the Hawaiian Islands were unified under one ruler. Kamehameha died on May 8, 1819 in Kailua-Kona, and once again the culture of Hawaiʻi was to change radically. Six months after his death, his son and successor, Liholiho (Kamehameha II), met with *kuhina nui*, Kaʻahumanu, and a council of chiefs and chiefesses at Kailua. His advisors, who included the *kahuna* Hewahewa, convinced him to abolish the *kapu* system. He signified his agreement by sitting down and eating with his mother Keopulani, breaking the *ʻai kapu*.

Liholiho's cousin, Kekuaokalani, caretaker of the war god Ku-Kailimoku, disagreed with the breaking of the *ʻai kapu* and revolted. By December of 1819 the revolution was quelled. Kamehameha II sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the *heiau* images, and ordering that the *heiau* structures be destroyed or abandoned and left to deteriorate. He did, however, allow the personal family religion, the *ʻaumakua* worship, to continue. In October of 1819, seventeen Protestant missionaries set

sail from Boston to Hawai‘i. They arrived in Kailua-Kona on March 30, 1820 to a society with a religious void to fill. Many of the *ali‘i*, who were already exposed to western material culture, welcomed the opportunity to become educated in a western style and adopt their dress and religion. Soon they were rewarding their teachers with land and positions in the Hawaiian government.

The Reverend William Ellis, a London missionary, visited the Ka‘ū District in July of 1823. He traveled through Ka‘alāiki Ahupua‘a, although he doesn’t mention it by name. What follows are excerpts from his journey from Honuapo to Hōkūkano and his arrival at Hīlea:

> After traveling some time over a wide tract of lava, in some places almost as rugged as any we had yet seen, we reached Hokukano. Here we found an excellent spring of fresh water, the first we had yet seen on our tour, though we had travelled upwards of a hundred miles. While we were stopping to drink, and rest ourselves, many natives gathered around us from the neighbourhood…
>
> We travelled over another rugged tract of lava about two hundred rods wide. It had been most violently torn to pieces, and thrown up in the wildest confusion; in some places it was heaped forty or fifty feet high. The road across it was formed of large smooth round stones, placed in a line two or three feet apart…
>
> About half-past eleven we reached Hilea, a pleasant village belonging to the governor. As we approached it, we observed a number of artificial fish-ponds, formed by excavating the earth to the depth of two or three feet, and banking up the sides…
>
> We went into the house of the head man, and asked him to collect the people together, as we wished to speak to them about the true God. He sent out, and most of the people of the village, then at home, about two hundred in number, soon collected in his house, which was large, where Mr. Thurston preached to them… (Ellis 2004: 195-196).

It’s possible that when Ellis referred to the fresh water springs of Hōkūkano, he was actually in Ka‘alāiki where the Kāwā Springs are located. A review of cartographic resources for the archaeological survey showed no springs in Hōkūkano. The fishpond Ellis refers to may actually have been the pond at Ka‘alāiki, or there may have been a pond at Kāwā Bay, which is in Hīlea Nui.

The missionaries conducted censuses for the Hawaiian Islands in 1831-1832 and 1835-1836, before which there were only rough estimates. The missionary census data from 1835-1836 lists 238 people, including 67 children for both Ka‘alāiki and Hīlea Nui combined. Kelly (1969) estimated that the Ka‘ū District had a population of between 10,000 and 13,500 at the time of European contact, but that it declined to less than 2,000 people by 1872. There was no one single reason for the decrease in population, but rather it occurred through an accumulation of changes that took place after European contact. One often cited reason is that foreigners brought foreign diseases with them, to which the Native Hawaiians had no resistance. In addition to this, many

people migrated to other islands, such as when Governor Kuakini moved from Hawai‘i Island to O‘ahu, and many of his people followed him. Also, men who began working on foreign whaling ships emigrated to foreign countries and rarely ever returned to Hawai‘i.

Native land tenure practices also changed markedly during the early Historic Period. As discussed above, districts were divided into *ahupua‘a* in Precontact Hawai‘i. In these land units the native tenants tended fields and cultivated crops necessary to sustain their families, and the chiefly communities with which they were associated. As long as sufficient tribute was offered and *kapu* (restrictions) were observed, the common people, who lived in a given *ahupua‘a* had access to most of the resources from mountain slopes to the ocean. These access rights were almost uniformly tied to residency on a particular land, and earned as a result of taking responsibility for stewardship of the natural environment, and supplying the needs of the *ali‘i*.

Entire *ahupua‘a* were generally under the jurisdiction of appointed konohiki or lesser chief-landlords, who answered to an *ali‘i-‘ai-ahupua‘a* (chief who controlled the *ahupua‘a* resources). The *ali‘i-‘ai-ahupua‘a* in turn answered to an *ali‘i ‘ai moku* (chief who claimed the abundance of the entire district). Thus, *ahupua‘a* resources supported not only the *maka‘āinana* and *‘ohana* who lived on the land, but also contributed to the support of the royal community of regional and/or island kingdoms. This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resources management planning. In this system, the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources. Also, in communities with long-term royal residents, divisions of labor (with specialists in various occupations on land and in procurement of marine resources) came to be strictly adhered to.

Handy and Handy (1972:554) provided a cartographic sketch indicating the various zones of sea and land in the District of Ka‘ū and their uses by Hawaiians. The construct is based on the Hawaiian terms for the major vegetation zones that are used to define and segregate space within the region’s *ahupua‘a*. The zones are bands roughly parallel to the coast that mark changes in elevation and rainfall. The current project site falls within what has been termed the *kula kai* zone. The *kula kai* was the lowest habitable zone. Residents of the *kula kai* depended largely on marine resources, but also grew sweet potato and gourds. Other vegetables were acquired through trade with *mauka* relatives.

The socioeconomic and demographic changes that took place in the period between 1790 and the 1840s altered the traditional Hawaiian land tenure system and promoted the establishment of a Euroamerican style of land ownership. In 1848, the *Māhele* was the vehicle for determining ownership of the native land. The *Māhele* defined the land interests of Kamehameha III (the King), the high-ranking chiefs, and the *konohiki*. As a result of the *Māhele*, all land in the Kingdom of Hawai‘i came to be placed in one of three categories: (a) Crown Lands (for the occupant of the throne); (b) Government Lands; and (c) Konohiki Lands. Laws in the period of the *Māhele* record that ownership rights to all lands in the kingdom were “subject to the rights of the native tenants;” those individuals who lived on the land and worked it for their subsistence and the welfare of the chiefs (Sinoto and Kelly 1970). During the *Māhele*, Ka‘alāiki was retained as Government land. There were a total of seven *kuleana* awarded within Ka‘alāiki (Table 1). A single LCAw. was awarded *makai* of Highway 11

at the coast, and the remaining six were located *mauka* of Highway 11 at 1,200 feet elevation or higher. One claimant (Kaluahine) received two sections (LCAw. 7091:1 and 2). LCAw. 7091:1 was located at the coast and LCAw. 7091:2 was located in the *mauka* reaches of Ka‘alāiki.

Following the *Māhele*, the Kingdom established a program of selling parcels of land to interested residents. The grant program was initiated in an effort to encourage more native tenants onto fee-simple parcels of land. The parcels of land sold in the grants were quite large, ranging in size from approximately ten acres to many hundreds of acres. When the sales were agreed upon, Royal Patents were issued and recorded following a numerical system that remains in use today. There were a total of sixteen land grants sold within Ka‘alāiki. One grant purchaser (Waapa) was also a *kuleana* awardee. The grant sales occurred between 1852 and 1910, with a majority sold during 1859. The project site crosses two grants (Grants 993 and 2370). Grant 993 was sold to Keawe Kimokeo in 1852 and consisted of 119.5 acres. Grant 2370 was sold to Noa Malailua in 1857 and consisted of 350.0 acres.

In 1862, the Commission of Boundaries (Boundary Commission) was established in the Kingdom of Hawai‘i to legally set the boundaries of all the *ahupua‘a* that had been awarded as a part of the *Māhele*. Subsequently, in 1874, the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them. The primary informants for the boundary descriptions were older native residents of the lands, many of which had also been claimants for kuleana during the *Māhele*. This information was collected primarily between 1873 and 1885 and was usually given in Hawaiian and transcribed in English as it occurred. As Ka‘alāiki was retained as Government land, there was no boundary testimony taken for this *ahupua‘a*. The *ahupua‘a* neighboring Ka‘alāiki to the north and south were also Government lands.

In this part of Ka‘ū, many Native Hawaiians who received *kuleana* lands took part in the *pulu* (the hairy substance covering emerging tree fern fronds) trade of the 1860’s. The *pulu* trade pulled families away from their land and houses and created a dependency on *pulu* for material possessions. This was a sharp contrast to the self-reliant lifestyle they were accustomed to. The Rev. Shipman wrote about the effects of the *pulu* trade on the people:

> …The effect—on them—is not good; not that the pulu is not a source from which they might secure comfort to themselves and families, but the actual result is the reverse. They are offered goods to almost any amount, to be paid for in pulu; this to a native is a strong temptation to go into debt…When once in this condition they are almost entirely under the control of their creditors, and are compelled to live in the pulu regions, at the peril of losing their houses and lots, and whatever other property they possess. Thus their homes are almost in reality deserted, ground uncultivated (Station Report, Ms. [1860] in Kelly 1980).

Mann and Bowen (1976) specifically relate that the residents of Kaʻalāiki complained to the Interior Department that they were being mistreated by Nicolas George, a *pulu* trader who controlled their land under government lease; and asked the Kingdom government to revoke his interest in the land.

In 1868, as must have happened countless times during the Precontact Period, a volcanic eruption emanating from Mauna Loa shook Kaʻū, changing the landscape forever. Beginning on March 27th, a series of earthquakes were felt and lava began flowing on the slopes of Mauna Loa. These initial eruptions destroyed all the stone dwellings and the church in Kahuku. Then on April 4th an even larger eruption occurred. Fredrick S. Lyman, who witnessed the eruption first hand, wrote:

> Soon after four o'clock p.m. on Thursday we experienced a most fearful earthquake. First the earth swayed to and fro from north to south, then from east to west, then round and round, up and down, and finally in every imaginable direction, for several minutes, everything crashing around, and the trees thrashing as if torn by a hurricane, and there was a sound as of a mighty rushing wind. It was impossible to stand: we had to sit on the ground, bracing with hands and feet to keep from being rolled over…we saw…an immense torrent of molten lava, which rushed across the plain below… swallowing everything in its way – trees, houses, cattle, horses, goats, and men, all overwhelmed in an instant. This devouring current passed over a distance of about three miles in as many minutes, and then ceased (Lyman 1868:109).

Within minutes of the initial quake, the ocean rose up and a tsunami pounded the coast, washing inland in some locations as far as 150 yards, destroying 108 houses and drowning 46 people in Kaʻū. A *kamaʻāina* of Kaʻu who witnessed the destruction submitted a letter to *Ka Nupepa Kuokoa* (April 11, 18, 1868) in which, among a very descriptive retelling of the events he stated that "[T]he houses of Kaʻaluʻalu, Paiahaʻa, Honuʻapo, Hokukano, Kaʻalaiki, the two Hilea, Ninole, Wailau, Punaluʻu and as far as Keauhou, were all swept away by the sea…" (Handy and Handy 1972). The tsunami devastated coastal villages and forced people to move inland to towns such as Nāʻālehu and Pāhala. Frederick Lyman wrote:

> The villages on the shore were swept away by the great wave that rushed upon the land immediately after the earthquake. The eruption of earth destroyed thirty-one lives, but the waves swallowed a great number. Eight years following this catastrophic event, the Reciprocity Treaty in 1876 was signed, which granted the Hawaiian Islands free trade in certain commodities, such as sugar. Around this time at least five sugar plantations were started in Kaʻū. By 1880 there were three sugar mills and one under construction (Lyman 1868:110).

Plantation sugar became the dominant employer in Kaʻū and rearranged settlement patterns. Originally many camps or villages were scattered to provide housing for laborers near the fields that required them; e.g., the Hutchinson Sugar Plantation had villages located at Hīlea, Honuʻapo, Naʻalehu, and Kaʻalāiki. By 1928, however, the more remote plantation villages were closed down and the residents moved to Nāʻālehu. Following the heyday of the sugar plantations in this region, the project site was part of area being used as cattle pasture until recent times.

The cultural landscape of Kāwā today reflects much of this history but has been extremely modified by tsunami, cattle grazing, and degradation by invasive plants. In 1976, two graduate students (Herbert Mann and Anne Bowen) undertook an archaeological survey of along the coast of Kaʻalāiki and Hīlea Nui ahupuaʻa (Mann and Bowen 1976). Their survey extended from Highway 11 to the coast and was bordered to the north by Hīlea Stream and to the south by a property fence line within Kaʻalāiki Ahupuaʻa. Although the survey was limited in scope, it identified various house sites, enclosures for animal or garden use), *mākālua* planting holes, and possible burials. There were also enclosures associated with the house sites. Although they did not go into detail about the burials in the area, they did state that there were seven gravesites said to be of the Kinin Family. A number of petroglyphs were recorded along the coast that represented birds, fish, and anthropomorphic figures, as well as pecked bait cups. As discussed in detail in the next section, five archaeological sites are present in the actual area affected by the proposed project. They reflect mainly historic patterns of land use (cattle grazing) overlaid on some pre-Contact uses, and are considered significant only for information content.

According to Mann and Bowen (1976), the last member of the original Kāwā resident families was Mrs. Lydia Papalimu, reported to have left the area in 1957. Lydia Papalimu (her mother was Becky Kimokeo Napoleon) was a descendant of Kimokeo who had received *kuleana* land in neighboring Hilea Nui Ahupuaʻa and purchased fee simple grant lands in Kaʻalāiki. Another purported member of the Kimokeo lineage, Abel Lui, returned to the Kāwā coastal area several years after the village had been abandoned and took up residence there, claiming native tenant rights and sovereignty. Abel Lui today also claims *konohiki* status, and through his presence and stewardship at Kāwā has developed a sizeable following of both Hawaiian and non-Hawaiian sympathizers.

Cultural Resources and Practices on the Project Site

Documentary and field research indicated that the area around the highway that will be affected by the drainage improvements does not appear in itself to have significance in the cultural history of the area. The context of the project site is existing cattle pasture on the *mauka* side and no active land use on the *makai* side. The vegetation is highly weedy, influenced by cattle grazing and the highway, and it does not contain the quality and quantity or resources that would be important for native gathering. Furthermore, no caves, springs, *puʻu*, native forest groves, gathering resources or other natural features are present on or near the project site. The archaeological sites present are associated mainly with cattle grazing and are not significant beyond information content.

In addition to documentary and field research, an effort was made to consult with knowledgeable parties about potential traditional cultural properties and associated practices that might be present or have taken place in this area of Kaʻū. The Office of Hawaiian Affairs was contacted by letter but did not have specific information about the project site. In September 2007 a community informational meeting was held in Nāʻālehu at which the proposed drainage improvement project was described. Of the meeting attendees, of whom there were about twenty, one individual shared cultural information that was potentially relative to the proposed project. Darlyne Vierra, a Nāʻālehu resident and *kamaʻāina* to the area, described a local tradition of placing burials in lava cracks in areas now adjacent to the current Highway 11. The practice of burial in lava cracks was also described

by Lydia Papalimu (Mann and Bowen 1976) as a tradition of the Kinin family of Kāwā, although she asserted that "to bury my [Kimokeo] family, we dig." Burials in lava cracks along Highway 11 have also been identified during recent archaeological work (Clark et al. 2010) in nearby Hokukano and Hiona'ā ahupua'a. Darlyne Vierra stated that her and other family burials exist within 50 feet of the roadway. Several attempts by the archaeologist over the past year and a half to contact Ms. Vierra to discuss specific locations of such burial sites have been unsuccessful, but archaeological survey of the entire project area identified no burials, as discussed in the next section of this EA.

In addition, on several occasions members of the EA and archaeological teams had in-person conversations with Abel Lui and other individuals who reside or visit this land and associate with him (Abel Lui *mā*). While they shared details of the cultural practices being conducted in the coastal Kāwā area, they did not relate any specific information on the presence of cultural resources and ongoing practices within the area affected by drainage improvements. However, the conversations with Abel Lui *mā* did emphasize the general practice of *mālama 'āina*, and concerns were expressed that the governmental agencies proposing the project might undertake the work without consideration for this traditional stewardship concept.

It should be emphasized that the general area of Kāwā is highly significant in terms of association with legendary events, recorded history, and cultural practices including recreation and shoreline subsistence activities. The information provided Lydia Papalimu (born at Kāwā in 1907) in her 1976 interview (Mann and Bowen 1976) identifies the Kāwā Village area as a culturally significant place. This place continues to hold cultural significance and remains a locus of modern cultural practice. The shoreline and other sensitive areas lie about 2,000 feet *makai* from the areas affected by the drainage improvements. The project will not affect this area directly or indirectly. As discussed in Section 3.1.2, the improvements essentially reproduce the existing hydrology of the intermittent drainage, passing the flow under, rather than over, the highway. No measurable change in downstream sediment delivery or water quality is expected. The duplication of existing hydrology will result in a continuance of surface and groundwater conditions for the coastal ponds.

In summary, the project site itself does not appear to support any traditional resource uses, nor are there any specific Hawaiian customary and traditional rights or practices known to be associated with affected area, but local residents emphasize that the practice of *mālama 'āina* is important in this setting.

Impacts and Mitigation Measures

Although there are no indications so far from literature review or consultation with State Historic Preservation Division, the Office of Hawaiian Affairs, or local residents knowledgeable about Hawaiian cultural practices that there are any specific traditional cultural properties or practices on or near the project site, various parties are being supplied a copy of the EA in order to help finalize this finding. Many within the Hawaiian community, along with the Office of Hawaiian Affairs, recognize that *mālama ʻāina* as an ongoing cultural practice with traditional roots. Although seemingly not currently practiced within the specific project site, the concept can be applied to the current project. Such responsible stewardship will include carefully and precisely fencing the boundaries of the proposed work area in areas where cultural resources exist outside of the proposed work area in order to prevent accidental damage to them, and to have appropriate monitors present when conducting ground disturbing activities. Additionally, there are three general concepts that have a traditional basis and which will be adopted by those responsible for conducting the proposed drainage improvement project: *Makaʻala* – to watch were you walk, and to be mindful where you go. To step with respect for the land, and all that it holds and represents; *Akahele* – as you move forward, physically and figuratively, know where you are and be aware in detail of all that surrounds you; and *Makawalu* – to be aware of the spiritual beyond the physical, to envision the things that cannot be seen with the outer eyes. This will occur through a pre-construction briefing by the archaeological monitor for all personnel involved in the initial construction, continuing personal orientation for construction workers through the monitoring phase, and development of a written guide for the construction manager and workers who enter the project after archaeological monitoring is complete.

3.2.4 Archaeology and Historic Sites

The proposed project involves State land and State and federal funds, and thus the environmental documentation is being prepared pursuant to the National Environmental Policy Act (NEPA), the implementing regulations of the Council on Environmental Quality (40 CFR 1500-1508), and the U.S. Department of Transportation regulations for NEPA (23 CFR 771). To comply with these environmental regulations with respect to assessing potential impacts to historic properties, the archaeological survey was prepared in accordance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations (36 CFR 800).

Section 106 requires that federal agencies identify and assess the effects of federally assisted undertakings on historic properties and to consult with others to find acceptable ways to resolve adverse effects. Properties protected under Section 106 are sites, buildings, structures, or objects included on or eligible for listing on the National Register of Historic Places. Eligible properties must generally be at least 50 years old, possess integrity of physical characteristics, and meet at least one of four criteria for significance. Regulations implementing Section 106 (36 CFR Part 800) encourage maximum coordination with the environmental review process required by the National Environmental Policy Act (NEPA) and with other statutes. Hawaiʻi Revised Statutes 6E, Historic Preservation, also applies to the project.

An archaeological inventory survey was conducted by Rechtman Consulting, which is contained in full in Appendix 2b and is summarized below. In the interest of readability, the summary below has eliminated most scholarly references; readers interested in sources may consult Appendix 2b.

Existing Environment

As part of the Section 106 compliance (36 CFR 800.4(a)(1)) for this project, an Area of Potential Effects (APE) was established by HDOT and concurrence was sought from the State Historic Preservation Officer (SHPO) by letter of March 11, 2010 (Appendix 2a). Given the design requirements of the proposed drainage control features, the need for a temporary bypass road, and the desire to limit potential effects on possible historic properties, the APE was is defined as a corridor that was of variable width but a minimum of 50 feet on either side of the existing highway. The physical archaeological survey included and extended just outside this APE.

The identification of potential historic properties was accomplished using three approaches: 1) by examining archival data, 2) through oral consultation, and 3) by an archaeological field investigation. Kaʻalāiki Ahupuaʻa has been the subject of five archaeological investigations, but none identified sites in the current APE. The archival data did not reveal the presence of any historic properties within the current APE; and the historic maps of the area did not show any potential historic properties. Likewise, the oral consultations did not indicate the presence of any specific historic properties within the APE.

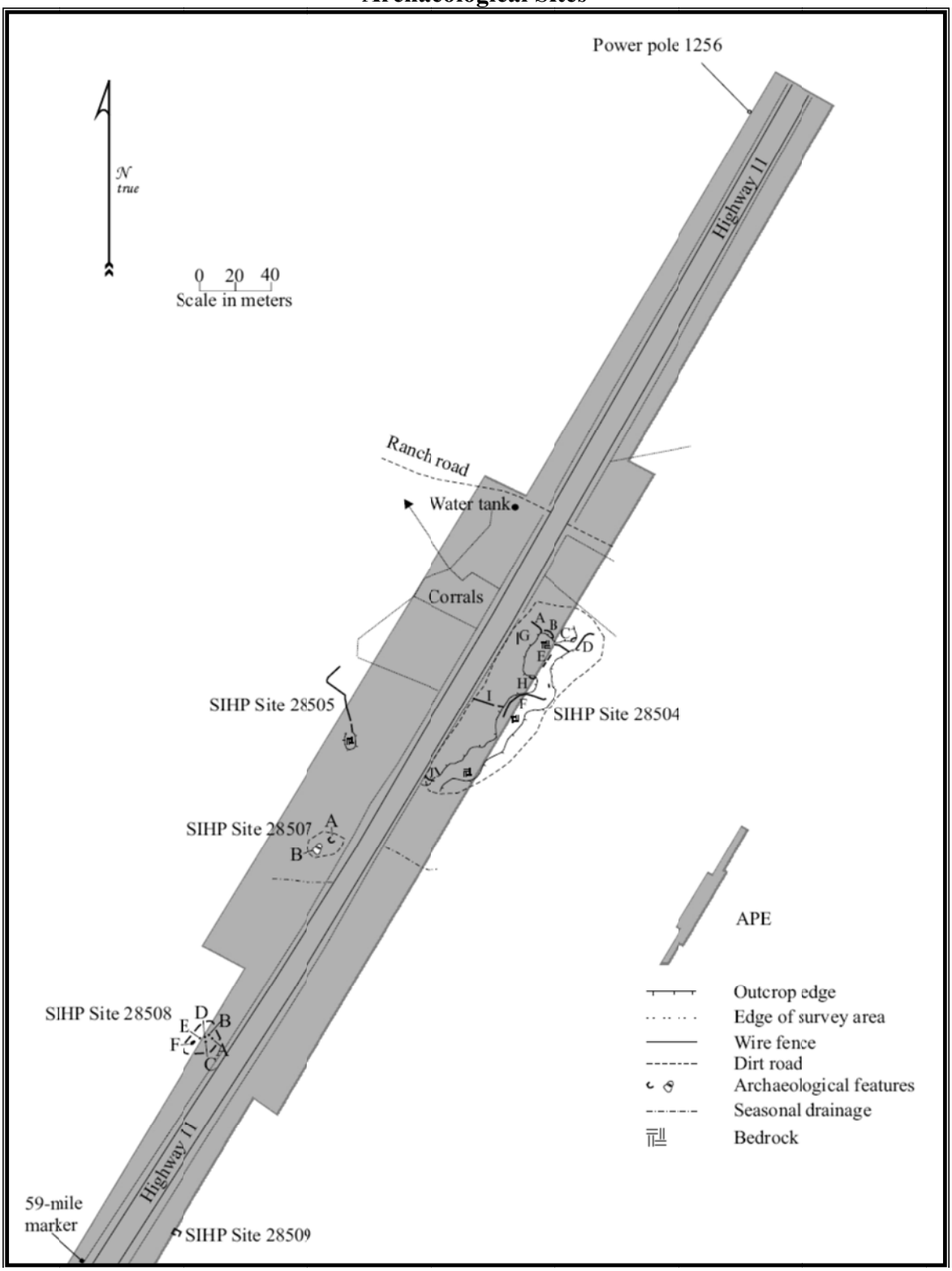
Archaeological fieldwork was conducted between January 31 and February 6, 2008 by a five person field crew working eight-hour days. This work identified and recorded five archaeological sites (State Inventory of Historic Properties [SIHP] Sites 28504, 28505, 28507, 28508, and 28509) within the APE (Table 4; Figure 7).

Site 28504 is a Historic Period wall complex to which numerous modifications have been made in an apparent effort to control the movement of cattle. Site 28505 is a Historic Period wall about 50 meters long in which raised bedrock outcrops were utilized as a means to increase the height. This wall likely served as a way to control the movement of cattle. Site 28507 is a Precontact Period U-shape enclosure and modified lava depression. The construction attributes and the presence of volcanic glass and waterworn cobbles suggest that the enclosure may have been used as a Precontact temporary habitation with the modified depression used as a planting or storage area. Site 28508 is a clustering of pahoehoe rock piles that may have had an agricultural function. Site 28509 is a Historic Period enclosure in a poor state of preservation that may have served as a temporary habitation during the Historic Period.

Table 4
Archaeological Sites

SIHP Site #*	Type	# of Features	Age
28504	Wall complex	10	Historic
28505	Wall	1	Historic
28507	Enclosure	2	Precontact
28508	Rock piles	6	Precontact?
28509	Enclosure	1	Historic

Figure 7
Archaeological Sites



These five sites were assessed for their significance based on the National Register Criteria. Although not in pristine states of preservation, all five do retain sufficient integrity to be considered significant under Criterion d for the information they have yielded relative to former Precontact and Historic land use in this portion of the Kaʻū District of Hawaiʻi Island, thus making the sites potentially eligible for listing in the National Register of Historic Places. All five of the sites have been significantly impacted by prior highway construction and past ranching activities. Only the most recent of the sites, those likely associated with twentieth century ranching activities, exhibit intact architecture.

Impacts and Mitigation Measures

The archaeologists concluded that a reasonable and adequate amount of information has been collected about these historic properties during the current study to warrant a no-mitigation work requirement, and thus a no adverse effects determination for these sites with respect to the project. After review of the initial report by the State Historic Preservation Division (SHPD), the report was modified to include mitigation in the form of data recovery for Site 28507. By letters of May 6, and September 13, 2011 (see Appendix 2a), the SHPD concurred with the finding. Prior to project construction, FHWA and SHPD will prepare and implement a data recovery plan for Site 28507.

Construction fencing will be used to prevent damage to historic sites outside the work area. Most of the area will have black silt BMP fencing that will mark areas beyond which no work will be permitted. Furthermore, in areas that lack the BMP, orange fencing will be installed around identified archaeological sites that are within 25 feet of the work area. An archaeological monitor will be present during the establishment of the fencing to help guide the installation in an effort to protect as many sites both inside and outside of the APE as possible. A monitor will also be in place during initial grubbing and grading activities and excavation so that an immediate response can occur if previously unrecognized potential historic properties are inadvertently discovered during construction activities.

The monitor will conduct a pre-construction briefing for all personnel involved in the initial construction, continuing personal orientation for construction workers through the monitoring phase, and development of a written guide for the construction manager and workers who enter the project after archaeological monitoring is complete. By letters of May 6, and September 13, 2011, the State Historic Preservation Division (SHPD) concurred with this mitigation (see Appendix 2a).

3.3 Infrastructure

3.3.1 Utilities

Existing Facilities and Services

Electrical power to the area is supplied by Hawaiʻi Electric Light Company (HELCO), a privately owned utility company regulated by the State Public Utilities Commission, via their islandwide distribution network, which includes electrical poles and lines in the area affected by the project. Telephone lines belonging to Hawaiian Telcom are also present. No other utilities are present, and none are needed for the project.

Impacts and Mitigation Measures

The proposed action would not have any substantial impact on existing electrical or telephone facilities, but the poles and lines may require relocation. Appropriate coordination will be conducted with HELCO and Hawaiian Telcom as part of project design. Short outages of service may be required.

3.3.2 Traffic

State Highway 11 in this area of Kaʻū is classified as a rural minor arterial. Traffic counts conducted by HDOT (data from HDOT offices on CD-ROM) on June 17 and 18, 2009, found a total Average Daily Traffic (ADT) of about 2,250. This compares to ADT values on arterials in Hilo, Puna and Kona exceeding 10,000 vehicles. The AM peak hour occurred in the mid-morning – 9:00 to 10:00 AM on one of the days, 9:30 to 10:30 AM on the other – with a peak value averaging 175 vehicles. The PM peak hour occurred in the mid-morning – 3:00 to 4:00 PM on one of the days, 3:15 to 4:15 PM on the other – with a peak averaging 210 vehicles.

Impacts and Mitigation Measures

The project would cause temporary delays during construction although delays would be alleviated by construction of the single-lane bypass roadway. Given the relatively light traffic volumes, no significantly long traffic lines or delays are expected.

3.4 Secondary and Cumulative Impacts

Secondary impacts from road projects can include significant population changes or effects on public facilities. Although the project would provide some short-term construction jobs, these would almost certainly be filled by local residents and would not induce in-migration. The project would only serve to alleviate road closures from natural causes and maintain highway access, and no adverse secondary impacts are expected.

Cumulative impacts result when implementation of several projects that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures.

At the current time, one large development is planned in the project area, completion of the Sea Mountain Five development at Punaluʻu. This project involves construction of 350 vacation units and 1,050 residential units. However, the project appears to be on hold, and the timing or even the likelihood that it will be completed is uncertain. Very few public infrastructure projects such as highways, wastewater, solid waste, or drainage project are in planning or construction in Kaʻū. Several natural and cultural resource protection and restoration projects are also underway in the area, including most notably the steady restoration of ecosystems *mauka* of the project area in Kahuku section of Hawaiʻi Volcanoes National Park and the Kaʻū Forest Reserve.

The adverse effects of the project – very minor and temporary disturbance to air quality, noise, visual and traffic congestion quality during construction – are very limited in severity, nature and geographic scale. None of the impacts from the project would accumulate with adverse impacts from any other of the projects listed above. The project would only interact positively, through alleviating road closures during floods.

3.5 Required Permits and Approvals

Table 5 provides a list of major required permits and approvals.

Table 5
Permits and Approvals

Permit/Approval	Applicable Activities	Regulatory Agency
Historic Sites Review (Section 106 of NHPA and Chapter 6e, HRS)	Any construction in the vicinity of a designated historic place or archaeological site.	State Department of Land and Natural Resources (DLNR), Historic Preservation Division
State Highways Permit	Any work.	State DOT
Conservation District Use Permit (CDUP)	Any use of conservation lands.	State DLNR
National Pollutant Discharge Elimination System (NPDES)	Discharge of any pollutant, altering the quality of any discharge, increasing the quantity of any discharge.	State DOH
Subdivision Approval	Dividing or consolidating parcels of land for right-of-way.	County of Hawai‘i Planning Dept.
Special Management Area (SMA) Permit	Development within SMA	County of Hawai‘i Planning Dept.
Grading, Grubbing, Excavating and Stockpiling Permits	Any excavation or fill, removal of vegetation from the surface, or the purposeful accumulation and set-aside of loose soil.	County of Hawai‘i Department of Public Works

After the Chapter 343/NEPA Environmental Assessment and historic sites review processes are complete, the project will apply for a Special Management Area permit. Concurrently, work on the State Highways permit and the NPDES and Grading/Grubbing/Stockpiling permits would begin. After the SMA is granted, a Conservation District Use Permit (if required) will be sought. Finally, the construction permits and subdivision will be processed.

3.6 Consistency with Government Plans and Policies

3.6.1 Hawai‘i State Plan

Adopted in 1978 and last revised in 1991 (Hawai‘i Revised Statutes, Chapter 226, as amended), the Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State’s long-run growth

and development activities. The three themes that express the basic purpose of the Hawai‘i State Plan are individual and family self-sufficiency, social and economic mobility and community or social well-being. The project would promote these goals primarily by enhancing public safety by removing potential hazards to motorists and possible barriers to emergency vehicles.

3.6.2 Hawai‘i County General Plan and Zoning

The Hawai‘i County General Plan Land Use Pattern Allocation Guide (LUPAG). The LUPAG map component of the General Plan is a graphic representation of the Plan's goals, policies, and standards as well as of the physical relationship between land uses. It also establishes the basic urban and non-urban form for areas within the planned public and cultural facilities, public utilities and safety features, and transportation corridors. The LUPAG classifies the project site as extensive agriculture *mauka* (uphill) of the highway and conservation *makai* (towards the sea) of the highway. The project is in no way inconsistent with these designations.

Hawai‘i County Zoning and Special Management Area. The project site is within the Hawai‘i County Agricultural (A-20a) zoning designation. Areas southeast of the highway have no County zoning designation as they are located in the Conservation District. Areas southeast of the highway are also within the Special Management Area (SMA).

General Plan. The General Plan for the County of Hawai‘i is a policy document expressing the broad goals and policies for the long-range development of the Island of Hawai‘i. The General Plan itself is organized into thirteen elements, with policies, objectives, standards, and policies for each. There are also discussions of the specific applicability of each element to the nine judicial districts comprising the County of Hawai‘i. Most relevant to the project are the following Goals, Standards, Policies and Courses of Action of particular chapters:

Economic – Goals
(a) Provide residents with opportunities to improve their quality of life through economic development that enhances the County's natural and social environments.
(d) Provide an economic environment that allows new, expanded, or improved economic opportunities that are compatible with the County's cultural, natural and social environment.

Discussion: The project would help to achieve the stated goals of the Economic chapter of the General Plan by repairing a dangerous flood problem that poses an occasional barrier to the movement of goods, services and customers, implementing the project in a manner that enhances the social environment.

Environmental Quality – Goals
(b) Maintain and, if feasible, improve the existing environmental quality of the island.
(c) Control pollution.

Environmental Quality – Policies
(a) Take positive action to further maintain the quality of the environment.
(h) Work with the appropriate agencies to adopt appropriate measures and provide incentives to control point and nonpoint sources of pollution.
Environmental Quality – Standards
(a) Pollution shall be prevented, abated, and controlled at levels that will protect and preserve the public health and well being, through the enforcement of appropriate Federal, State and County standards.
(c) Federal and State environmental regulations shall be adhered to.

Discussion: The project would help to achieve the goals of the Environmental Quality chapter of the General Plan by maintaining the existing environmental quality of the island and controlling pollution through mitigation of potential air and water quality impacts.

Flooding and Other Natural Hazards – Goals
(a) Protect human life.
(b) Prevent damage to man-made improvements.
(c) Control pollution.
(d) Prevent damage from inundation.
(e) Reduce surface water and sediment runoff.
(f) Maximize soil and water conservation.
Flooding and Other Natural Hazards – Policies
(g) Development-generated runoff shall be disposed of in a manner acceptable to the Department of Public Works and in compliance with all State and Federal laws.
Flooding and Other Natural Hazards – Standards
(a) "Storm Drainage Standards," County of Hawaii, October, 1970, and as revised.
(b) Applicable standards and regulations of Chapter 27, "Flood Control," of the Hawai‘i County Code.
(c) Applicable standards and regulations of the Federal Emergency Management Agency (FEMA).
(d) Applicable standards and regulations of Chapter 10, "Erosion and Sedimentation Control," of the Hawaii County Code.
(e) Applicable standards and regulations of the Natural Resources Conservation Service and the Soil and Water Conservation Districts.

Discussion: The flooding at Kāwā Flats is a hazard to motorists and also creates a potential hazard to area communities, as floods prevent access by emergency vehicles and other services. Additionally, flooding may damage the roadway structure, possibly resulting in a longer-term road closure in the future. Implementing the project is an appropriate response to an existing drainage problem. It should be noted that the project site is not located in a designated flood zone. The project will conform with applicable standards and regulations pertaining to drainage and erosion and sediment control. Therefore the project will conform to and abide by applicable goals, policies and standards of the Flooding and Other Natural Hazards chapter of the General Plan.

Historic Sites – Goals
(a) Protect, restore, and enhance the sites, buildings, and objects of significant historical and cultural importance to Hawaii.
Historic Sites – Policies
(c) Require both public and private developers of land to provide historical and archaeological surveys and cultural assessments, where appropriate, prior to the clearing or development of land when there are indications that the land under consideration has historical significance.
(i) Signs explaining historic sites, buildings and objects shall be in keeping with the character of the area or the cultural aspects of the feature.
Historic Sites – Standards
(a) The evaluation of the importance of specific historic sites is necessary for future action. The following standards establish a framework for evaluating sites.
(b) Importance in the life or activities of a major historic person.
(c) Associated with a major group or organization in the history of the island or community.
(d) Associated with a major historic event (cultural, economic, military, social, or political).
(e) Associated with a major recurring event in the history of the community (such as annual celebrations).
(f) Associated with a past or continuing institution that has contributed substantially to the life of the community.
(g) Unique example of a particular style or period.
(h) One of the few of its age remaining.
(i) Original materials and/or workmanship that can be valued in themselves.
(j) Sites with a preponderance of original materials in context and complexes rather than single isolated sites unless they are of great significance.
(k) Sites of traditional and cultural significance.

Discussion: The project site has been the subject of an archaeological inventory survey. Up to five agricultural archaeological sites that have been determined to be significant for data recovery only and not for preservation will be disturbed by the project. The project conforms with applicable portions of the Historic Sites chapter of the General Plan.

Natural Beauty – Goals
(a) Protect, preserve and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.
(b) Protect scenic vistas and view planes from becoming obstructed.
Natural Beauty – Policies
(h) Protect the views of areas endowed with natural beauty by carefully considering the effects of proposed construction during all land use reviews.
(i) Do not allow incompatible construction in areas of natural beauty.

Discussion: The project will have no adverse effect on the Natural Beauty and scenery of the area. Elevation of the road will provide better views for motorists of the scenic coastline without interfering with views of the mountains from the shore.

Natural Resources and Shoreline – Goals
(a) Protect and conserve the natural resources from undue exploitation, encroachment and damage.
(b) Provide opportunities for recreational, economic, and educational needs without despoiling or endangering natural resources.
(c) Protect and promote the prudent use of Hawaii's unique, fragile, and significant environmental and natural resources.
(d) Protect rare or endangered species and habitats native to Hawaii.
(f) Ensure that alterations to existing land forms, vegetation, and construction of structures cause minimum adverse effect to water resources, and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation, or failure in the event of an earthquake.
Natural Resources and Shoreline – Policies
(a) Require users of natural resources to conduct their activities in a manner that avoids or minimizes adverse effects on the environment.
(j) Encourage the protection of watersheds, forest, brush, and grassland from destructive agents and uses.
(p) Encourage the use of native plants for screening and landscaping.
(t) Preserve and protect significant lava tube caves.
(u) Ensure that activities authorized or funded by the County do not damage important natural resources.
Natural Resources and Shoreline – Standards
The following shall be considered for the protection and conservation of natural resources.
(a) Areas necessary for the protection and propagation of specified endangered native wildlife, and conservation for natural ecosystems of endemic plants, fish and wildlife.

Discussion: The project would not subject natural resources to exploitation, encroachment, and damage and would assist in public safety. No sensitive biological communities are present or at risk. The project will essentially reproduce the existing hydrology of the intermittent drainage, passing the flow under, rather than over, the highway. No measurable change in downstream sediment delivery or water quality is expected. The duplication of existing hydrology will result in a continuance of surface and groundwater conditions for the coastal ponds located about 0.4 miles *makai* (towards the sea). For these reasons the project would conform to the applicable goals, policies, and standards of the Natural Resources and Shoreline chapter of the General Plan.

It should also be noted that the Kaʻū Community Development Plan (CDP) is in process. This CDP encompasses the judicial district of Kaʻū, and is being developed under the framework of the February 2005 County of Hawaiʻi General Plan. Community Development Plans are intended to translate broad General Plan Goals, Policies, and Standards into implementation actions as they apply to specific geographical regions around the County. CDPs are also intended to serve as a forum for community input into land-use, delivery of government services and any other matters relating to the planning area. The General Plan now requires that a Community Development Plan shall be adopted by the County Council as an "ordinance", giving the CDP the force of law. This is in contrast to plans created over past years, adopted by "resolution" that served only as guidelines or reference documents to decision-makers. According to the County's CDP website (http://www.hcrc.info/community-planning/kau-cdp/where-are-we-and-whats-next/):

"Based on community values and vision as well as insights from the community profile, the basic framework for the Ka'u CDP was developed during the November 16-21, 2009 planning 'charrette' (or workshop). The first draft of the CDP is now being developed."

It is expected that the proposed drainage improvements at Kāwā will be incorporated in the Ka'ū CDP, and that the project will be consistent with the CDP.

3.6.3 Hawai'i State Land Use Law

All land in the State of Hawai'i is classified into one of four land use categories – Urban, Rural, Agricultural, or Conservation – by the State Land Use Commission, pursuant to Chapter 205, HRS. The property is in the State Land Use Agricultural District (*mauka* or uphill of the highway) and Conservation District (*makai* or towards the sea from the highway). It is expected that a Conservation District Use Permit (CDUP) will be required for the action, as part of the project would involve use of the Conservation District. As part of the Conservation District Use Permit process, the exact boundary between the Conservation and Agricultural Districts will be determined through consultation with the Hawai'i State Land Use Commission.

3.7 Federal Laws and Executive Orders

Section 3.7 discusses federal laws and executive orders that have not been discussed in the context of resource evaluation in other sections of this chapter. The reader is directed to Section 3.1.3 for discussion of the Endangered Species Act of 1973, as Amended (16 USC 1531-1544) the Migratory Bird Treaty Act and Migratory Bird Conservation Act (16 USC 701-715), and the Fish and Wildlife Coordination Act, as Amended (16 USC 661 et seq.). Section 3.2.4 contains discussion of the National Historic Preservation Act (16 USC 470 et seq., 110).

3.7.1 Coastal Zone Management Act (CZMA) and Coastal Barriers

No Coastal Barriers are present in the State of Hawai'i. The Hawai'i Coastal Zone Management (CZM) Program was established in 1977 through the adoption of the Coastal Zone Management Act, incorporated in Chapter 205A HRS. Projects with federal involvement significantly affecting areas under jurisdiction of the State CZM Agency must undergo review for consistency with the State's approved coastal program. The entire State of Hawai'i is included in the coastal zone for such purposes. The CZM objectives are outlined as follows.

- Recreational Resources. Provide coastal recreational opportunities accessible to the public.
- Historic Resources. Protect, preserve, and, where desirable, restore those natural, man-made historic, and pre-historic resources in the CZM area that are significant in Hawaiian and American history and culture.
- Scenic and Open Space Resources. Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.
- Coastal Ecosystems. Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems.
- Economic Use. Provide public or private facilities and improvements important to the State's economy in suitable locations.

- Coastal Hazards. Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, and subsidence.
- Managing Development. Improve the development review process, communication, and public participation in the management of coastal resources and hazards.
- Public Participation. Stimulate public awareness, education, and participation in coastal management, and maintain a public advisory body to identify coastal management problems and provide policy advice and assistance to the CZM program.
- Beach Protection. Protect beaches for public use and recreation; locate new structures inland from the shoreline setback to conserve open space and minimize loss of improvements due to erosion.
- Marine Resources: Implement the state's ocean resources management plan.

HDOT and FHWA have evaluated the project and believe that the project does not impact these coastal zone resources and is consistent with the objectives of the program. In accordance with consultation with the State Coastal Zone Management Program, this EA has been included as part of the materials submitted by HDOT to the Hawai'i Coastal Zone Management Program for CZMA consistency review. Appendix 5 contains CZM correspondence.

Chapter 205A also established the *Special Management Area* (SMA), which is an area of particular concern that requires a higher level of management to ensure the coastal resources are appropriately protected and managed. Accordingly, any development proposed within the SMA requires the approval of a minor or major use permit from the County of Hawai'i, depending on the cost and impact of the proposed activity. Areas *makai* (towards the sea) of the highway at the project site are within the SMA. As discussed in Section 3.6.2, an SMA Major permit will be sought for the project.

3.7.2 Clean Water Act, as Amended (33 USC 1251 et seq.)

It has been determined through fieldwork and confirmed through consultation with the U.S. Army Corps of Engineers (see letter of April 16, 2010 in Appendix 1a) that implementation of the project would not involve the discharge of dredged or fill materials into waters of the United States, as discussed in Section 3.1.2, above. The project would thus be in compliance with the Clean Water Act, Section 404(b)(1) Guidelines. None of the proposed construction materials would be expected to contain any contaminants.

As discussed in Section 3.1.2, because the project will disturb more than one acre of surface, a National Pollutant Discharge Elimination System (NPDES) permit pursuant to Section 402 of the Clean Water Act must be obtained by the contractor before the project commences. This permit requires the completion of a Storm Water Pollution Prevention Plan (SWPPP). In order to properly manage storm water runoff, the SWPPP will describe the emplacement of a number of best management practices (BMPs) for the project.

3.7.3 Clean Air Act As Amended (42 USC 7401, et seq.)

The Clean Air Act requires states to develop plans, called State Implementation Plans (SIP), for eliminating or reducing the severity and number of violations of National Ambient Air Quality Standards (NAAQS) while achieving expeditious attainment of the NAAQS.

The State and federal governments periodically monitor air quality to determine whether it meets the AAQ standards. Areas that do not meet these standards are termed non-attainment areas and are subject to Conformity Rules. These rules were issued by the Environmental Protection Agency (EPA) in response to Section 176 of the 1977 Clean Air Act. Conformity Rules prohibit any federal agency from engaging in any actions that do not conform to a state's plan to correct nonattainment situations. The entire State of Hawaiʻi is considered to have acceptable air quality and is thus an attainment area not subject to application of Conformity Rules.

The project would have no long-term affect on air quality. All equipment used in construction will be required to meet appropriate emission standards.

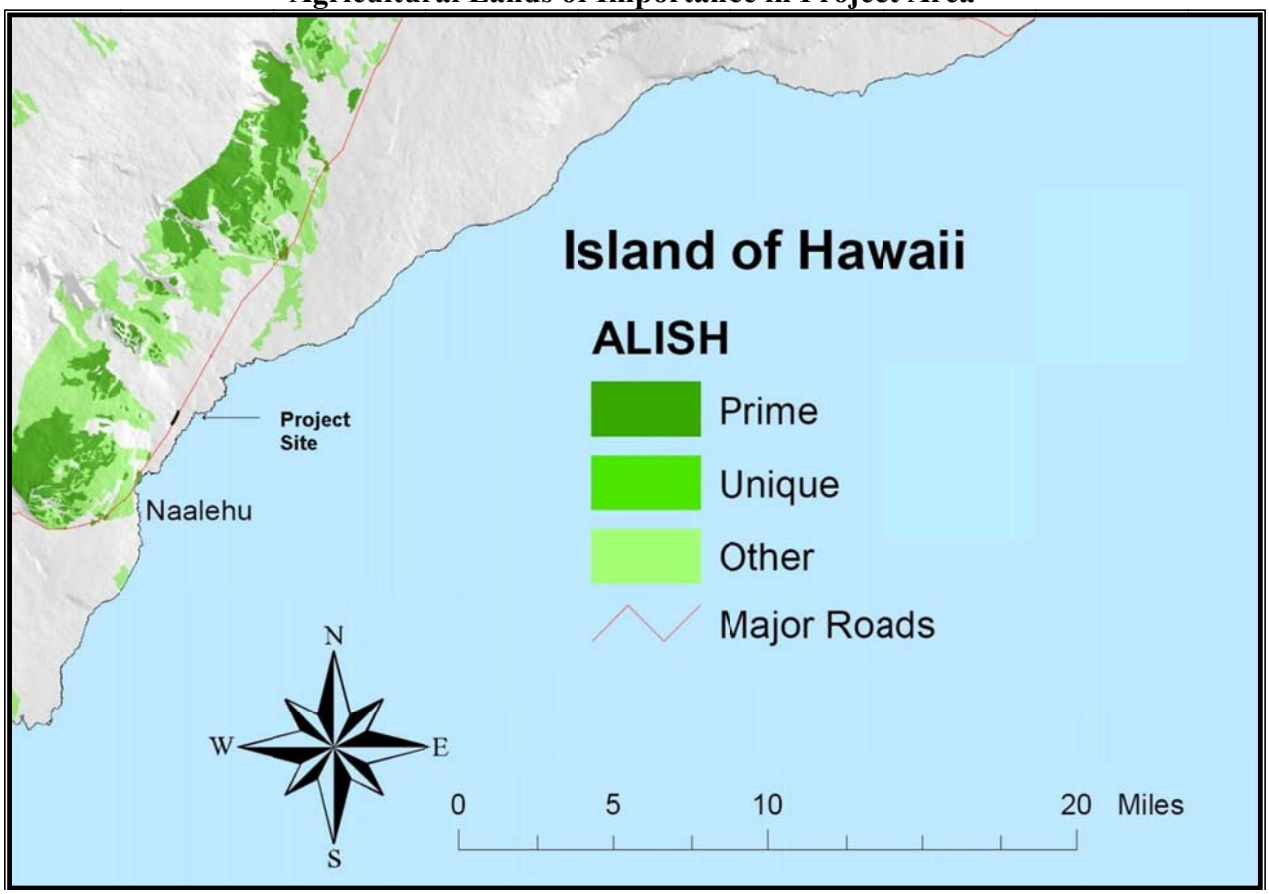
3.7.4 Wild And Scenic Rivers Act (16 U.S.C. 1271-1287)

The Wild and Scenic Rivers Act (P.L. 90-542, as amended) selected rivers of the Nation that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values. The purpose of the Act is to preserve these rivers in their freeflowing condition, and protect them for the benefit and enjoyment of present and future generations. An inventory, the National Wild and Scenic Rivers System, was established in December 1, 1992 and is published by the Department of the Interior and the Department of Agriculture, Forest Service and can be found at web site http://www.nps.gov/rivers/wildriverslist.html#wa. No rivers in Hawaiʻi are on this list, and thus there will thus be no impact to Wild and Scenic Rivers.

3.7.5 Farmland Protection Policy Act (7 U.S.C. 4201, et seq.)

The Farmland Protection Policy Act (Public Law 97-98, Sec. 1539-1549) requires identification of proposed actions that would affect any lands classified as prime and unique farmlands. Agencies must consider alternative actions that could reduce adverse effects and ensure that their programs, to the extent practicable, are compatible with State, local government and private programs and policies to protect farmland. The Agricultural Lands of Importance in the State of Hawaiʻi (ALISH), prepared by the State Department of Agriculture, classifies lands into three categories: 1) Prime Agricultural Land, (2) Unique Agricultural Land, and (3) Other Important Agricultural Land. As shown in Figure 8, the project site is not classified as Important Agricultural Land of any category under the ALISH system.

Figure 8
Agricultural Lands of Importance in Project Area



Source: Hawai'i State GIS system

3.7.6 Resource Conservation and Recovery Act (RCRA) (42 USC 6901 et seq.)

RCRA was enacted in 1976 to address the issue of how to safely manage and dispose of municipal and industrial waste, regulate underground storage tanks (USTs) that store petroleum or hazardous substances, establish a system for managing solid (primarily nonhazardous) waste, including household waste, and set forth the framework for EPA's comprehensive waste management program.

No systematic records evaluation (i.e. Phase I Environmental Site Assessment and subsequent investigations) or intensive field investigation have been undertaken at the project site. The site has been used for cattle grazing, with no history of urban use, and there is no obvious evidence of dumping. Although it is unlikely that any potentially hazardous, toxic or radioactive waste

would be found on the proposed project site, reasonable precautions would be undertaken in the context of the project's BMP plan to include provisions for the appropriate response and remediation should any such hazardous, toxic, or radioactive material be encountered during the construction phase of the project, in accordance with RCRA or CERCLA requirements. The project is in compliance with RCRA.

3.7.7 Executive Order 11988, Floodplain Management (24 May 1977)

Executive Order 11988 requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy of the floodplain, and to avoid direct and indirect support of floodplain development where there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains."

The project site is not within a designated floodplain, and the project's purpose and need is to deal with intermittent but severe flooding outside a designated floodplain. The project is not inconsistent with EO 11988.

3.7.8 Executive Order 11990, Protection of Wetlands (24 May 1977)

Executive Order 11990 (and 23 CFR 771.126(a)(1)) state that it is federal policy to avoid long and short-term adverse impacts associated with the destruction or modification of wetlands, and to avoid direct and indirect support of new construction in wetlands where there is a practicable alternative. The Order further directs federal agencies to avoid undertakings in wetlands unless the head of the agency finds that there is no practicable alternative to such construction, and that the proposed action includes all practicable mitigation measures to minimize harm to wetlands which may result from such use. In the case of the project, there are no wetlands present, as determined through fieldwork and confirmed through consultation with the U.S. Army Corps of Engineers (see letter of April 16, 2010 in Appendix 1a).

3.7.9 Executive Order 12898, Environmental Justice

Executive Order 12898 directs every federal agency to identify and address disproportionately high and adverse human health or environmental effects of agency programs and activities on minority and low-income populations.

The project site itself is several miles away from population centers, but the broader project area contains high proportions of both minority and low-income segments of the population, as shown in Table 3. On balance, low-income and minority populations would substantially benefit from the project, because the intermittent flooding cuts off individuals of these populations from medical care, schools, jobs and family. As the project does not have adverse effects, it would not produce disproportionately high and adverse human health or environmental effects for low-income or minority populations.

3.7.10 Section 4(f)

The material in this section complies with and is submitted pursuant to 42 U.S.C. 4332(2)(c), 49 U.S.C, 303, 23 U.S.C 138, and 23 CFR 774 [referred to as Section 4(f)]. These requirements apply to all actions or projects undertaken by agencies of the U.S. Department of Transportation. The purpose of Section 4(f) is to ensure that special efforts are made to protect public parks and recreation lands, wildlife and waterfowl refuges, and historic sites. The law states that the Secretary of Transportation shall approve a project which requires the use of publicly owned land from a public park, recreation area, wildlife or waterfowl refuge, or historic site of significance only if (1) there is no prudent and feasible alternative to such use and (2) the project includes all possible planning to minimize harm to the resource being used.

The Federal Highway Administration has determined that no 4(f) properties are present. Consultation with the U.S. Fish and Wildlife Service, the Hawai‘i County Department of Parks and Recreation and the Hawai‘i State Department of Land and Natural Resources has determined that no public parks, public recreation areas, or wildlife/waterfowl refuges would be affected by the project (see Appendices 1a, 3 and 4 for consultation letters). Although there are four archaeological sites determined to be eligible for listing on the National Register of Historic Places, none are important for preservation in place. This finding will be reconsidered and finalized after consultation with the State Historic Preservation Officer (SHPO – the agency with jurisdiction over the potential 4(f) properties) that will occur as part of review of the Draft EA. The Final EA will report the final Section 4(f) finding.

PART 4: DETERMINATION

The Federal Highway Administration will review the comments received after circulation of this Environmental Assessment and make a determination of whether the project would have significant impacts and thus require preparation of an Environmental Impact Statement. Based on information to this point, the Hawai‘i State Department of Transportation, expects to determine that the project will not significantly alter the environment, as impacts will be minimal, and that an Environmental Impact Statement is not warranted, and is thus expected to issue a Finding of No Significant Impact (FONSI). Comments on the EA will be reviewed in order to ascertain whether this anticipated determination is appropriate.

PART 5: STATE OF HAWAI‘I, FINDINGS AND REASONS

Chapter 11-200-12, Hawai‘i Administrative Rules, outlines those factors State of Hawai‘i agencies must consider when determining whether an Action has significant effects:

1. *The project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources*. No valuable natural or cultural resources would be committed or lost. Up to five agricultural archaeological sites that have been determined to be significant for data recovery only and not for preservation in place will be disturbed by the project.
2. *The project will not curtail the range of beneficial uses of the environment*. No restriction of beneficial uses would occur. The project represents a highly beneficial use of the environment.
3. *The project will not conflict with the State's long-term environmental policies. The State’s long-term environmental policies are set forth in Chapter 344, HRS.* The broad goals of this policy are to conserve natural

resources and enhance the quality of life. The project is minor, environmentally beneficial, and fulfills aspects of these policies calling for an improved social environment. It is thus consistent with all elements of the State's long-term environmental policies.

4. *The project will not substantially affect the economic or social welfare of the community or State.* The project would not have any adverse effect on the economic or social welfare of the County or State. It would improve the social welfare of the community by curing a critical deficiency along this route in which flood waters periodically overtop the highway and completely close this round-the-island highway – the only route connecting the two main towns of Kaʻū, making a hazard to motorists, preventing the passage of emergency vehicles, and damaging the roadway structure.

5. *The project does not substantially affect public health in any detrimental way*. The project would affect public health and safety in only beneficial ways by allowing residents to access their homes and emergency services during heavy rains.

6. *The project will not involve substantial secondary impacts, such as population changes or effects on public facilities*. The project would involve no population changes or effects on public facilities.

7. *The project will not involve a substantial degradation of environmental quality.* The potential for air water quality impacts during construction would be mitigated, and there will be no substantial degradation of any aspect of environmental quality.

8. *The project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat*. The project site supports overwhelmingly alien vegetation. Impacts to rare, threatened or endangered species of flora or fauna will not occur.

9. *The project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions*. The adverse effects of the project – very minor and temporary disturbance to air quality, noise, visual and traffic congestion quality during construction – are very limited in severity, nature and geographic scale. None of the impacts from the project would accumulate with adverse impacts from the limited number of other projects in the area.

10. *The project will not detrimentally affect air or water quality or ambient noise levels.* No adverse effects on these resources would occur. Mitigation of construction-phase impacts will preserve water quality. Ambient noise impacts due to construction will be temporary and restricted to daytime hours.

11. *The project does not affect nor would it likely to be damaged as a result of being located in environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal area*. Although the project is located in an area with flooding, volcanic and seismic risk, the entire Island of Hawaiʻi shares this risk, and the project is not imprudent to construct; in fact, the project addresses flood hazard.

12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies*. No scenic vistas and viewplanes identified in county or state plans or studies will be adversely affected by the project.

13. *The project will not require substantial energy consumption*. The construction and maintenance of the project would require minimal consumption of energy. No adverse effects would be expected.

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MAMALAHOA HIGHWAY DRAINAGE IMPROVEMENTS AT KĀWĀ FLATS

ENVIRONMENTAL ASSESSMENT

TMKs (3rd): 9-5-016:006, 022, 025 & 026
Kāʻu District, County of Hawaiʻi, State of Hawaiʻi

APPENDIX 1a
Comments in Response to Early Consultation

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Harry Kim
Mayor

Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-2389

March 6, 2008

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

Dear Mr. Terry:

SUBJECT: Environmental Assessment (EA) for Mamalahoa Highway (SR 11) Drainage Improvements at Kawa Flats (TMKs: 9-5-16:006, 025, & 026)

This responds to your February 15, 2008, letter requesting comments relative to an Environmental Assessment (EA) for Mamalahoa Highway (SR 11) dealing with drainage improvements at Kawa Flats (TMKs: 9-5-16:006, 025, and 026).

Staff submits the following comments:

- Implement a method to ensure that the dirt and mud deposited by the flood waters do not end up clogging the waterway or overflowing onto the highway.
- Recommend that this project be expedited due to the current hazardous issues caused by the flooding.

Should you have any questions, please contact Acting Captain Robert Fujitake at the Kau Police Station, 939-2520.

Sincerely,

LAWRENCE K. MAHUNA
POLICE CHIEF

JOHN E. DAWRS
ACTING ASSISTANT POLICE CHIEF
AREA II OPERATIONS

RJ:dmv

LINDA LINGLE
GOVERNOR OF HAWAII

Laura H. Thielen
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

Russell Y. Tsuji
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR FOR
THE COMMISSION ON
WATER RESOURCE MANAGEMENT

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

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISION OF FORESTRY AND WILDLIFE

1151 PUNCHBOWL STREET

HONOLULU, HAWAII 96813

March 3, 2008

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

Dear Mr. Terry:

Subject: Preconsultation Environmental Assessment Review for 1) Mamalahoa Highway (SR11) Drainage Improvements at Kawa Flats, Kau, Hawaii; 2) Hotel Renovations, King Kamehameha's Kona Beach Hotel, Kailua, Kona, Hawaii; and 3) Convenience Center Improvements, Volcano, Glenwood, and Pahoa, Hawaii.

DLNR, Division of Forestry and Wildlife provide the following comments to your request. Our preliminary review of the three Environmental Assessments shows no impacts to our management programs or endangered plant species. However, we would like to receive copies of the three subject EA documents through the Environmental review process. For the Convenience Centers of Volcano, Glenwood, and Pahoa involving Conservation lands, a copy of our response will be sent to DLNR, OCCL. Thank you for allowing us to review your intention to prepare Environmental Assessments for these proposed projects.

Sincerely yours,

Paul J. Conry

Paul J. Conry
Administrator

C: DLNR, OCCL

Harry Kim
Mayor

Darryl J. Oliveira
Fire Chief

Glen P.I. Honda
Deputy Fire Chief

County of Hawai'i
HAWAI'I FIRE DEPARTMENT
25 Aupuni Street • Suite 103 • Hilo, Hawai'i 96720
(808) 981-8394 • Fax (808) 981-2037

March 5, 2008

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

SUBJECT: ENVIRONMENTAL ASSESSMENT FOR MAMALAHOA HIGHWAY (SR11) DRAINAGE IMPROVEMENTS AT KAWA FLATS
TMKs: 9-5-16:006, 025 & 026

We have no comments to offer at this time in reference to the above-mentioned Environmental Assessment.

DARRYL OLIVEIRA
Fire Chief

PBW:lpc

Harry Kim
Mayor

Christopher J. Yuen
Director

Brad Kurokawa, ASLA
LEED® AP
Deputy Director

County of Hawaii
PLANNING DEPARTMENT
101 Pauahi Street, Suite 3 • Hilo, Hawaii 96720-4224
(808) 961-8288 • FAX (808) 961-8742

April 2, 2008

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

Dear Mr. Terry:

Subject: Pre-consultation for Environmental Assessment (EA)
Project: Mamalahoa Highway (SR 11) Drainage Improvements at Kawa Flats
Tax Map Key: (3) 9-5-16:006, 025, 026; Ka`u, Hawaii

This is in response to your letter dated February 19, 2008 in which you requested our comments on any special environmental conditions or impacts related to the proposed highway drainage improvements.

The parcel mauka of the highway (9-5-16:026) is located in the State Land Use Agriculture district and is zoned Agriculture (A-20a) by the County of Hawaii. The two parcels makai of the highway (9-5-16:006 & 025) are zoned Open by the County of Hawaii and are located in both the State Land Use Conservation district and the Special Management Area. Therefore, the Department of Transportation (DOT) will need to submit a Special Management Area Assessment Application to determine whether the improvements are exempt or an SMA permit is required. The State of Hawaii Department of Land and Natural Resources may also require that the DOT submit a Conservation District Use Permit application.

Parcels 9-5-16:025 & 026 appear to be within the FEMA flood zone. Contact the County of Hawaii, Department of Public Works, Engineering Division at (808) 961-8327 to verify whether measures are required to mitigate flooding during construction.

Please provide this office with a copy of the draft EA upon its publication. Should you have questions, please contact Ron Whitmore of my staff at 961-8288, extension 250.

Sincerely,

Chris Yuen

CHRISTOPHER J. YUEN
Planning Director

RW:cs
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LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
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DEPUTY DIRECTOR - WATER

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CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:MC

Corr HA-08-200

Ron Terry
Geometrician Associates
PO Box 396
Hilo, HI 96721

Dear Mr. Terry,

SUBJECT: Mamalahoa Highway Drainage Improvements
Kawa Flats, Ka`u, Hawai`i
TMK (3) 9-5-16:6, 25, 26

The Office of Conservation and Coastal Lands (OCCL) has reviewed your correspondence regarding the Department of Transportation's proposed drainage improvements along Mamalahoa Highway on the above subject parcels.

The parcels makai of the highway are in the State Land Use Conservation District. The work appears to be centered in the Limited Subzone, although some of the work might also occur in the General Subzone. Given that the Limited Subzone has a higher level of protection than the General, for permitting purposes we can focus on the land uses identified in Hawai`i Administrative Rules (HAR) §13-5 for the Limited Subzone.

According to the information you provided, the project involves raising the road's surface and placing box culverts underneath to improve drainage. A bypass road would be built mauka of the highway, and outside the Conservation District.

OCCL is unable to determine from the information you provided if the proposal would involve land uses within the Conservation District itself, and which would trigger the need for a Conservation District Use Permit. If the project will involve land uses in the Conservation District please contact our office to determine the appropriate level of permitting.

Should you have any questions, please contact Michael Cain at 587-0048.

Aloha,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

Aloha Terry
Please e-mail EA for Kawa Flats. There is a group of about five people that would really like to see this project go thru. The Principle of Ka`u High, Sharon Beck, Administrator of the Hospital Merilyn Harris, Fire Dept of Ka`u (Volunteers and Professionals) and Dennis and myself representing Na`alehu Work Force Development Programs.

Thanks
Marge Elwell

delwell@hawaii.rr.com

PHONE (808) 594-1888

FAX (808) 594-1865

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

HRD08/3518

March 12, 2008

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

RE: Pre-consultation on Draft Environmental Assessment for drainage improvements at Māmalahoa Highway, TMKs: 9-5-16:006, 025 and 026.

Dear Ron Terry,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-referenced pre-consultation letter. The state Department of Transportation is planning on conducting improvements to the drainage system of Māmalahoa Highway at Kāwā flats in Ka'ū. OHA offers the following comments.

OHA requests that a comprehensive archaeological inventory survey for the project area be conducted and submitted to the Department of Land and Natural Resources Historic Preservation Division for review and approval. OHA should be allowed the opportunity to comment on the criteria assigned to any cultural or archaeological sites identified within the archaeological inventory survey. We also request the applicant complete a Cultural Impact Assessment for the project. Consideration should be afforded to any individuals accessing the project area for constitutionally protected traditional and customary purposes.

We further 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.

Thank you for the opportunity to comment, and we look forward to reviewing the Draft Environmental Assessment more thoroughly when it becomes available. If you have further questions, please contact Sterling Wong (808) 594-0248 or e-mail him at sterlingw@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

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

REPLY TO
ATTENTION OF:

April 16, 2010

Regulatory Branch

POH-2010-00060

Ron Terry
Geometrician Associates, LLC
P.O. Box 396
Hilo, Hawai`i 96721

Dear Mr. Terry:

We have received your letter dated March 10, 2010 on behalf of the State of Hawaii, Department of Transportation, Highways Division regarding proposed drainage improvements for the Mamalahoa Highway at Kawa Flats, Ka`u, Island of Hawai`i. Your letter specifically requests concurrence with your findings that there are no waters of the United States (U.S.) in the project area. It is our understanding that your firm will use the information in the preparation of a joint State-federal Environmental Assessment (EA) for the proposed action involving State

We have reviewed your proposal pursuant to Section 10 of the Rivers and Harbors Act of 1899 (Section 10) and Section 404 of the Clean Water Act (Section 404). Using in-office resources, we have determined that there are no jurisdictional waters; therefore, a Department of Army (DA) permit is not required for any proposed or future work. Section 10 requires that a DA permit be obtained for certain structures or work in or affecting navigable waters of the U.S., prior to conducting the work (33 U.S.C. 403). Section 404 requires that a DA permit be obtained for the discharge of dredged and/or fill material into waters of the U.S., including wetlands and navigable waters of the U.S, prior to conducting the work (33 U.S.C. 1344). Because the worksite is not located near a navigable water, a Section 10 DA permit is not required. We have also determined that there are no waters of the U.S. in the area of the proposed work. As such, work that would occur within this area does not require DA authorization under Section 404 of the Clean Water Act. Other state and local regulations may still apply.

We recommend Best Management Practices be incorporated into the project design to minimize and contain any runoff from the proposed worksite which could eventually make its way to a tributary to and impact the Pacific Ocean, This office does not wish to receive a copy of the final EA when it is completed.

This letter contains an approved JD for the property in question and is valid for a period of 5 years from the date of this letter unless new information warrants revisions of the determination. If you object to this determination, you may request an Administrative Appeal under Corps regulations at 33 Code of Federal Regulations (CFR) Part 331. We have enclosed an *Administrative Appeal Process Flowchart* and the *Notification of Administrative Appeal Options*

and Process and Request for Appeal (NAP/RFA) form. If you wish to appeal this determination you must submit a completed RFA form, as detailed in the attached NAP/RFA form, to the Corps' Pacific Ocean Division office at the following address:

Thom Lichte, Appeals Review Officer
U.S. Army Corps of Engineers
Pacific Ocean Division, ATTN: CEPOD-PDC
Building 525
Fort Shafter, HI 96858-5440

Thank you for giving us the opportunity to review this proposal and for your cooperation with our regulatory program. Please be advised you can provide comments on your experience with the Honolulu District Regulatory Branch by accessing our web-based customer survey form at http://per2.nwp.usace.army.mil/survey.html.

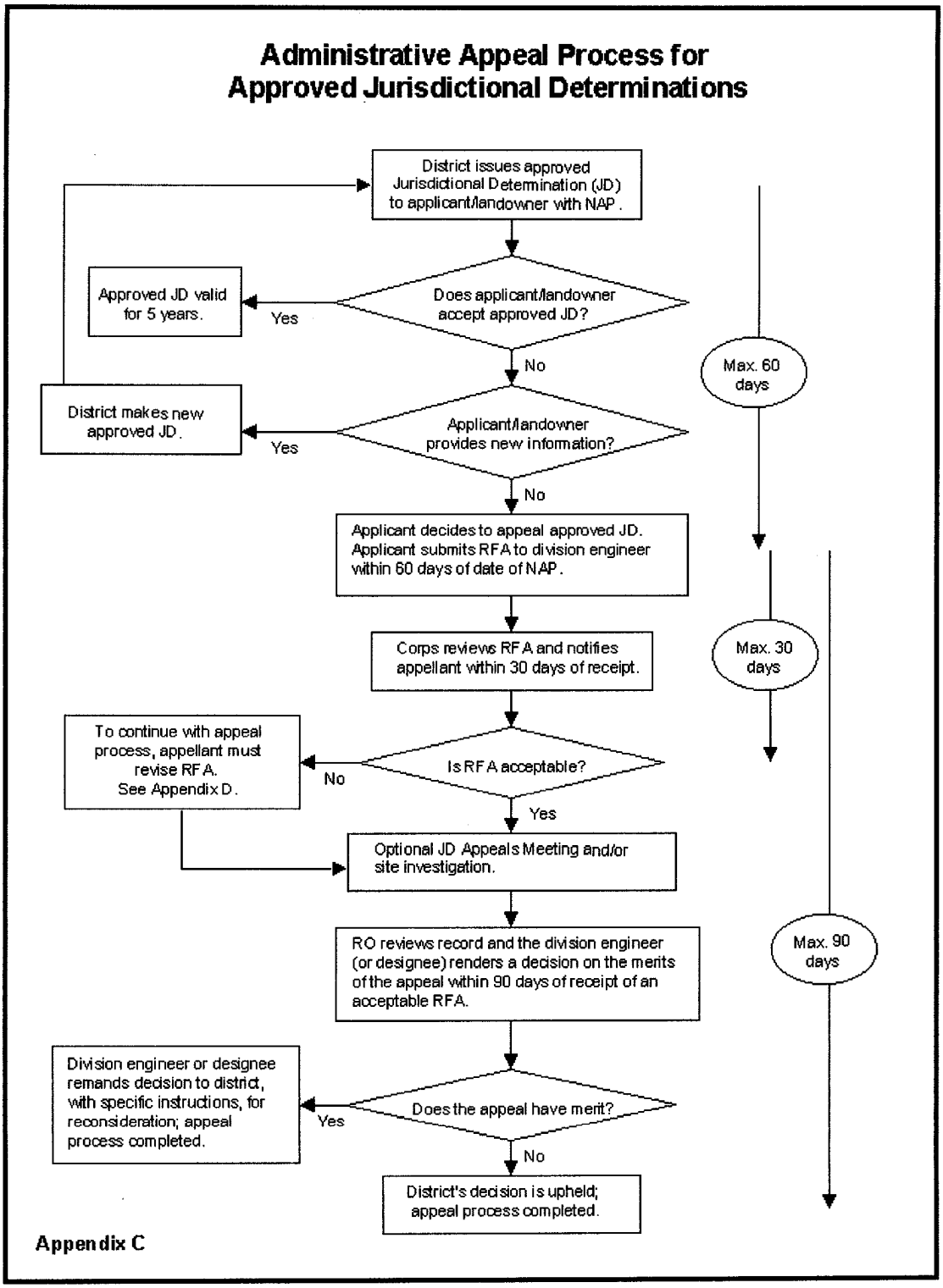
Should you have any questions, please contact Robert Deroche of my staff at (808) 438-2039, by facsimile at (808) 438-4060, or by Email at robert.d.deroche2@usace.army.mil.
Please refer to File No. POH-2010-0060 in all future communications with this office regarding this or other projects at this location.

Sincerely,

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

Enclosures

Final JD Form
Flowchart
RFA Document


Administrative Appeal Process for
Approved Jurisdictional Determinations
District issues approved Jurisdictional Determination (JD) to applicant/landowner with NAP.
Does applicant/landowner accept approved JD?
Yes
Approved JD valid for 5 years.
No
Applicant/landowner provides new information?
Yes
District makes new approved JD.
No
Applicant decides to appeal approved JD. Applicant submits RFA to division engineer within 60 days of date of NAP.
Max. 60 days
Corps reviews RFA and notifies appellant within 30 days of receipt.
Max. 30 days
Is RFA acceptable?
No
To continue with appeal process, appellant must revise RFA. See Appendix D.
Yes
Optional JD Appeals Meeting and/or site investigation.
RO reviews record and the division engineer (or designee) renders a decision on the merits of the appeal within 90 days of receipt of an acceptable RFA.
Max. 90 days
Does the appeal have merit?
Yes
Division engineer or designee remands decision to district, with specific instructions, for reconsideration; appeal process completed.
No
District's decision is upheld; appeal process completed.

Appendix C

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL		
Applicant: State of Hawaii, Department of Transportation, Highways Division	File Number: POH-2010-00060	Date: April 16, 2010
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
XX	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Robert D. Deroche U.S. Army Corps of Engineers Honolulu District, ATTN: CEPOH-EC-R Building 230 Fort Shafter, Hawaii 96858-5440 Tel. (808) 438-2039	Mr. Thom Lichte, Appeal Review Officer Pacific Ocean Division ATTN: CEPOD-PDC Building 525 Fort Shafter, HI 96858-5440 Tel. (808) 438-0397

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

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

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): April 15, 2010

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CEPOH-EC-R Mamalahoa Hwy Drainage Improvements Project POH-2010-00060

C. PROJECT LOCATION AND BACKGROUND INFORMATION: Mamalahoa Highway
State: Hawaii County/parish/borough: Hawaii City: Kau
Center coordinates of site (lat/long in degree decimal format): Lat. 19.1138° N, Long. -155.5325° W.
Universal Transverse Mercator:
Name of nearest waterbody: 5
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pacific Ocean
Name of watershed or Hydrologic Unit Code (HUC): 20010000
- ☒ 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 this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
- ☒ Office (Desk) Determination. Date: April 15, 2010
- ☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "*navigable waters of the U.S.*" within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]
- ☐ 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 **Are no** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
   - ☐ TNWs, including territorial seas
   - ☐ Wetlands adjacent to TNWs
   - ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
   - ☐ Non-RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
   - ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
   - ☐ Impoundments of jurisdictional waters
   - ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
   Non-wetland waters: linear feet: width (ft) and/or acres.
   Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Pick List**
   Elevation of established OHWM (if known): .

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   - ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: .

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[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.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW: .

   Summarize rationale supporting determination: .

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent": .

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

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

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

   (i) General Area Conditions:
   Watershed size: **Pick List**
   Drainage area: **Pick List**
   Average annual rainfall: inches
   Average annual snowfall: inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☐ Tributary flows directly into TNW.
   ☐ Tributary flows through **Pick List** tributaries before entering TNW.

   Project waters are **Pick List** river miles from TNW.
   Project waters are **Pick List** river miles from RPW.
   Project waters are **Pick List** aerial (straight) miles from TNW.
   Project waters are **Pick List** 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: .

---

[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.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☐ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: .

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):

☐ Silts	☐ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☐ Bedrock	☐ Vegetation. Type/% cover:	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: .
Presence of run/riffle/pool complexes. Explain: .
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☐ High Tide Line indicated by:	☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

[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.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

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

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain: .

Surface flow is: **Pick List**

Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW.

Project waters are **Pick List** aerial (straight) miles from TNW.

Flow is from: **Pick List.**

Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

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

All wetland(s) being considered in the cumulative analysis: **Pick List**

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed: .

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.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D: .

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

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 (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain: .
☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

---

[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.***

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ 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, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

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 (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☐ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☐ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name: 1:24K CA-SAUNDERS REEF.
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☒ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): GOOGLE 2010 and applicant supplied.
or ☒ Other (Name & Date): Applicant supplied with request dated March 10, 2010.
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

MAMALAHOA HIGHWAY DRAINAGE IMPROVEMENTS AT KĀWĀ FLATS

ENVIRONMENTAL ASSESSMENT

TMKs (3rd): 9-5-016:006, 022, 025 & 026
Kāʻu District, County of Hawaiʻi, State of Hawaiʻi

APPENDIX 2a
Archaeological Correspondence

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geometrician
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integrating geographic science and planning

phone: (808) 969-7090 PO Box 396 Hawai'i 96721 rterry@hawaii.rr.com

March 11, 2010

Nancy McMahon, Deputy SHPO
Kākuhihewa Building, Room 555
601 Kamokila Blvd
Kapolei, HI 96707

Dear Ms. McMahon:

Subject: Section 106 NHPA Area of Potential Effect Concurrence Request, Kāwā Flats Drainage Improvements, TMKS: (3rd): 9-5-016:006, 022, 025 & 026, Ka'ū, Island of Hawai'i

The Hawai'i State Department of Transportation, Highways Division (DOT-HWY) is preparing a joint State-federal Environmental Assessment (EA) for a proposed action involving State land and State and federal funds. The EA is being prepared pursuant to the National Environmental Policy Act (NEPA) and the implementing regulations of the Council on Environmental Quality at 40 CFR Parts 1500-1508, the U.S. Department of Transportation regulations for NEPA, at 23 CFR Part 771, and Chapter 343, Hawai'i Revised Statutes and its implementing regulations at Title 11, Chapter 200 HAR.

To better explain the project site, I have attached a USGS topographic map portion, a TMK map, an airphoto, a photo of severe flooding, and a portion of a project plan with the proposed Area of Potential Effect. The project involves a 2,400-foot section of the Mamalahoa Highway (see attached Figures 1-3) with endpoints at approximately 19° 06' 50" N. Lat., 155° 31' 57" W. Long., and 19° 06' 32" N. Lat., 155° 32' 08" W. Long. Because the highway was built with insufficient drainage in this area, it floods during hard rains (see attached Figure 4). This flooding is an immediate hazard to motorists and can also be a danger to all Ka'ū residents since it may obstruct emergency vehicles. The project would raise the surface of the highway by 12 feet and place box culverts beneath it to restore proper drainage (see Attached Design Figure 1). A temporary paved, bypass roadway would be constructed on the makai side of the highway in order to allow traffic to move during construction. The project will essentially reproduce the pre-existing hydrology of the intermittent drainage, passing the flow under, rather than over, the highway, and will not change the quantity or sediment characteristics of the flood water as it makes its way overland or underground towards the sea. Therefore, no effects to water bodies outside the culvert area or changes in coastal or marine ecosystems are expected.

As part of the Section 106 compliance for the project, DOT-HWY and the Federal Highway Administration, Hawai‘i Division (FHWA) have authorized my firm, working in conjunction with Rechtman Consulting, to contact your office. We will be providing a comprehensive archaeological survey of this project for SHPO concurrence. In accordance with 36 CFR 800.4(a)(1), and on behalf of DOT-HWY and FHWA, we are seeking SHPO concurrence on the Area of Potential Effects (APE) associated with this project. Given the design requirements of the proposed drainage control features and the need for a temporary bypass road, the APE is defined as a corridor that extends 50 feet on either side of the existing highway beginning at the northern extent of construction and extending southward for 800 feet; at which point the APE will expand to a corridor that extends 100 feet *makai* and 150 *mauka* of the existing highway, and follow this course until the southern extent of the construction. Accordingly, the attached Design Figure 2 shows the proposed roadway improvements, the temporary bypass road, and the APE for which we are seeking concurrence.

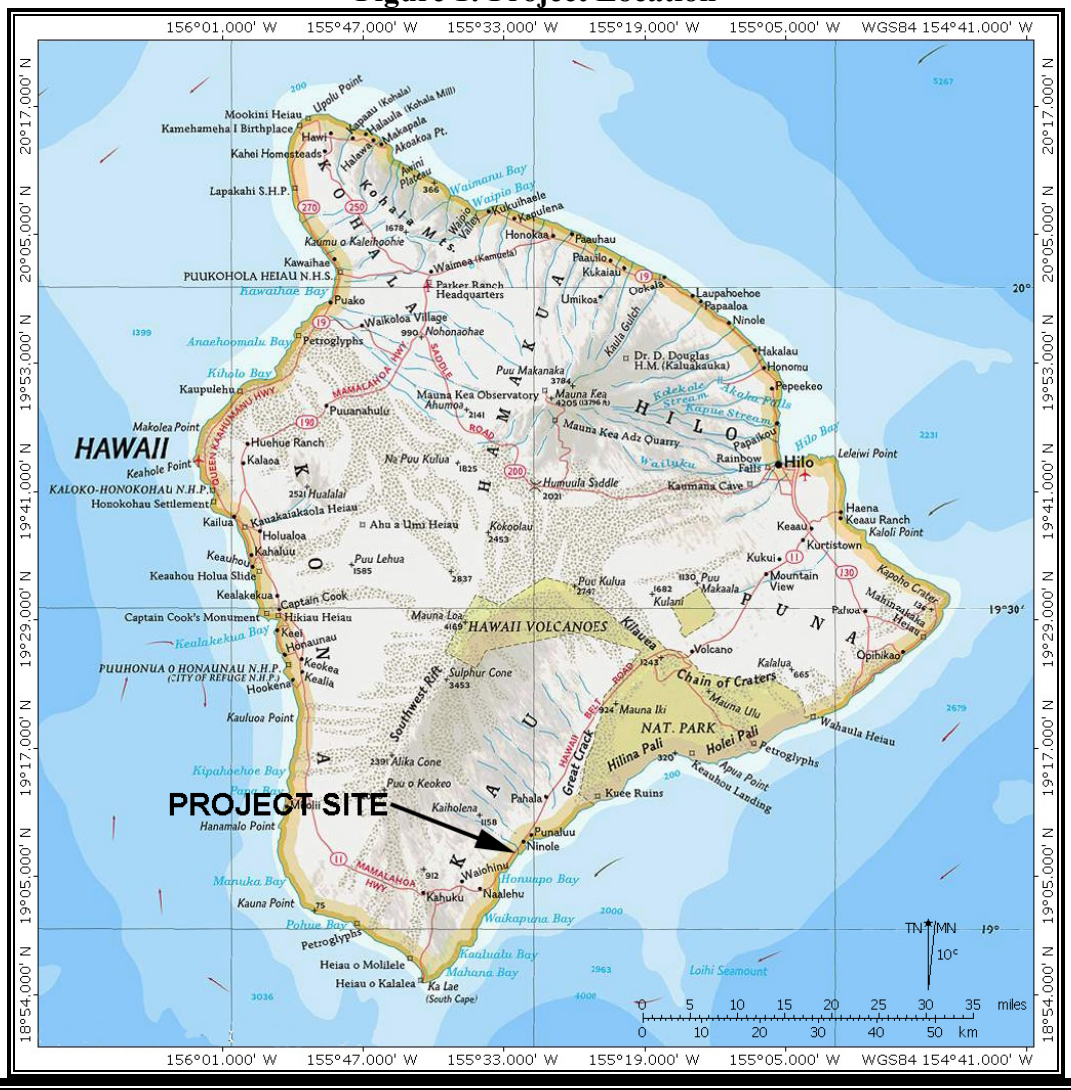
Thank you for your assistance, and should you have any questions, please contact me at (808) 969-7090 or rterry@hawaii.rr.com. You may also wish to contact either Dr. Bob Rechtman at (808) 969-6066, or Mr. Roy Shioji of the DOT-HWY Hawai‘i District Office at (808) 933-2755 or Roy.Shioji@hawaii.gov. We look forward to receiving information from your agency. Kindly indicate whether you wish to receive a copy of the EA when it is prepared.

Sincerely,

Ron Terry, Principal
Geometrician Associates

Cc: Roy Shioji, DOT-HWY, and Steve Yee, SSFM

Figure 1: Project Location



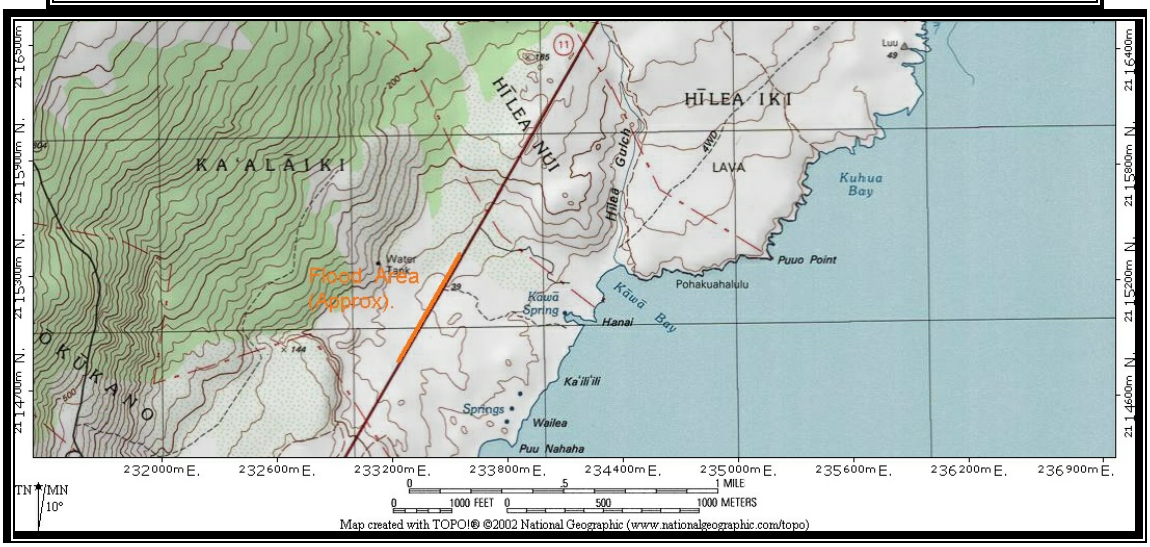


Figure 2: TMK Map

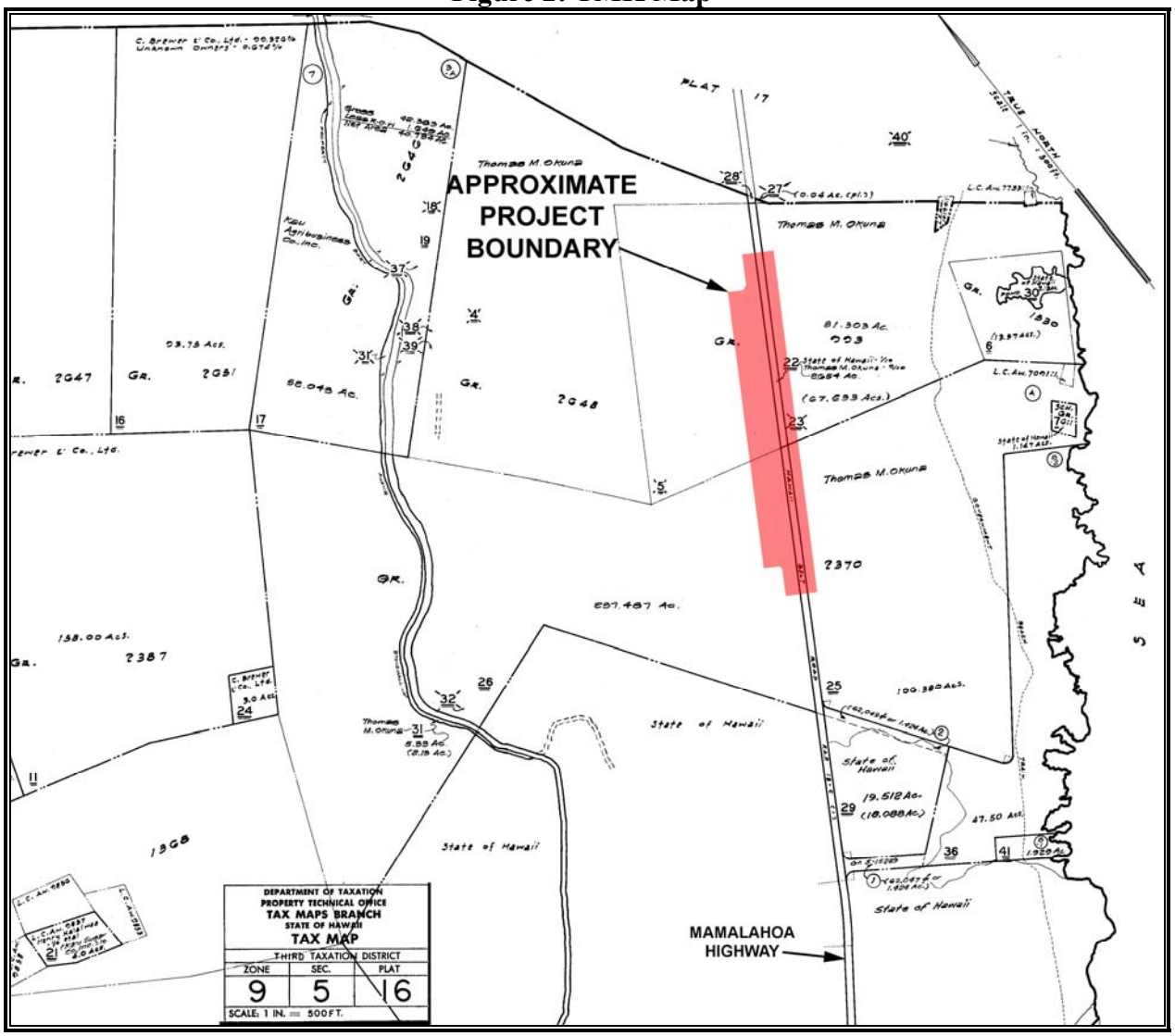


Figure 3: Aerial Image

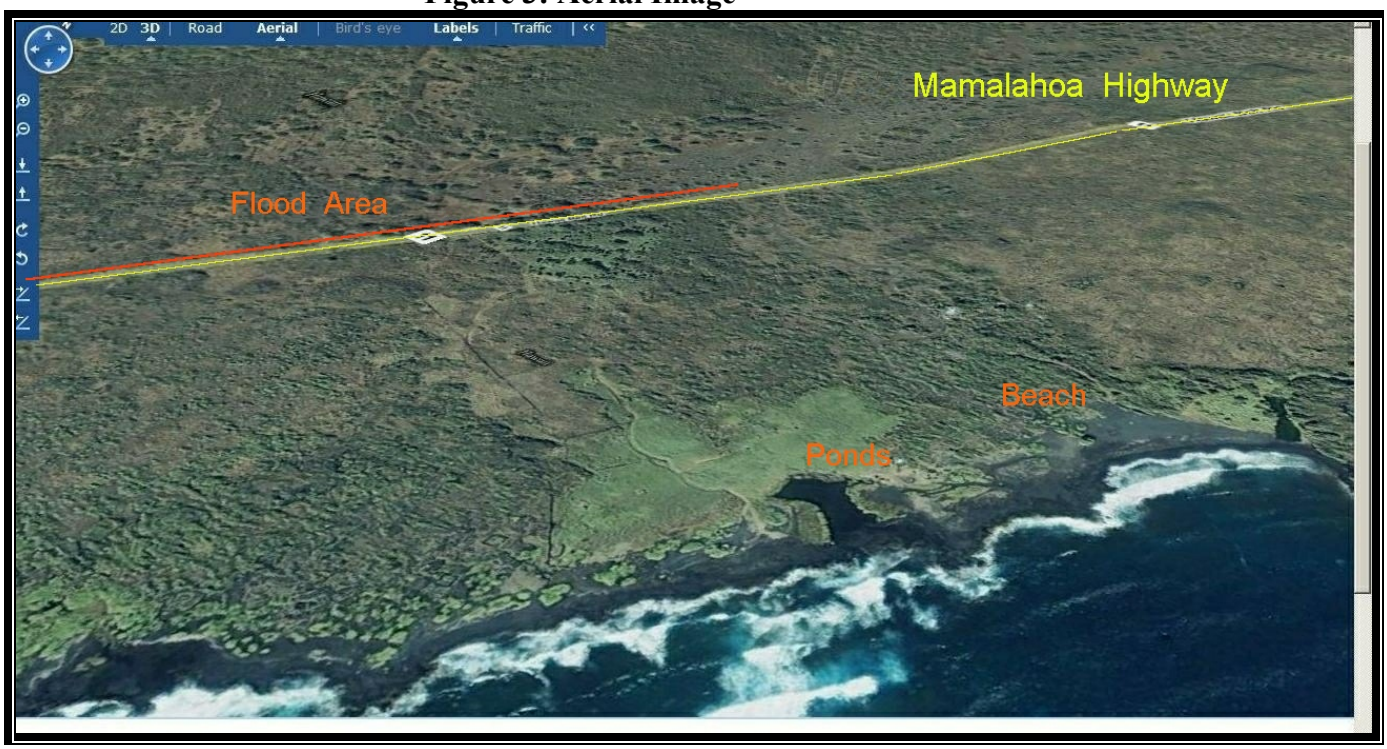
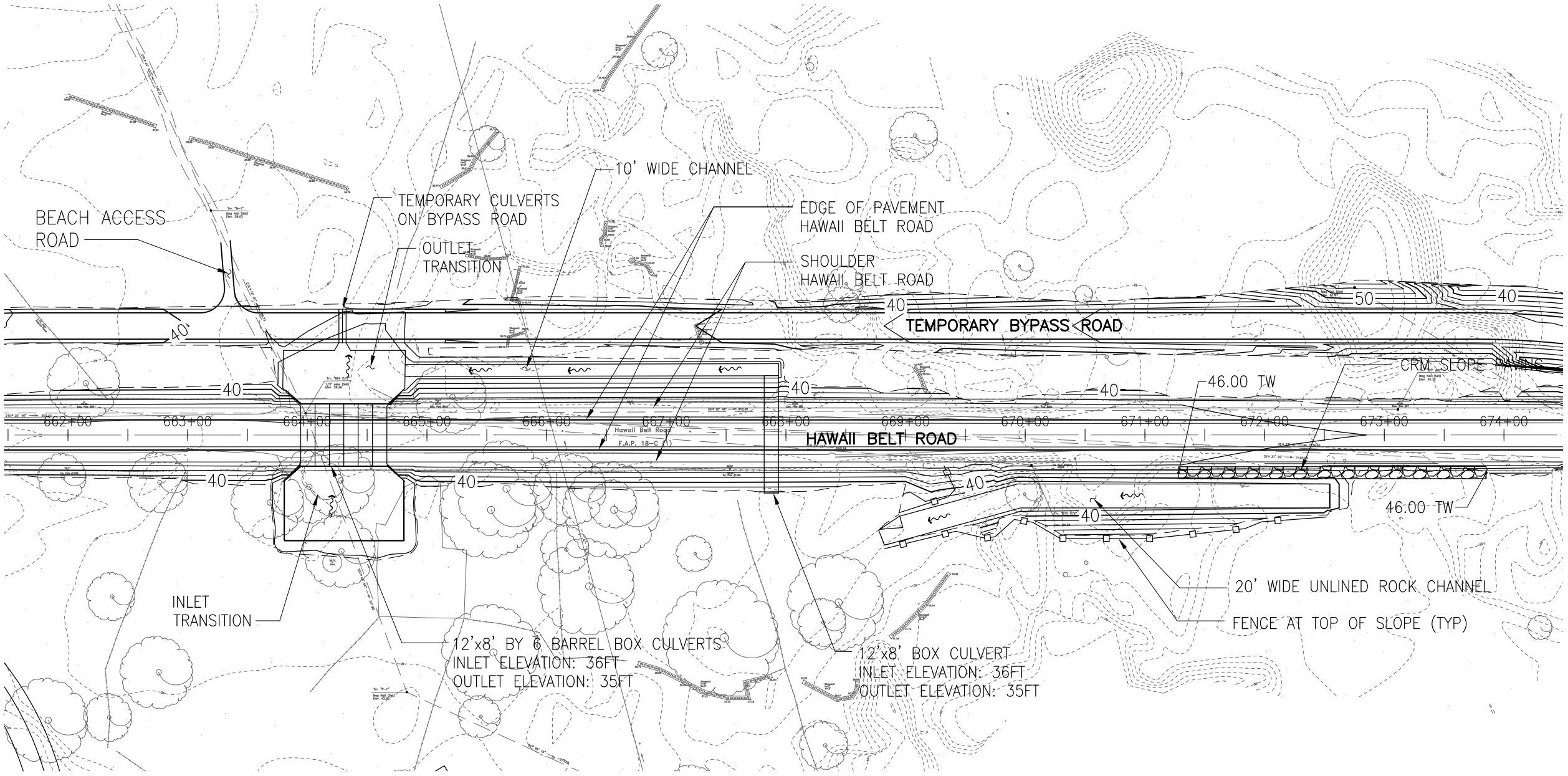
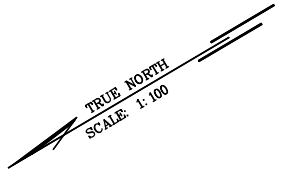


Figure 4: Flooding in 2004





SCALE: 1" = 100'

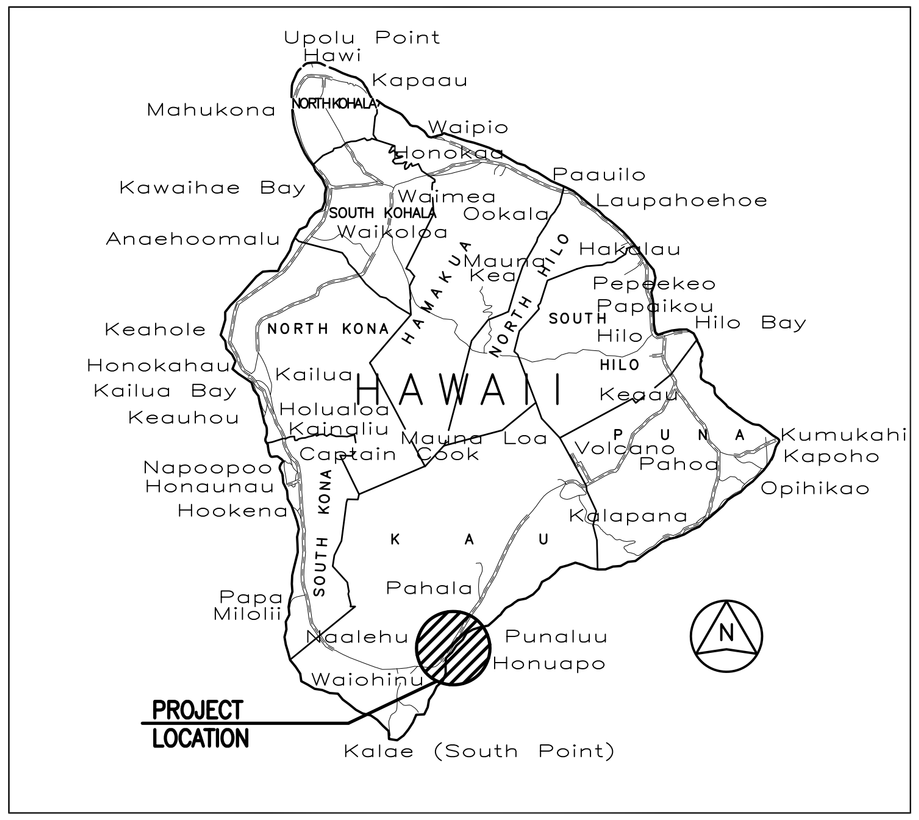
SSFM INTERNATIONAL

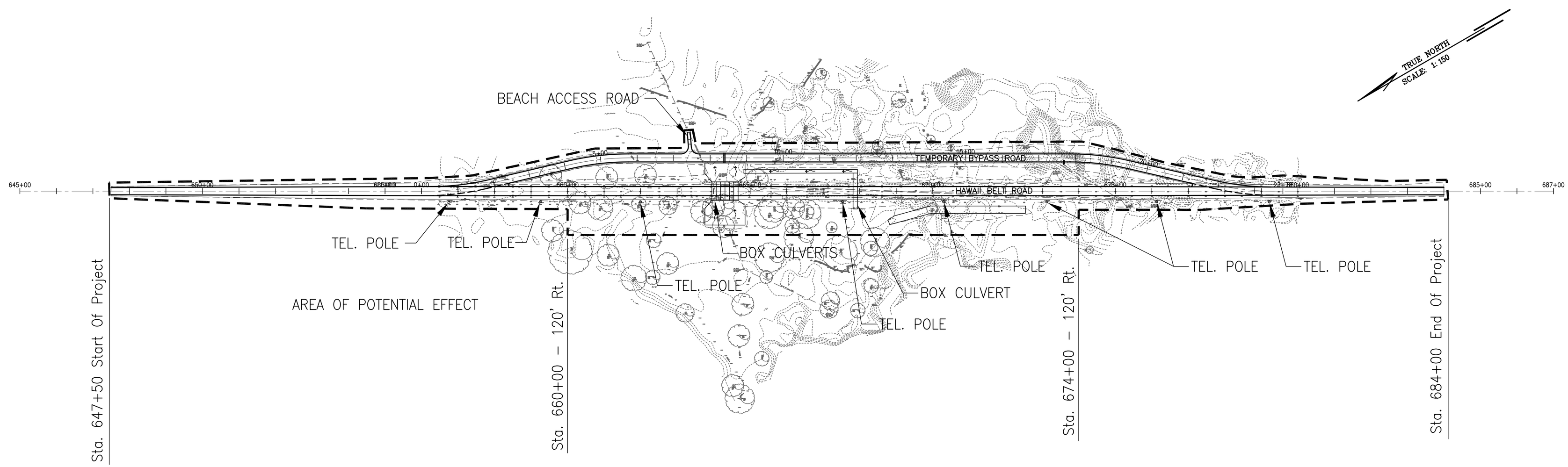
SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 502
Honolulu, Hawaii 96817

KAWA FLATS DRAINAGE IMPROVEMENTS
REVIEW OF CULVERT CROSSING OPTIONS

DESIGN FIGURE 1

SCALE: 1" = 100' | DATE: MARCH, 2010





OVERALL SITE PLAN

SCALE: 1" = 150'

GRAPHICAL SCALES:

150' 75' 0 150' 300'

SCALE: 1" = 150'

SSFM INTERNATIONAL

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 502
Honolulu, Hawaii 96817

KAWA FLATS DRAINAGE IMPROVEMENTS
REVIEW OF CULVERT CROSSING OPTIONS

DESIGN FIGURE 2

SCALE: NOT TO SCALE | DATE: MARCH, 2010

RECHTMAN CONSULTING, LLC
507-A E. Lanikaula St. Hilo, Hawaii 96720
phone: (808) 969-6066 fax: (808) 443-0065
e-mail: bob@rechtmanconsulting.com
ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

April 1, 2011 RC-0545

Theresa Donham
Deputy State Historic Preservation Officer
40 Poʻokela Street
Hilo, HI 96720

Dear Theresa:

Please find enclosed an archaeological report prepared in compliance with Section 106 of the National Historic Preservation Act in conjunction with the proposed Māmalahoa Highway Drainage Improvements Project (Federal Aid Project No. STP-011-2(36)) in the Kāwā vicinity Kaʻalāiki Ahupuaʻa, Kaʻū District, Island of Hawaiʻi.

As specified in 36 CFR 800.4(d)(1)(i), we look forward to an official SHPO response within 30 days of receipt of this report documenting our findings. Should you require additional information or if you have any questions please feel free to contact me directly.

Regards,

Bob Rechtman, Ph.D.
Principal Archaeologist

cc:/Ron Terry, Ph.D. (Geometrician Associates, LLC)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

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

GUY H. KAULUKUKUI
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

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

May 6, 2011

Robert B. Rechtman, Ph. D.
Rechtman Consulting, LLC
507-A East Lanikaula Street
Hilo, Hawai`i 96720
(bob@rechtmanconsulting.com)

LOG NO: 2011.0955
DOC NO: 1105TD05

Dear Dr. Rechtman:

Subject: **National Historic Preservation Act (NHPA) Section 106 Review –**
Comprehensive Archaeological Survey, Māmalahoa Highway Drainage Improvements
Ka‘alāiki Ahupua‘a, Ka‘ū District, Island of Hawai‘i
TMK: (3) 9-5-016: 006, 022, 025, and 026

Thank you for submitting the draft report titled *A Comprehensive Archaeological Study for the Proposed Māmalahoa Highway Drainage Improvements Project in Compliance with Section 106 of the National Historic Preservation Act (TMKs: 3-9-5-016: 006, 022, 025 and 026) Ka‘alāiki Ahupua‘a, Ka‘ū District, Island of Hawai‘i, Federal Aid Project No. STP-011-2(36)* (R. B. Rechtman, July 2010). We received your submittal April 6, 2011.

The report presents findings of archival research, consultation and field survey for the area of potential effect (APE) identified in connection with the proposed Kāwā Flats drainage improvements project. The fieldwork portion of the study included a systematic pedestrian survey of the APE, defined in the report as a corridor 50 to 150 feet wide and approximately 3,650 feet long on both sides of the existing Māmalahoa Highway. No historic properties were identified through archival or records research; the potential presence of historic properties was identified during consultation; and five historic properties were identified during the field survey. Identified historic properties include a historic wall complex (SIHP Site 50-10-74-28504), a historic ranch wall (Site 28505), a pre-contact temporary habitation complex (Site 28507), a group of six rock/soil piles (Site 28508), and a historic enclosure (Site 28509). Three of the sites will be directly impacted by the proposed construction (Sites 28504, 28505, and 28507), and the remaining two sites may potentially be avoided, although their status is not certain at this time.

The discussion and findings of archival research and previous archaeological work is adequate to determine expected findings, and to establish that no historic properties were previously documented within the APE. The discussion of oral consultation is too brief to determine the nature and extent of actual consultation. Please see comments in the attachment. We also have some questions regarding the methods by which age and function was determined for certain of the sites. At this time, we concur with the significance assessments and recommended treatments for SIHP Sites 28504, 28505 and 28508. We also concur with the recommendation that ground alteration and APE perimeter fencing in the project area be subjected to archaeological monitoring. We request additional information before we concur with your recommended finding of no adverse effect for the overall project (see attachment). If you have any questions, please contact me at 808-933-7653.

Aloha,

Theresa K. Donham
Deputy State Historic Preservation Officer
Historic Preservation Division

cc: Ron Terry, Geometrician Associates, LLC

ATTACHMENT

Comments and Questions: *A Comprehensive Archaeological Study for the Proposed Māmalahoa Highway Drainage Improvements Project in Compliance with Section 106 of the National Historic Preservation Act (TMKs: 3-9-5-016: 006, 022, 025 and 026) Ka'alāiki Ahupua'a, Ka'ū District, Island of Hawai'i, Federal Aid Project No. STP-011-2(36)* (R. B. Rechtman, July 2010

Executive Summary

1. Please identify the lead federal agency and clarify whether or not this report is intended to fulfill all or only part of the agency's responsibilities under Section 106 (see additional comments below).

Identifying Possible Historic Properties

2. This section contains one sentence describing the consultation that occurred in connection with this project. Your scope of work includes consultation as one of three important elements of the comprehensive study. We would therefore expect a section in the report describing in greater depth the consultation process, the participants and the discussion topics.
3. On page 12, you describe a community meeting held at Nā'ālehu in September 2007. Please explain the type of meeting (was it a presentation, charrett, open house, etc) and the organizer(s). Please indicate whether you or anyone representing historic preservation or cultural concerns gave a presentation or answered questions. Please provide a general discussion of the topics covered at the meeting, and number of persons from the community in attendance.
4. On page 12, the same sentence referenced above states that "…follow-up consultations with individuals expressing a specific knowledge of the current study area were conducted…". Please provide information on the persons interviewed, the questions asked, and responses received during the interviews.
5. The consultation process as represented in the report does not fulfill the Section 106 requirements for consultation. Pursuant to 36CFRPart 800.2, Native Hawaiian organizations shall be provided a reasonable opportunity to identify concerns, advise on the identification and evaluation of historic properties, articulate views on the effects of the undertaking and participate in the resolution of adverse effects [800.2(c)(2)(ii)(A)]. There is no reference to any consultation with Native Hawaiian organizations. If this consultation has or will be conducted by the lead federal agency, please state such in the report.

Findings

6. This section includes one reference to family information provided by Darlyne Vierra regarding burial sites within the APE. This discussion would be more appropriate in the consultation section.
7. There is no discussion in this section regarding any follow-up to Ms. Vierra's information regarding burials in natural lava crevices. Based on the information provided, it is not clear whether the field survey was conducted before or after Ms. Vierra's information was available. Was the survey team briefed on the potential for this type of feature to occur? Were any crevices found in the APE? Was an effort made to identify and check all crevices? This information is important to document that a good-faith effort was made to identify all potential historic properties.
8. Our records indicate that you requested six SIHP site numbers for this project area. Please provide information in the report, or as a separate communication as to why SIHP Site 28506 (a lava blister, temporary habitation) is not reported here. Is it outside the APE, or was it determined to be non-cultural? If your survey area was larger than the final APE, please disclose that information in the report.
9. Please discuss why no subsurface testing was conducted of the soil areas of Site 28507.
10. Please discuss why no subsurface testing was conducted at Site 28509.
11. Explain the basis for your determination that Site 28509 is historic in age; portable remains observed here are similar to those found at Site 28507, which was determined to be pre-contact.

Determination of Effects

12. On page 31, you indicate that a reasonable and adequate amount of information has been collected about these historic properties to warrant a "no mitigation work requirement". As indicated in items 9 and 10, we are not certain that all of the potentially significant information has been collected at Sites 29507 and 28509. This argument needs to be strengthened with additional descriptive data, or we will request that testing occur at these sites in order to better determine age and function.

RECHTMAN CONSULTING, LLC
507-A E. Lanikaula St. Hilo, Hawaii 96720
phone: (808) 969-6066 fax: (808) 443-0065
e-mail: bob@rechtmanconsulting.com
ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

April 1, 2011 RC-0545

Theresa Donham
Deputy State Historic Preservation Officer
40 Poʻokela Street
Hilo, HI 96720

Dear Theresa:

Please find enclosed an archaeological report prepared in compliance with Section 106 of the National Historic Preservation Act in conjunction with the proposed Māmalahoa Highway Drainage Improvements Project (Federal Aid Project No. STP-011-2(36)) in the Kāwā vicinity Kaʻalāiki Ahupuaʻa, Kaʻū District, Island of Hawaiʻi.

As specified in 36 CFR 800.4(d)(1)(i), we look forward to an official SHPO response within 30 days of receipt of this report documenting our findings. Should you require additional information or if you have any questions please feel free to contact me directly.

Regards,

Bob Rechtman, Ph.D.
Principal Archaeologist

cc:/Ron Terry, Ph.D. (Geometrician Associates, LLC)

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

WILLIAM J. AILA, JR.
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GUY H. KAULUKUKUI
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ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

September 13, 2011

Robert B. Rechtman, Ph. D.
Rechtman Consulting, LLC
507-A East Lanikaula Street
Hilo, Hawai`i 96720
(bob@rechtmanconsulting.com)

LOG NO: 2011.2071
DOC NO: 1109TD11

Dear Dr. Rechtman:

Subject: **National Historic Preservation Act (NHPA) Section 106 Review –**
Revised Archaeological Survey Report, Māmalahoa Highway Drainage Improvements
Ka‘alāiki Ahupua‘a, Ka‘ū District, Island of Hawai‘i
TMK: (3) 9-5-016: 006, 022, 025, and 026

Thank you for submitting the revised report titled *A Comprehensive Archaeological Study for the Proposed Māmalahoa Highway Drainage Improvements Project in Compliance with Section 106 of the National Historic Preservation Act (TMKs: 3-9-5-016: 006, 022, 025 and 026) Ka‘alāiki Ahupua‘a, Ka‘ū District, Island of Hawai‘i, Federal Aid Project No. STP-011-2(36)* (R. B. Rechtman, June 2011). We received your submittal June 16, 2011, and apologize for the delay in responding.

The revised report addresses questions and comments addressed to the first draft report, dated July 2010 (*Log 2011.0955, Doc 1105TD05*). The fieldwork portion of the study included a systematic pedestrian survey of the APE, defined in the report as a corridor 50 to 150 feet wide and approximately 3,650 feet long on both sides of the existing Māmalahoa Highway. Identified historic properties include a historic wall complex (SIHP Site 50-10-74-28504), a historic ranch wall (Site 28505), a pre-contact temporary habitation complex (Site 28507), a group of six rock/soil piles (Site 28508), and a historic enclosure (Site 28509). Three of the sites will be directly impacted by the proposed construction (Sites 28504, 28505, and 28507), and the remaining two sites will be avoided.

We concur with the significance assessments and recommended treatments for SIHP Sites 28504, 28505, 28507, 28508 and 28509. These sites are determined to be significant under NRHP criteria D. Sites 28504, 28505, 28508 and 28509 have yielded information important to history of Kāwā; and Site 28507 may be likely to yield information important to the history of Kāwā. We concur with the recommendation that additional fieldwork occur at Site 28507 in order to better identify the age and function of this site. We also concur with the recommendation that ground alteration and APE perimeter fencing in the project area be subjected to archaeological monitoring. The proposed mitigation measures (data recovery at Site 28507 and monitoring) can be presented in a single mitigation plan if preferred, in order to expedite the review and approval process.

The report is approved, pursuant to the Secretary of the Interior’s Standards for Identification and Evaluation; and HAR §13-276. Please send one hardcopy of the document, clearly marked FINAL, along with a copy of this review letter and a text-searchable PDF version on CD to the Kapolei SHPD office, attention of “SHPD Library”.

Aloha,

Theresa K. Donham
Deputy State Historic Preservation Officer
Historic Preservation Division

MAMALAHOA HIGHWAY DRAINAGE IMPROVEMENTS AT KĀWĀ FLATS

ENVIRONMENTAL ASSESSMENT

TMKs (3rd): 9-5-016:006, 022, 025 & 026
Kāʻu District, County of Hawaiʻi, State of Hawaiʻi

APPENDIX 2b
Archaeological Report

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RC-0545

A Comprehensive Archaeological Survey for the Proposed Māmalahoa Highway Drainage Improvements Project in Compliance with Section 106 of the National Historic Preservation Act

(TMKs: 3-9-5-16:006, 022, 025, and 026)

Kaʻalāiki Ahupuaʻa
Kaʻū District
Island of Hawaiʻi

(Federal Aid Project No. STP-011-2(36))

DRAFT VERSION

PREPARED BY:

Robert B. Rechtman, Ph.D.,

PREPARED FOR:

Ron Terry, Ph.D.
Geometrician Associates, LLC
P.O. Box 396
Hilo, HI 96720

July 2010

RECHTMAN CONSULTING, LLC
507-A E. Lanikaula St. Hilo, Hawaii 96720
phone: (808) 969-6066 fax: (808) 443-0065
e-mail: bob@rechtmanconsulting.com
ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

RC-0545

A Comprehensive Archaeological Survey for the Proposed Māmalahoa Highway Drainage Improvements Project in Compliance with Section 106 of the National Historic Preservation Act

(TMKs: 3-9-5-16:006, 022, 025, and 026)

Kaʻalāiki Ahupuaʻa
Kaʻū District
Island of Hawaiʻi

RECHTMAN CONSULTING

EXECUTIVE SUMMARY

At the request of Ron Terry, Ph.D. of Geometrician Associates, LLC, on behalf of the Hawaiʻi State Department of Transportation Highways Division, Rechtman Consulting, LLC conducted a comprehensive archaeological survey associated with the proposed Kāwā Flats Drainage Improvements Project on TMKs: 3-9-5-16:006 and 022; 25, and 026 located along Highway 11 within Kaʻalāiki Ahupuaʻa, Kaʻū District, Island of Hawaiʻi. This proposed undertaking involves state land and state and federal funds, thus the environmental documentation is being prepared pursuant to the National Environmental Policy Act (NEPA), the implementing regulations of the Council on Environmental Quality (40 CFR 1500-1508), and the U.S. Department of Transportation regulations for NEPA (23 CFR 771). To comply with these environmental regulations with respect to assessing potential impacts to historic properties, the current study was prepared in accordance with Section 106 of the National Historic Preservation Act (NHPA) and it implementing regulations (36 CFR 800). As part of the Section 106 compliance (36 CFR 800.4(a)(1)) for this project, an Area of Potential Effects (APE) was established by the agency and concurrence was sought from the State Historic Preservation Officer.

The identification of potential historic properties was accomplished using three approaches: 1) by examining archival data, 2) through oral consultation, and 3) by an archaeological field investigation. The archival data did not reveal the presence of any historic properties within the current APE; and the historic maps of the area did not show any potential historic properties. Likewise, the oral consultations did not indicate the presence of any specific historic properties within the APE. However, as a result of the archaeological fieldwork, five archaeological sites (SIHP Sites 28504, 28505, 28507, 28508, and 28509) were identified and recorded within the APE. Site 28504 is a Historic Period wall complex, Site 28505 is a Historic Period wall, Site 28507 is a Precontact Period enclosure and lava depression, Site 28508 is a clustering of rock pile, and Site 28509 is a Historic Period enclosure. These five sites are assessed for their significance based on the National Register Criteria. Although not in pristine states of preservation, all five do retain sufficient integrity to be considered significant under Criterion d for the information they have yielded relative to former Precontact and Historic land use in this portion of the Kaʻū District of Hawaiʻi Island; thus making the sites potentially eligible for listing in the National Register of Historic Places. However, it is suggested that a reasonable and adequate amount of information has been collected about these potential historic properties during the current study to warrant a no mitigation work requirement, and thus a no adverse effects determination for these sites with respect to the proposed Māmalahoa Highway Drainage Improvements Project.

It is recommended that construction fencing be placed along the APE boundaries and no construction work permitted outside of the fencing. It is the further recommendation of this study that an archaeological monitor be present during the establishment of the APE fencing to help guide the installation in an effort to protect as many sites both inside and outside of the APE as possible. A monitor is also recommended during initial grubbing and grading activities so that an immediate response can occur if previously unrecognized potential historic properties are inadvertently discovered during construction activities.

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INTRODUCTION

At the request of Ron Terry, Ph.D. of Geometrician Associates, LLC, on behalf of the Hawai‘i State Department of Transportation Highways Division, Rechtman Consulting, LLC conducted a comprehensive archaeological survey associated with the proposed Kāwā Flats Drainage Improvements Project on TMKs: 3-9-5-16:006 and 022; 25, and 026 located along Highway 11 within Ka‘alāiki Ahupua‘a, Ka‘ū District, Island of Hawai‘i (Figures 1 and 2). This proposed undertaking involves state land and state and federal funds, thus the environmental documentation is being prepared pursuant to the National Environmental Policy Act (NEPA), the implementing regulations of the Council on Environmental Quality (40 CFR 1500-1508), and the U.S. Department of Transportation regulations for NEPA (23 CFR 771). To comply with these environmental regulations with respect to assessing potential impacts to historic properties, the current study was prepared in accordance with Section 106 of the National Historic Preservation Act (NHPA) and it implementing regulations (36 CFR 800).

This report contains background information outlining the project area’s physical and cultural contexts, a presentation of previous archaeological work, and current survey expectations based on that previous work. Also presented is an explanation of the project’s methods, detailed description of the archaeological resources encountered, interpretation and evaluation of the significance of those resources, and treatment recommendations for all of the documented sites.

Area of Potential Effects and Project Area Description

As part of the Section 106 compliance (36 CFR 800.4(a)(1)) for this project, an Area of Potential Effects (APE) was established by the agency and concurrence was sought from the State Historic Preservation Officer (SHPO). No response was provided by the SHPO and the APE as presented below is a slightly modified version of that for which concurrence was sought. Given the design requirements of the proposed drainage control features, the need for a temporary bypass road, and the desire to limit potential effects on possible historic properties, the APE (Figure 3) is defined as a corridor that is 50 feet on either side of the existing highway beginning at the northern extent of construction. On the *mauka* side of the highway this corridor extends southward for 1250 feet; at which point it expand to a distance of 150 feet *mauka* of the existing highway, and follows this course for 1,400 feet at which point it returns to a corridor that extends 50 feet on the *mauka* side of the existing highway until the southern extent of the construction. On the *makai* side of the existing highway, the initial 50 foot distance is maintained for 1,000 feet at which point it expands to 100 feet distant from the existing highway. The APE travels this course for 2,000 feet where it returns to a distance of 50 feet *makai* of the existing highway until the southern extent of the construction. During construction the APE boundary will be marked by the placement of orange construction fencing, and no construction work will occur outside of the barrier fencing.

The study area is located between 40 and 80 feet above sea level, and terrain within this area slopes to the southeast and consists of *pāhoehoe* outcrops, overhangs, and pockets of soil. A portion of the northern end of the project area is classified as rock land (rRO) consisting of *pāhoehoe* bedrock covered in some places by a thin soil layer (Sato et al. 1973). The *pāhoehoe* lava originated from Mauna Loa 750 to 1,500 years ago (Wolfe and Morris 1996). The average depth of the soil is between 6 and 8 inches. In some places the soil extends down into cracks within the bedrock. Vegetation in this area is usually confined to the soil filled areas and cracks. The remainder of the project area consists of *pāhoehoe* lava flows (rLW) in which there are no soils covering the lava and there are hummocks and pressure domes (Sato et al. 1973). This *pāhoehoe* lava originated from Mauna Loa 3,000 to 5,000 years ago (Wolfe and Morris 1996). A number of pressure domes appear to have collapsed either during formation or following formation, as there are numerous lava blisters small overhangs within the study area.

Vegetation within the current project area consists of *koa haole* (*Leucaena leucocephala*), fountain grass (*Pennisetum setaceum*), Christmas-berry (*Schinus terebinthifolius*), banyan (*Ficus benghalensis*), *kiawe (Prosopis pallida*), lantana (*Lantana camara*), guinea grass (*Panicium maximum*), and other various grasses and vines.

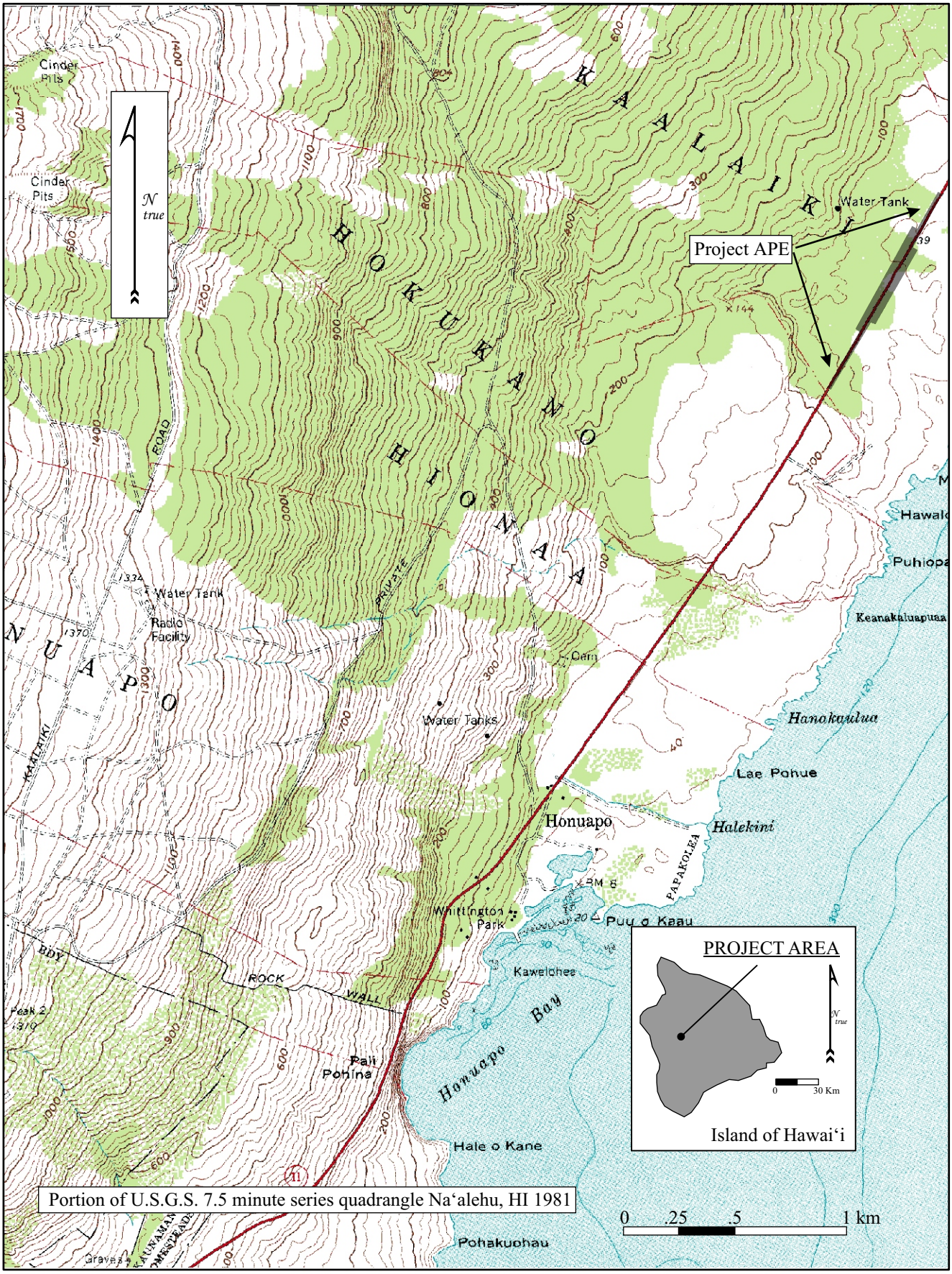

Figure 1. Project area location.

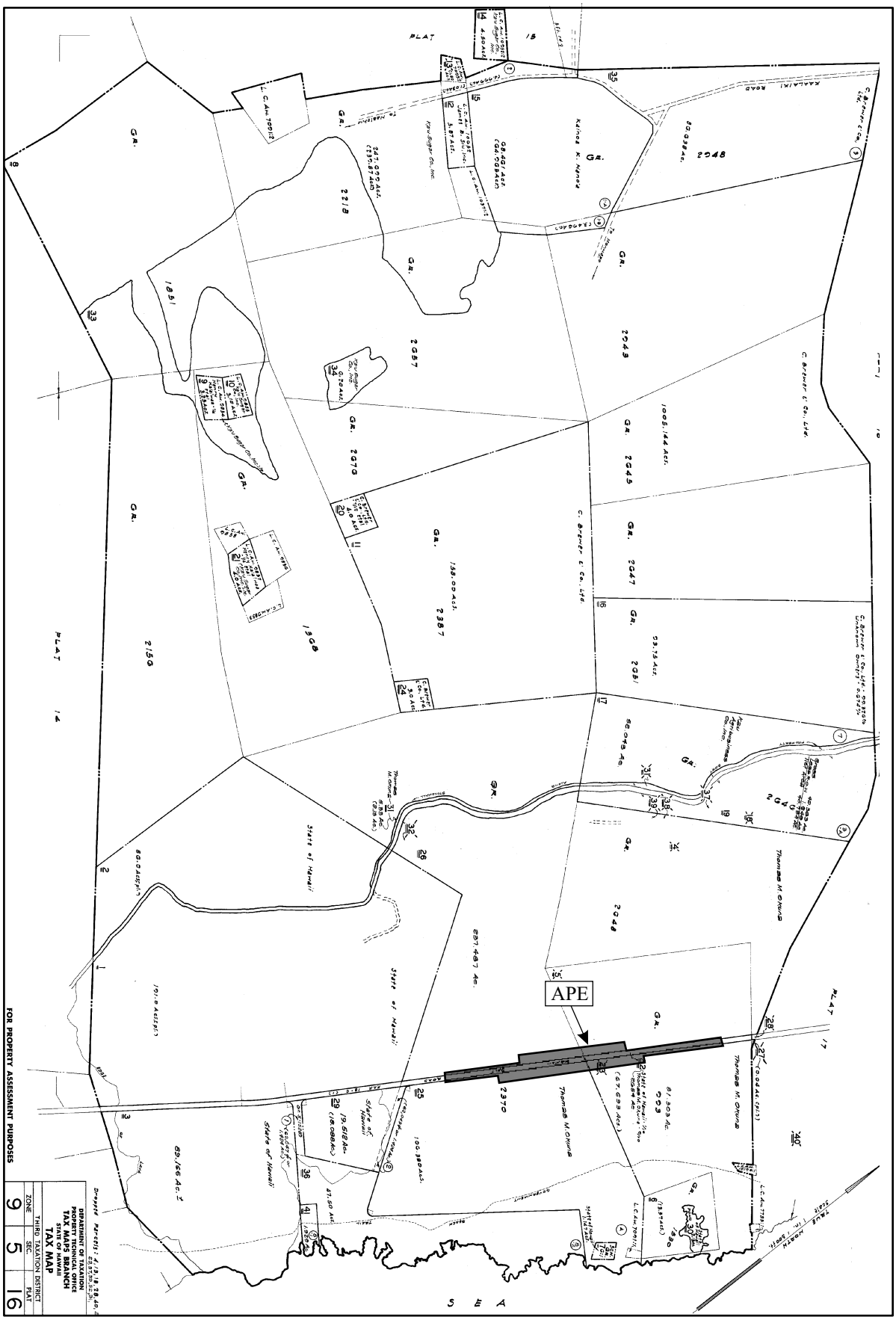

Figure 2. Tax Map Key (TMK): 3-9-5-16: portion of parcels: 022, 025, 026.

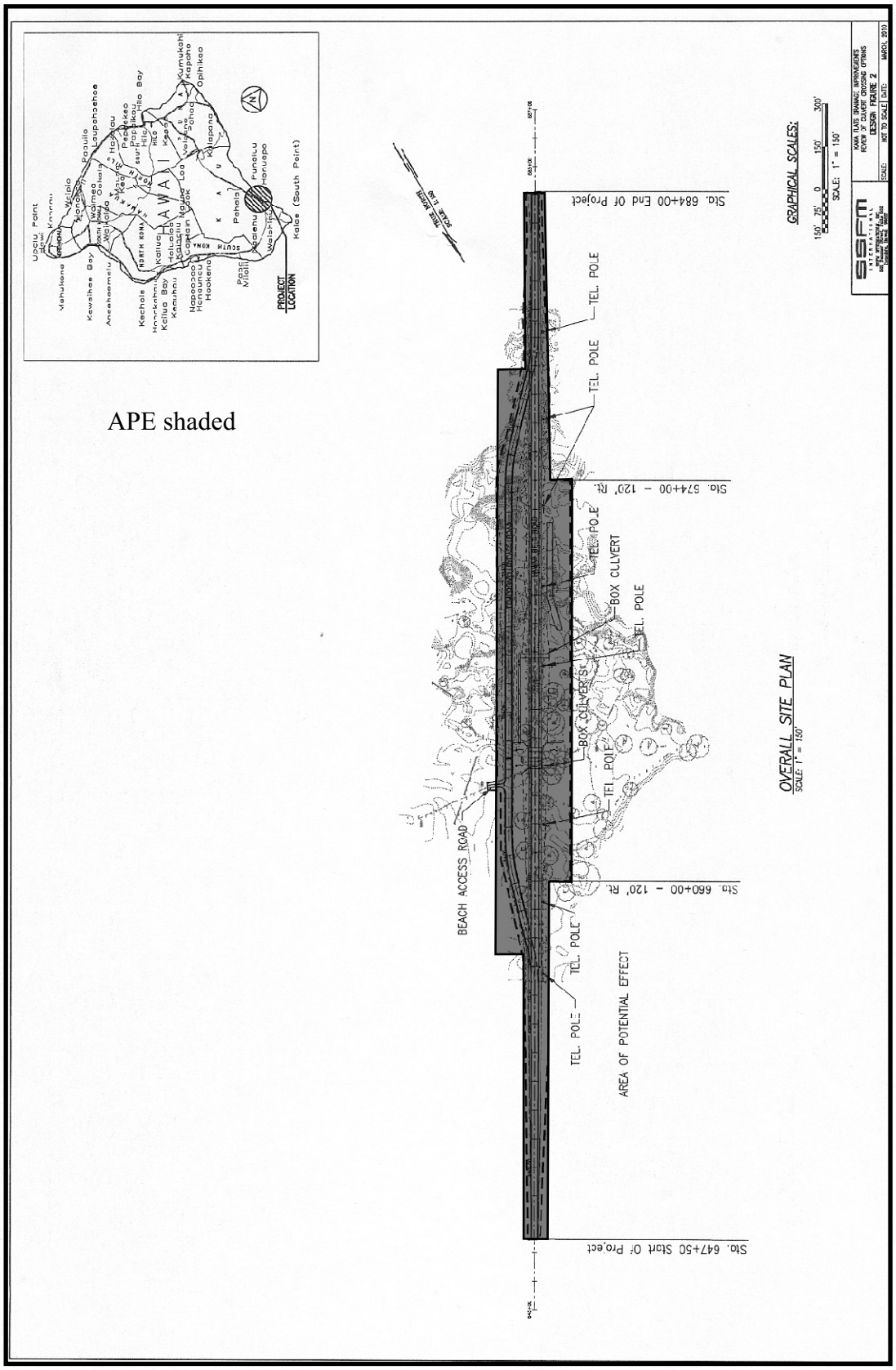

Figure 3. Area of Potential Effects

BACKGROUND

To generate a set of expectations regarding the nature of archaeological resources that might be encountered in the study area, and to establish an environment within which to assess the significance of any such resources, a general historical context for the region and a summary of previous archaeological studies nearby the project area are presented.

Cultural-Historical Context and Ahupuaʻa Settlement Patterns

The current project area is in the district of Kaʻū, the largest of the six traditional districts on the island of Hawaiʻi. It lies in Kaʻalāiki Ahupuaʻa. Pukui et al. (1974:60) indicate that Kaʻalāiki literally translates as "small lava rock;" however, *ʻalā* are better defined as "dense waterworn volcanic stone" (Pukui and Elbert 1986:16), and the name may be in reference to the natural concentration of such stones along the shoreline of this *ahupuaʻa*. Alternatively, *alāiki* (without the *okina*) means "appropriation of property by force" (Pukui and Elbert 1986:18), and could reference past events that may have occurred in this area.

A Generalized Model of Hawaiian Prehistory

Archaeologists and historians describe the inhabiting of the Hawaiian Islands in the context of settlement that resulted from voyages taken across the open ocean. For many years, researchers have proposed that early Polynesian settlement voyages between Kahiki (the ancestral homelands of the Hawaiian gods and people) and Hawaiʻi were underway by A.D. 300, with long distance voyages occurring fairly regularly through at least the thirteenth century. It has been generally reported that the sources of the early Hawaiian population—the Hawaiian Kahiki—were the Marquesas and Society Islands (Emory in Tatar 1982:16-18). The southern part of Hawaiʻi Island was likely one of the first places to be settled.

Over a period of several centuries areas with the richest natural resources became populated and perhaps crowded, and by about A.D. 900 to 1100, the population began expanding to the *kona* (leeward side) and more remote regions of the island (Cordy 2000:130). In Kaʻū, where the land is dry and rugged, a few small communities were initially established along sheltered bays with access to fresh water and rich marine resources. The coastal area of Kaʻalāiki, including a portion of the southern part of Hīlea Nui is generally referred to as Kāwā. The Kāwā springs are located within Kaʻalāiki Ahupuaʻa, near the shore. The springs "empty into a tidal inlet that extends inland for over 500 ft" (Kelly 1980:26). The spring fed pond acted as a fishpond and there is said to be a large red stone in the middle of the pond that is a *kū ula*, or fish god (Kelly 1980:26).

The communities shared extended familial relations, and there was an occupational focus on the collection of marine resources. By the fourteenth century, inland elevations were being turned into dryland agricultural fields. By the fifteenth century, residency in the uplands was becoming permanent, and there was an increasing separation of the chiefly class from the common people. In the sixteenth century the population stabilized and the *ahupuaʻa* land management system was established as a socioeconomic unit (see Ellis 1963; Handy and Handy 1972; Kamakau 1992; Kelly 1983; and Tomonari-Tuggle 1985). Soon, large areas of land began to be controlled by the most powerful chiefs.

In the first part of the 18th century Kalaniopuʻu (Kamehameha I's uncle) established himself as the high chief of Kaʻū. This following the death of the Kaʻū chief Nuʻuanupaʻahu, who was an excellent surfer and was said to have practiced at Kāwā (Kamakau 1992:106). Kāwā was also mentioned by John Papa Iʻi (1963:134) as a famous surfing place.

In 1754, after many bloody battles, Kalaniopuʻu defeated Keaweopala in South Kona and declared himself ruler of the Island of Hawaiʻi (Kamakau 1992:78). Kalaniopuʻu went on to rule for nearly thirty years and was ruler during the first recorded visit to Hawaiʻi by European explorers.

History After Contact

Captain James Cook landed in the Hawaiian Islands on January 18, 1778. In January of 1779 he visited South Point for the first time on board his ships the Resolution and Discovery. Cook recorded a large village on the point and he met with some of the inhabitants who brought supplies to his ships. Cook was not overly impressed with the size of the pigs, nor the amount of fruit and vegetables offered, and he noted

that "the Country did not seem capable of producing many of either having been destroyed by a Volcano…" (Beaglehole 1967:486). King, who accompanied Cook on the voyage, wrote:

> It is not only by far the worst part of the Island but as barren waste looking a country as can be conceived to exist…we could discern black Streaks coming from the Mountain even down to the Seaside. But the [southern] neck seems to have undergone a total change from the Effect of Volcanoes, Earthquakes, etc…By the SE side were black honey combed rocks, …horrid & dismal as this part of the Island appears, yet there are many Villages interspersed, & it struck as being more populous than the part of Opoona [Puna] which joins Koa [Kaʻū]. There are houses built even on the ruins [lava flows] we have described (Beaglehole 1967:611).

Around 1781, after the Resolution and Discovery had come and gone, a rebel Puna chief named Imakakoloʻa led an uprising against Kalaniopuʻu. The rebel chief was defeated in Puna by Kalaniopuʻu's superior forces, but Imakakoloʻa managed to avoid capture and hide from detection for the better part of a year. While the rebel chief was sought, Kalaniopuʻu "went to Kaʻū and stayed first at Punaluʻu, then at Waiohinu, then at Kamaʻoa in the part of Kaʻu, and erected a heiau called Pakini, or Halauwailua, near Kamaʻoa" (Kamakau 1992:108). Imakakoloʻa was eventually captured and brought to the *heiau*, where Kiwalaʻo (Kalaniopuʻu's son) was to sacrifice him as an offering. "The routine of the sacrifice required that the presiding chief should first offer up the pigs prepared for the occasion, then bananas, fruit, and lastly the captive chief" (Fornander 1996:202). However, before Kiwalaʻo could finish the first offerings, Kamehameha, following the counsel of chiefs loyal to him, "grasped the body of Imakakoloʻa and offered it up to the god, and the freeing of the tabu for the heiau was completed" (Kamakau 1992:109). Upon observing this single act of insubordination, many of the chiefs believed that Kamehameha would eventually rule over all of Hawaiʻi.

By 1796 Kamehameha had indeed conquered all of the islands except Kauaʻi. It wasn't until 1810 when Kaumualiʻi of Kauai gave his allegiance to Kamehameha that the Hawaiian Islands were unified under one ruler (Kuykendall and Day 1976). Kamehameha died on May 8, 1819 in Kailua-Kona, and once again the culture of Hawaiʻi was to change radically. Six months after his death, his son and successor, Liholiho (Kamehameha II), met with *kuhina nui,* Kaʻahumanu, and a council of chiefs and chiefesses at Kailua. His advisors, which included the *kahuna* Hewahewa, convinced him to abolish the *kapu* system. He signified his agreement by sitting down and eating with his mother Keopulani, breaking the *ʻai kapu* (Oliver 1961; Kuykendall and Day 1976; Kamakau 1992).

Liholiho's cousin, Kekuaokalani, caretaker of the war god *Ku-Kailimoku*, disagreed with the breaking of the *ʻai kapu* and revolted. By December of 1819 the revolution was quelled. Kamehameha II sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the *heiau* images, and ordering that the *heiau* structures be destroyed or abandoned and left to deteriorate. He did, however, allow the personal family religion, the *ʻaumakua* worship, to continue (Oliver 1961; Kamakau 1992).

In October of 1819, seventeen Protestant missionaries set sail from Boston to Hawaiʻi. They arrived in Kailua-Kona on March 30, 1820 to a society with a religious void to fill. Many of the *aliʻi,* who were already exposed to western material culture, welcomed the opportunity to become educated in a western style and adopt their dress and religion. Soon they were rewarding their teachers with land and positions in the Hawaiian government.

The Reverend William Ellis, one of the missionaries, visited the Kaʻū District in July of 1823. He traveled through Kaʻalāiki Ahupuaʻa, although he doesn't mention it by name. What follows are excerpts from his journey from Honuapo to Hōkūkano and his arrival at Hīlea:

> After traveling some time over a wide tract of lava, in some places almost as rugged as any we had yet seen, we reached Hokukano. Here we found an excellent spring of fresh water, the first we had yet seen on our tour, though we had travelled upwards of a hundred miles.

> While we were stopping to drink, and rest ourselves, many natives gathered around us from the neighbourhood…
>
> We travelled over another rugged tract of lava about two hundred rods wide. It had been most violently torn to pieces, and thrown up in the wildest confusion; in some places it was heaped forty or fifty feet high. The road across it was formed of large smooth round stones, placed in a line two or three feet apart…
>
> About half-past eleven we reached Hilea, a pleasant village belonging to the governor. As we approached it, we observed a number of artificial fish-ponds, formed by excavating the earth to the depth of two or three feet, and banking up the sides…
>
> We went into the house of the head man, and asked him to collect the people together, as we wished to speak to them about the true God. He sent out, and most of the people of the village, then at home, about two hundred in number, soon collected in his house, which was large, where Mr. Thurston preached to them… (Ellis 2004: 195-196).

It's possible that when Ellis referred to the fresh water springs of Hōkūkano, he was actually in Kaʻalāiki where the Kāwā Springs are located. A review of cartographic resources for this current study showed no springs in Hōkūkano. The fishpond Ellis refers to may actually have been the pond at Kaʻalāiki, or there may have been a pond at Kāwā Bay, which is in Hīlea Nui.

The missionaries first initiated population census reports for the Hawaiian Islands in 1831-1832 and 1835-1836, before which there were only rough estimates. The missionary census data from 1835-1836 lists 238 people, including 67 children for both Kaʻalāiki and Hīlea Nui combined.

Kelly (1969) estimated that the Kaʻū District had a population of between 10,000 and 13,500 at the time European contact, but that it declined to less than 2,000 people by 1872. There was not a single reason for the decrease in population, but rather it occurred through an accumulation of changes that took place after European contact. One often cited reason is that foreigners brought foreign diseases with them, to which the Native Hawaiians had no resistance. In addition to this, many people migrated to other islands, such as when Governor Kuakini moved from Hawaiʻi Island to Oʻahu, and many of his people followed him. Also, men who began working on foreign whaling ships emigrated to foreign countries and rarely ever returned to Hawaiʻi (Schmitt 1973:16).

Native land tenure practices also underwent drastic changes during the early Historic Period. In Precontact Hawaiʻi the districts, such as Kaʻū, were divided into *ahupuaʻa*. In these land units the native tenants tended fields and cultivated crops necessary to sustain their families, and the chiefly communities with which they were associated. As long as sufficient tribute was offered and *kapu* (restrictions) were observed, the common people, who lived in a given *ahupuaʻa* had access to most of the resources from mountain slopes to the ocean. These access rights were almost uniformly tied to residency on a particular land, and earned as a result of taking responsibility for stewardship of the natural environment, and supplying the needs of the *aliʻi* (see Kamakau 1992:372-377 and Malo 1951:63-67).

Entire *ahupuaʻa*, or portions of the land were generally under the jurisdiction of appointed *konohiki* or lesser chief-landlords, who answered to an *aliʻi-ʻai-ahupuaʻa* (chief who controlled the *ahupuaʻa* resources). The *aliʻi-ʻai-ahupuaʻa* in turn answered to an *aliʻi ʻai moku* (chief who claimed the abundance of the entire district). Thus, *ahupuaʻa* resources supported not only the *makaʻāinana* and *ʻohana* who lived on the land, but also contributed to the support of the royal community of regional and/or island kingdoms. This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resources management planning. In this system, the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources. Also, in communities with long-term royal residents, divisions of labor (with specialists in various occupations on land and in procurement of marine resources) came to be strictly adhered to.

Handy and Handy (1972:554) provide a cartographic sketch indicating the various zones of sea and land in the District of Kaʻū and their uses by Hawaiians. The construct is based on the Hawaiian terms for

the major vegetation zones that are used to define and segregate space within the regions *ahupua‘a*. The zones are bands roughly parallel to the coast that mark changes in elevation and rainfall. The current project area falls within what has been termed the *kula kai* zone. The *kula kai* was the lowest habitable zone. Residents of the *kula kai* depended largely on marine resources, but also grew sweet potato and gourds. Other vegetables were acquired through trade with *mauka* relatives (Handy and Handy 1972).

The socioeconomic and demographic changes that took place in the period between 1790 and the 1840s altered the traditional Hawaiian land tenure system and promoted the establishment of a Euroamerican style of land ownership. In 1848, the *Māhele* was the vehicle for determining ownership of the native land. The *Māhele* defined the land interests of Kamehameha III (the King), the high-ranking chiefs, and the *konohiki*. As a result of the *Māhele*, all land in the Kingdom of Hawai‘i came to be placed in one of three categories: (a) Crown Lands (for the occupant of the throne); (b) Government Lands; and (c) *Konohiki* Lands. Laws in the period of the *Māhele* record that ownership rights to all lands in the kingdom were “subject to the rights of the native tenants;” those individuals who lived on the land and worked it for their subsistence and the welfare of the chiefs (Sinoto and Kelly 1970).

During the *Māhele*, Ka‘alāiki was retained as Government land. There were a total of seven *kuleana* awarded within Ka‘alāiki (Table 1). A single LCAw. was awarded *makai* of Highway 11 at the coast and the remaining six were located *mauka* of Highway 11 at 1,200 feet elevation or higher. One claimant (Kaluahine) received two sections (LCAw. 7091:1 and 2). LCAw. 7091:1 was located at the coast and LCAw. 7091:2 was located in the *mauka* reaches of Ka‘alāiki.

Following the *Māhele*, the Kingdom established a program of selling parcels of land to interested residents. The grant program was initiated in an effort to encourage more native tenants onto fee-simple parcels of land. The parcels of land sold in the grants were quite large, ranging in size from approximately ten acres to many hundreds of acres. When the sales were agreed upon, Royal Patents were issued and recorded following a numerical system that remains in use today. There were a total of sixteen land grants sold within Ka‘alāiki (see Table 1). One grant purchaser (Waapa) was also a *kuleana* awardee. The grant sales span between 1852 and 1910, with a majority sold during 1859. The current project area crosses two grants (Grants 993 and 2370). Grant 993 was sold to Keawe Kimokeo in 1852 and consisted of 119.5 acres. Grant 2370 was sold to Noa Malailua in 1857 and consisted of 350.0 acres.

Table 1. Land Commission Awards and land grants within Ka‘alāiki Ahupua‘a.

Claimant	*LCAw. #*	*Grant #*	*Year the grant was purchased*
Kaluahine	7091:1 and 2		
Waapa	10952:2	2948	1864
Nawahine	10371:2		
Punanoa	10652		
Aea	10554		
Uluhani	10914:2		
Kauikoaole	7093		
Nakuaau		2527	1858
Kimokeo, Keawe		993 and 1530	1852 and 1855
Kapuni		2218	1857
Malailua, Noa		2370	1857
Lio		2387	1857
Apiki		2645	1859
Kapai		2646	1859
Kahaku		2647	1859
Puhi		2648	1859
Kauwe		2651	1859
Kailiulaole		2657	1859
Kainoa		2676	1859
Keheananui		2943	1864
Kau Ag. Co. Ltd.		5234	1910

In 1862, the Commission of Boundaries (Boundary Commission) was established in the Kingdom of Hawai‘i to legally set the boundaries of all the *ahupua‘a* that had been awarded as a part of the *Māhele*. Subsequently, in 1874, the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them. The primary informants for the boundary descriptions were older native residents of the lands, many of which had also been claimants for *kuleana* during the *Māhele*. This information was collected primarily between 1873 and 1885 and was usually given in Hawaiian and transcribed in English as it occurred. As Ka‘alāiki was retained as Government land, there was no boundary testimony taken for this *ahupua‘a*. Likewise the *ahupua‘a* neighboring Ka‘alāiki to the north and south were also Government lands.

In this part of Ka‘ū, many Native Hawaiians that received *kuleana* lands took part in the *pulu* trade of the 1860's. The *pulu* trade pulled families away from their land and houses and created a dependency on *pulu* for material possessions. This was a sharp contrast to the self-subsistent lifestyle they were accustomed to. The Rev. Shipman wrote about the effects of the *pulu* trade on the people:

> …The effect—on them—is not good; not that the pulu is not a source from which they might secure comfort to themselves and families, but the actual result is the reverse. They are offered goods to almost any amount, to be paid for in pulu; this to a native is a strong temptation to go into debt…When once in this condition they are almost entirely under the control of their creditors, and are compelled to live in the pulu regions, at the peril of losing their houses and lots, and whatever other property they possess. Thus their homes are almost in reality deserted, ground uncultivated (Station Report, Ms. [1860] in Kelly 1980).

Mann and Bowen (1976) specifically relate that the residents of Ka‘alāiki complained to the Interior Department that they were being mistreated by Nicolas George, a *pulu* trader who controlled their land under government lease; and asked the Kingdom government to revoke his interest in the land.

In 1868, as must have happened countless times during the Precontact Period, a volcanic eruption emanating from Mauna Loa shook Ka‘ū, changing the landscape forever. Beginning on March 27th, a series of earthquakes were felt and lava began flowing on the slopes of Mauna Loa. These initial eruptions "destroyed a large stone church at Kahuku, and also all the stone dwelling houses in that place, including the houses….at the foot of the mountain" (Coan 1868:106). Then on April 4th an even larger eruption occurred. Fredrick S. Lyman, who witnessed the eruption first hand, wrote:

> Soon after four o'clock p.m. on Thursday we experienced a most fearful earthquake. First the earth swayed to and fro from north to south, then from east to west, then round and round, up and down, and finally in every imaginable direction, for several minutes, everything crashing around, and the trees thrashing as if torn by a hurricane, and there was a sound as of a mighty rushing wind. It was impossible to stand: we had to sit on the ground, bracing with hands and feet to keep from being rolled over…we saw…an immense torrent of molten lava, which rushed across the plain below…swallowing everything in its way;--trees, houses, cattle, horses, goats, and men, all overwhelmed in an instant. This devouring current passed over a distance of about three miles in as many minutes, and then ceased (Lyman 1868:109).

Within minutes of the initial quake, the ocean rose up and a *tsunami* pounded the coast, washing inland in some locations as far as 150 yards (Sinoto and Kelly 1970:51). It was recorded that the wave destroyed 108 houses in Ka‘ū and drowned forty-six people (Coan 1882:316). A *kama‘āina* of Ka‘u who witnessed the destruction submitted a letter to *Ka Nupepa Kuokoa* (April 11, 18, 1868) in which, among a very descriptive retelling of the events he stated that "[T]he houses of Ka‘alu‘alu, Paiaha‘a, Honu‘apo, Hokukano, Ka‘alaiki, the two Hilea, Ninole, Wailau, Punalu‘u and as far as Keauhou, were all swept away by the sea-… (Handy and Handy 1972). A ship passing South Point, about three miles distant from land, at the time of the eruption, reported that a conical island four hundred feet high rose out of the ocean midway between the vessel and shore (Whitney 1868:114). The *tsunami* devastated coastal villages and forced people to move inland to towns such as Nā‘ālehu and Pāhala. Frederick Lyman (1868:110) wrote:

> The villages on the shore were swept away by the great wave that rushed upon the land immediately after the earthquake. The eruption of earth destroyed thirty-one lives, but the waves swallowed a great number.

Eight years following this catastrophic event, the Reciprocity Treaty in 1876 was signed, which granted the Hawaiian Islands free trade in certain commodities, such as sugar. Around this time at least five sugar plantations were started in Kaʻū. By 1880 there were three sugar mills and one under construction. The Hutchinson Sugar Plantation villages were located at Hīlea, Honuʻapo, Naʻalehu, and Kaʻalāiki. By 1928, the more remote plantation villages were closed down and the residents moved to Nāʻālehu. Following the heyday of the sugar plantations in this region, the current study area was used as cattle pasture until recent times.

Previous Archaeological Research

Kaʻalāiki Ahupuaʻa has been the subject of five archaeological investigations (Stokes and Dye 1991; Ching 1967; Emory 1970; Ewart 1978; and Mann and Bowen 1976). The findings of these studies are presented in chronological order below.

Early archaeology in Kaʻalāiki began with John Stokes. Stokes recorded one *heiau* in Kaʻalāiki. The *heiau* was called ʻImakakaloa Heiau or ʻImakakoloa Heiau, and was located approximately one mile inland from the ocean (at approximately the 300 foot elevation), *mauka* of Highway 11, and west of the current study area. It is unclear whether this *heiau* still exists. John Stokes description of ʻImakakoloa/ʻImakakaloa Heiau is provided below:

> *ʻImakakaloa Heiau, or ʻImakakoloa Heiau*
>
> *Heiau* of ʻImakakaloa or ʻImakakoloa, land of Kaʻalāiki, Kaʻū. Located on slopes of the open country, a mile from the sea.
>
> This *heiau* is a series of enclosures with walls sometimes broadened into platforms. The ground declines to the southeast, but the earth floors of the enclosure have been approximately leveled as though by cutting and filling. The large enclosure on the southeast is said to have been for the chiefs and *kahuna,* the stone pavement shown being the *kuahu*. Outside and adjoining the wall of this enclosure on the west is a platform on foot high. To the north of the latter is another platform 4.5 feet high, an extension of the walls. This last is said to have been the *hale o Papa*. The second largest enclosure is said to have been for the *hale hula*. There was no information regarding the smallest enclosure. [In Thrum's catalogue the larger enclosure was "said to have been devoted to hula" (1907a:47). W.T.B.] (Stokes and Dye 1991:126,127)

In 1967 Francis Ching investigated selected areas on Hawaiʻi Island to determine where National Historic Landmark plaques should be placed (Ching 1967). In Kaʻalāiki, around Kāwā Bay, Ching reiterated what was written in a 1967 Lloyd Soehren letter; that from the southern side of Kāwā Bay to the next lava flow there were "…a considerable number of house sites, grave sites, camp sites, and other architectural features pertaining to the aboriginal and early post-European Hawaiian culture" (Ching 1967:10). These features were located to the southeast of the current APE.

In 1970, the Bishop Museum Department of Anthropology conducted an inventory of archaeological and historical sites in the districts of Kona, and Kaʻū and in ʻAnaehoʻomalu, South Kohala, Island of Hawaiʻi (Emory 1970). The work for this study was largely based on Violet Hansen's island wide survey and the Bishop Museum's register. All of the sites and features were already listed in the Bishop Museum register, and this report was only a visit to the sites to observe their then present condition. In Kaʻalāiki, Kāwā, there were ninety-seven sites recorded along the coast, southeast of the current APE. In the immediate vicinity of the Kāwā Spring there were six sites, two wells, and one enclosure. To the south of the spring there were ten house sites, two platforms, twenty-two burials, ten enclosures, and one shelter. On the coast at Kaʻiliʻiki, within Kaʻalāiki were two house complexes, a shelter cave, a platform, a burial

platform, and a house site. On the coast at Wailea, within Kaʻalāiki there were five house sites, two agricultural features, two burial platforms, and a walled pond. From Wailea to Hawaloa, in the extreme southern part of the *ahupuaʻa* there were eight house sites, five platforms, three agricultural features, and thirty or more burials, mostly the platform type. A petroglyph consisting of a large circle, with small circles on the interior was located at the boundary between Kaʻalāiki and Hōkūkano.

In 1976, two graduate students (Herbert Mann and Anne Bowen) undertook an archaeological survey of Kāwā, located along the coast of Kaʻalāiki and Hīlea Nui *ahupuaʻa* (Mann and Bowen 1976). Their survey extended from Highway 11 to the coast and was bordered to the north by Hīlea Stream, and to the south by a property fence line within Kaʻalāiki Ahupuaʻa. They re-identified and mapped previous Bishop Museum sites. Mann and Bowen (1976) did not identify any archaeological sites within the current APE. Due to time constraints they recorded mainly house sites, enclosures, depressions, and possible burials. Those sites in which they were unsure of the earlier Bishop Museum site number received the nearest site number, followed by the letter "A". They recorded three house sites that were not previously identified in Bishop Museum records. There were seven house sites that were identified as having Bishop Museum site numbers. Some of the house sites appeared to predate the 1868 *tsunami*. There were also enclosures (animal or garden use), and planting holes (*mākālua*) associated with the house sites. Although they did not go into detail about the burials in the area, they did state that there were seven gravesites said to be of the Kinin Family. A number of petroglyphs were recorded along the coast that represented birds, fish, and anthropomorphic figures, as well as pecked bait cups. Large concentrations of traditional and transitional artifacts were located on the hill *mauka* of Hīlea Stream. It appeared that this area may have once been settled, but was in disarray and badly disturbed, presumably by the 1868 *tsunami*. The *tsunami* was said to have "destroyed the villages of Ninole, Kawaa and Honuapo" (Hawaiian Gazette in Kelly 1980:41). As a result of their survey they did not identify any sites that were exclusively Precontact in age. According to Mann and Bowen (1976), the last member of the original Kāwā resident families was Mrs. Lydia Papalimu, reported to have left the area in 1957.

In 1978, the Archaeological Research Center Hawaii, Inc. (ARCH) conducted an archaeological reconnaissance of TMK: 3-9-5-16:32 por. in Kaʻalāiki Ahupuaʻa (Ewart 1978), southeast of the current APE. The area investigated was a portion of Parcel 36, on the *mauka* side of the government road. The property owner, Arthur Ulrich, had done an initial investigation of his property. After having located numerous archaeological features he contacted ARCH and requested a professional evaluation of those resources. An ARCH archaeologist spent one day in the field reviewing the sites and features recorded by Mr. Ulrich. Archaeological features included platforms, walls, enclosures, and modified sinks, lava blisters, and caves. Ewart suggests that the features post date 1868 and are those of habitation areas (platforms), with nearby agricultural use areas (modified sinks, lava blisters, and caves), and animal pens (enclosures). Evidence such as ash and faunal remains suggested possible shelter use within some of the sinks, caves, and blisters. Cultural deposits encountered were disturbed and with the exception of three platforms, the archaeological features were evaluated as being in poor condition.

ARCHAEOLOGICAL EXPECTATIONS FOR THE CURRENT APE

Although no archaeological resources were identified during an earlier survey (Mann and Bowen 1976) of a portion of the current study area, that work was more intensively focused on the extreme coastal portions of Kaʻalāiki. Ewart's (1978) study of an area more consistent with the conditions of the current APE indicates that post-1868 habitation and agricultural features may exist in the vicinity of Highway 11. This possibility along with Precontact habitation and burial sites is supported by the results of recent work (Clark et al 2010; Haun et al. 2004) conducted in Hiʻonaʻā and Honuʻapo *ahupuaʻa* to the south of the current study area. As the current study area was actively used for cattle ranching during historic times, walls and enclosures used to control animal movement would also be expected. It is recognized that the placement of existing Highway 11 could have significantly impacted any prior existing historic properties.

IDENTIFYING POSSIBLE HISTORIC PROPERTIES

The identification of potential historic properties was accomplished using three approaches: 1) by examining archival data, 2) through oral consultation, and 3) by an archaeological field investigation. The data repositories at DLNR-SHPD were examined as well as at the University of Hawai‘i Hilo. Maps from the State Archives were also studied. Oral consultation for this specific undertaking began in September 2007 at a community meeting conducted at the Nā‘ālehu Community Center; and follow-up consultations with individuals expressing a specific knowledge of the current study area were conducted subsequent to that community meeting.

Archaeological fieldwork for the current study was conducted between January 31 and February 6, 2008 by a five person field crew working eight-hour days. Fieldworkers included J. David Nelson, B.A., Olivier M. Bautista, B.A., Christopher S. Hand, B.A., Ashton Dircks Ah Sam, B.A., and Johnny R. Dudoit, B.A. All fieldwork was directed by Robert B. Rechtman, Ph.D., who also returned to the project t area for two days of follow-up fieldwork in June and July 2010. The APE boundaries were identified in the field through the use of GPS, and the APE was subject to pedestrian transects with a spacing interval of 5 meters. When archaeological resources (or land alterations; e.g. bulldozing, fence lines, etc.) were encountered, they were plotted on a map using Garmin 76s handheld GPS technology (set to the WGS 84 datum). The archaeological features were then cleared of vegetation, mapped in detail using tape and compass, photographed (both with and without a meter-stick included for scale), and described using standardized site record forms. Features were grouped into sites based on proximity, presumed age, and function.

Findings

The archival data on file at DLNR-SHPD and at the University of Hawai‘i Hilo did not reveal the presence of any historic properties within the current APE; and the historic maps of the area did not show any potential historic properties. Likewise, the oral consultations, while very informative about the area, did not indicate the presence of any specific historic properties within the APE. However, as a result of the archaeological fieldwork, five archaeological sites were identified and recorded within the APE (Table 2), and three additional sites were observed (but not fully recorded) to exist in the proximity of, but outside the APE boundary. Descriptions of the five archaeological sites identified within the APE are presented below and their locations are shown on Figure 4.

Table 2. Archaeological sites identified within the project APE.

*SIHP Site #**	*Type*	*# of Features*	*Age*
28504	Wall complex	10	Historic
28505	Wall	1	Historic
28507	Enclosure	2	Precontact
28508	Rock piles	6	Precontact?
28509	Enclosure	1	Historic

*The Site 28506 designation was omitted intentionally.

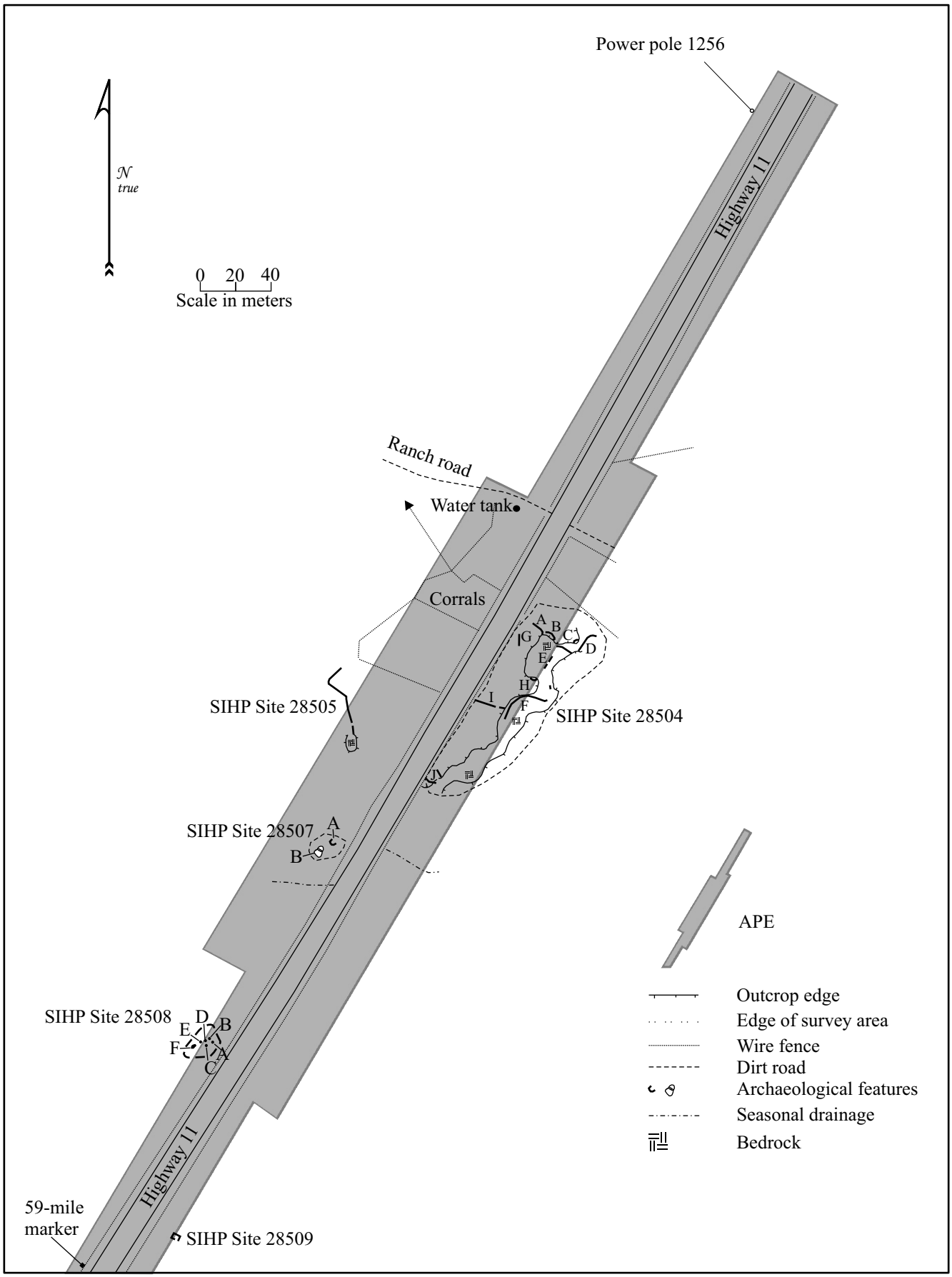

Figure 4. Project are plan view.

SIHP Site 28504

SIHP Site 28504 is a modified outcrop located in the central portion of the study area on the *makai* side of Highway 11 (see Figure 4). The outcrop, aligned northeast/southwest, extends parallel to the highway and stretches for approximately 120 meters. Numerous modifications have been made to the outcrop in an apparent effort to control the movement of cattle. Ten individual features (Features A-J) were identified on the outcrop (Figure 5) and these seem to correspond with the modern metal corral on the *mauka* side of the highway at this location (see Figure 4).

Feature A

Feature A is a northwest/southeast trending wall segment located at the northeastern portion of Site 28504 approximately 20 meters east of Highway 11 (see Figures 4 and 5). The wall is constructed on level bedrock and is built against the bedrock outcrop on its southeastern side to a height of 60 centimeters (Figure 6). It extends 14 meters to the northwest until it terminates at the edge of the highway corridor. It is composed of stacked medium and large sized cobbles three courses high and is on average 80 centimeters wide. The wall is aligned with a wire fence on the *mauka* side of the highway. This wall likely functioned as a ranching wall constructed for the containment of cattle. A large cattle corral is located opposite from Feature A, across Highway 11. Feature A may have been altered and partially destroyed by the construction of Highway 11.

Figure 6. SIHP Site 28504 Feature A, view to the southwest.

Feature B

Feature B is an "L"-shaped alignment of cobbles located in the northern portion of Site 28504 (see Figure 5). The alignment is constructed of medium and large cobbles, in its current collapsed state is one to two courses high, and extends north from the outcrop for 1.5 meters before turning sharply to the west, and extending 5 meters. Heights along the alignment vary from 10 to 45 centimeters. This feature (Figure 7) seems to have functioned in conjunction with Feature A to keep cattle away from the outcrop.

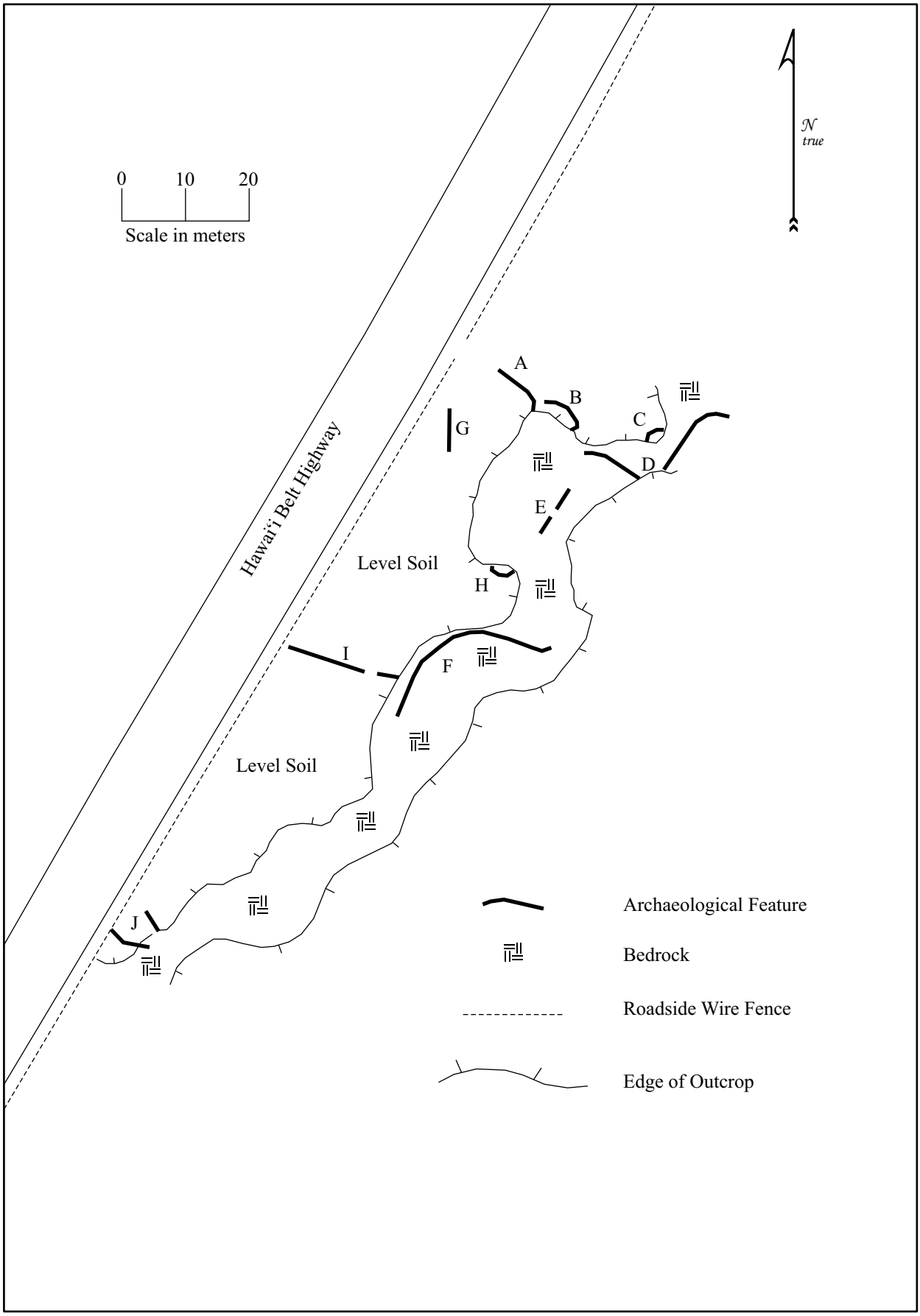

Figure 5. SIHP Site 28504 plan view.

Figure 7. SIHP Site 28504 Feature B, view to the south.

Feature C

Feature C is a modification to the outcrop located in the northern portion of Site 28504 (see Figure 5). Feature C consists of large cobbles and small boulders stacked in a semi-circle that block overhanging bedrock on the north edge of an east-west running *pāhoehoe* ridge. The overhang is 60 centimeters tall (floor to ceiling) and 70 centimeters recessed from the outcrop edge. The wall is 60 centimeters tall, up to three courses high, with widths varying from 50 to 100 centimeters (Figure 8). This feature likely functioned to keep cattle away from the bedrock outcrop; the natural overhang would have presented a hazard to grazing livestock.

Figure 8. SIHP Site 28504 Feature C, view to the southeast.

Feature D

Feature D is a northwest/southeast trending wall remnant located in the northern portion of Site 28504 (see Figure 5). The wall measures 10 meters long, 80 to 90 centimeters wide and 60 to 90 centimeters in height. It is constructed of medium and large cobbles. The wall is built in between the edges of protruding bedrock and likely functioned as a means to keep cattle off of the outcrop.

Feature E

Feature E is a northeast/southwest trending wall remnant located in the north-central portion of Site 28504 (see Figure 5). The wall measures 8 meters long and has a 1 meter break in the center. It is 80 to 90 centimeters wide and 60 to 90 centimeters in height. Feature E (Figure 9) is constructed of stacked medium and large cobbles, three to six courses high. It likely functioned as a means to keep cattle off of the outcrop.

Feature F

Feature F is a wall remnant located in the central portion of Site 28504 (see Figure 5). This wall is curved and follows the outcrop edge. It is constructed of stacked medium and large cobbles, three to six courses high, and measures 30 meters long, 80 to 90 centimeters wide and 60 to 90 centimeters in height. Feature F likely functioned to protect grazing cattle from the dangerous footing of the outcrop.

Figure 9. SIHP Site 28504 Feature E, view to the south.

Feature G

Feature G is a north/south trending wall remnant located in the northwest portion of Site 28504 (see Figure 5). The wall measures 10 meters long, 80 centimeters wide and 60 centimeters tall. This wall was truncated by the construction of Highway 11, and seems to have been constructed for cattle control purposes a part of the corral system located *mauka* of the highway.

Feature H

Feature H is a modification to the outcrop located in the central portion of Site 28504 (see Figure 5). Feature H consists of stacked cobbles that enclose overhanging bedrock on the south edge of a *pāhoehoe* ridge (Figure 10). The overhang is 60 centimeters tall (floor to ceiling) and 1.5 meters recessed from the outcrop edge. Feature H is stacked medium and large cobbles measuring 80 centimeters wide and 50 centimeters tall, and built off the outcrop edge. Feature H, like Feature C would have deterred livestock from a dangerous overhanging area.

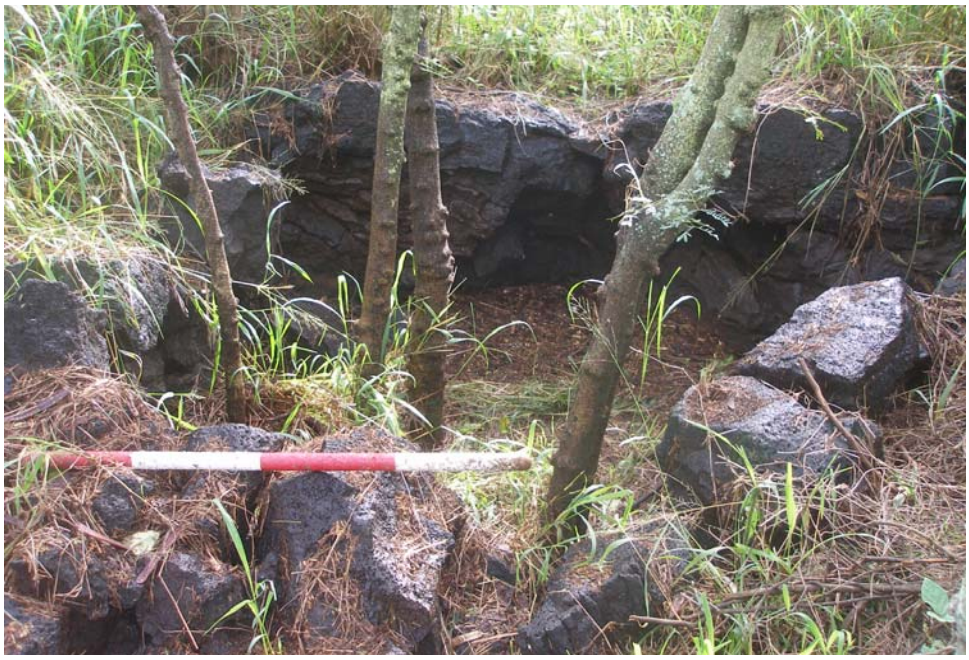

Figure 10.SIHP Site 28504 Feature H, view to the northeast.

Feature I

Feature I is an east/west trending wall remnant located in the southwestern portion of the Site 28504, approximately 6 meters *makai* of Highway 11 (see Figure 5). The wall measures 17 meters long and has a break in the middle that measures 2.2 meters wide. It is constructed of medium and large sized stacked *pāhoehoe* cobbles with a few small boulders (Figure 11). The wall stands between 30 and 100 centimeters in height. The width of the wall averages 60 centimeters. The eastern end of the wall is built against a large *pāhoehoe* outcrop and the western end terminates at a wire fence that parallels Highway 11. Feature I is in alignment with a wire fence on the *mauka* side of the Highway, indicating possible use of the wall for cattle ranching purposes. A rusted iron was found adjacent to Feature I (Figure 12).

Figure 11. SIHP Site 28504 Feature I, view to the south.

Figure 12. Iron found near SIHP Site 28504 Feature I.

Feature J

Feature J, located in the extreme southern portion of Site 28504 (see Figure 5), consists of two wall segments that form a possible enclosure using the bedrock outcrop as a possible nature third wall. The southern wall segment is 10 meters long, 1 meter tall, and 90 centimeters wide; the northern wall segment 2.5 meters long, 60 centimeters tall, and 90 centimeters wide. The walls are built against a 1.3-meter tall bedrock outcrop on the eastern side. The southern wall continues on top the outcrop for approximately 4 meters. These walls likely originally continued to the west prior to the construction of Highway 11, and ultimately may have been associated with Site 28505.

SIHP Site 28505

SIHP Site 28505 is a north/south trending wall remnant located in the central portion of the APE, approximately 30 meters *mauka* of Highway 11 (see Figure 4). The wall measures 50 meters long and is constructed of stacked medium and large sized cobbles 100 to 120 centimeters in height (Figure 13). The average width of the wall is 60 to 80 centimeters. There is a sharp bend to the east in the northern portion of the wall. A portion of the wall runs along an outcrop and partially encloses a lava blister occurring on the outcrop edge. Following its course along the outcrop, the wall then traverses through a pasture. There is a 1.7 meter wide break in the wall at the southern end. The break appears intentional, as there were no scattered cobbles nearby to signify collapse of the wall. The wall ends at a steep outcrop approximately 30 meters *mauka* of the highway. Raised bedrock outcrops were utilized in the construction of the wall as a means to increase the height. This wall likely served as a way to control the movement of cattle.

Figure 13. SIHP Site 28505, view to the southwest.

SIHP Site 28507

SIHP Site 28507 is a U-shape enclosure and modified depression (Figure 14) located on the *mauka* side of the highway in the southern two thirds of the APE (see Figure 4). The enclosure measures 3 meters by 2 meters with an average wall width of 1 meter and an average height of 30 centimeters. It is constructed of small to large sized cobbles piled on a bedrock outcrop (Figure 15). The interior ground surface is exposed bedrock. Volcanic glass and waterworn cobbles were observed in association with this feature (Figure 16). The enclosure exhibits signs of collapse, likely as a result of cattle disturbance.

Approximately 3.5 meters west of the enclosure is a modified depression (see Figure 14). The modification of the depression consists of a wall measuring 2.0 meters long by 0.8 meters wide that crosses the depression, thereby creating two separate spaces (Figure 17). The wall is constructed of piled medium and large sized cobbles 70 to 90 centimeters in height, two to four courses high. The depressed area on the southwestern side of the wall measures 4.5 meters by 2.0 meters. The depressed area on the northeastern side of the wall measures 1.9 meters by 1.4 meters. The surrounding raised bedrock has created an overhang around much of the northeastern portion of the depressed area. The interior ceiling of the overhang measures 50 to 70 centimeters in height and the inside extends 50 to 150 centimeters deep. No cultural material was observed in association with this depression.

The construction attributes and the presence of volcanic glass and waterworn cobbles suggest that the enclosure may have been used as a Precontact temporary habitation with the modified depression used as a planting or storage area.

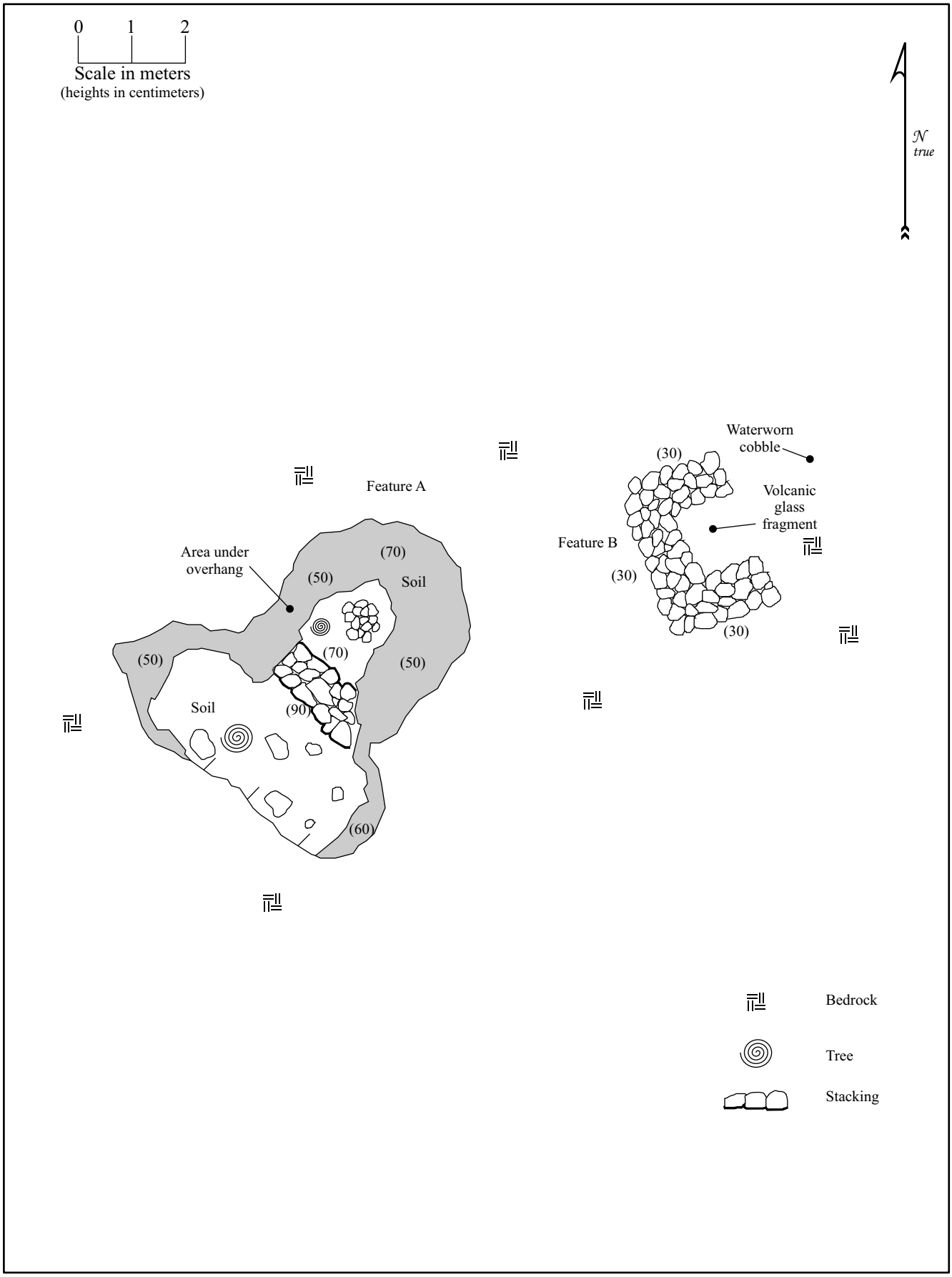

Figure 14. SIHP Site 28507 plan view.

Figure 15. SIHP Site 28507 Feature A, view to the southwest.

Figure 16. SIHP Site 28507 Feature A artifacts on bedrock surface.

Figure 17. SIHP Site 28507 Feature B, view to the north.

SIHP Site 28508

Site 28508 is a cluster of six (Features A-F) rock and soil piles (Figure 18) located approximately 10 meters *mauka* of Highway 11 (see Figure 4) on an elevated *pāhoehoe* flow ridge. All of these features are of a similar nature (loosely piled) and incorporate the *pāhoehoe* bedrock. These piles appear to be natural erosional features that may have been modified for agricultural purposes. The accumulation of rough *pāhoehoe* cobble and boulders seems to reflect an in situ erosion of bedrock outcrops and the soil that is present could be the result of augmentation for planting purposes. Alternatively, these features may be entirely natural. While within the APE, this site is situated in an area that may be spared from development activity. Table 3 provides a summary of the six features, which are shown in Figures 19 through 24.

Table 3. SIHP Site 28508 feature metrics.

Feature #	*Length**	*Width**	*Height**
A	170	120	30
B	95	75	25
C	130	80	15
D	180	120	30
E	110	80	20
F	300	90	40

* all measurements in centimeters.

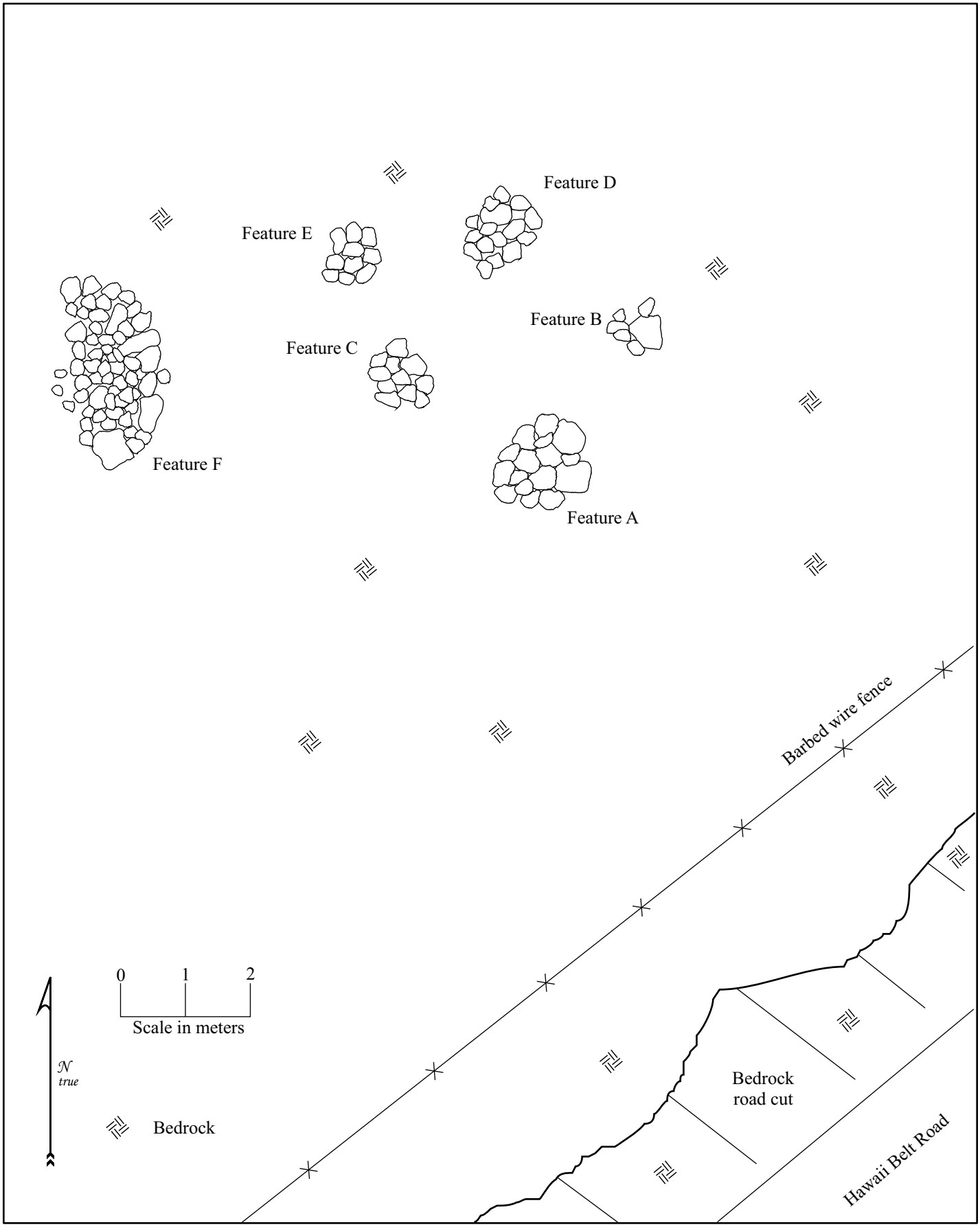

Figure 18. SIHP Site 28508 plan view.

Figure 19. SIHP Site 28508 Feature A, view to the south.

Figure 20. SIHP Site 28508 Feature B, view to the north.

Figure 21. SIHP Site 28508 Feature C, view to the northwest.

Figure 22. SIHP Site 28508 Feature D, view to the north.

Figure 23. SIHP Site 28508 Feature E, view to the north.

Figure 24. SIHP Site 28508 Feature B, view to the northeast.

SIHP Site 28509

Site 28509 is an enclosure located toward the southern end of the APE on the *makai* side of Highway 11 situated on a *pāhoehoe* outcrop about 18 meters from the edge of the highway (see Figure 4). The enclosure is rectangular in shape (Figure 25) and measures 5.5 meters (northwest/southeast) by 4.5 meters (northeast/southwest). The northeast wall is 55 centimeters tall and 90 centimeters wide. The southeast wall is one course of aligned large sized cobbles along the top of steeply sloping bedrock. The northwest wall is one course of medium sized cobbles on top of bedrock, and the southwestern wall is core-filled (Figure 26), measuring 3 meters long by 0.7 meters wide, and stands 30 centimeters in height. There is a gap in the southwestern corner where the southwestern and southeastern walls do not meet up. This possibly could be an entryway into the enclosure. The enclosure is situated on a prominent outcrop and has a commanding view in all directions. The interior surface of the enclosure consists mainly of exposed bedrock with pockets of thinly deposited soil. A small waterworn cobble was observed in the southeastern corner of the enclosure (Figure 27). This site is in a poor state of preservation and likely reflects temporary habitation use of the area during the Historic Period.

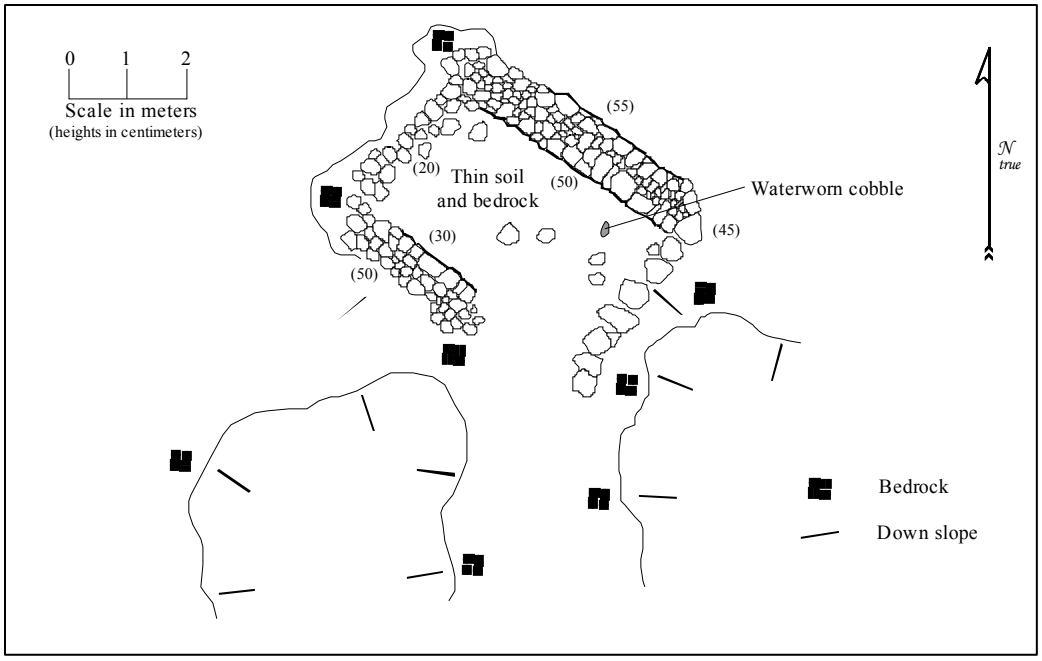

Figure 25. SIHP Site 25809 plan view.

Figure 26. SIHP Site 28509 north wall.

Figure 27. SIHP Site 28509 waterworn cobble on surface.

Summary and Discussion

As a result of the current study five archaeological sites were recorded within the project APE. These sites reflect possible Precontact temporary habitation and opportunistic agricultural activities (SIHP Sites 28507 and 28508), and nineteenth and twentieth century habitation (SIHP Site 28509) and ranching activities (SIHP Sites 28504 and 28505). All five of the sites have been significantly impacted by prior highway construction and past ranching activities. Only the most recent of the sites, those likely associated with twentieth century ranching activities, exhibit intact architecture. However, when taken as a whole the five sites documented in the current study enhance and expand our knowledge of the past land use history for Ka‘alāiki Ahupua‘a laid out in the “Portrait of Life at Kāwā” (Mann and Bowen 1976) as painted through the interview of Lydia Papalimu (born at Kāwā in 1907 and resident there until the 1957; the last of the original Kāwā villagers). The current study area lays *mauka* of the coastal village and *makai* of the inland farm lands. While evidence from SIHP Sites 28507 and 28508 may reflect Precontact activities, use of this area prior to Historic Period plantation and ranching activities, was likely very sporadic. Lydia Papalimu (her mother was Becky Kimokeo Napoleon) was a descendant of Kimokeo who had received *kuleana* land in neighboring Hilea Nui Ahupua‘a and who had purchased fee simple grant lands in Ka‘alāiki. It is through these latter lands that the highway was constructed and the current APE lies. Another purported member of the Kimokeo lineage (Abel Lui and his extended family) returned to the Kāwā coastal area several years after the village had been abandoned and took up residence there claiming native tenant right and sovereignty. Abel Lui today also claims *konohiki* status and through his presence and stewardship at Kāwā has developed a sizeable following of both Hawaiian and non-Hawaiian sympathizers. I mention this here because their presence had an impact on our work (the field crew was intimidated and verbally abused) and may affect future work in the area.

SIGNIFICANCE EVALUATION AND DETERMINATION OF EFFECTS

The sites recorded during the current study are assessed for their significance based on the National Register Criteria. This significance evaluation should be considered as preliminary until the Hawaiʻi State Historic Preservation Officer (SHPO) provides concurrence. As contained in the Federal legislation and its implementing regulation (Section 106 of the National Historic Preservation Act and 36 CFR Part 800, respectively), a resource must be considered a Historic Property, that is a resource "listed or eligible for listing in the National Register of Historic Places" before a determination of effects can be made. The criteria for evaluating eligibility (36 CFR § 60.4) are as follows:

> The quality of significance in American History, architecture, archaeology, engineering, and culture is present in districts, sites buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and,
>
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) that are associated with the lives of persons significant in our past; or
>
> (c) that embody the distinctive characteristics of a type, period, or method of construction; or that represent the work of a master; or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or;
>
> (d) that have yielded, or may be likely to yield, information important in prehistory or history.

Table 4 is a listing of the five sites (SIHP Sites 28504, 28505, 28507, 28508, and 28509) documented during the current study. Although not in pristine states of preservation, all five do retain sufficient integrity to be considered significant under Criterion d for the information they have yielded relative to former Precontact and Historic land use in this portion of the Kaʻū District of Hawaiʻi Island; thus making the sites potentially eligible for listing in the National Register of Historic Places. However, it is suggested that a reasonable and adequate amount of information has been collected about these potential historic properties during the current study to warrant a no mitigation work requirement, and thus a no adverse effects determination for these sites with respect to the proposed Māmalahoa Highway Drainage Improvements Project. Two of the sites (Sites 28508 and 28509) while within the APE are situated at locations where they potentially could be avoided during construction. If the engineering for the new highway can work without impacting these sites, then the APE fencing can be placed between these sites and the proposed construction areas thus preserving these two sites through avoidance.

Table 4. Site significance and treatment recommendations.

SIHP Site #	*Significance*	*Treatment*	*Comment*
28504	d	No further work	
28505	d	No further work	
28507	d	No further work	
28508	d	No further work	Potential avoidance during construction
28509	d	No further work	Potential avoidance during construction

As noted earlier in this study in an effort to protect potential historic properties that may exist outside of the APE, construction fencing will be placed along the APE boundaries and no construction work will be permitted outside of the fencing. It is the further recommendation of this study that an archaeological monitor be present during the establishment of the APE fencing to help guide the installation in an effort to protect as many sites both inside and outside of the APE as possible. A monitor is also recommended during initial grubbing and grading activities so that an immediate response can occur if previously unrecognized potential historic properties are inadvertently discovered during construction activities.

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MAMALAHOA HIGHWAY DRAINAGE IMPROVEMENTS AT KĀWĀ FLATS

ENVIRONMENTAL ASSESSMENT

TMKs (3rd): 9-5-016:006, 022, 025 & 026
Kāʻu District, County of Hawaiʻi, State of Hawaiʻi

APPENDIX 3
Cultural Impact Assessment

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RC-0545

Cultural Impact Assessment for the Proposed Māmalahoa Highway Drainage Improvements Project

Kaʻalāiki Ahupuaʻa
Kaʻū District
Island of Hawaiʻi

DRAFT VERSION

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July 2010

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ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL STUDIES

RC-0545

Cultural Impact Assessment for the Proposed Māmalahoa Highway Drainage Improvements Project

Ka‘alāiki Ahupua‘a
Ka‘ū District
Island of Hawai‘i

RECHTMAN CONSULTING

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INTRODUCTION

At the request of Ron Terry, Ph.D. of Geometrician Associates, LLC, on behalf of the Hawai‘i State Department of Transportation Highways Division, Rechtman Consulting, LLC has prepared this Cultural Impact Assessment (CIA) associated with the proposed Kāwā Flats Drainage Improvements Project on TMKs: 3-9-5-16:006 and 022; 25, and 026 located along Highway 11 within Ka‘alāiki Ahupua‘a, Ka‘ū District, Island of Hawai‘i (Figure 1). This proposed undertaking involves state land and state and federal funds, thus environmental documentation is being prepared pursuant to both federal and state regulations. Specifically, this report was prepared in support of an environmental assessment in compliance with HRS Chapter 343 as amended by Act 50 approved by the governor April 26, 2000, and in accordance with the Office of Environmental Quality Control (OEQC) *Guidelines for Assessing Cultural Impact*, adopted by the Environmental Council, State of Hawai‘i, on November 19, 1997.

A comprehensive archaeological study (Rechtman 2010) for the current project area was also recently completed in compliance with Section 106 of the National Historic Preservation Act. As a result of that study, five archaeological sites (SIHP Sites 28504, 28505, 28507, 28508, and 28509) were identified and recorded within the project area. Site 28504 is a Historic Period wall complex, Site 28505 is a Historic Period wall, Site 28507 is a Precontact Period enclosure and lava depression, Site 28508 is a clustering of rock piles, and Site 28509 is a Historic Period enclosure (Figure 2). These five sites were assessed for their significance based on the National Register Criteria, and although not in pristine states of preservation, all five were considered significant under Criterion d for the information they have yielded relative to former Precontact and Historic land use in this portion of the Ka‘ū District of Hawai‘i Island; thus making the sites potentially eligible for listing in the National Register of Historic Places. However, it was suggested that a reasonable and adequate amount of information had been collected from the sites during the archaeological study to warrant a no mitigation work requirement, and thus a no adverse effects determination for these sites with respect to the proposed project. It was recommended that construction fencing be placed along the limits of the proposed construction area and that no construction work be permitted outside of the fencing. It was the further recommended that an archaeological monitor be present during the establishment of the perimeter fencing to help guide the installation in an effort to protect as many sites both inside and outside of the project as possible. A monitor was also recommended during initial grubbing and grading activities so that an immediate response can occur if previously unrecognized potential historic properties were to be inadvertently discovered during construction activities.

Because this section of Highway 11 was built with insufficient drainage, it is subject to severe flooding during periods of intense rainfall (Figure 3). This flooding presents an immediate hazard to motorists and can also be a danger to all Ka‘ū residents since it may obstruct emergency vehicles. The proposed drainage improvements will include installing new culverts and raising the level of the highway. A temporary bypass road built on the *makai* side of the highway will be used during construction. This road will also remain after construction to provide access to an existing dirt road that provides access to the shore. The project is designed to reproduce the pre-existing hydrology of the intermittent drainage, passing the flow of water under, rather than over, the highway, and will not change the quantity or sediment characteristics of the flood water as it makes its way overland or underground towards the sea. Therefore, no effects to resources outside of the defined project area or changes in coastal or marine ecosystems are expected.

Below is a description of the general project area and the proposed development activities. This is followed by a detailed background section providing setting and context (cultural, historical, and regional) to facilitate a more complete understanding of the potential significance of the cultural landscape and the historic and cultural properties within that landscape. Next, the consultation process is described, which is followed by a discussion of potential cultural impacts and the appropriate actions and strategies that mitigate any potential impacts.

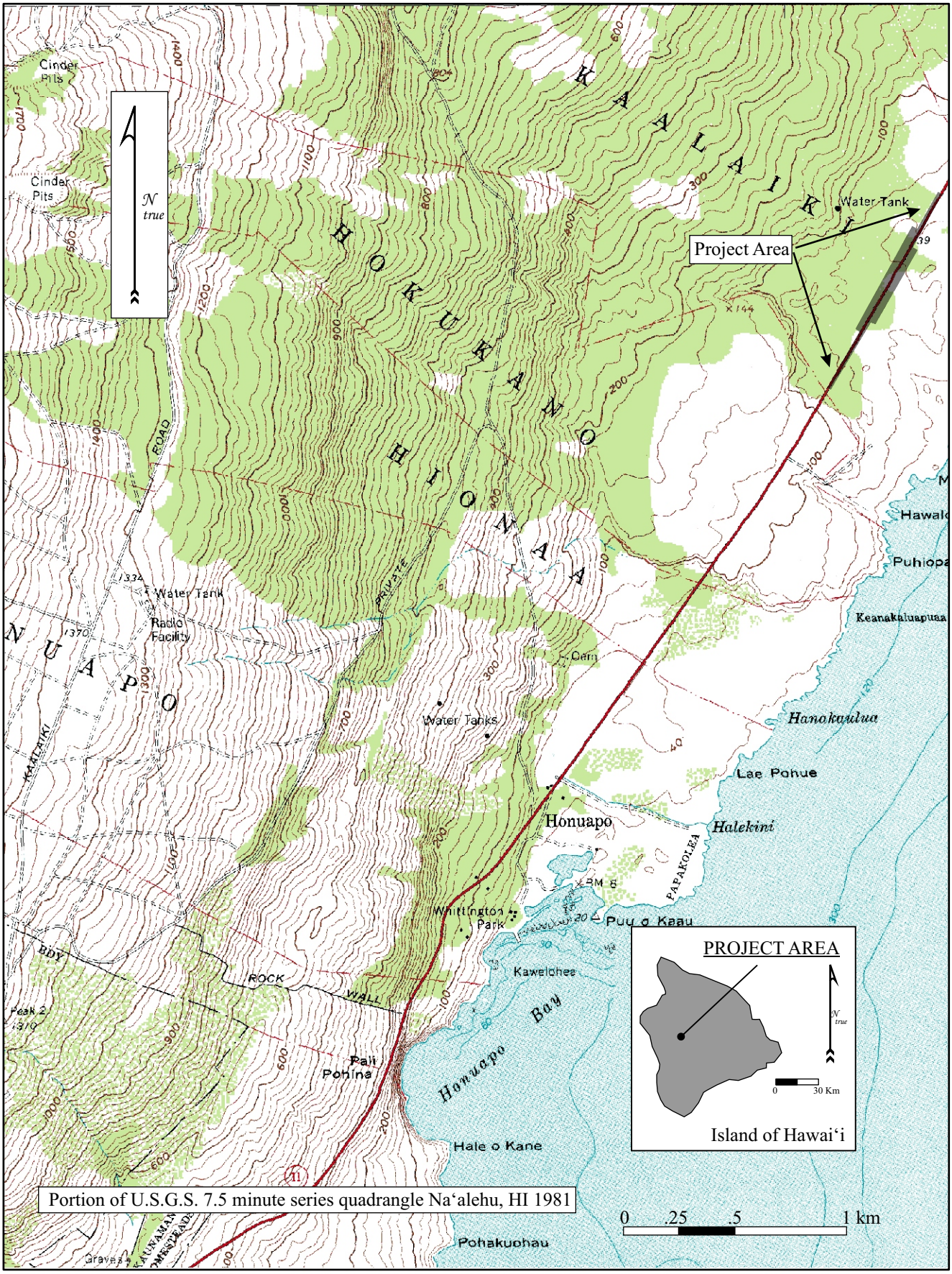

Figure 1. Project area location.

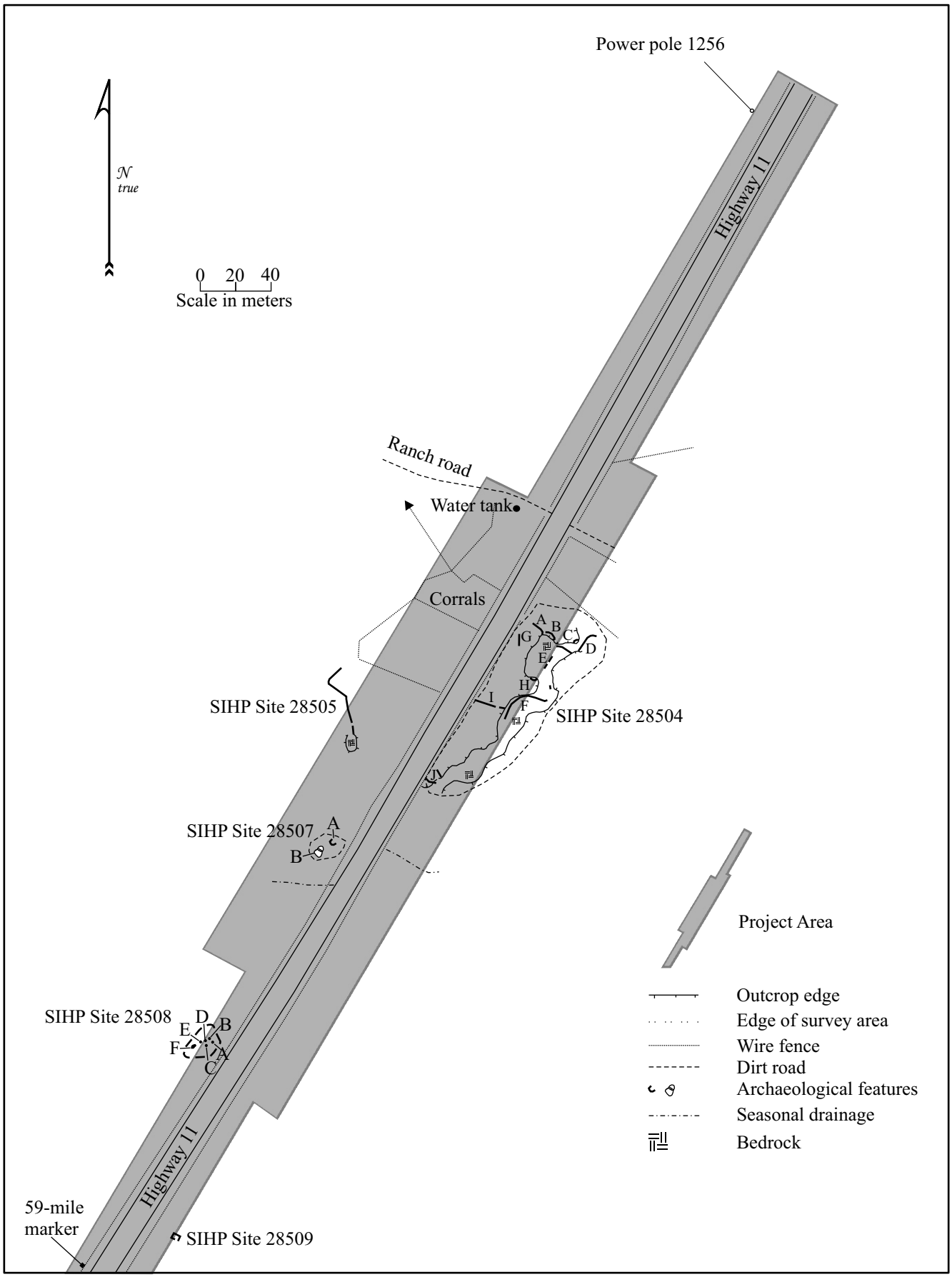

Figure 2. Archaeological sites recorded within the project are.

Figure 3. The section of Highway 11 that is subject to flooding.

PROJECT AREA DESCRIPTION AND PROPOSED DEVELOPMENT ACTIVITIES

Given the design requirements of the proposed drainage control features, the need for a temporary bypass road, and the desire to limit potential effects on possible cultural resources, the project area (see Figure 2) is defined as a corridor that is 50 feet on either side of the existing highway beginning at the northern extent of construction. On the *mauka* side of the highway this corridor extends southward for 1250 feet; at which point it expand to a distance of 150 feet *mauka* of the existing highway, and follows this course for 1,400 feet at which point it returns to a corridor that extends 50 feet on the *mauka* side of the existing highway until the southern extent of the construction. On the *makai* side of the existing highway, the initial 50 foot distance is maintained for 1,000 feet at which point it expands to 100 feet distant from the existing highway. The project area boundary travels this course for 2,000 feet where it returns to a distance of 50 feet *makai* of the existing highway until the southern extent of the construction. During construction the boundaries will be marked by the placement of orange construction fencing, and no construction work will occur outside of the barrier fencing.

The study area is located between 40 and 80 feet above sea level, and terrain within this area slopes to the southeast and consists of *pāhoehoe* outcrops, overhangs, and pockets of soil. A portion of the northern end of the project area is classified as rock land (rRO) consisting of *pāhoehoe* bedrock covered in some places by a thin soil layer (Sato et al. 1973). The *pāhoehoe* lava originated from Mauna Loa 750 to 1,500 years ago (Wolfe and Morris 1996). The average depth of the soil is between 6 and 8 inches. In some places the soil extends down into cracks within the bedrock. Vegetation in this area is usually confined to the soil filled areas and cracks. The remainder of the project area consists of *pāhoehoe* lava flows (rLW) in which there are no soils covering the lava and there are hummocks and pressure domes (Sato et al. 1973). This *pāhoehoe* lava originated from Mauna Loa 3,000 to 5,000 years ago (Wolfe and Morris 1996). A number of pressure domes appear to have collapsed either during formation or following formation, as there are numerous lava blisters small overhangs within the study area.

Vegetation within the current project area consists of *koa haole* (*Leucaena leucocephala*), fountain grass (*Pennisetum setaceum*), Christmas-berry (*Schinus terebinthifolius*), banyan (*Ficus benghalensis*), *kiawe (Prosopis pallida*), lantana (*Lantana camara*), guinea grass (*Panicium maximum*), and other various grasses and vines.

CULTURE-HISTORICAL BACKGROUND

The current project area is in the district of Kaʻū, the largest of the six traditional districts on the island of Hawaiʻi. It lies in Kaʻalāiki Ahupuaʻa. Pukui et al. (1974:60) indicate that Kaʻalāiki literally translates as "small lava rock;" however, *ʻalā* are better defined as "dense waterworn volcanic stone" (Pukui and Elbert 1986:16), and the name may be in reference to the natural concentration of such stones along the shoreline of this *ahupuaʻa*. Alternatively, *alāiki* (without the *okina*) means "appropriation of property by force" (Pukui and Elbert 1986:18), and could reference past events that may have occurred in this area.

A Generalized Model of Hawaiian Prehistory

Archaeologists and historians describe the inhabiting of the Hawaiian Islands in the context of settlement that resulted from voyages taken across the open ocean. For many years, researchers have proposed that early Polynesian settlement voyages between Kahiki (the ancestral homelands of the Hawaiian gods and people) and Hawaiʻi were underway by A.D. 300, with long distance voyages occurring fairly regularly through at least the thirteenth century. It has been generally reported that the sources of the early Hawaiian population—the Hawaiian Kahiki—were the Marquesas and Society Islands (Emory in Tatar 1982:16-18). The southern part of Hawaiʻi Island was likely one of the first places to be settled.

Over a period of several centuries areas with the richest natural resources became populated and perhaps crowded, and by about A.D. 900 to 1100, the population began expanding to the *kona* (leeward side) and more remote regions of the island (Cordy 2000:130). In Kaʻū, where the land is dry and rugged, a few small communities were initially established along sheltered bays with access to fresh water and rich marine resources. The coastal area of Kaʻalāiki, including a portion of the southern part of Hīlea Nui is generally referred to as Kāwā. The Kāwā springs are located within Kaʻalāiki Ahupuaʻa, near the shore. The springs "empty into a tidal inlet that extends inland for over 500 ft" (Kelly 1980:26). The spring fed pond acted as a fishpond and there is said to be a large red stone in the middle of the pond that is a *kū ula*, or fish god (Kelly 1980:26).

The communities shared extended familial relations, and there was an occupational focus on the collection of marine resources. By the fourteenth century, inland elevations were being turned into dryland agricultural fields. By the fifteenth century, residency in the uplands was becoming permanent, and there was an increasing separation of the chiefly class from the common people. In the sixteenth century the population stabilized and the *ahupuaʻa* land management system was established as a socioeconomic unit (see Ellis 1963; Handy and Handy 1972; Kamakau 1992; Kelly 1983; and Tomonari-Tuggle 1985). Soon, large areas of land began to be controlled by the most powerful chiefs.

In the first part of the 18th century Kalaniopuʻu (Kamehameha I's uncle) established himself as the high chief of Kaʻū. This following the death of the Kaʻū chief Nuʻuanupaʻahu, who was an excellent surfer and was said to have practiced at Kāwā (Kamakau 1992:106). Kāwā was also mentioned by John Papa Iʻi (1963:134) as a famous surfing place.

In 1754, after many bloody battles, Kalaniopuʻu defeated Keaweopala in South Kona and declared himself ruler of the Island of Hawaiʻi (Kamakau 1992:78). Kalaniopuʻu went on to rule for nearly thirty years and was ruler during the first recorded visit to Hawaiʻi by European explorers.

History After Contact

Captain James Cook landed in the Hawaiian Islands on January 18, 1778. In January of 1779 he visited South Point for the first time on board his ships the Resolution and Discovery. Cook recorded a large village on the point and he met with some of the inhabitants who brought supplies to his ships. Cook was not overly impressed with the size of the pigs, nor the amount of fruit and vegetables offered, and he noted that "the Country did not seem capable of producing many of either having been destroyed by a Volcano…" (Beaglehole 1967:486). King, who accompanied Cook on the voyage, wrote:

> It is not only by far the worst part of the Island but as barren waste looking a country as can be conceived to exist…we could discern black Streaks coming from the Mountain even down to the Seaside. But the [southern] neck seems to have undergone a total

> change from the Effect of Volcanoes, Earthquakes, etc…By the SE side were black honey combed rocks, …horrid & dismal as this part of the Island appears, yet there are many Villages interspersed, & it struck as being more populous than the part of Opoona [Puna] which joins Koa [Ka‘ū]. There are houses built even on the ruins [lava flows] we have described (Beaglehole 1967:611).

Around 1781, after the Resolution and Discovery had come and gone, a rebel Puna chief named Imakakolo‘a led an uprising against Kalaniopu‘u. The rebel chief was defeated in Puna by Kalaniopu‘u’s superior forces, but Imakakolo‘a managed to avoid capture and hide from detection for the better part of a year. While the rebel chief was sought, Kalaniopu‘u “went to Ka‘ū and stayed first at Punalu‘u, then at Waiohinu, then at Kama‘oa in the part of Ka‘u, and erected a heiau called Pakini, or Halauwailua, near Kama‘oa” (Kamakau 1992:108). Imakakolo‘a was eventually captured and brought to the *heiau*, where Kiwala‘o (Kalaniopu‘u’s son) was to sacrifice him as an offering. “The routine of the sacrifice required that the presiding chief should first offer up the pigs prepared for the occasion, then bananas, fruit, and lastly the captive chief” (Fornander 1996:202). However, before Kiwala‘o could finish the first offerings, Kamehameha, following the counsel of chiefs loyal to him, “grasped the body of Imakakolo‘a and offered it up to the god, and the freeing of the tabu for the heiau was completed” (Kamakau 1992:109). Upon observing this single act of insubordination, many of the chiefs believed that Kamehameha would eventually rule over all of Hawai‘i.

By 1796 Kamehameha had indeed conquered all of the islands except Kaua‘i. It wasn’t until 1810 when Kaumuali‘i of Kauai gave his allegiance to Kamehameha that the Hawaiian Islands were unified under one ruler (Kuykendall and Day 1976). Kamehameha died on May 8, 1819 in Kailua-Kona, and once again the culture of Hawai‘i was to change radically. Six months after his death, his son and successor, Liholiho (Kamehameha II), met with *kuhina nui,* Ka‘ahumanu, and a council of chiefs and chiefesses at Kailua. His advisors, which included the *kahuna* Hewahewa, convinced him to abolish the *kapu* system. He signified his agreement by sitting down and eating with his mother Keopulani, breaking the *‘ai kapu* (Oliver 1961; Kuykendall and Day 1976; Kamakau 1992).

Liholiho’s cousin, Kekuaokalani, caretaker of the war god *Ku-Kailimoku*, disagreed with the breaking of the *‘ai kapu* and revolted. By December of 1819 the revolution was quelled. Kamehameha II sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the *heiau* images, and ordering that the *heiau* structures be destroyed or abandoned and left to deteriorate. He did, however, allow the personal family religion, the ‘*aumakua* worship, to continue (Oliver 1961; Kamakau 1992).

In October of 1819, seventeen Protestant missionaries set sail from Boston to Hawai‘i. They arrived in Kailua-Kona on March 30, 1820 to a society with a religious void to fill. Many of the *ali‘i,* who were already exposed to western material culture, welcomed the opportunity to become educated in a western style and adopt their dress and religion. Soon they were rewarding their teachers with land and positions in the Hawaiian government.

The Reverend William Ellis, one of the missionaries, visited the Ka‘ū District in July of 1823. He traveled through Ka‘alāiki Ahupua‘a, although he doesn’t mention it by name. What follows are excerpts from his journey from Honuapo to Hōkūkano and his arrival at Hīlea:

> After traveling some time over a wide tract of lava, in some places almost as rugged as any we had yet seen, we reached Hokukano. Here we found an excellent spring of fresh water, the first we had yet seen on our tour, though we had travelled upwards of a hundred miles.
>
> While we were stopping to drink, and rest ourselves, many natives gathered around us from the neighbourhood…
>
> We travelled over another rugged tract of lava about two hundred rods wide. It had been most violently torn to pieces, and thrown up in the wildest confusion; in some places it was heaped forty or fifty feet high. The road across it was formed of large smooth round stones, placed in a line two or three feet apart…

> About half-past eleven we reached Hilea, a pleasant village belonging to the governor. As we approached it, we observed a number of artificial fish-ponds, formed by excavating the earth to the depth of two or three feet, and banking up the sides…
>
> We went into the house of the head man, and asked him to collect the people together, as we wished to speak to them about the true God. He sent out, and most of the people of the village, then at home, about two hundred in number, soon collected in his house, which was large, where Mr. Thurston preached to them… (Ellis 2004: 195-196).

It's possible that when Ellis referred to the fresh water springs of Hōkūkano, he was actually in Kaʻalāiki where the Kāwā Springs are located. A review of cartographic resources for this current study showed no springs in Hōkūkano. The fishpond Ellis refers to may actually have been the pond at Kaʻalāiki, or there may have been a pond at Kāwā Bay, which is in Hīlea Nui.

The missionaries first initiated population census reports for the Hawaiian Islands in 1831-1832 and 1835-1836, before which there were only rough estimates. The missionary census data from 1835-1836 lists 238 people, including 67 children for both Kaʻalāiki and Hīlea Nui combined.

Kelly (1969) estimated that the Kaʻū District had a population of between 10,000 and 13,500 at the time European contact, but that it declined to less than 2,000 people by 1872. There was not a single reason for the decrease in population, but rather it occurred through an accumulation of changes that took place after European contact. One often cited reason is that foreigners brought foreign diseases with them, to which the Native Hawaiians had no resistance. In addition to this, many people migrated to other islands, such as when Governor Kuakini moved from Hawaiʻi Island to Oʻahu, and many of his people followed him. Also, men who began working on foreign whaling ships emigrated to foreign countries and rarely ever returned to Hawaiʻi (Schmitt 1973:16).

Native land tenure practices also underwent drastic changes during the early Historic Period. In Precontact Hawaiʻi the districts, such as Kaʻū, were divided into *ahupuaʻa*. In these land units the native tenants tended fields and cultivated crops necessary to sustain their families, and the chiefly communities with which they were associated. As long as sufficient tribute was offered and *kapu* (restrictions) were observed, the common people, who lived in a given *ahupuaʻa* had access to most of the resources from mountain slopes to the ocean. These access rights were almost uniformly tied to residency on a particular land, and earned as a result of taking responsibility for stewardship of the natural environment, and supplying the needs of the *aliʻi* (see Kamakau 1992:372-377 and Malo 1951:63-67).

Entire *ahupuaʻa*, or portions of the land were generally under the jurisdiction of appointed *konohiki* or lesser chief-landlords, who answered to an *aliʻi-ʻai-ahupuaʻa* (chief who controlled the *ahupuaʻa* resources). The *aliʻi-ʻai-ahupuaʻa* in turn answered to an *aliʻi ʻai moku* (chief who claimed the abundance of the entire district). Thus, *ahupuaʻa* resources supported not only the *makaʻāinana* and *ʻohana* who lived on the land, but also contributed to the support of the royal community of regional and/or island kingdoms. This form of district subdividing was integral to Hawaiian life and was the product of strictly adhered to resources management planning. In this system, the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources. Also, in communities with long-term royal residents, divisions of labor (with specialists in various occupations on land and in procurement of marine resources) came to be strictly adhered to.

Handy and Handy (1972:554) provide a cartographic sketch indicating the various zones of sea and land in the District of Kaʻū and their uses by Hawaiians. The construct is based on the Hawaiian terms for the major vegetation zones that are used to define and segregate space within the regions *ahupuaʻa*. The zones are bands roughly parallel to the coast that mark changes in elevation and rainfall. The current project area falls within what has been termed the *kula kai* zone. The *kula kai* was the lowest habitable zone. Residents of the *kula kai* depended largely on marine resources, but also grew sweet potato and gourds. Other vegetables were acquired through trade with *mauka* relatives (Handy and Handy 1972).

The socioeconomic and demographic changes that took place in the period between 1790 and the 1840s altered the traditional Hawaiian land tenure system and promoted the establishment of a Euroamerican style of land ownership. In 1848, the *Māhele* was the vehicle for determining ownership of

the native land. The *Māhele* defined the land interests of Kamehameha III (the King), the high-ranking chiefs, and the *konohiki*. As a result of the *Māhele*, all land in the Kingdom of Hawai‘i came to be placed in one of three categories: (a) Crown Lands (for the occupant of the throne); (b) Government Lands; and (c) *Konohiki* Lands. Laws in the period of the *Māhele* record that ownership rights to all lands in the kingdom were "subject to the rights of the native tenants;" those individuals who lived on the land and worked it for their subsistence and the welfare of the chiefs (Sinoto and Kelly 1970).

During the *Māhele*, Ka‘alāiki was retained as Government land. There were a total of seven *kuleana* awarded within Ka‘alāiki (Table 1). A single LCAw. was awarded *makai* of Highway 11 at the coast and the remaining six were located *mauka* of Highway 11 at 1,200 feet elevation or higher. One claimant (Kaluahine) received two sections (LCAw. 7091:1 and 2). LCAw. 7091:1 was located at the coast and LCAw. 7091:2 was located in the *mauka* reaches of Ka‘alāiki.

Following the *Māhele*, the Kingdom established a program of selling parcels of land to interested residents. The grant program was initiated in an effort to encourage more native tenants onto fee-simple parcels of land. The parcels of land sold in the grants were quite large, ranging in size from approximately ten acres to many hundreds of acres. When the sales were agreed upon, Royal Patents were issued and recorded following a numerical system that remains in use today. There were a total of sixteen land grants sold within Ka‘alāiki (see Table 1). One grant purchaser (Waapa) was also a *kuleana* awardee. The grant sales span between 1852 and 1910, with a majority sold during 1859. The current project area crosses two grants (Grants 993 and 2370). Grant 993 was sold to Keawe Kimokeo in 1852 and consisted of 119.5 acres. Grant 2370 was sold to Noa Malailua in 1857 and consisted of 350.0 acres.

Table 1. Land Commission Awards and land grants within Ka‘alāiki Ahupua‘a.

Claimant	*LCAw. #*	*Grant #*	*Year the grant was purchased*
Kaluahine	7091:1 and 2		
Waapa	10952:2	2948	1864
Nawahine	10371:2		
Punanoa	10652		
Aea	10554		
Uluhani	10914:2		
Kauikoaole	7093		
Nakuaau		2527	1858
Kimokeo, Keawe		993 and 1530	1852 and 1855
Kapuni		2218	1857
Malailua, Noa		2370	1857
Lio		2387	1857
Apiki		2645	1859
Kapai		2646	1859
Kahaku		2647	1859
Puhi		2648	1859
Kauwe		2651	1859
Kailiulaole		2657	1859
Kainoa		2676	1859
Keheananui		2943	1864
Kau Ag. Co. Ltd.		5234	1910

In 1862, the Commission of Boundaries (Boundary Commission) was established in the Kingdom of Hawai‘i to legally set the boundaries of all the *ahupua‘a* that had been awarded as a part of the *Māhele*. Subsequently, in 1874, the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them. The primary informants for the boundary descriptions were older native residents of the lands, many of which had also been claimants for *kuleana* during the *Māhele*. This information was collected primarily between 1873 and 1885 and was usually given in Hawaiian and transcribed in English as it occurred. As Ka‘alāiki was retained as Government land, there was no boundary testimony taken for this *ahupua‘a*. Likewise the *ahupua‘a* neighboring Ka‘alāiki to the north and south were also Government lands.

In this part of Kaʻū, many Native Hawaiians that received *kuleana* lands took part in the *pulu* trade of the 1860's. The *pulu* trade pulled families away from their land and houses and created a dependency on *pulu* for material possessions. This was a sharp contrast to the self-subsistent lifestyle they were accustomed to. The Rev. Shipman wrote about the effects of the *pulu* trade on the people:

> …The effect—on them—is not good; not that the pulu is not a source from which they might secure comfort to themselves and families, but the actual result is the reverse. They are offered goods to almost any amount, to be paid for in pulu; this to a native is a strong temptation to go into debt…When once in this condition they are almost entirely under the control of their creditors, and are compelled to live in the pulu regions, at the peril of losing their houses and lots, and whatever other property they possess. Thus their homes are almost in reality deserted, ground uncultivated (Station Report, Ms. [1860] in Kelly 1980).

Mann and Bowen (1976) specifically relate that the residents of Kaʻalāiki complained to the Interior Department that they were being mistreated by Nicolas George, a *pulu* trader who controlled their land under government lease; and asked the Kingdom government to revoke his interest in the land.

In 1868, as must have happened countless times during the Precontact Period, a volcanic eruption emanating from Mauna Loa shook Kaʻū, changing the landscape forever. Beginning on March 27th, a series of earthquakes were felt and lava began flowing on the slopes of Mauna Loa. These initial eruptions "destroyed a large stone church at Kahuku, and also all the stone dwelling houses in that place, including the houses….at the foot of the mountain" (Coan 1868:106). Then on April 4th an even larger eruption occurred. Fredrick S. Lyman, who witnessed the eruption first hand, wrote:

> Soon after four o'clock p.m. on Thursday we experienced a most fearful earthquake. First the earth swayed to and fro from north to south, then from east to west, then round and round, up and down, and finally in every imaginable direction, for several minutes, everything crashing around, and the trees thrashing as if torn by a hurricane, and there was a sound as of a mighty rushing wind. It was impossible to stand: we had to sit on the ground, bracing with hands and feet to keep from being rolled over…we saw…an immense torrent of molten lava, which rushed across the plain below…swallowing everything in its way;--trees, houses, cattle, horses, goats, and men, all overwhelmed in an instant. This devouring current passed over a distance of about three miles in as many minutes, and then ceased (Lyman 1868:109).

Within minutes of the initial quake, the ocean rose up and a *tsunami* pounded the coast, washing inland in some locations as far as 150 yards (Sinoto and Kelly 1970:51). It was recorded that the wave destroyed 108 houses in Kaʻū and drowned forty-six people (Coan 1882:316). A *kamaʻāina* of Kaʻu who witnessed the destruction submitted a letter to *Ka Nupepa Kuokoa* (April 11, 18, 1868) in which, among a very descriptive retelling of the events he stated that "[T]he houses of Kaʻaluʻalu, Paiahaʻa, Honuʻapo, Hokukano, Kaʻalaiki, the two Hilea, Ninole, Wailau, Punaluʻu and as far as Keauhou, were all swept away by the sea-… (Handy and Handy 1972). A ship passing South Point, about three miles distant from land, at the time of the eruption, reported that a conical island four hundred feet high rose out of the ocean midway between the vessel and shore (Whitney 1868:114). The *tsunami* devastated coastal villages and forced people to move inland to towns such as Nāʻālehu and Pāhala. Frederick Lyman (1868:110) wrote:

> The villages on the shore were swept away by the great wave that rushed upon the land immediately after the earthquake. The eruption of earth destroyed thirty-one lives, but the waves swallowed a great number.

Eight years following this catastrophic event, the Reciprocity Treaty in 1876 was signed, which granted the Hawaiian Islands free trade in certain commodities, such as sugar. Around this time at least five sugar plantations were started in Kaʻū. By 1880 there were three sugar mills and one under construction. The Hutchinson Sugar Plantation villages were located at Hīlea, Honuʻapo, Nāʻālehu, and Kaʻalāiki. By 1928, the more remote plantation villages were closed down and the residents moved to Nāʻālehu. Following the heyday of the sugar plantations in this region, the current study area was used as cattle pasture until recent times.

DISCUSSION OF PRIOR STUDIES

There have been only a few prior studies within Kaʻalāiki Ahupuaʻa, and of the five archaeological investigations (Stokes and Dye 1991; Ching 1967; Emory 1970; Ewart 1978; and Mann and Bowen 1976), conducted one (Mann and Bowen 1976) contained an oral historical component. A summary of these studies is presented in chronological order below.

Early archaeology in Kaʻalāiki began with John Stokes. Stokes recorded one *heiau* in Kaʻalāiki. The *heiau* was called ʻImakakaloa Heiau or ʻImakakoloa Heiau, and was located approximately one mile inland from the ocean (at approximately the 300 foot elevation), *mauka* of Highway 11, and west of the current study area. It is unclear whether this *heiau* still exists. John Stokes description of ʻImakakoloa/ʻImakakaloa Heiau is provided below:

> *ʻImakakaloa Heiau, or ʻImakakoloa Heiau*
>
> *Heiau* of ʻImakakaloa or ʻImakakoloa, land of Kaʻalāiki, Kaʻū. Located on slopes of the open country, a mile from the sea.
>
> This *heiau* is a series of enclosures with walls sometimes broadened into platforms. The ground declines to the southeast, but the earth floors of the enclosure have been approximately leveled as though by cutting and filling. The large enclosure on the southeast is said to have been for the chiefs and *kahuna,* the stone pavement shown being the *kuahu*. Outside and adjoining the wall of this enclosure on the west is a platform on foot high. To the north of the latter is another platform 4.5 feet high, an extension of the walls. This last is said to have been the *hale o Papa*. The second largest enclosure is said to have been for the *hale hula*. There was no information regarding the smallest enclosure. [In Thrum's catalogue the larger enclosure was "said to have been devoted to hula" (1907a:47). W.T.B.] (Stokes and Dye 1991:126,127)

In 1967 Francis Ching investigated selected areas on Hawaiʻi Island to determine where National Historic Landmark plaques should be placed (Ching 1967). In Kaʻalāiki, around Kāwā Bay, Ching reiterated what was written in a 1967 Lloyd Soehren letter; that from the southern side of Kāwā Bay to the next lava flow there were "…a considerable number of house sites, grave sites, camp sites, and other architectural features pertaining to the aboriginal and early post-European Hawaiian culture" (Ching 1967:10). These features were located to the southeast of the current project area.

In 1970, the Bishop Museum Department of Anthropology conducted an inventory of archaeological and historical sites in the districts of Kona, and Kaʻū and in ʻAnaehoʻomalu, South Kohala, Island of Hawaiʻi (Emory 1970). The work for this study was largely based on Violet Hansen's island wide survey and the Bishop Museum's register. All of the sites and features were already listed in the Bishop Museum register, and this report was only a visit to the sites to observe their then present condition. In Kaʻalāiki, Kāwā, there were ninety-seven sites recorded along the coast, southeast of the current project area. In the immediate vicinity of the Kāwā Spring there were six sites, two wells, and one enclosure. To the south of the spring there were ten house sites, two platforms, twenty-two burials, ten enclosures, and one shelter. On the coast at Kaʻiliʻiki, within Kaʻalāiki were two house complexes, a shelter cave, a platform, a burial platform, and a house site. On the coast at Wailea, within Kaʻalāiki there were five house sites, two agricultural features, two burial platforms, and a walled pond. From Wailea to Hawaloa, in the extreme southern part of the *ahupuaʻa* there were eight house sites, five platforms, three agricultural features, and thirty or more burials, mostly the platform type. A petroglyph consisting of a large circle, with small circles on the interior was located at the boundary between Kaʻalāiki and Hōkūkano.

In 1976, two graduate students (Herbert Mann and Anne Bowen) undertook an archaeological survey of Kāwā, located along the coast of Kaʻalāiki and Hīlea Nui *ahupuaʻa* (Mann and Bowen 1976). Their survey extended from Highway 11 to the coast and was bordered to the north by Hīlea Stream, and to the south by a property fence line within Kaʻalāiki Ahupuaʻa. They re-identified and mapped previous Bishop Museum sites. Mann and Bowen (1976) did not identify any archaeological sites within the current project area. Due to time constraints they recorded mainly house sites, enclosures, depressions, and possible burials. Those sites in which they were unsure of the earlier Bishop Museum site number received the nearest site number, followed by the letter "A". They recorded three house sites that were not previously

identified in Bishop Museum records. There were seven house sites that were identified as having Bishop Museum site numbers. Some of the house sites appeared to predate the 1868 *tsunami*. There were also enclosures (animal or garden use), and planting holes (*mākālua*) associated with the house sites. Although they did not go into detail about the burials in the area, they did state that there were seven gravesites said to be of the Kinin Family. A number of petroglyphs were recorded along the coast that represented birds, fish, and anthropomorphic figures, as well as pecked bait cups. Large concentrations of traditional and transitional artifacts were located on the hill *mauka* of Hīlea Stream. It appeared that this area may have once been settled, but was in disarray and badly disturbed, presumably by the 1868 *tsunami*. The *tsunami* was said to have "destroyed the villages of Ninole, Kawaa and Honuapo" (Hawaiian Gazette in Kelly 1980:41). As a result of their survey they did not identify any sites that were exclusively Precontact in age. According to Mann and Bowen (1976), the last member of the original Kāwā resident families was Mrs. Lydia Papalimu, reported to have left the area in 1957. Mann and Bowen (1976) conducted an oral-historical interview with Mrs. Papalimu, who was born in a grass house at Kāwā in 1907. This interview paints the portrait of live at Kāwā during the early twentieth century when about 50 people were living in the coastal village. Mrs. Papalimu described that her family lived at Kāwā year round and maintained household gardens that produces potatoes, taro, gourds, pumpkins, and small tomatoes. They also grew tobacco for personal consumption and raised cows, donkeys, horses, dogs, cats, pigs, and chickens. Fishing was the economic focus of the village and salt collected from Honu'apo was used to dry the fish, which some was traded to mauka relatives in exchange bananas, *poi*, and *'ōkolehao*. She also described how all but her family moved away from Kāwā around 1919 to work at the plantation.

In 1978, the Archaeological Research Center Hawaii, Inc. (ARCH) conducted an archaeological reconnaissance of TMK: 3-9-5-16:32 por. in Ka'alāiki Ahupua'a (Ewart 1978), southeast of the current APE. The area investigated was a portion of Parcel 36, on the *mauka* side of the government road. The property owner, Arthur Ulrich, had done an initial investigation of his property. After having located numerous archaeological features he contacted ARCH and requested a professional evaluation of those resources. An ARCH archaeologist spent one day in the field reviewing the sites and features recorded by Mr. Ulrich. Archaeological features included platforms, walls, enclosures, and modified sinks, lava blisters, and caves. Ewart suggests that the features post date 1868 and are those of habitation areas (platforms), with nearby agricultural use areas (modified sinks, lava blisters, and caves), and animal pens (enclosures). Evidence such as ash and faunal remains suggested possible shelter use within some of the sinks, caves, and blisters. Cultural deposits encountered were disturbed and with the exception of three platforms, the archaeological features were evaluated as being in poor condition.

SUMMARY OF CONSULTATION

As stated in the OEQC Guidelines for Assessing Cultural Impacts, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected project area. It is the present author's further contention that the oral interviews should also be used to augment the process of assessing the significance of any traditional cultural properties that may be identified. It is however, the researcher's responsibility to use the gathered information to identify and describe potential cultural impacts and propose appropriate mitigation as necessary.

In September 2007 a community informational meeting was held in Nā'ālehu at which the proposed roadway drainage improvement project was described. Of the meeting attendees, of whom there were about twenty, one individual shared cultural information that was potentially relative to the proposed project. Darlyne Vierra, a Nā'ālehu resident and *kama'āina* to the area, described a local tradition of placing burials in lava cracks in areas now adjacent to the current Highway 11. The practice of burial in lava cracks was also described by Lydia Papalimu (Mann and Bowen 1976) as a tradition of the Kinin family of Kāwā, while she asserted that "to bury my [Kimokeo] family, we dig." Burials in lava cracks along Highway 11 have also been identified during recent archaeological work (Clark et al. 2010) in nearby Hokukano and Hiona'ā *ahupua'a*. Darlyne Vierra described that her and other family burials exist within 50 feet of the roadway. Several attempts over the past year and a half to contact Ms. Vierra to discuss specific locations of such burial sites have been unsuccessful. There were no burial sites identified during the archaeological survey (Rechtman 2010) of the current project area; and while I believe the specific areas she was referring to are not within the current proposed project area, attempts to contact her to gather further information will be ongoing.

The information provided Lydia Papalimu (born at Kāwā in 1907) in her 1976 interview (Mann and Bowen 1976) identifies the Kāwā Village area as a culturally significant place. This place continues to hold cultural significance and remains a locus of modern cultural practice. As reported by Lydia Papalimu, the last of the original village families vacated Kāwā in 1957. Lydia Papalimu's mother was Becky Kimokeo who was a descendant of Kimokeo who had received *kuleana* land in neighboring Hilea Nui Ahupuaʻa and who had purchased fee simple grant lands in Kaʻalāiki; Lydia had inherited her Kāwā land from her family. Another purported member of the Kimokeo lineage (Abel Lui and his extended family) [Abel Lui *mā*] returned to the Kāwā coastal area several years after the village had been abandoned and took up residence there claiming native tenant rights and sovereignty. Abel Lui today also claims *konohiki* status and through his presence and stewardship at Kāwā has developed a sizeable following of both Hawaiian and non-Hawaiian sympathizers. In person conversations were conducted with Abel on several occasions and while he shared details of the cultural practices being conducted in the coastal Kāwā area, he did not relate any specific information on the presence of cultural resources or ongoing practices within the proposed roadway drainage improvement project area.

IDENTIFICATION AND MITIGATION OF POTENTIAL CULTURAL IMPACTS

The OEQC guidelines identify several possible types of cultural practices and beliefs that are subject to assessment. These include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The guidelines also identify the types of potential cultural resources, associated with cultural practices and beliefs that are subject to assessment. Essentially these are nature features of the landscape and historic sites, including traditional cultural properties. In the Hawaiʻi Revised Statutes–Chapter 6E a definition of traditional cultural property is provided.

> "Traditional cultural property" means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community's history and contribute to maintaining the ethnic community's cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

The origin of the concept of traditional cultural property is found in National Register Bulletin 38 published by the U.S. Department of Interior-National Park Service. "Traditional" as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission of information from one generation to the next, either orally or by act. "Cultural" refers to the beliefs, practices, lifeways, and social institutions of a given community. The use of the term "Property" defines this category of resource as an identifiable place. Traditional cultural properties are not intangible, they must have some kind of boundary; and are subject to the same kind of evaluation as any other historic resource, with one very important exception. By definition, the significance of traditional cultural properties should be determined by the community that values them.

It is however with the definition of "Property" wherein there lies an inherent contradiction, and corresponding difficulty in the process of identification and evaluation of potential Hawaiian traditional cultural properties, because it is precisely the concept of boundaries that runs counter to the traditional Hawaiian belief system. The sacredness of a particular landscape feature is often times cosmologically tied to the rest of the landscape as well as to other features on it. To limit a property to a specifically defined area may actually partition it from what makes it significant in the first place. However offensive the concept of boundaries may be, it is nonetheless the regulatory benchmark for defining and assessing traditional cultural properties. As the OEQC guidelines do not contain criteria for assessing the significance for traditional cultural properties, this study will adopt the state criteria for evaluating the significance of historic properties, of which traditional cultural properties are a subset. To be significant the potential historic property or traditional cultural property must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

A Be associated with events that have made an important contribution to the broad patterns of our history;

B Be associated with the lives of persons important in our past;

C Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

D Have yielded, or is likely to yield, information important for research on prehistory or history;

E Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

While it is the practice of the DLNR-SHPD to consider most historic properties significant under Criterion D at a minimum, it is clear that traditional cultural properties by definition would also be significant under Criterion E. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Pa'akai O Ka'āina* v Land Use Commission court case. The court decision established a three-part process relative to evaluating such potential impacts: first, to identify whether any valued cultural, historical, or natural resources are present; and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired; and third, specify any mitigative actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

As was previously mentioned, five archaeological sites (SIHP Sites 28504, 28505, 28507, 28508, and 28509) were identified and recorded within the project area. Site 28504 is a Historic Period wall complex, Site 28505 is a Historic Period wall, Site 28507 is a Precontact Period enclosure and lava depression, Site 28508 is a clustering of rock piles, and Site 28509 is a Historic Period enclosure (see Figure 2). With respect to the present study, these five sites are assessed as significant under Criterion D for the information they have yielded relative to former Precontact and Historic land use in this portion of the Ka'ū District of Hawai'i Island. However, it was suggested that a reasonable and adequate amount of information had been collected from the sites during the archaeological study to warrant a no mitigation work requirement, and thus no impact on these sites with respect to the proposed project. It was recommended that construction fencing be placed along the limits of the proposed construction area and that no construction work be permitted outside of the fencing. It was the further recommended that an archaeological monitor be present during the establishment of the perimeter fencing to help guide the installation in an effort to protect as many sites both inside and outside of the project as possible. A monitor was also recommended during initial grubbing and grading activities so that an immediate response can occur if previously unrecognized resources were inadvertently discovered during construction activities.

The shoreline area of Ka'alāiki (Kāwā) was and continues to be used as a locus of habitation, subsistence, recreation, and spiritual activity. This activity can be considered an ancient as well as ongoing practice; thus the shoreline itself could be considered a traditional cultural property and would be significant under Criterion E. While this area is not within the current boundary, access to a portion of it is via a dirt road that extends shoreward from Highway 11 near the middle of the current project area; thus it is important to maintain that access during and after the current project so as to not have an impact on possible cultural practices that take place along the Kāwā shoreline. As described, a vehicle bypass road will be built on the *makai* side of the existing highway. This road will provide continued access to the dirt road that leads to the shoreline, and once the drainage improvements have been completed, at least a portion of the bypass road will be left in place to connect the highway (which in its finished state will be elevated several feet above its existing state) to the shoreline access road; thereby not resulting in an impact to shoreline access.

While it is clear from the archaeological record that the study area was used during both precontact and historic times for habitation, agricultural, and ranching purposes nobody shared knowledge of any specific traditional cultural practices currently being exercised within the study area. During conversations with Abel Lui *mā* the general practice of *mālama 'āina* was discussed and concerns were expressed that the

governmental agencies proposing the current study would do the work without consideration for this traditional stewardship concept. Many within the Hawaiian community, along with the Office of Hawaiian Affairs, recognize such caretakership of the land as an ongoing cultural practice with traditional roots. Although seemingly not currently practiced within the specific study area the *mālama ʻāina* concept could and should be applied to the current project. Such responsible stewardship would include carefully and precisely fencing the boundaries of the proposed work area in an effort to protect any cultural resources that might exist outside of the proposed work area, and to have appropriate monitors present when conducting ground disturbing activities. Additionally, there are three general concepts that have a traditional basis, which could be adopted and promoted by those responsible for conducting the proposed drainage improvement project: *Maka`ala*—to watch were you walk, and to be mindful where you go. To step with respect for the land, and all that it holds and represents; *Akahele*—as you move forward, physically and figuratively, know where you are and be aware in detail of all that surrounds you; and *Makawalu*—to be aware of the spiritual beyond the physical, to envision the things that cannot be seen with the outer eyes. Adopting a policy that incorporates these concepts would be one way of demonstrating a commitment to the *mālama ʻāina* practice. Implementation and adoption of the above described measures and will help to ensure that no cultural resources, practices, or beliefs will be adversely affected by the proposed Māmalahoa Highway Drainage Improvements Project.

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MAMALAHOA HIGHWAY DRAINAGE IMPROVEMENTS AT KĀWĀ FLATS

ENVIRONMENTAL ASSESSMENT

TMKs (3rd): 9-5-016:006, 022, 025 & 026
Kāʻu District, County of Hawaiʻi, State of Hawaiʻi

APPENDIX 4
U.S. Fish and Wildlife Service Correspondence

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DOT 4-326a
(HWY-H 4/84)

HIGHWAYS DIVISION
HAWAII DISTRICT
TRANSMITTAL MEMORANDUM

Letter No. _____

To SSFM International
Attn: Stephen Yee

Date May 21, 2008

FROM Roy Shioji

SUBJECT: Mamalahoa Highway
Drainage Improvements, Vicinity of Kawa
11G-01-06

We are forwarding the following:

- [ ] under separate cover
- [ ] attached
- [ ] shop drawings
- [ ] prints/sketches
- [ ] mix design
- [ ] calculations
- [ ] change order
- [ ] plans
- [ ] _____
- [ ] letter/memo

COPIES	DESCRIPTION
1	Response from Fish & Wildlife Service (dated 5/16/08)

RECEIVED
MAY 27 2008
SSFM INTERNATIONAL, INC.
HAWAII

These are transmitted as checked below:

- [ ] for approval
- [ ] approved as submitted
- [ ] for review and comments
- [ ] approved as noted
- [X] for your information & file
- [ ] returned for corrections
- [X] appropriate attention & action
- [ ] resubmit _____ copies for approval
- [ ] as requested

REMARKS: _____

copies sent to:
R. Shioji

Signed R. Shioji
By Roy Shioji, Consultant Engineer

This space for reply:

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

MAY 16 2008

In Reply Refer To:
12200-2008-TA-0197

Mr. Stanley M. Tamura, Hawaii District Engineer
State of Hawaii Department of Transportation
Highways Division
50 Makaala Street
Hilo, Hawaii 96720

Subject: Technical Assistance for Kawa Flats Drainage Improvements, Kawa Flats, Kau, Island of Hawaii

Dear Mr. Tamura:

This letter is in response to your April 16, 2008, letter received on April 17, 2008, requesting information regarding potential impacts to threatened and endangered species from the Kawa Flats drainage improvements project in Kau District on the island of Hawaii. The proposed project involves a 2,400-foot section of the Mamalahoa Highway. The highway was built with insufficient drainage that leads to frequent flooding during heavy rains. This flooding is an immediate hazard to motorists and can also be a danger to Kau residents since it may obstruct emergency vehicles. The proposed project will raise the surface of the highway and place box culverts beneath it to restore proper drainage. A temporary, paved, bypass roadway will be constructed on the mountain side of the existing highway in order to allow traffic to move during construction. Construction is expected to start in 2010 and normal working hours will be 7:00 a.m. to 3:30 p.m.

A survey by Geometrician Associates in January of 2008, found no listed plant species on the site and our records support this. For clarification, in your plant species table, *Caesalpinia bonduc* is described as an indigenous species; however, it is a non-native species.

There is no federally designated critical habitat in the vicinity of this proposed project. Based information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, and the Hawaii GAP Program, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) and Hawaiian hawk (*Buteo solitarius*) occur in the project vicinity. In preparing your environmental assessment, we recommend you address potential project impacts to these listed species and include the following recommended conservation measures to avoid potential adverse impacts:

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- Hawaiian hoary bats roost and give birth in both exotic and native woody vegetation. However, use of the project area by Hawaiian hoary bats is currently unknown. To avoid potential impacts to this species, no woody plants suitable for bat roosting should be removed or trimmed during the bat birthing and pup rearing season (July through September). If you must clear the property during the Hawaiian hoary bat pupping season, we recommend conducting biological surveys to determine if bats are present. Please contact our office regarding survey methodology.

- Hawaiian hawks also nest in both exotic and native woody vegetation. To avoid impacts to Hawaiian hawks we recommend avoiding brush and tree clearing during the breeding season for Hawaiian hawks (March through September). If you must clear the property during the Hawaiian hawk breeding season, we recommend conducting biological surveys to determine if nests are present.

We hope that these conservation measures can be incorporated into your project description. Thank you for the opportunity to provide comments related to your proposed project. If you have any questions regarding this letter, please contact Dr. Jeff Zimpfer, Fish and Wildlife Biologist, Consultation and Technical Assistance Program (phone: 808-792-9431; fax: 808-792-9581).

Sincerely,

for Patrick Leonard
Field Supervisor

U.S. Department of Transportation
Federal Highway Administration

Hawaii Federal-Aid Division

300 Ala Moana Blvd., Rm 3-306
Box 50206
Honolulu, HI 96850
Phone: (808) 541-2700
Fax: (808) 541-2704
http://www.fhwa.dot.gov/hidiv

May 5, 2011

In Reply Refer To:
HDA-HI

Dr. Loyal A. Mehrhoff, Field Supervisor
U.S. Department of the Interior
U.S. Fish and Wildlife Service
300 Ala Moana Boulevard, Rm 3-122, Box 50088
Honolulu, Hawaii 96850

Subject: Mamalahoa Highway Drainage Improvements at Kāwā Flats, Section 7 Consultation – Request for Concurrence

Dear Dr. Mehrhoff:

The Federal Highway Administration (FHWA), in cooperation with the State of Hawai'i Department of Transportation (HDOT), wishes to inform you of its determination that the subject project is "not likely to adversely affect (NLAA)" any listed threatened or endangered species discussed below. Moreover, there is no federally designated critical habitat within the project area. This determination has been made in accordance with Section 7 of the Endangered Species Act (ESA), and we are seeking your concurrence with our determination.

Project Overview

The State of Hawai'i, Department of Transportation (HDOT), is proposing to improve drainage improvements along an approximately 3,600-foot section of the Mamalahoa Highway (State Route 11) located at Kāwā Flats (figures 1-3). The highway was constructed over 50 years ago with no drainage facilities for this low-lying section. Flood waters from an intermittent stream frequently overtop the highway and completely close this round-the-island highway – the only route connecting the two main towns of Ka'ū (figure 4). The flooding is a hazard to motorists, prevents the passage of emergency vehicles, and damages the roadway structure.

Coordination with the USFWS

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, the Migratory Bird Treaty Act and Migratory Bird Conservation Act (16 USC 701-715), the Fish and Wildlife Coordination Act, as Amended (16 USC 661 et seq.), federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed or proposed threatened

or endangered species. On April 16, 2008, the HDOT sent a letter to the U.S. Fish and Wildlife Service (USFWS) requesting technical assistance under Section 7 of the ESA. This letter also included a plant species list from the botanical investigation, which indicated that no threatened or endangered species were found. The HDOT received a response from the USFWS on May 16, 2008. In the response, the USFWS indicated that there is no federally designated critical habitat in the vicinity of this proposed project. However, based on information from your files, including data compiled by the Hawaii Biodiversity and Mapping Program, and the Hawaii GAP Program, the endangered Hawaiian hoary bat *(Lasiurus cinereus semotus)* and Hawaiian hawk *(Buteo solitarius)* occur in the project vicinity. Regarding the Environmental Assessment (EA), the USFWS recommended that the HDOT address potential project impacts to these listed species and include their recommended conservation measures to avoid potential adverse impacts.

Potential Impacts to ESA protected Species

Hawaiian Hawk

The principal potential impact that the construction of the proposed project poses to Hawaiian Hawks is if during the clearing and grubbing phases of the project an active Hawaiian Hawk nest is disturbed. There are three large exotic trees along this section that potentially could be used by hawks as nest trees.

Hawaiian Hoary Bat

The principal potential impact that the construction and operation of the proposed project poses to bats is during the clearing and grubbing phases of construction as vegetation is removed. During the pup-rearing season, female carrying their pups may be less able to rapidly vacate a roost site as the vegetation is cleared. Additionally, adult female bats sometimes leave their pups in the roost tree while they themselves forage, where very small pups may be unable to flee a tree that is being felled.

Minimization Measures

As recommended by the USFWS, the project proposes to implement the following minimization measures during the course of construction activities. These measures have been incorporated into the EA, which is due for release in the summer of 2011.

- To minimize impacts to the endangered Hawaiian hoary bat, contract specifications will prohibit cutting, removing or trimming woody plants greater than 15 feet in height during the bat birthing and pup-rearing season (May 15 through August 15).

- To avoid impacts to Hawaiian Hawks, contract specifications will prohibit brush and tree clearing during the breeding season for Hawaiian hawks (March through September). If this time period cannot be avoided, a hawk nest search will be conducted by a qualified biologist, and if hawk nests are present in or near the corridor, all land clearing activity will cease.

Also, it is important to note that the project scope does not include the installation of new highway lighting systems, utility poles, lines, or similar appurtenances. No night work will take place, which could potentially affect threatened or endangered seabirds.

NLAA Determination

Based on the above information, we have determined that the project is not likely to adversely affect the Hawaiian Hawk or Hawaiian hoary bats. We respectfully seek your concurrence with this determination. Should you have any questions, please do not hesitate to contact me at (808) 541-2308. Thank you for your assistance.

Sincerely yours,

Clifford L. Chew

Clifford L. Chew
Construction Programs Manager

Enclosures

cc: Roy A. Shioji, HDOT
Project Files

Figure 1: Project Location

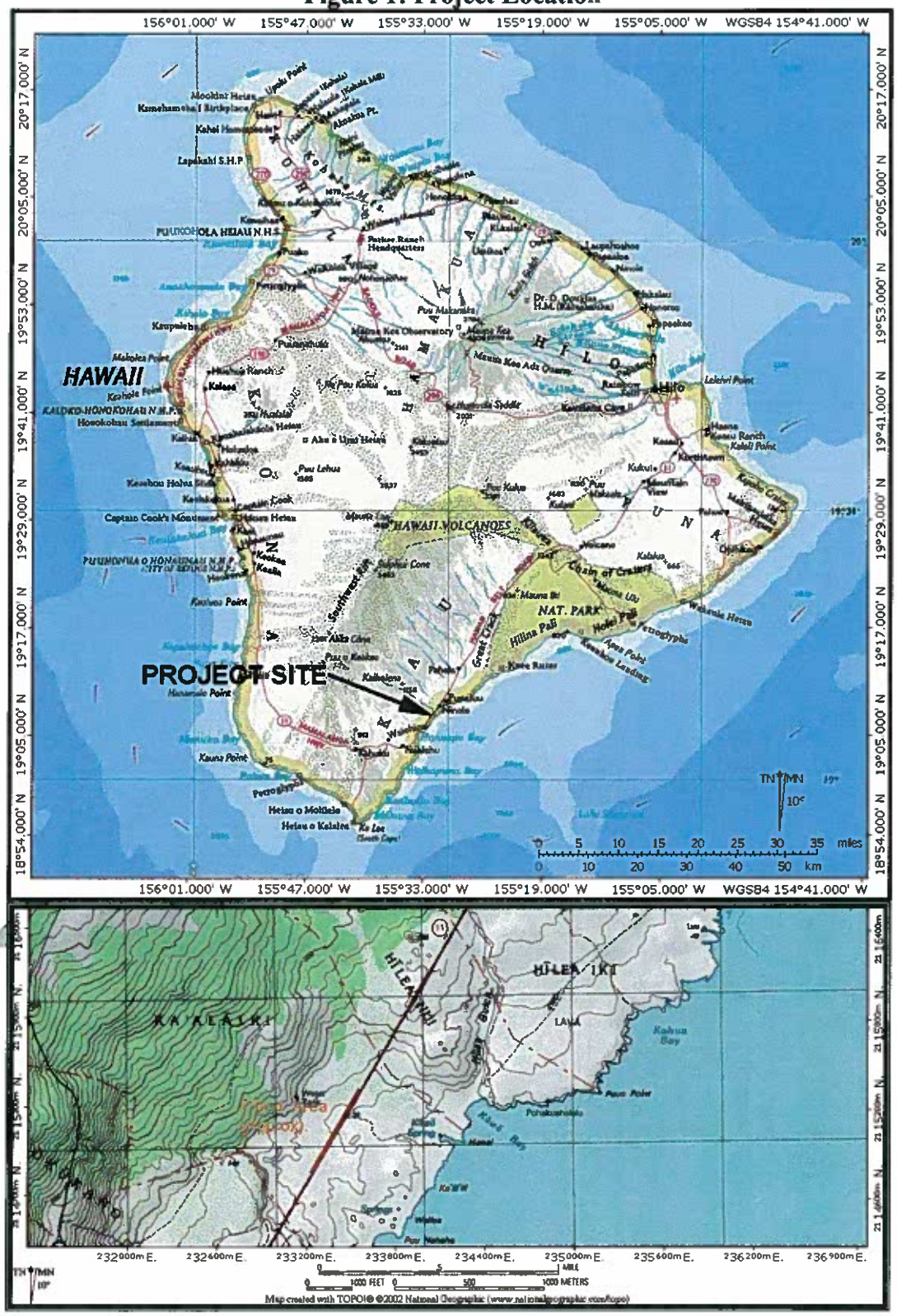
156°01.000' W
155°47.000' W
155°33.000' W
155°19.000' W
155°05.000' W
WGS84 154°41.000' W
20°17.000' N
20°05.000' N
19°53.000' N
19°41.000' N
19°29.000' N
19°17.000' N
19°05.000' N
18°54.000' N
HAWAII
PROJECT SITE
HAWAII VOLCANOES
NAT. PARK
Hilo
Kailua
Kona
Kawaihae
Waimea
Kamuela
Honokaa
Paauilo
Pahoa
Volcano
Kaloko
Chain of Craters
Hilina Pali
Hole Pali
Petroglyphs
Great Crack
Southwest Rift
Kaunu Point
Kawaihae Point
Kawaihae Landing
Kaiwi Point
Kaiwi Channel
Kaiwi Channel
Kaiwi Channel

Figure 2: TMK Map

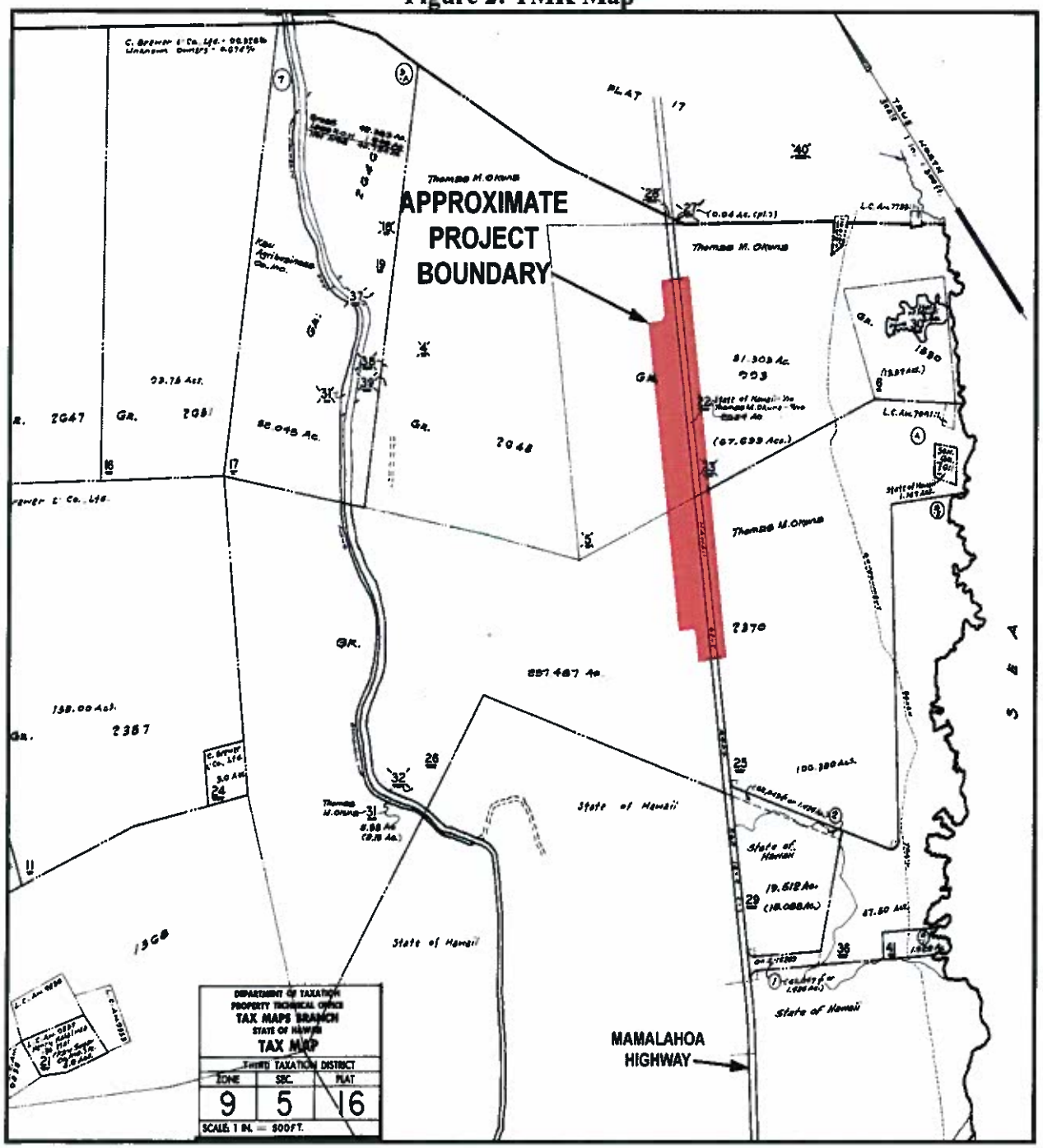

Figure 3: Aerial Image

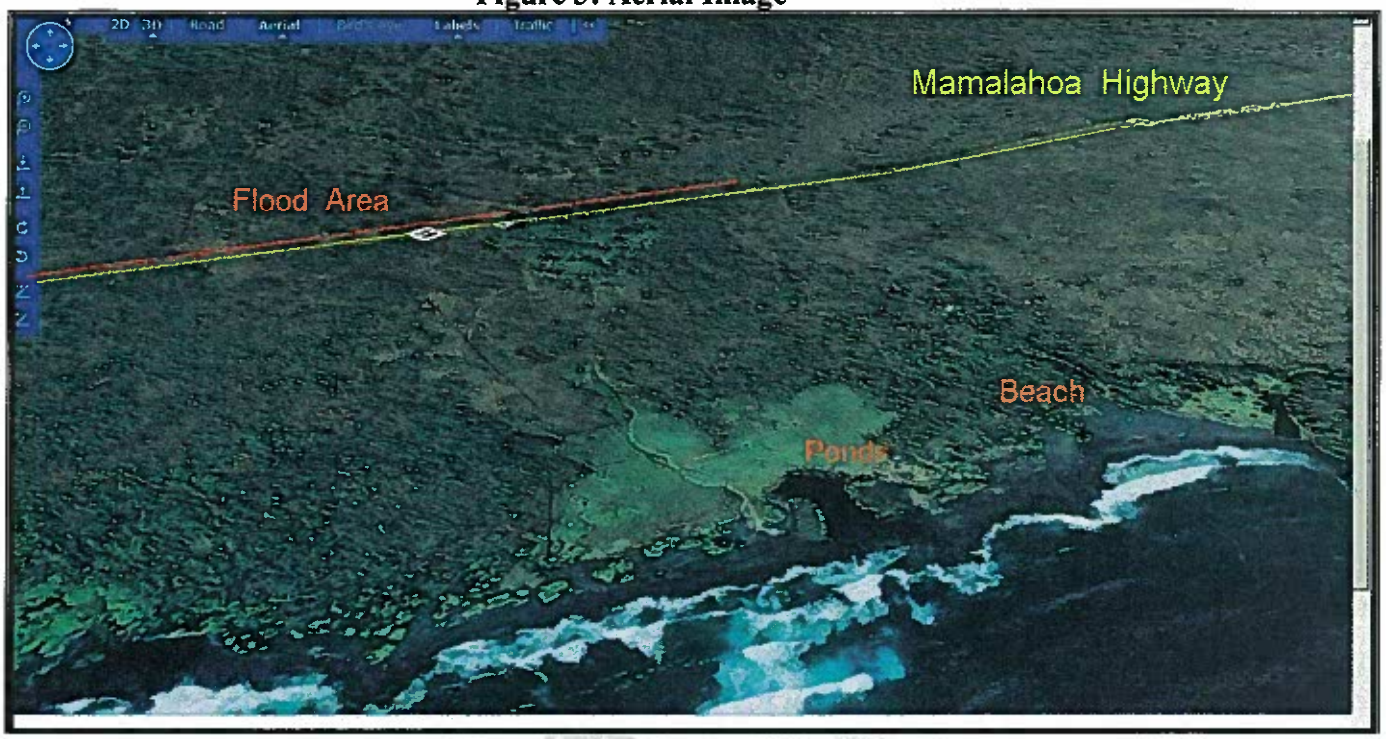

Figure 4: Flooding in 2004

cc —

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

RECEIVED
JUN 08 2011
HAWAII DIVISION

In Reply Refer To:
2011-I-0295

JUN 0 6 2011

Mr. Clifford Chew
Construction Programs Manager
300 Ala Moana Boulevard
Room 3-306, Box 50206
Honolulu, Hawaii 96850

Subject: Informal Section 7 Consultation for Kawa Flats Drainage Improvements, Hawaii

Dear Mr. Chew:

We received your letter dated May 5, 2011, on May 6, 2011, seeking our concurrence that the proposed Kawa Flats Drainage Improvements Project is not likely to adversely affect the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) or Hawaiian hawk (*Buteo solitarius*). We reviewed the project pursuant to the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.), as amended, and the Migratory Bird Treaty Act [16 U.S.C. 703-712].

Project Description

The Hawaii Department of Transportation is proposing to improve drainage on a 3,600-foot section of Mamalahoa Highway located at Kawa Flats, in the District of Kau, Hawaii. This proposed project will decrease roadway flooding as floodwaters from a nearby stream frequently overtop the roadway.

Species Affected

Hawaiian hawk
To avoid impacts to Hawaiian hawk, you have agreed to insure the following avoidance and minimization measures are implemented:

- In areas with suitable hawk nesting trees, if clearing and grubbing of the right-of-way must occur between January and June (the hawk breeding season), a hawk nest survey will be conducted by a qualified biologist to identify if Hawaiian hawks are nesting in the area.

- If an active hawk nest is discovered during the course of the Hawaiian hawk nest surveys, clearing will cease until such time as the hawks are no longer in attendance at the nest, and the chick has fledged.

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Based on the above avoidance and minimization measures, we concur with your determination, this proposed project may affect, but is not likely to adversely affect Hawaiian hawk.

Hawaiian hoary bat
To avoid impacts to Hawaiian hoary bat, you have agreed to insure the following avoidance and minimization measure is implemented:

- Woody vegetation taller than 15 feet high will not be cleared between April 15 and August 15, the bat breeding and pupping season.

Based on the above avoidance and minimization measures, we concur with your determination, this proposed project may affect, but is not likely to adversely affect Hawaiian hoary bat.

Unless the project description changes, or new information reveals the proposed project may affect listed species in a manner or to an extent not considered, or a new species or critical habitat is designated that may be affected by the proposed action, no further action pursuant to section 7 of the ESA is necessary. If you have any questions regarding this letter, please contact Dr. Jeff Zimpfer, Fish and Wildlife Biologist, Consultation and Habitat Conservation Planning Program (phone: 808-792-9431; email: jeff_zimpfer@fws.gov).

Sincerely,

For Loyal Mehrhoff
Field Supervisor

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MAMALAHOA HIGHWAY DRAINAGE IMPROVEMENTS AT KĀWĀ FLATS

ENVIRONMENTAL ASSESSMENT

TMKs (3rd): 9-5-016:006, 022, 025 & 026
Kāʻu District, County of Hawaiʻi, State of Hawaiʻi

APPENDIX 5
Hawaiʻi Coastal Zone Management Program Correspondence

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geometrician
ASSOCIATES, LLC
integrating geographic science and planning

phone: (808) 969-7090 fax: (866) 316-6988 PO Box 396 Hilo Hawaii 96721
rterry@hawaii.rr.com

October 20, 2011

John Nakagawa
Hawai‘i CZM Program
Office of State Planning
PO Box 2359
Honolulu HI 96804

Dear Mr. Nakagawa:

Subject: CZM Consistency Determination for Mamalahoa Highway Drainage Improvements At Kāwā Flats, Ka‘ū District, Island of Hawai‘i, State of Hawai‘i

I am representing the Federal Highway Administration (FHWA), Hawai‘i Division, and the Hawai‘i State Department of Transportation (HDOT) in their environmental documentation process for the subject project.

The project would construct drainage improvements along an approximately 3,700-foot section of the Mamalahoa Highway (State Route 11) located at Kāwā Flats. The highway was built over 50 years ago with no drainage facilities for this low-lying section. Flood waters from an intermittent stream frequently overtop the highway and completely close this round-the-island highway – the only route connecting the two main towns of Ka‘ū. The flooding is a hazard to motorists, prevents the passage of emergency vehicles, and damages the roadway structure. Erosion and sedimentation impacts will be mitigated through Best Management Practices, and impacts to archaeological sites have been mitigated through data recovery as part of inventory. Threatened or endangered species, important farmland, wetlands or other waters of the U.S., or other sensitive resources are not present at the project site and will not be affected directly or indirectly. No adverse cumulative impacts will occur.

Based on the goals and objectives of the Hawai‘i CZM Program as they relate to project characteristics, FHWA evaluates the project as consistent to the maximum extent practicable with the objectives and polices of the CZM Program.

Attached is material to assist your office in deciding whether you will concur with FHWA’s determination that the project is consistent with the Hawai‘i CZM Program. Please note that

because a portion of the project site is within the SMA, FHWA and HDOT will be applying for an SMA Major Permit once the EA process is complete.

In addition to this letter, the following CZM Consistency Determination application material is attached:

- CZM Application Form, signed by the Federal Highway Administration.
- The Environmental Assessment, with maps, plans and other detailed information.

In lieu of a CZM Assessment Form, per my discussion with your office on previous occasions, we are providing a narrative summary of the consistency with specific criteria, as follows.

- Recreational Resources. The project site is located approximately 2,000 feet *mauka* of the shoreline adjacent to the highway in an area of no recreational uses. However, the shoreline at Kāwā and adjacent areas is accessed by Ka‘ū residents and some visitors for surfing, fishing, gathering, hiking, horseback riding, and other purposes. Although there is a coastal trail that provides hiking access from the north and south, the principal accesses are two rough four-wheel drive roads that extend southeast towards the sea from Highway 11. The main access is located to the north of the project and will not be affected. The secondary access, which is used by several cars per day, is within the project limits. Because the road will be raised in this area, the existing access will no longer be accessible. However, the temporary paved, two-lane bypass roadway that would be built on the *makai* side of the highway will provide permanent access to this existing four-wheel drive road towards the shoreline once construction is finished. To the extent feasible, this access will also be open during the approximately one-year construction period.
- Historic Resources. Archaeological survey located five historic sites. Site 28504 is a Historic Period wall complex to which numerous modifications have been made in an apparent effort to control the movement of cattle. Site 28505 is a Historic Period wall about 50 meters long in which raised bedrock outcrops were utilized as a means to increase the height. This wall likely served as a way to control the movement of cattle. Site 28507 is a Precontact Period U-shape enclosure and modified lava depression. The construction attributes and the presence of volcanic glass and waterworn cobbles suggest that the enclosure may have been used as a Precontact temporary habitation with the modified depression used as a planting or storage area. Site 28508 is a clustering of pahoehoe rock piles that may have had an agricultural function. Site 28509 is a Historic Period enclosure in a poor state of preservation that may have served as a temporary habitation during the Historic Period. The archaeologists concluded that a reasonable and adequate amount of information has been collected about these historic properties during the current study to warrant a no-mitigation work requirement, and thus a no adverse effects determination for these sites with respect to the project. After review of the initial report by the State Historic Preservation Division (SHPD), the report was modified to include mitigation in the form of data recovery for Site 28507. By letters of May 6, and September 13, 2011, the SHPD concurred with the finding. Prior to project construction, FHWA and SHPD will prepare and implement a data recovery plan for Site 28507. Construction fencing will be used to prevent damage to historic sites outside the work

area. Most of the area will have black silt BMP fencing that will mark areas beyond which no work will be permitted. Furthermore, in areas that lack the BMP, orange fencing will be installed around identified archaeological sites that are within 25 feet of the work area. An archaeological monitor will be present during the establishment of the fencing to help guide the installation in an effort to protect as many sites both inside and outside of the APE as possible. A monitor will also be in place during initial grubbing and grading activities and excavation so that an immediate response can occur if previously unrecognized potential historic properties are inadvertently discovered during construction activities. The monitor will conduct a pre-construction briefing for all personnel involved in the initial construction, continuing personal orientation for construction workers through the monitoring phase, and development of a written guide for the construction manager and workers who enter the project after archaeological monitoring is complete. By letters of May 6, and September 13, 2011, the State Historic Preservation Division (SHPD) concurred with this mitigation.

- Scenic and Open Space Resources**.** Certain areas and viewplanes are noted in the Hawai‘i County General Plan as being sites of particular natural beauty, including Kāwā Bay and Spring (TMK 9-5-15:20, 9-5-17:07, Ahupuaa of Ka‘alaiki and Hilea Nui), views of Mauna Loa from Volcano- Ka‘ū Highway (various TMKs and *ahupua‘a*) and views of *pu‘u* (hills) located *mauka* of the project site (i.e., Enuhe, Makanau, Kaiholena, and One). The modest rise in the roadway elevation will not have any effects on scenic resources or viewplanes, as there are no viewpoints in the cattle pastures and vacant land on either side of the roadway.
- Coastal Ecosystems. The project site is located approximately 2,000 feet *mauka* of the shoreline on the foothills of Mauna Loa. One named ephemeral stream, Hilea Gulch, as well as a number of mapped and unmapped ephemeral drainages, drain the steep uplands of the Ninole Hills, Hilea and Honu‘apo. No wetlands are present at or near the highway or in any area affected by the proposed construction. In the broader project area, wetlands area consisting of small marshes in salty or brackish water in the backshore of pahoehoe areas are present near the shoreline, about 2,000 feet from the highway. The rugged shoreline in the project area offers an array of habitats. In several places headlands or points enclose small coves or bays where the coastal plain broadens. These flatter areas sustain tidepools. Several streams feed the coast, and lava tubes discharge fresh water into the nearshore zone all along the shoreline. There are sand and cobble beaches, intertidal benches and pools, basalt benches and cliffs, spring-fed ponds, wetlands, and coastal strand vegetation communities over a range of exposure and disturbance conditions. The project will essentially reproduce the existing hydrology of the intermittent drainage, passing the flow under, rather than over, the highway, and will not change the quantity or sediment characteristics of the flood water as it makes its way overland or underground towards the sea. Therefore, no changes in wetlands or coastal or marine ecosystems that are 2,000 feet makai of the project site are expected
- Economic Use. The project would have social and economic benefits by alleviating road closures from flooding and maintaining highway access critical for accessing jobs, schools, medical care, social services, family, and social activities. The project would provide some short-term construction jobs which would almost certainly be filled by on-island residents.

- Coastal Hazards. The project site is 2,000 feet from the shoreline and unaffected by coastal hazards. However, during natural disasters (tsunami, storm waves, stream flooding, lava flows, erosion, and subsidence), other key roads on the island (e.g. SR 19 and Saddle Road) may be blocked or partially destroyed. It is important to ensure that in such emergencies SR 11 is able to remain open and not be rendered impassable by flooding.
- Managing Development. The proposed drainage improvement is not inconsistent with the objective to improve the development review process, communication, and public participation in the management of coastal resources and hazards. Permits for the process are outline in Table 5 of the attached EA.
- Public Participation. The proposed drainage improvement is not inconsistent with the objective of stimulating public awareness, education, and participation in coastal management. Public meetings and other public contact have occurred throughout project development and will continue during the EA review process.
- Beach Protection. No beaches are present at the project site nor would be affected by the proposed project.
- Marine Resources. The drainage improvement will not affect marine resources in any adverse way, will not adversely affect implementation of the state's ocean resources management plan, and is not inconsistent with this objective.

The key mitigation measures related to the objectives and policies of the CZM program are listed in several sections of the EA: Section 3.2.4 relating to archaeological, historic, and traditional cultural properties; Section 3.1.4 relating to visual resources, Section 3.1.2 relating to water quality and floodplains, and Section 3.1.3 relating to threatened and endangered species.

Please contact me at (808) 969-7090, or Roy Shioji of HDOT Highways Division at (808) 933-2755, if you have any questions.

Sincerely,

Ron Terry

Ron Terry, Principal
Geometrician Associates

Attach: CZM Application
EA

Cc: (w/o attach) Roy Shioji, HDOT, Clifford Chew, FHWA Hawai'i Division;

Hawaii CZM Program
Coastal Zone Management

HAWAII CZM PROGRAM
APPLICATION FOR CZM FEDERAL CONSISTENCY REVIEW

Project/Activity Title or Description: Mamalahoa Highway Drainage Improvements

At Kāwā Flats,

Location: Ka'ū District,

Island: Hawai`i

Tax Map Key: (3) 9-5-16:6,22,25-6

Applicant and Agent Information

1. State DOT, Highways Div.
   Name of Applicant
   50 Makaala
   Address
   Hilo HI 96720
   City & State Zip Code
   808-933-2755 n/a
   Daytime Phone Fax Number
   Roy.Shioji@hawaii.gov
   E-mail Address

2. Ron Terry, Ph.D.
   Name of Agent
   PO Box 396
   Address
   Hilo HI 96721
   City & State Zip Code
   808-969-7090 866-316-6988
   Daytime Phone Fax Number
   rterry@hawaii.rr.com
   E-mail Address

CZM Consistency Determination or Certification

x Check the type of application below and sign.

☐ I. Federal Agency Activity

CZM Consistency Determination: "The proposed activity will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of the Hawaii Coastal Zone Management Program."

Signature _____ Date _____
(Applicant or responsible party)

☐ II. Federal Permit or License (Please sign below)

CZM Consistency Certification: "The proposed activity complies with the enforceable policies of Hawaii's approved management program and will be conducted in a manner consistent with such program."

Signature _____ Date _____
(Applicant or responsible party)

☒ III. Federal Grants and Assistance (Please sign below)

CZM Consistency Certification: "The proposed activity complies with the enforceable policies of Hawaii's approved management program and will be conducted in a manner consistent with such program."

Signature _____ Date _____
(Applicant or responsible party)

Send To: Office of Planning, P.O. Box 2359, Honolulu, Hawaii 96804

Print Form

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