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County of Hawaii
PLANNING DEPARTMENT
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July 21, 1994

Mr. Brian J. J. Choy, Director
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

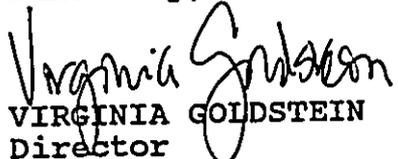
Dear Mr. Choy:

Final Environmental Assessment (EA) for the Development of
a 45-lot Single Family Residential Subdivision located
within the Kahalu'u Historic District
Applicant: Kamehameha Investment Corporation
Tax Map Key: 7-8-10: Portion of 50, South Kona, Hawaii

The County of Hawaii Planning Department nor the applicant has
received any comments during the 30-day public comment review
period which began on May 23, 1994. The County of Hawaii
Planning Department has determined that this project will not
have significant environmental effect and has issued a negative
declaration. Please publish notice of this determination in the
August 8, 1994, OEQC Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and
four copies of the Final Environmental Assessment as required.
Please contact Daryn Arai or Rodney Nakano of this office should
you have any questions.

Sincerely,


VIRGINIA GOLDSTEIN
Director

DSA:pak
Enclosure - (4 copies/Final EA)
A:\LKEAUH09.DSA

cc: West Hawaii Office w/ 1 copy of FEA
Mr. Glen Koyama - Belt Collins Hawaii
Mr. Wallace Tirrell - Kamehameha Investment Corp.

1994-08-08-HI-*FEA*-Keauhou Subdivision

AUG 8 1994

**FINAL
PROJECT DESCRIPTION
AND
ENVIRONMENTAL ASSESSMENT**

**PROPOSED RESIDENTIAL SUBDIVISION
Keauhou, North Kona, Hawaii
TMK 7-8-10: portion of 50**

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July 1994

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I. INTRODUCTION AND IDENTIFICATION OF APPLICANT

Kamehameha Investment Corporation (KIC), the applicant and landowner, is proposing to develop a 45-lot single-family residential subdivision on The Crown Lands of Keauhou in North Kona, Hawaii (see Figure 1). The property's Tax Map Key is Third Division, 7-8-10: portion of 50.

The Planning Department, County of Hawaii is the Accepting Authority for this Final Environmental Assessment, and Belt Collins Hawaii is the consultant for the Applicant.

The proposed project, which is located on approximately 22.2 acres of vacant land, is situated within the Special Management Area (SMA) of the County of Hawaii and, therefore, is required to obtain an SMA Use Permit from the Hawaii County Planning Commission. Further, the proposed project is required to obtain a Change of Zone approval from U Unplanned to RS-15 Residential from the Hawaii County Council. Approval of this rezoning request would allow the applicant to construct 15,000 sq. ft. residential lots on the property.

This Environmental Assessment (EA) has been prepared to accompany the Special Management Area (SMA) Use Permit Petition and Change of Zone Application which had been filed with the County Planning Department in late 1992.

II. AGENCIES CONSULTED

The following agencies have been consulted in the preparation of this environmental assessment.

County of Hawaii Agencies

- Planning Department
- Department of Water Supply
- Department of Public Works

State of Hawaii Agencies

- State Historic Preservation Division
- Hawaii Island Burial Council

III. PROPOSED ACTION'S TECHNICAL CHARACTERISTICS

Project Objectives

According to the applicant's current sales records for residential projects in Keauhou, the inventory of home lots in Keauhou has diminished. The proposed project is intended to replenish the supply of residential lots to meet the present and near-term future demand of residential units in the resort and to fulfill KIC's long-term goal of developing a master-planned, resort-residential community.

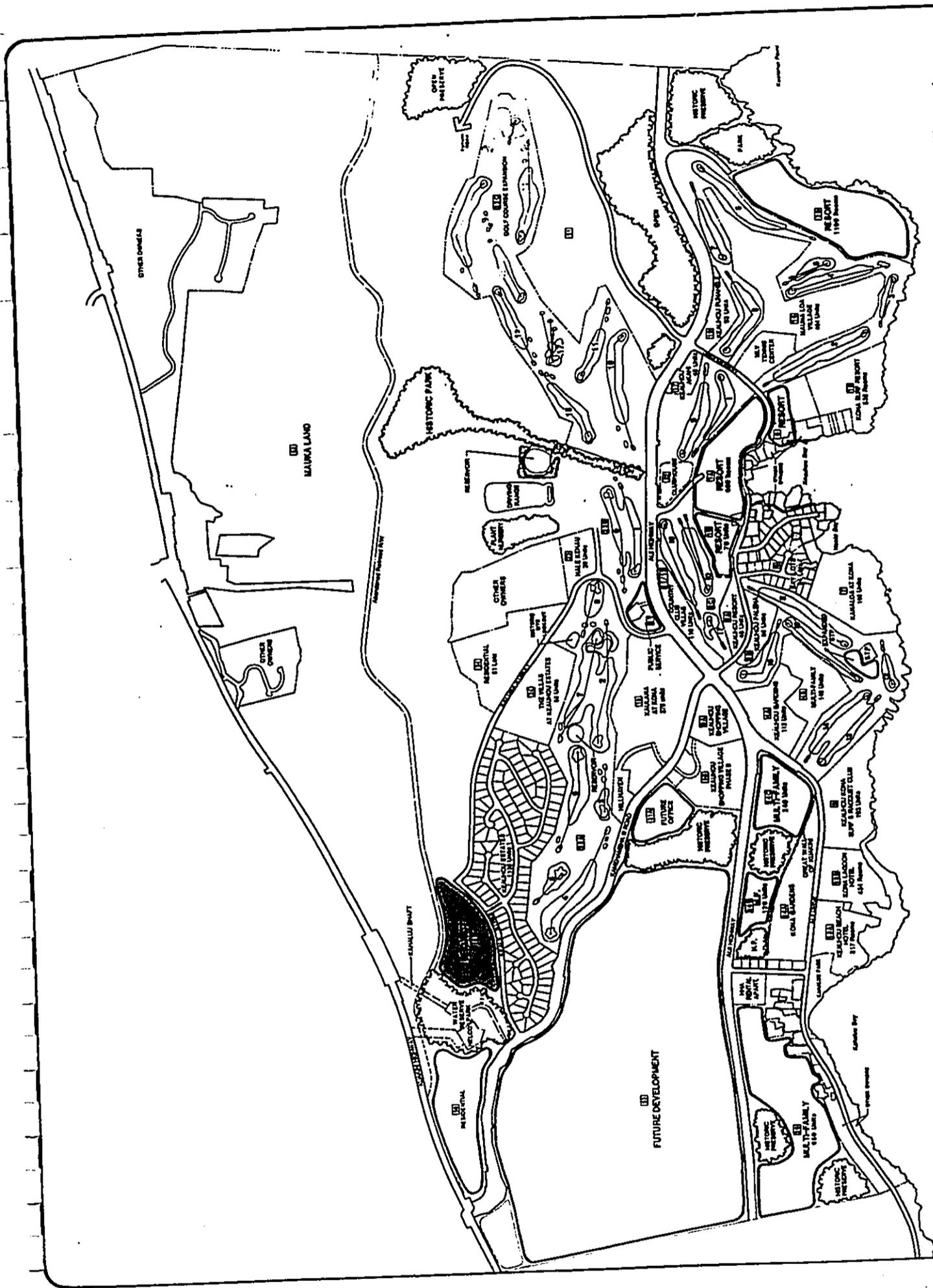


Figure 1
Location Map

AUGUST 1982

 0 20 40 60
 FEET

LAND USE MASTER PLAN
 Keauhou, North Kona, Hawaii



An earlier County-approved 51-lot residential subdivision along Kaluna Street is presently under construction. A Special Management Area Use Permit was granted for the project in late 1991, and in January 1992 the County Council granted Land Use Boundary Amendment and Change of Zone approvals. Construction is expected to be completed in the fall of 1994. This project is also part of KIC's long-range residential development for the resort. The 51-lot residential project along with the proposed 45-lot residential project will provide a continued supply of needed residential homes within the Crown Lands of Keauhou.

Project Description

The proposed subdivision is located along Kealii Street across from the Keauhou Estates subdivision. It will contain 45 single-family residential lots within a landscaped, gated community (see Figure 2). The subdivision will have lot sizes ranging from 15,000 to approximately 24,000 sq. ft., and all of the lots will have mauka-makai orientation with panoramic views of the ocean. Access to the subdivision will be from Kealii Street near its intersection with Kaluna Street.

The roadways within the subdivision will be to County dedicable standards which include minimum-required pavement and right-of-way widths, curbs, gutters and sidewalks and underground utilities, such as water, sewer, electricity and telephone. The subdivision roadways will remain in private ownership, and a security gate will be installed at the entrance.

A rock wall accompanied by landscaping will be provided on the perimeter of the subdivision along Kealii Street. Near the entrance to the proposed subdivision, an archaeological site was discovered and is being designated for preservation. A buffer and archaeological site easement will be established to encompass the feature.

The proposed subdivision will be developed in a manner similar to the existing Keauhou Estates. Lot purchasers will be responsible for grading their own lots and building their own homes. The design of the residences will be monitored by a homeowner's design committee to assure quality house design and construction. Design guidelines and restrictive covenants will be used by the design committee as a basis for the design review and approval.

Development Schedule

Construction of the proposed subdivision would commence in early 1995 after all County permits and approvals are obtained. It is anticipated that construction will take approximately six to ten months to complete.

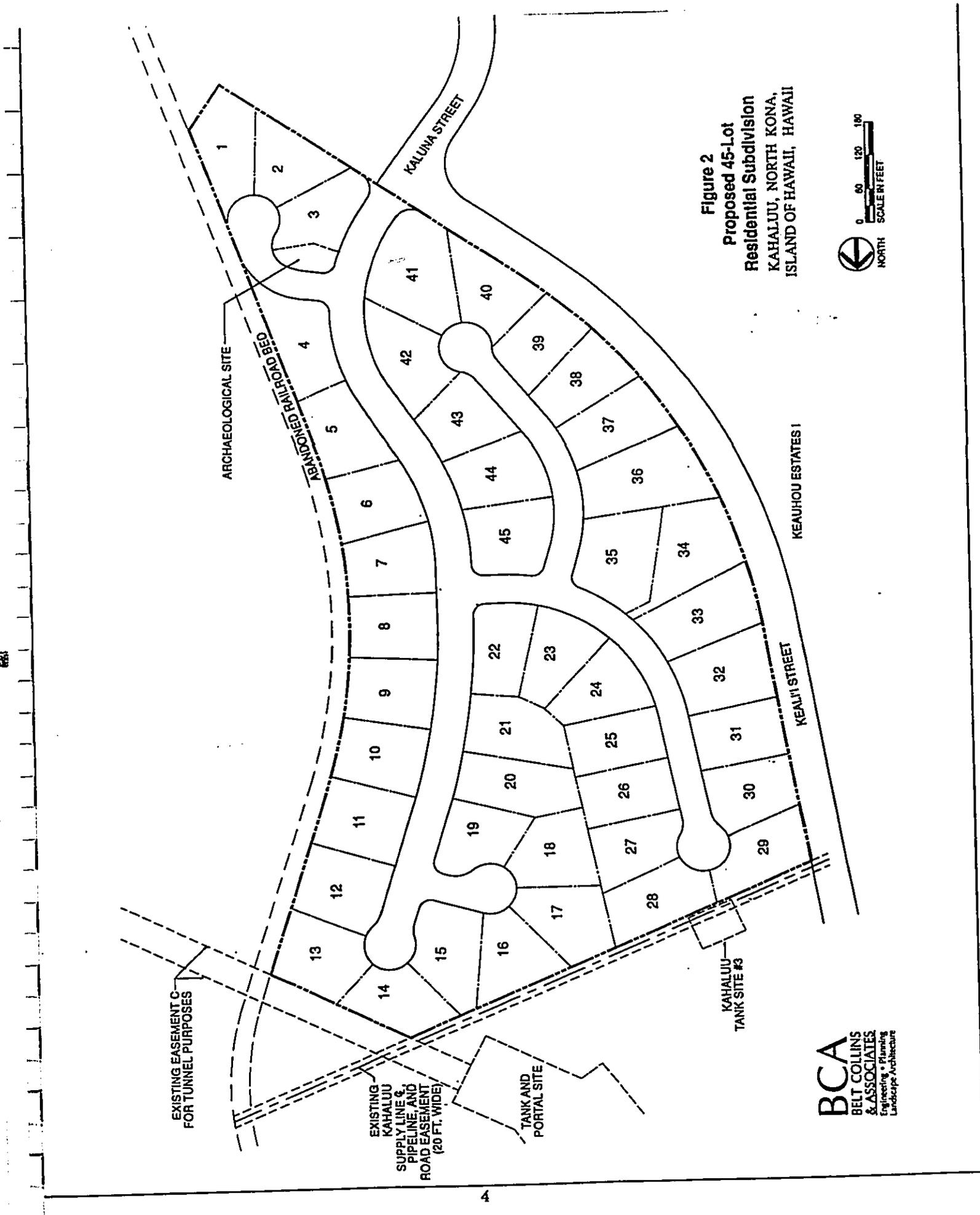


Figure 2
 Proposed 45-Lot
 Residential Subdivision
 KAHALUU, NORTH KONA,
 ISLAND OF HAWAII, HAWAII



BCA
 BELT COLLINS
 & ASSOCIATES
 Engineering • Planning
 Landscape Architecture

Total Construction Cost

The preliminary construction cost for the proposed subdivision is estimated to be over \$2.4 million. This would include the cost of sitework, infrastructure, landscaping, perimeter wall and entry gate. Design consultant fees are also included.

IV. PROPOSED ACTION'S RELATIONSHIP TO STATE AND COUNTY LAND USE POLICIES

State Land Use Law

All lands in the State of Hawaii are classified in one of four land use districts: Urban, Rural, Agricultural, or Conservation, under the State Land Use Law (Chapter 205, HRS). The State Land Use District Map No. H-8 designates the project site as Urban. This designation allows, among other land uses, residential development. Thus, the proposed project is consistent with the State Land Use Law.

Hawaii County General Plan

The Hawaii County General Plan is the County's comprehensive land use policy for guiding long-range development on the island of Hawaii. It specifies goals, policies and standards of development for the most desirable land uses on the island. The General Plan's associated Land Use Pattern Allocation Guide (LUPAG) Map designates the general location of the various desired land uses, such as residential, recreational, agricultural, resort, commercial and industrial.

Keauhou is identified by the General Plan as a major resort in Kona and, as such, is comprised of basic visitor-oriented and support facilities. The General Plan states that within designated resorts, portions of their land may be included in the Urban Expansion designation. This designation allows for a mix of high density urban development, medium density urban development, low density urban development, industrial and/or open land uses for areas where new settlements may be desirable, but where the specific settlement pattern and mix of uses have not yet been determined.

The project site is located within the Urban Expansion area of The Crown Lands of Keauhou resort. As such, the proposed project is consistent with the overall land use policies of the County General Plan on resort development and its associated land uses.

The following is a discussion of the project's consistency with the specific goals, policies, and courses of action of the General Plan that are relevant to the proposed subdivision.

Economic

Goal

- *Provide residents with opportunities to improve their quality of life.*

Discussion: The proposed project will provide short-term construction related job opportunities. Property, income, excise and other taxes will be generated, resulting in an increase in Federal, State and County revenues. These revenues can be used to provide needed public services and facilities.

Environmental Quality

Goal

- *Maintain and, if feasible, improve the existing environmental quality of the island.*

Discussion: The proposed project will not result in any significant adverse effect on the environment. During construction, there will be adverse effects associated with construction activities, however, mitigative measures are planned to reduce or lessen the impacts on the surrounding area.

Flood Control and Drainage

Goals

- *Conserve scenic and natural resources.*
- *Prevent damage to man-made improvements.*
- *Reduce surface runoff and sediment runoff.*

Policy

- *All development-generated runoff shall be disposed of in a manner acceptable to the Department of Public Works.*

Discussion: The proposed project is a low-profile development which will not affect scenic view planes in the area. It is not located within any floodway or flood plain. Surface water runoff and sedimentation will be minimized by methods approved by the Department of Public Works.

Historic Sites

Goal

- *Protect and enhance the sites, buildings and objects of significant historical and cultural importance to Hawaii.*

Discussion: An intensive archaeological survey of the project site was conducted by International Archaeological Research Institute, Inc. (IARII) in April and May of 1991 (see Appendix A). A total of five archaeological features were discovered and recorded. Four of the features, which were not previously identified or described, consist of rock walls associated with ranching, other walls, agricultural mounds and terraces and a lava tube. The fifth feature is a railroad berm that was previously identified.

A secondary survey was conducted by IARII after a small lava tube was identified in the area (see Appendix B). The survey revealed two burials within a small lava tube as well as a nearby cluster of agricultural elements. As recommended by the archaeologist, proper mitigation measures will be taken to minimize the impact on these archaeological sites. The mitigation measures are discussed in detail in Section VI, Mitigation Measures.

Natural Beauty

Goals

- *Protect, preserve and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.*
- *Protect scenic vistas and view planes from becoming obstructed.*
- *Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.*

Discussion: Scenic view planes toward the shoreline will not be obstructed by the proposed subdivision. The new development is located more than 300 feet makai of the Kuakini Highway and is not visible to motorist travelling along the State right-of-way. Notably, existing topography and vegetation effectively shield the proposed subdivision from the highway.

From the shoreline, the proposed subdivision will be visible but indistinguishable as part of the larger regional view of the Keauhou mauka lands.

Natural Resources and Shoreline

Goals

- *Protect and conserve the natural resources of the County of Hawaii from undue exploitation, encroachment and damage.*
- *Provide opportunities for the public to fulfill recreational, economic, and educational needs without despoiling or endangering natural resources.*
- *Protect and promote the prudent use of Hawaii's unique, fragile, and significant environmental and natural resources.*
- *Ensure that alterations to existing land forms and vegetation, except crops, 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 earthquake.*

Policies

- *The shoreline of the island of Hawaii shall be maintained for recreational, educational, and/or scientific uses in a manner that is protective of resources and is of the maximum benefit to the general public.*
- *The shoreline shall be protected from the encroachment of man-made improvements and structures.*

Discussion: The proposed subdivision is located more than 3,500 feet from the ocean and is not anticipated to have any direct adverse impact on the shoreline resources. The overall Keauhou resort, however, does provide beneficial recreational opportunities, such as beach parks and public shoreline accesses, for the general public.

Housing

Goals

- *Attain safe, sanitary, and livable housing for the residents of the County of Hawaii.*
- *Maintain a housing supply which allows a variety of choice.*
- *Develop better places to live in Hawaii County by creating viable communities with decent housing and suitable living environments for our people.*

Discussion: As stated previously, the proposed subdivision is intended to replenish the existing inventory of residential lots in Keauhou. This will allow the market to have a continued as well as diverse supply of quality resort residential units. The proposed subdivision will be constructed in accordance with the standards and requirements of the Department of Public Works.

Public Utilities

Goal

- *To have public utility facilities which are designed to fit into their surroundings or concealed from public view.*

Policies

- *A systematic program by the County, State and private interest shall identify sources of additional water supply to ensure the development of sufficient quantities of water for future needs of high growth areas.*
- *All water systems shall be designed and built to Department of Water Supply standards.*
- *Power distribution shall be placed underground when and where feasible. The County shall encourage developers of new urban areas to place utilities underground.*
- *Private systems shall be installed by land developers for major resort and other developments along shorelines and sensitive higher inland areas, except where connection to nearby treatment facilities is feasible and compatible with the County's long-range plans, and in conformance with state and county requirements.*

Discussion: All utilities for the proposed subdivision will be installed underground and constructed in accordance with State and County design standards and requirements.

Recreation

Goals

- *Provide a wide variety of recreational opportunities for the residents and visitors of the County.*
- *Maintain the natural beauty of recreation areas.*
- *Provide a diversity of environments for active and passive pursuits.*

Policy

- *Public access to the shoreline shall be provided in accordance with an adopted program of the County of Hawaii.*

Discussion: The proposed project does not have any recreational facilities within the subdivision. The Keauhou resort, however, has recreational opportunities, such as golf, boating and beach activities, that are available to its guests, visitors and Hawaii island residents.

All of the recreational facilities within Keauhou have been developed to maintain the natural beauty of the area. All new oceanfront projects within the resort include, to some extent, beach and/or shoreline accesses for public use.

Land Use

Goals

- *To maximize choices of single-family residential lots and/or housing for residents of the County.*
- *To provide single-family residential areas conveniently located to public and private services, shopping, other community activities and convenient access to employment centers.*

Discussion: The proposed subdivision is one of several future residential projects that will replenish the existing inventory of residential lots in Keauhou, thus providing a continued choice of residential units in the area. The Keauhou resort is a major visitor destination area that has been carefully planned and programmed for implementation to produce a quality resort/residential community consisting of public and private services, shopping center and community facilities.

County Zoning

The Hawaii County zoning map for the North Kona District designates the project site as Unplanned. A change of zone from Unplanned to RS-15 Residential will be required to allow the development of single-family residential lots with a minimum size of 15,000 sq. ft. A Change of Zone Application for the proposed project has been filed with the County Planning Department.

Special Management Area

The proposed project is located within the Special Management Area and is therefore subject to the SMA Rules and Regulations of the County of Hawaii. This environmental assessment has been prepared to meet the requirements of the SMA Use Permit Petition.

Proposed Action in Relation to the Objectives and Policies as Provided by Chapter 205A, HRS:

The Hawaii Coastal Zone Management Act (Chapter 205A, Hawaii Revised Statutes) established State policies for any action affecting the coastal zone. The act established specific objectives and policies in seven broad categories. The relationship of the proposed subdivision to these categories of concern is discussed below.

Recreational Resources

Objectives:

"Provide coastal recreational opportunities accessible to the public."

Policies:

"Improve coordination and funding of coastal recreational planning and management; and"

"Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area"

The proposed subdivision is over 3,500 feet from the shoreline and is not directly tied to the recreational resources of the coastal area. The Keauhou resort, however, is a master planned development in which recreational opportunities such as a beach park, golf course, boat ramp and recreational pier are provided and accessible to the public.

Historic Resources

Objectives:

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

Policies:

"Identify and analyze significant archaeological resources;"

"Maximize information retention through preservation of remains and artifacts or salvage operations; and"

"Support state goals for protection, restoration, interpretation, and display of historic resources."

An intensive archaeological survey was conducted by International Archaeological Research Institute, Inc. in 1991. A total of five sites were

recorded; four newly identified and one previously recorded. Subsequently, a secondary study was conducted after a small lava tube cave was recently found. Also found during the secondary study was a cluster of agricultural features. Proper mitigation measures, such as in situ preservation, mapping and recording of sites and, excavation and data recovery will be undertaken with the approval of the State Historic Preservation Division and the Hawaii Island Burial Council.

Scenic and Open Space Resources

Objectives:

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

Policies:

"Identify valued scenic resources in the coastal zone management area;"

"Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;"

"Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and"

"Encourage those developments which are not coastal dependent to locate in inland areas."

The proposed subdivision will not impact coastal scenic and open space resources. The project site is located approximately three quarters of a mile away from the shoreline and will have minimal impact on the public views to and along the shoreline. Grading will involve the use of a series of small terraces for the lots to minimize intensive earthwork on the property.

Coastal Ecosystems

Objectives:

"Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems."

Policies:

"Improve the technical basis for natural resource management;"

"Preserve valuable coastal ecosystems of significant biological or economic importance;"

"Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs;"

"Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards."

The proposed project is located more than 600 feet above sea level and 3,500 feet from the coastal ecosystems of the shoreline. The residential lots are not anticipated to have any direct effect on groundwater and marine coastal waters.

Economic Uses

Objectives:

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

Policies:

"Concentrate in appropriate areas the location of coastal dependent development necessary to the State's economy;"

"Ensure that coastal dependent development such as harbors and ports, visitor industry facilities, and energy generating facilities are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area."

The proposed project is part of a master planned resort which is visitor-oriented and coastal dependent. As a tourism destination area, it is part of the largest industry in the state and therefore important to the islands' economy.

Coastal Hazards

Objectives:

"Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, and subsidence."

Policies:

"Develop and communicate adequate information on storm wave, tsunami, flood, erosion, and subsidence hazard;"

"Ensure that developments comply with requirements of the Federal Flood Insurance Program; and"

"Prevent coastal flooding from inland projects."

The Flood Insurance Rate Maps (FIRM) show no riverine or coastal floodways affecting the property. The project site is also not expected to be affected by any major erosions or subsidences.

Proposed Development in Relation to the Special Management Area Guidelines:

The proposed development falls within the "Special Management Area" and is therefore subject to the Special Management Area (SMA) Rules and Regulations of the County of Hawaii. Following is a discussion of the proposed project's relationship to the SMA Guidelines in the Hawaii County Planning Commission's Rule No. 9.

SMA Guidelines A.1-5

A. The Authority and/or the Director, in reviewing any proposed development, shall seek to minimize where reasonable:

- 1. Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough, or lagoon.*
- 2. Any development which would reduce the size of any beach or other area usable for public recreation.*
- 3. Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the Special Management Area and the mean high tide line where there is no beach.*
- 4. Any development which would substantially interfere with or detract from the line of sight toward the sea from the State highway nearest the coast or from other scenic areas identified in the General Plan.*
- 5. Any development which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, estuarine sanctuaries, potential or existing agricultural uses of land.*

The proposed project is located more than 600 feet above sea level and more than 3,500 feet from the shoreline. It is not expected to have any noticeable adverse effect on ground water, surface water and coastal waters.

The proposed project is located deep within the Keauhou property, and the line-of-sight from Kuakini Highway to the shoreline is not expected to be obstructed by the proposed subdivision.

Development of the vacant project site will not adversely affect potential or existing agricultural uses of land.

SMA Guidelines B.1-3

B. No development shall be approved by the Authority or the Director unless it is first found that:

- 1. The development will not have any significant adverse environmental or ecological effect, except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health, safety, or compelling public interest. Such adverse effect shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which taken in itself might not have a substantial adverse effect, and the elimination of planning options;*
- 2. The development is consistent with the objectives and policies as provided by Chapter 205A, HRS, and the Special Management Area guidelines as contained herein; and*
- 3. The development is consistent with the General Plan, zoning and subdivision codes and other applicable ordinances.*

The proposed project will not have any significant adverse effect on the environment, and mitigating measures will be employed, wherever possible, to reduce or lessen any major negative environmental effects as described earlier in this environmental assessment.

The proposed subdivision is consistent with the objectives and policies of Chapter 205A, HRS and the SMA Guidelines. As stated in the State and County Land Use Policies section of this environmental assessment, the proposed subdivision is consistent with the *Hawaii County General Plan*.

SMA Guidelines C.1-6

C. All development permitted in the Special Management Area shall be subject to reasonable terms and conditions as necessary in order to ensure that:

- 1. Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas, and natural reserves is provided to the extent consistent with sound conservation principles;*
- 2. Adequate and properly located public recreation areas and wildlife preserves are reserved;*
- 3. Provisions are made for solid and liquid waste treatment, disposition, and management which will minimize adverse effects upon Special Management Area resources;*

4. Alterations to existing land forms and vegetation, except crops, and construction of structures shall 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 earthquake;

5. Adverse environmental or ecological impacts are minimized to the extent practicable; and

6. The proposed development is consistent with the goals, policies, and standards of the General Plan.

The proposed subdivision will not affect public accesses to publicly owned or used beaches, recreation areas and natural reserves.

The proposed subdivision will not have any significant adverse impact on water, scenic and recreational resources. It is not located in any area prone to flooding, landslides, erosion, siltation, or failure in the event of an earthquake and thus will not increase the danger or risk to human life. Erosion and siltation will be dealt with by erosion control and other mitigating measures approved by the Chief Engineer of the County of Hawaii.

As stated in the previous section, no significant adverse impacts on the environment are anticipated, and mitigative measures will be employed, wherever possible, to reduce or lessen any negative effects.

The proposed subdivision is consistent with the goals, policies and standards of the *Hawaii County General Plan*.

V. PROPOSED ACTION'S ENVIRONMENTAL CHARACTERISTICS AND ANTICIPATED IMPACTS

Existing Land Use

The project site is currently vacant and heavily vegetated (see Figure 3). It is located adjacent to and east of Kealii Street and Keauhou Estates. To the north is the County Department of Water Supply's Kahaluu tunnel and tanks and a Hawaii Electric Light Company substation. To the east is an abandoned railroad bed, which is bounded to the east by additional vacant lands. To the south is a construction equipment storage yard.

The Crown Lands of Keauhou contain several hotels, multi-family and single family residential projects, two 18-hole golf courses, shopping village, long-term health care facility and several areas set aside for future development. The proposed subdivision, when completed, will fit into the development scheme of the resort and not adversely affect any adjacent land uses.

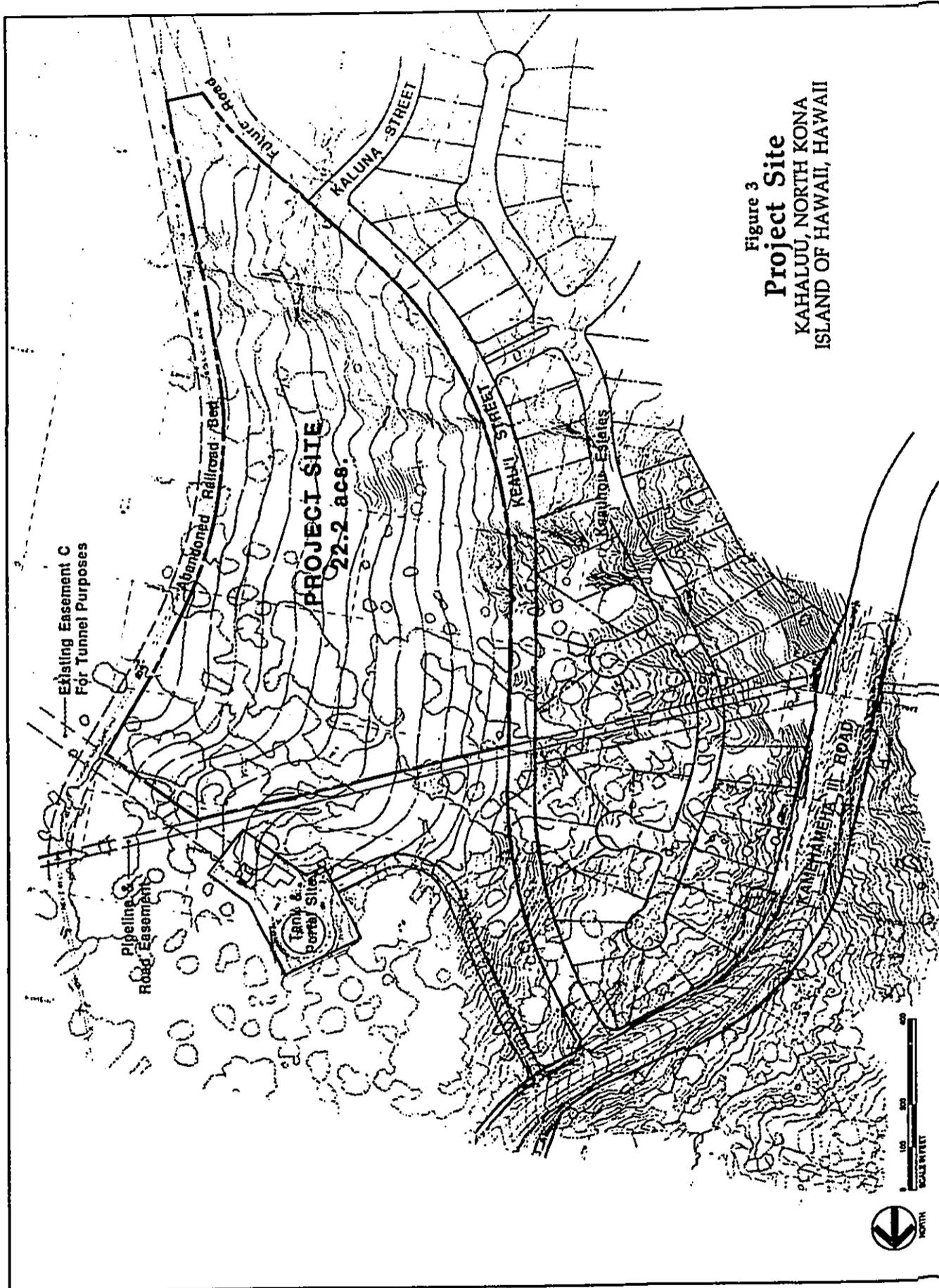


Figure 3
Project Site
 KAHALUU, NORTH KONA
 ISLAND OF HAWAII, HAWAII

Physiography, Geology and Soils

The project site is located between the 550- and 690-foot elevations. The terrain is generally even with no distinct geologic or physiographic features. The average slope is approximately 17 percent.

The northern half of the project site is classified as Type "E" land according to the University of Hawaii Land Study Bureau's Detailed Land Classification - Island of Hawaii map. This land type has very poor agricultural productivity potential. Should the property be developed, there will be no loss of good agricultural land.

The southern half of the property is located on Type "C" land which is fairly suitable for agricultural use.

According to the Soil Survey of the Island of Hawaii, State of Hawaii prepared by the U.S. Soil Conservation Service in 1973, there are basically two types of soil on the property: Kaimu extremely stony peat and Punaluu extremely rocky peat.

Kaimu extremely stony peat is rapidly permeable. Its runoff is slow and erosion hazard is slight. Its Capability subclass is VIIs, non-irrigated. This soil type is not suitable for cultivation.

The Punaluu extremely rocky peat is also rapidly permeable. The underlying pahoehoe lava, however, is slowly permeable. Runoff on the rocky peat is slow, and the erosion hazard is slight. Roots are matted over the pahoehoe lava. This soil is used for pasture, and its Capability subclass is VIIs, non-irrigated.

The Agricultural Lands of Importance to the State of Hawaii (ALISH) Map No. H-8, indicates no designation for a majority (approximately 60 percent) of the proposed site. Although the smaller portion of the property is classified as "Other Important Agricultural Land", there are no unique or prime designated agricultural lands.

Hydrology and Drainage

There are no major drainageways or other surface water features on the property. As stated in the previous section of this environmental assessment, the area's predominant soil type is highly permeable and allow much of the rainfall to percolate into the ground. Any surface runoff that does occur on the property would sheetflow downhill. A drainage system approved by the County Public Works Department will be used to accommodate runoff resulting from the project.

The proposed project is not subject to hazardous surface flooding. According to the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency, the project site is located outside of any 100-year riverine or coastal flood plain.

Flora

Plant species found in the vicinity are common varieties: 1) trees including such species as kiawe, kukui, African tulip tree, noni and monkeypod; 2) shrubs including koa-haole, Christmas berry, klu, castor bean and sodom apple; and 3) common herbs including such varieties as bermuda grass, spiny pigweed, four-o'clock, beggar's ticks, Sacramento bur, goose grass, heliotrope, sow thistle, rattlepod, finger grass, crab grass and sand bur. Bindweed, coccinea and koali awahi'a represent existing vine types.

None of these plant species are classified as rare or endangered. Of the native or presumed-native species found on the property, many are weedy varieties and are able to compete in the face of disturbance or invasion by other weeds.

Large trees will be preserved wherever it is determined to be feasible. Overall, negligible impact on flora is expected, since plant species on the property are common to the island.

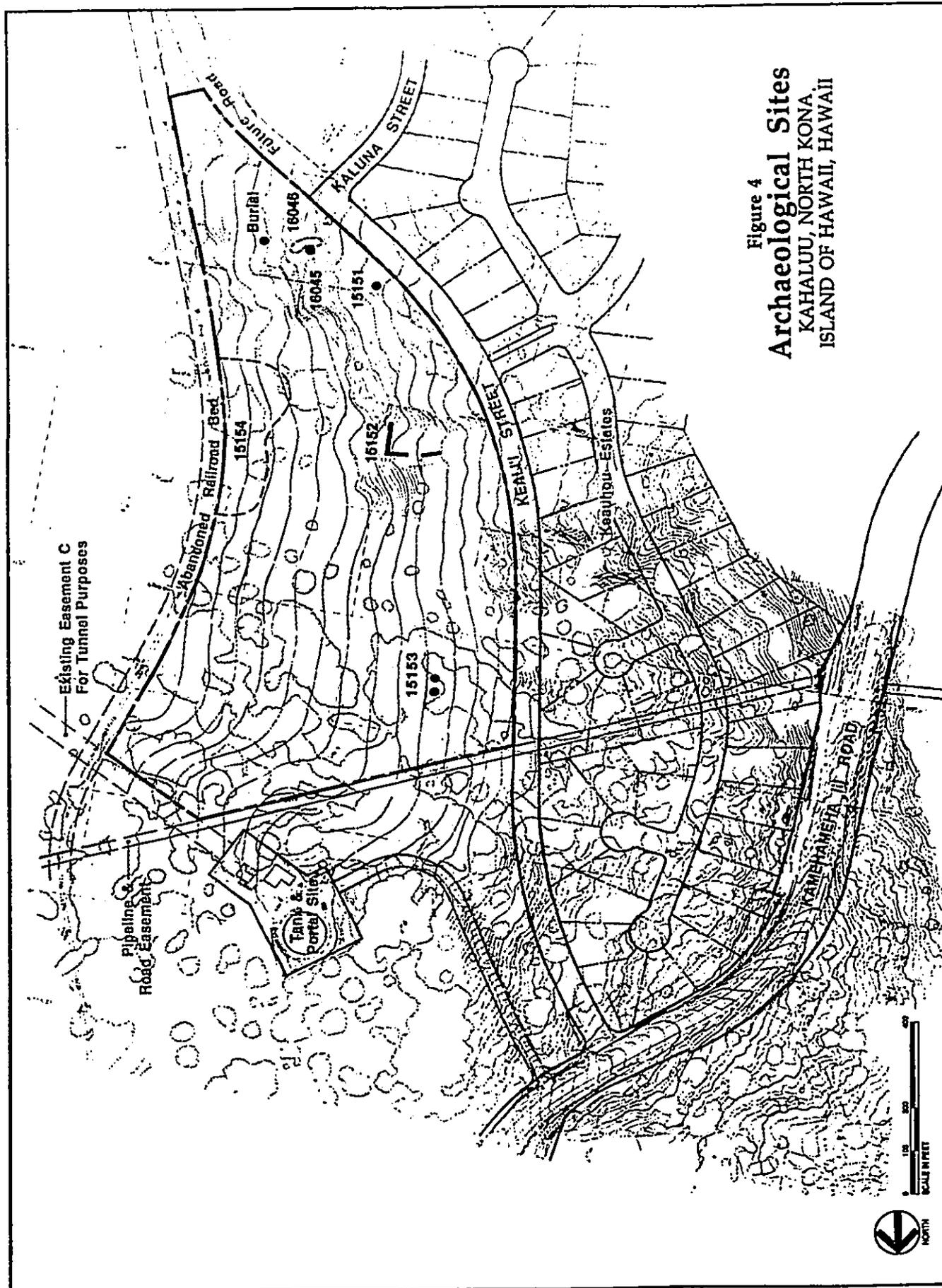
Fauna

Fauna studies conducted in the project vicinity indicate that there are no observed resident endemic land birds, resident indigenous land birds, resident indigenous sea birds, resident endemic and indigenous water birds and migratory indigenous birds in the area. Some of the species, that were found around the project area, include the Japanese white-eye, yellow-billed cardinal, zebra dove, common myna, house sparrow, house finch, and mongoose. These species are highly mobile and will have little trouble in relocating to other areas. None of the species are rare or endangered. The Hawaiian (Hoary) Bat, a species listed by both the Federal and State governments as endangered, has been observed offshore in the Kailua-Kona area a number of times, but its presence in the project vicinity has not been documented.

The proposed subdivision would create a more open and urbanized habitat than what presently exists. This change in the habitat would probably result in a decrease or increase in the numbers of different species depending on the habitat preference of the species. The number of feral cats and dogs could decrease due to the urban nature of the residential development.

Archaeological Sites

An archaeological inventory survey of the property was conducted by International Archaeological Research Institute, Inc. (IARI) in April and May 1991 (Refer to Appendix A). Four new archaeological sites were identified and described in the survey: Sites 15151, 15152, 15153 and 15154. A fifth site, an abandoned railroad bed (Site 7214) was previously recorded (See Figure 4).



Three broad functional categories can be established to describe the archaeological sites: 1) walls associated with ranching (Site 15152); 2) walls, mounds and terraces associated with agricultural activities (Sites 15153 and 15154); and 3) lava tube (Site 15151) which does not appear to have been utilized.

Site 15154 (four complexes consisting of features with agricultural function) is considered significant in terms of its potential information content and research value. It is recommended that archaeological data recovery excavations of a sample of the feature be conducted prior to the development of the parcel.

Site 15152 (three cattle wall remnants) and Site 15153 (two agricultural mounds) are considered significant for their research value. No further information is required for collection from these sites.

The last site, Site 15151, is a small lava tube. It is not considered significant since the feature does not appear to have been utilized or to have paleontological deposits of interest.

A secondary archaeological study was conducted after a recent discovery of a small lava tube on the property. The lava tube, which was found to have two burials, was not noted in the archaeologist's earlier fieldwork. Adjacent to the lava tube (Site 50-10-37-16045), a small cluster of previously unrecorded agricultural features (Site 16046) was also identified (Refer to Appendix B).

The lava tube is likely to yield important information for research purposes and has important cultural value to long-time residents of the area. There are three possible actions that can be taken with respect to the burials: 1) creation of an easement around the burials; 2) creation of a lot in which the burials are located; and 3) removal and reinterment of the burials to another location.

The Hawaii Island Burial Council has reviewed the burials study and has recommended that they be covered with cloth and the lava tube in which they are located be collapsed (see Appendix B). The ground surface above the burials should then be left in its natural state and protected. With the concurrence of the State Historic Preservation Division of the Department of Land and Natural Resources, the applicant plans to proceed with the Burial Council's recommendation.

The adjacent agricultural site is significant for its information content and research value. It is recommended that the site be mapped and recorded, as appropriate, and a sample of the feature be excavated. Development of the area can then proceed.

Site 7214 (old railroad bed) is considered culturally and historically significant. It has a high degree of structural integrity and is recommended for in situ preservation. It is part of a large berm that runs for several miles to the south. The proposed subdivision will abut the railroad berm but will not alter or intrude into its right-of-way.

On February 12, 1993, a Historic Preservation Mitigation Plan was submitted for review to the SHPD and County Planning Department. The SHPD approved the mitigation plan with conditions in April 1993, and IARII has begun the data recovery and mitigation work. A report on the fieldwork will be submitted for approval to the County and SHPD upon its completion.

Visual

The proposed subdivision will not impact views of the shoreline from the Kuakini Highway, the nearest State coastal right-of-way in the Kailua-Kona/Keauhou area. The proposed subdivision is located approximately 300 feet makai of the highway and more than 3,500 feet mauka of the shoreline. It is situated in an obscure area where topography and vegetation screens the development from view. From the shoreline, the proposed subdivision will be visible but not distinguishable as part of a larger regional view of the Keauhou mauka lands.

Air Quality

The air quality of Keauhou resort is comparable to that of other rural resorts on the island. The absence of large sources of air pollutants, such as industrial manufacturing, agricultural burnings and multi-lane traffic congestions, is generally the reason for this quality. The Big Island had recently experienced a decline in air quality due to the volcanic haze that has blanketed the island as a result of the Puu O'o eruptions.

The proposed residential development will not affect the area's long-term air quality. It is not a generator of significant airborne pollutants.

Short-term adverse impacts are expected during the construction of the proposed subdivision. Specifically, heavy earthmoving machinery powered by gasoline or diesel fuel are anticipated to emit airborne particulates.

An increase in dust can also be anticipated as a result of site clearing/grading and infrastructure construction. Proper mitigating measures will be employed to minimize these impacts on air quality.

Sonic Quality

The actual long-term residential use of the proposed subdivision is not anticipated to significantly affect the sonic quality of the area. Noise from traffic generated by the proposed subdivision is expected to have an effect but not at any significant level.

Construction work at the project site will be a source of noise, but the anticipated activities will be short-term. Proper mitigating measures will be employed to minimize the impact on sonic quality.

VI. **PROPOSED ACTION'S SOCIO-ECONOMIC CHARACTERISTICS AND ANTICIPATED IMPACTS**

Market Study

No market study was prepared for the proposed project. The applicant's sales record shows that the inventory of available residential lots has diminished and there is a need to replenish it. To restock its housing inventory, KIC is proposing to construct the 45-lot residential subdivision and continue its long-range development of the resort.

Population

The proposed project could increase the population in the Keauhou area by possibly 122 persons or by about 4 percent using 2.7 persons per household for each lot. This increase in population is relatively insignificant when compared to the total population of the Keauhou area which according to the 1990 Census is 3,089.

Employment

The construction work associated with the proposed subdivision will provide short-term direct employment in the construction industry.

Long-term employment opportunities may exist for possible security personnel and ground maintenance workers for the subdivision's landscaped areas. Job creation from these opportunities may be very limited, however, to probably no more than four positions.

Income

Short-term direct household income will be generated during the project's construction period. This would occur in the form of wages earned by construction workers employed on the project.

Long-term direct household income will be generated for possible employees hired as security personnel and ground maintenance workers.

Housing

The proposed project will increase the housing supply in the Keauhou resort area by 45 units. This increase is relatively insignificant when compared to the number of residential units proposed for the overall resort, according to Keauhou's Land Use Master Plan, and to the number of homes that are expected to be built in the Kailua-Kona to Keauhou area within the next two years.

The proposed project will not result in the displacement of existing homes nor the relocation of existing families from the project site.

VII. PUBLIC FACILITIES AND SERVICES

Schools

Since the proposed residential project is a small development and its residents are expected to be mid-level management career persons, retirees, and second homeowners, the number of children in the subdivision is expected to be small. The demand for educational services consequently would be minimal. Schools that may be affected are Konawaena High School, Kealakehe and Konawaena Intermediate Schools and Kahakai Elementary School.

Parks

It appears there are sufficient park lands available in the North Kona area for the proposed residential development. In a letter from the County Parks Department to the County Planning Department regarding the planned 51-lot residential subdivision along Kaluna Street, it was stated "based on a July 1989 population estimate of 22,773 and the availability of 138 acres of State and County parks, there are approximately 6 acres of park/1,000 population". This exceeds the 5 acres of park per 1,000 population standard established by the County for park needs.

Assuming the total park acreage in the region has not changed and that the population has increased at an annual rate of 5.5 percent, the 1992 population for the Kailua to Kainaliu area would be 26,740 and the park/population ratio would be 5.2 acres per 1,000 population.

Keauhou resort along with Azabu U.S.A. (Kona) Co., Ltd. has been working with an advisory committee to prepare an improvement plan for Kahaluu Beach Park. Through their meetings with the committee, a concept plan was completed and subsequently submitted to the County Parks & Recreation Department for consideration. This effort is part of the County's desire to improve the beach facility and increase its useability. Keauhou resort is intending to participate in the implementation of the plan.

Medical Facilities

Medical services are available at the State Department of Health's Kona Hospital at Kealakekua. The proposed development would not generate a significant demand for medical services and facilities.

Protective Services

The police station for North and South Kona is located in Captain Cook. A substation is also located in Kealakehe to serve the Kailua-Kona area.

Similarly, the Hawaii County Fire Department has a station in Kailua-Kona and Captain Cook. The Kailua-Kona facility provides air, land and sea rescue and conventional fire fighting services. The Captain Cook facility provides the

conventional services. Volunteer stations at Hualalai and Kona Village supplement the regular facilities.

Kona's existing police and fire protection services should adequately accommodate the slight increase in anticipated demand generated by the proposed project.

Additionally, the applicant has dedicated a fire station site to the County for future use. It is located at the intersection of Alii Drive and Kaluna Street within the Keauhou resort.

Public Roads

The major roadways serving Keauhou resort include Kuakini Highway, Kamehameha III Road and Alii Drive. All are directly connected with roadways serving Kailua-Kona. Kuakini Highway is a State right-of-way, and the latter two rights-of-way are County facilities.

Access to the project site is via Kealii Street and Kamehameha III Road or via Kaluna Street and Alii Highway. Kealii Street is a 60' wide collector road that extends from Kamehameha III Road to Keauhou's mauka lands. Kamehameha III Road is a 120' wide arterial that connects Kuakini Highway and Alii Highway. It serves as the mauka entrance road to the resort from the north and mauka lands.

Kaluna Street connects Alii Highway and Kealii Street. This 60-foot-wide right-of-way provides an alternative route to the project site.

Traffic through the Keauhou resort moves very well at the present time. This would change with the development of the proposed project and other projects in the area. According to a traffic impact assessment report prepared by Wilbur Smith Associates, entitled: Areas 8B and 31A Traffic Study, Keauhou, Hawaii, the proposed subdivision will generate a small volume of traffic from its 45-lot development (a copy of the study is on file with the County of Hawaii Planning Department). The study was prepared in May 1990 but the projections are still valid. It was estimated that the project site, which showed 40 units at the time of the study, would generate the following traffic volumes onto Kealii Street:

Morning Peak Hour		Afternoon Peak Hour	
<u>Inbound</u>	<u>Outbound</u>	<u>Inbound</u>	<u>Outbound</u>
8	20	24	16

With 45 lots in the proposed subdivision, the above traffic volumes would increase by about 1 to 3 vehicles per peak hour. The morning peak hour occurs from 7:30 AM to 8:30 AM, and the afternoon peak hour occurs from 3:30 PM to 4:30 PM. The Wilbur Smith study, which was originally conducted for Keauhou's Phase II shopping village and new office complex, does not anticipate any traffic problems on Kealii and Kaluna Streets. Traffic on those streets is extremely low at the present because the two streets serve a limited number of

traffic generators. Present peak hour traffic on Kealii Street is approximately 100 vehicles and on Kaluna Street is about 50 vehicles.

In the future, as more properties are developed in the mauka properties above the project site, traffic volumes at the "T" intersections of Kealii Street and Kamehameha III Road and Kaluna Street and Alii Highway will be higher resulting in some delays.

Short-term negative impacts are expected during the construction of the subdivision roads and infrastructure. Construction vehicles will slow area traffic while on the public roadways, and possible minor rerouting of public traffic lanes at the subdivision entrance may be required.

Water

The proposed subdivision will connect with the County's North Kona Water System which, among other areas, serves Keauhou. The source for this system consists of four wells and one shaft in Kahaluu and one well in Holualoa. The County's distribution system consisting of transmission lines, service lines, pump stations and storage tanks then take the water throughout the North Kona District.

The proposed subdivision is projected to have an average daily water demand of 16,800 gallons per day (gpd) with a peak demand of 84,000 gpd. The County Department of Water Supply has indicated that there is water available for the project site (see Appendix C).

In 1991, the applicant developed a well at the 1,600-foot elevation above Keauhou as a source of water for future development in the Keauhou vicinity. The well, which was tested and showed good results, has been capped and is standing ready for future use.

More recently, a second well (approximately 1,700 feet south of the first well) was developed for Keauhou. Test pumping for this well showed good results. Although the two wells show good potential as a source for the area, they will not be ready for operation for several years.

To the south of Keauhou in Keei, the applicant, through its parent company Kamehameha Schools/B.P. Bishop Estate, contributed land to the County for a well site. In exchange, the County Department of Water has indicated it will provide the applicant with a designated number of water commitments for future development projects in Keauhou (see Appendix C).

The County has since dug a well at the Keei site, test pumped it and is expecting to put the well into production. This source will help supplement the existing sources for the South Kona Water System which notably is tied to the North Kona Water System that serves the Keauhou area.

Sewer

Keauhou's existing sewer system consists of gravity lines, force mains, pumping facilities, and a wastewater treatment plant (WWTP) near Heeia Bay. The proposed project, which will connect to the existing sewer system, is expected to generate an average daily flow of approximately 0.014 MGD, with a peak flow of 0.098 MGD.

Keauhou has recently completed expansion of its WWTP from its existing capacity of 0.75 MGD to a capacity of 1.8 MGD. The treatment facility can be further expanded to an ultimate size of 3.6 MGD.

Current usage at the WWTP is about 0.5 to 0.6 MGD which is slightly down from a few years ago when the hotels in Keauhou were operating at higher occupancy rates. The expanded WWTP has been in operation since early 1994 and is being maintained by a private company. With the proposed subdivision on line, the total usage at the facility would reach less than 50 percent of its expanded capacity.

Electricity and Telephone

Hawaii Electric Light Company (HELCO) is the supplier of electrical power on the Big Island. The power lines for the proposed subdivision will be located underground and meet approved design and installation standards of the utility company. The proposed project is not anticipated to overburden or require any improvements to the existing HELCO system.

Hawaiian Telephone Company provides telephone and other telecommunications services to Keauhou as well as to the rest of the island. Telephone lines for the proposed project will be installed underground from a connection along Kealii Street.

Solid Waste

The homes within the proposed subdivision will be a source of solid waste. Removal of the waste material from the subdivision will be done by a private hauler. The material will be transported to the Puuanahulu landfill in North Kona which replaced the Kealakehe landfill in 1993.

VIII. ALTERNATIVES CONSIDERED TO THE PROPOSED ACTION

No Action Alternative

The "no action" alternative will not allow the objectives of the proposed subdivision to be achieved. The inventory of residential lots for sale in Keauhou has been diminished and no additional new lots will be available.

This alternative will result in no physical change to the property. The land will remain unaltered and unimproved.

No source of income will be brought to the owner and consequently no increased government revenues from higher property taxes will be realized. More importantly, there will be no increased supply of residential lots to meet the demand in the Keauhou area.

Alternative Use

The current zoning for the property is Unplanned. In accordance with this zoning designation, agriculture is a permitted use. The project site, however, has long been master planned for residential development, and its location within the Keauhou resort has been carefully integrated with other resort uses. Existing as well as planned residential projects already abut the subject property.

The project site, notably, is not suitable for agricultural use. Poor soils and rapid ground percolation result in severe limitations for cultivation. Soil studies indicate that commercial agriculture on the project site would not be economically feasible.

Any other use of the project site, other than the proposed subdivision, would not be compatible with the Keauhou Resort Master Plan. This document has designated the project site for single-family residential development for over 12 years.

Alternative Location

There are no other vacant or non-committed sites (for resort use) in Keauhou that have the appropriate zoning for the proposed project. Other sites which are suitable for residential development would still require a change of zone application to the County. The proposed project follows an existing development pattern in the area and has been designated for residential use on the Keauhou Resort Master Plan for a number of years.

The master plan has been reviewed and is currently on file at the County Planning Department. Infrastructure is readily in place to serve the property, and a number of existing and planned convenience facilities, including a shopping center and future office complex, are located in the immediate vicinity.

IX. MITIGATING MEASURES

Construction-Related Impacts

Construction of the proposed subdivision will create noticeable short-term impacts on the environment; such as noise, dust and traffic impacts. These impacts, which would occur only during the period of construction, are expected to be temporary in nature. Mitigating measures, in any event, are being planned wherever major impacts are expected to occur.

Noise generated by construction equipment will be mitigated by limiting the use of heavy machinery to normal daylight working hours and employing muffler devices or noise suppressants on all gasoline and diesel-powered equipment.

Construction-generated dust could be controlled by water sprinkling, screen fences or other measures prescribed by the Chief Engineer of the County of Hawaii. Equipment used for onsite construction will emit some air pollutants via engine exhaust. Construction equipment will be properly maintained by the contractor to maximize the efficiency of fuel combustion and minimize excessive emissions from equipment.

Traffic disruptions will be minimized as much as possible. Construction will be limited to periods of low traffic flow and involve traffic detour provisions along Kealii Street, if necessary. A traffic control plan approved by the Chief Engineer of the County of Hawaii will be utilized to aid in the minimization of impacts on the public roadways.

Impacts on Archaeological Sites

The applicant is intending to follow the recommendations of IARII (the consultant archaeologist for the project), the State Historic Preservation Division (SHPD) and the Hawaii Island Burial Council.

IARII is recommending that Site 15154 (four complexes consisting of features with agricultural function) undergo archaeological data recovery excavations of a sample of the feature prior to the development of the parcel.

Site 15152 (three cattle wall remnants) and Site 15153 (two agricultural mounds) are considered significant for their research value. IARII is recommending that no further information is required for collection from these features.

Site 15151, a small lava tube, is not considered significant.

A secondary archaeological study was submitted after the discovery of a small lava tube on the property. The lava tube was found to contain two burials that had not been noted in the archaeologist's earlier fieldwork. Beside the lava tube (Site 50-10-37-16045), a small cluster of previously unrecorded agricultural features (Site 16046) was also identified (Refer to Appendix B).

Site 16045, the lava tube cave, is likely to yield important information for research purposes and has important cultural value to long-time residents of the area. The Hawaii Island Burial Council reviewed the burials within the lava tube cave and has recommended that they be covered with cloth, and the lava tube, in which the burials are located, be collapsed. The ground surface above the burials should then be left in its natural state and protected.

The adjacent agricultural site is significant for its information content and research value. IARII is recommending that the site be mapped and recorded, as appropriate, and a sample of the feature be excavated. Development of the area can then proceed.

Site 7214 (old railroad bed) is considered culturally and historically significant. It has a high degree of structural integrity and is recommended for in situ preservation. It is part of a large berm that runs for several miles to the south. The proposed subdivision will abut the railroad berm but will not alter or intrude into the railroad right-of-way.

Implementation of a Data Recovery/Mitigation Plan that was approved by SHPD was undertaken and a final report on the fieldwork and its findings will be submitted to the County Planning Department and SHPD for acceptance and final approval.

X. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The proposed project will commit the site to long-term residential use. Private funds, labor, construction equipment, building materials, landscape materials, energy sources, water resources, and other utility services will be committed to the development of the project.

Existing vegetation will be removed from the property and replaced with introduced landscape plants.

Long-term commitment of resources will include labor for possible security personnel and ground maintenance work, and utility connections, including water, sewage disposal, electricity, and telephone will be required to continually service the individual homes.

XI. DETERMINATION

This assessment presently shows that the proposed project will have no significant impacts on the environment and thus an Environmental Impact Statement is not required. In accordance with the provisions of Chapter 343, Hawaii Revised Statutes, a Negative Declaration is therefore determined to be in order.

XII. FINDINGS AND REASONS SUPPORTING THE DETERMINATION

The following findings and reasons support the determination that there will be no significant effect on the environment as a result of this project:

1. There will be no major adverse social or economic impacts resulting from the proposed action.
2. The impacts associated with construction activities are short-term and temporary. All short-term impacts will be minimized in accordance with applicable County of Hawaii, State of Hawaii, and Federal rules and regulations.
3. No rare or endangered wildlife or flora will be affected by the proposed action.
4. No significant archaeological, cultural, or historical sites will be adversely affected.
5. There will be no significant adverse impact on the visual environment.
6. The proposed project will be consistent with the County General Plan, the Hawaii Coastal Zone Management Program, and Special Management Area policies and objectives.
7. The primary benefit of the proposed project is to provide a much needed supply of residential lots in Keauhou where the existing inventory of such lots has been depleted.

APPENDICES

- **APPENDIX A**

Archaeological Inventory Survey of Development Parcel 33 at Keauhou Resort, prepared by International Archaeological Research Institute, Inc., August 1991

- **APPENDIX B**

Addendum to Final Archaeological Inventory Survey Report for Development Parcel 33 and Correspondence with Hawaii Island Burial Council

- **APPENDIX C**

Supplemental Information Regarding State Historic Preservation Division and County Department of Water Supply Comments

APPENDIX A

ARCHAEOLOGICAL INVENTORY SURVEY OF DEVELOPMENT
PARCEL 33 AT KEAUKOU RESORT, KEAUKOU, NORTH KONA, ISLAND
OF HAWAII

ARCHAEOLOGICAL INVENTORY SURVEY OF
DEVELOPMENT PARCEL 33, AT KEAUKOU RESORT,
KEAUKOU, NORTH KONA, ISLAND OF HAWAI'I

by

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August 1991

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ABSTRACT

In April and May 1991 an intensive archaeological survey was conducted at Parcel 33 of Keauhou Resort in Keauhou, North Kona, Hawai'i Island. Four new archaeological sites were identified and described during the survey. One of these, Site 15154, continues in the adjoining "Nursery" parcel to the east. Another site, the railroad berm (Site 7214), had been previously identified.

Each site was described and its location indicated on a topographical map and an aerial photograph. Only the largest site, Site 15154, was mapped in detail using tape and compass. Three broad functional categories of sites are present: walls associated with ranching (Site 15152); walls, mounds and terraces associated with agricultural activities (Sites 15153 and 15154), and one lava tube (Site 15151), which does not appear to have been utilized.

One test unit was excavated at Site 15154. This unit, unfortunately, was completely sterile of cultural remains. However, one cowrie shell fragment was discovered in a small mound adjacent to the test pit.

Site 15154 is considered significant in terms of its potential information content and research value. It is recommended that archaeological data recovery excavations of a sample of the features in the site be conducted prior to development of the parcel.

The railroad berm, Site 7214, is considered culturally and historically significant under multiple significance criteria. This feature, which has a high degree of structural integrity in the parcel, is recommended for *in situ* preservation. It is part of the same largely intact berm that runs for several miles through the adjacent Mauka Land parcel immediately to the south of Parcel 33.

Two of the sites--Sites 15152 and 15153--are considered significant for their research value. However, no further information need be collected from these sites to mitigate anticipated adverse impacts from development of the parcel.

The last site--Site 15151--is a small lava tube that does not appear to have been utilized or to have paleontological deposits of interest. This site is not considered significant.

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INTRODUCTION

This report provides the results of an archaeological inventory survey of Development Parcel 33 at Keauhou Resort in North Kona on the island of Hawai'i (Figs. 1, 2, and 3). Kamehameha Investment Corporation contracted International Archaeological Research Institute, Inc. (IARII) to conduct the survey in preparation for further development at this location.

The inventory survey was divided into two phases of archaeological field research at the parcel. The first phase--Phase I--was a reconnaissance survey conducted between September 25-29, 1990 by Ruth Van Dyke, M.A., and W. R. Fortini, Jr., B.A., of IARII. The objectives of Phase I were to locate and briefly describe archaeological sites in the project area. The researchers did not conduct subsurface testing, undertake detailed description, or prepare plan maps of any sites they located.

The second phase of fieldwork--Phase II--was directed by Michel Lutfy, B.A., who was assisted by Chris Westcott, B.A. This work was conducted between May 13 and May 24, 1991. J. S. Athens, Ph.D., the Principal Investigator, visited the parcel both prior to Phase II fieldwork (with William Fortini in Dec. of 1990) and for one day during fieldwork. The objectives of this phase of fieldwork included:

- 1) locating and inventorying all archaeological remains in the study area.
- 2) clearing features of vegetation.
- 3) preparing accurate written descriptions of the sites, mapping the sites, and photographing the sites.
- 4) conducting limited test excavations to evaluate the nature and extent subsurface deposits of a sample of the sites.

Several problems were encountered during the Phase II fieldwork, the most significant of which was the thick vegetation. Much of the parcel is covered with tall guinea grass (*Panicum maximum*). The grass was very difficult to walk through and it restricted visibility to such an extent that many of the features were nearly impossible to see until the grass was cleared away. Another problem concerned the nature of the agricultural remains in the parcel. Many of these remains

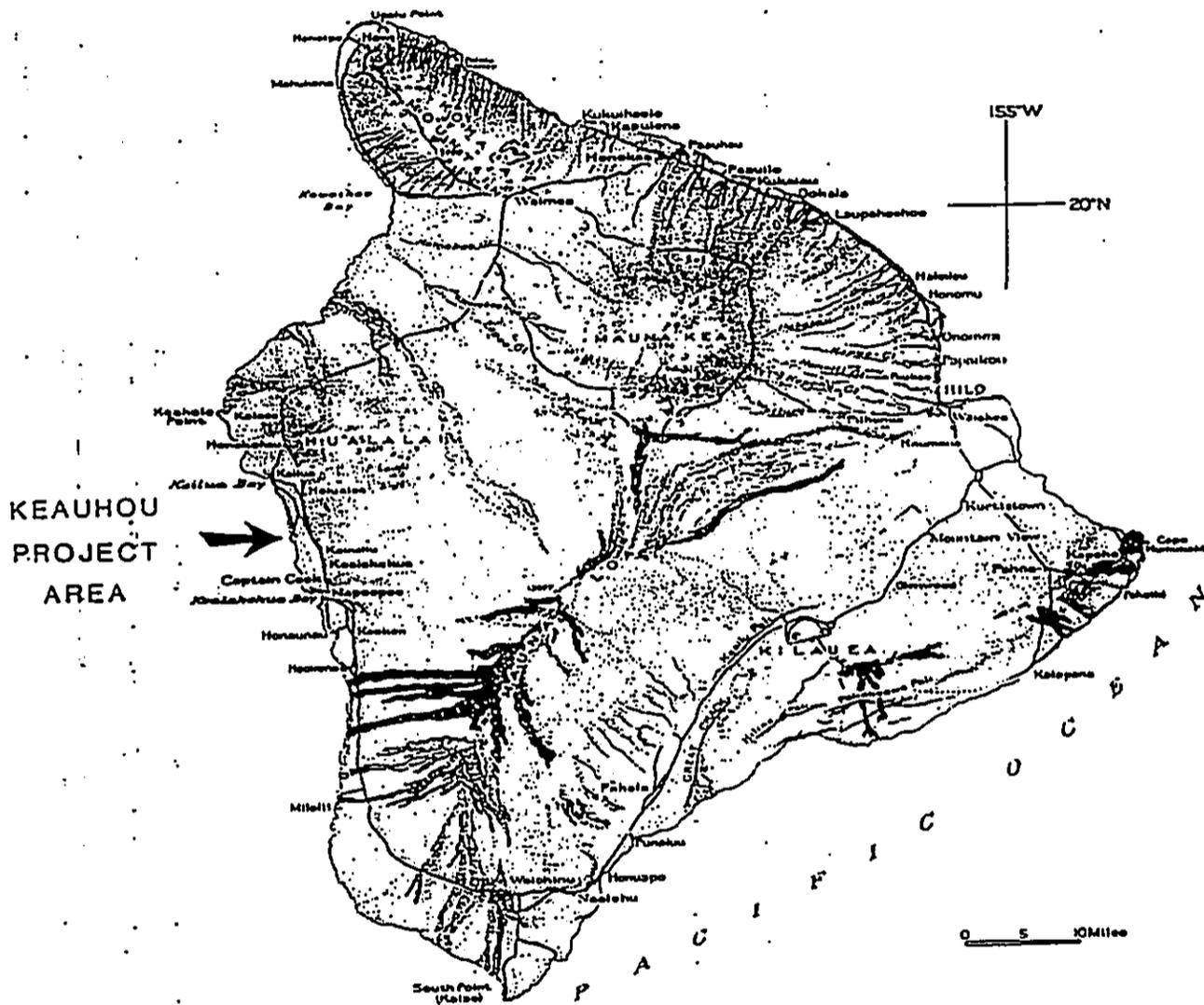


Figure 1. Map of Hawai'i Island showing location of Keauhou project area (Macdonald and Abbott 1970:288).

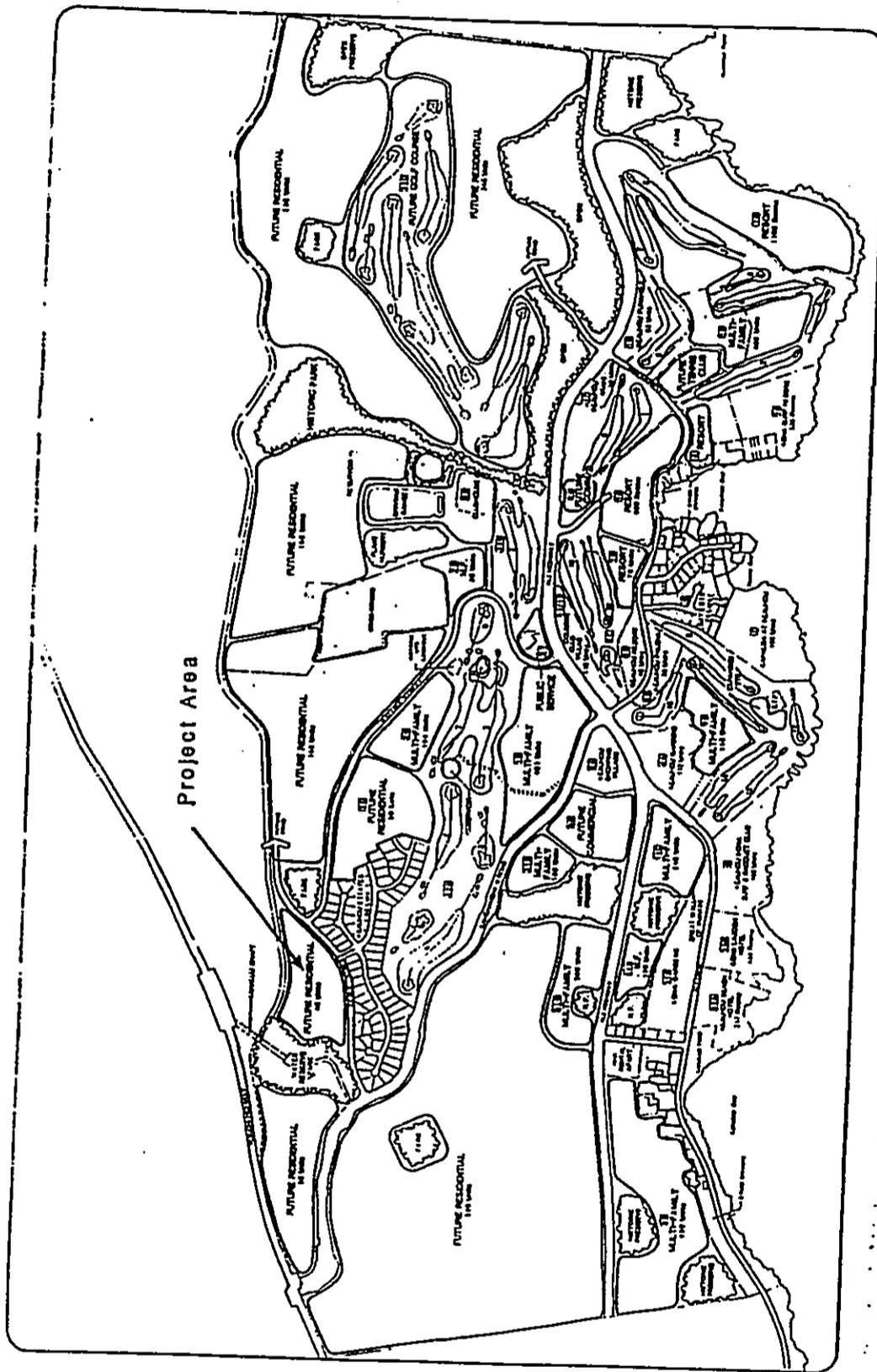


Figure 3. Map showing Keauhou Resort development parcels; note location of Project Area (Parcel 33).

consist of modifications of existing outcrops or old lava flows. This fact coupled with the dense vegetation made it difficult to determine the extent of several of the sites, and especially Site 15154.

BACKGROUND

Environment

The project area is designated Development Parcel 33 of Keauhou Resort, North Kona (see Fig. 3). Keauhou Resort is located approximately 8 km south of Kailua-Kona in the ahupua'a of Kahalu'u and Keauhou I. The resort development area extends from the coast to approximately 700 ft above sea level. The project area is approximately 22 acres and is situated at an elevation of 550 to 685 ft above sea level (see Fig. 3).

Tomonari-Tuggle (1985:13) describes the geological substrate of the Keauhou Resort development area as follows;

Extending inwards from the coast are the remnants of lava flows from Hualalai volcano which were laid down at different times and under different circumstances in the past. Thus, while Kahalu'u is generally characterized by pahoehoe which has weathered to an arable soil, Keauhou is stark in its barren expanse of relatively more recent flows of clinkery a'a.

Sato et al. (1972:22) include all but the northern margin of Parcel 33 lands under their rKED classification (Kaimu extremely stony peat), which is defined as follows:

Kaimu extremely stony peat: This soil is at low elevations on Mauna Loa. In a representative profile the surface layer is very dark brown, extremely stony peat about 3 inches thick. It is underlain by fragmental a'a lava.

The northern margin of the project area falls under the Sato et al. (1972:48) rPYD classification (Punaluu extremely rocky peat), which is defined as follows:

Punaluu extremely rocky peat: This soil is low on the leeward side of Mauna Loa. Rock outcrops occupy 40 to 50 percent of the surface.

The north section of the project area is dominated by Christmas berry (*Schinus terebinthifolius*) and kukui (*Aleurites moluccana*); a few papaya plants (*Carica papaya*) and lilikoi (*Passiflora edulis*) are present, the ground cover is sparse, consisting mainly of air plants (*Bryophyllum pinnatum*) growing directly on the a'a. The southern two-thirds of the parcel is dominated by a thick growth of guinea grass (*Panicum maximum*) mixed with koa-haole (*Leucaena glauca*) and scattered kukui groves along with some dense clusters of Christmas berry. Air plants are also found growing over rocks.

Feral pigs were frequently encountered during the survey. They have dramatically impacted the landscape by rooting, burrowing, and trampling paths across the rough terrain.

Historical Background

The North Kona area of the Island of Hawai'i has a rich prehistory. By A.D. 1300 agricultural fields in Kona had been developed in the upland areas (Tomonari-Tuggle 1985). Hydration-rind dates from Site D4-27B, located and excavated by Neal Crozier in 1971 as part of the Kamehameha III Road Project (Crozier 1971a, 1971b), indicate that the field system may have been used around A.D. 1350, suggesting inland expansion in the Keauhou area during the 14th century (Kirch 1985:230).

From the 14th to 16th centuries the Island of Hawai'i was essentially unified under the rule of ali'i nui (Hommon 1976). Over the course of the 14th century, inland expansion approached its maximum limits. According to Tomonari-Tuggle (1985:16), "The Kona Field System, of which Keauhou is a part, was probably first established during this period."

The first specific reference to Keauhou or Kahalu'u in the traditional literature dates to the late 16th to 18th century. When 'Umi-a'liloa killed the ruling ali'i nui of Hawai'i who was his half brother, most of the district rose in rebellion. Subsequently, 'Umi conquered each district and ultimately consolidated his power as ruling chief or ali'i nui. According to Kamakau, he then "...desired to dwell in Kona where the climate was warm" (1961:19).

Upon 'Umi's death the island was divided between his two sons into northern and southern districts (Tomonari-Tuggle 1985:20). The chief of the southern district defeated the northern chief to once again unify the island under centralized rule. In the early 17th century, Lono-ika-Makahiki, 'Umi's grandson, controlled Puna and Ka'u. Fornander (1916) writes that Lono also resided in Kahalu'u when his travels and wars were over.

From the mid 17th century to the early 18th century, the island was split on a windward/leeward axis. The ali'i nui controlling the leeward district is said to have resided on the Kona coast. Tomonari-Tuggle(1985:20) notes that:

From the time of 'Umi when Kona became the residence of the ruling chief, the Kahalu'u coastal area appears to have grown in political and religious significance, with concomitant growth of settlement around the main bay and along the coastline.

Kirch further observes that "the Kailua to Keauhou area of North Kona was a major center of population and of political development in the late prehistoric period" (Kirch 1985:167).

From 1700-1750, Hawai'i was once again united as a single political unit under the rule of Alapa'inui. But in 1752 Kalaniopu'u, who controlled Ka'u and Puna, revolted against Alapa'inui and seceded. Upon Alapa'inui's death, Kalaniopu'u defeated the designated heir and assumed the role of the ruling chief.

It was during the reign of Kalaniopu'u that Captain Cook arrived, marking the beginning of European influence in Hawai'i. Like most of his predecessors, Kalaniopu'u traveled extensively throughout the islands, but after Cook's death at Kealahou, the chief resided for some time in Kahalu'u. Within 25 years of contact Kamehameha I unified all the Hawaiian Islands. He too spent time residing in Kahalu'u with select members of his entourage.

Based on Kamakau (1961), Tomonari-Tuggle (1985:23) notes that from approximately 1750 to 1810:

several high-ranking chiefs were born at Keauhou and at Kahalu'u. Among them were Kuakini (born 1791; governor of the Island of Hawai'i from 1820 to 1845), Miriam Kekauloahi (born 1794; premier of Hawai'i from 1839 to 1845) and Kauikeauloahi (born 1813, Kamehameha III), Keopuolani, the "sacred" wife of Kamehameha and the mother of Kauikeaouli, resided at Keauhou sometime between 1789 and 1795.

The period of transition as Western ways were first introduced during the rule of Kalanipūʻu and Kamehameha ended dramatically at the battle of Kaumōʻo which took place on the southern coast of Keauhou I (Tomonari-Tuggle 1985). In 1819, after Liholiho broke the traditional religious laws, a small band of chiefs who wished to retain the old religious ways gathered together at Kealakekua. At the battle of Kuamōʻo they were defeated by Liholiho. Within a year, the first Protestant missionaries arrived in Hawaiʻi to establish a station at Kailua. At this same time, Liholiho's royal court moved to Honolulu, thereby transferring the focus of political and religious law away from the Kona coast.

Despite the administrative shift to Oʻahu, Kona remained important because of its rich agriculture and its protected bays. In 1838 Mackintosh wrote that Keauhou Bay "which affords a comfortable and safe anchorage, is resorted to by vessels for cargoes of firewood, sandal wood and other commodities of produce" (Mackintosh 1838:2). Introduced crops such as yams, coffee and melons were also cultivated.

During the early historic period, agriculture in Kona was divided into three planting zones: 1) breadfruit, sweet potato, and wauke were grown in dry areas at low elevations; 2) sweet potato and dryland taro were grown between sugarcane and ti in fields bounded by low walls in an intermediate zone; and 3) gardens of bananas and plantains were cultivated in the upland area just below the edge of the mountain forest (Newman 1970:130; Holland 1971; Tomonari-Tuggle 1985:26).

Land Units and Ownership

A total of 50 Land Commission Awards were granted in Keauhou I. The LCA's were awarded in one to three parcel allotments ranging from 0.14 to 6.66 acres (Tomonari-Tuggle 1985). In the project area there is only one Land Commission Award, which was to Victoria Kamamalu for the ahupuaʻa of Kahaluʻu (LCA 7713:6, book 10, page 435). There were no kuleana awards granted in the area (Tomonari-Tuggle 1985:208).

Previous Archaeological Investigations

Numerous archaeological investigations have been conducted at Keauhou I and the adjacent ahupuaʻa of Kahaluʻu to the north. The earliest surveys were conducted by John F. Stokes and J. E. Reinecke of the B. P. Bishop Museum as a part of regional or thematic studies. Kenneth Pike Emory also worked in the area in 1932 and again in 1971.

Kirch (1985:166) notes that North Kona is "an area of modern housing and resort development, the so-called Gold Coast, leading to a surge in contract archaeology in the past decade." By 1985 efforts to salvage information from sites endangered by urbanization had resulted in over 35 site specific studies (Tomonari-Tuggle 1985). In the years since 1985 archaeological salvage projects have continued. These projects have been located primarily along the coastal strip where development has been most extensive.

Four previous archaeological projects have been conducted that are directly related to Parcel 33 or its immediate vicinity. One of these, according to Tomonari-Tuggle (1985:89,208-209), was an overview/evaluation archaeological survey conducted for Keauhou Resort as part of the Cultural Resources Management Plan. During this work a brief walk-through of the windward portion of the parcel "indicated that it may contain impressive agricultural complexes" (Tomonari-Tuggle 1985:209, citing M. S. Allen). A second study was by Hammatt and Folk (1980), who also conducted an overview/evaluation of Keauhou Resort Property in 1980. This investigation included a portion of Parcel 33. Unfortunately, there was little information concerning the location of the sites found within the boundaries of the parcel. At this time the railroad berm was recorded as a site (State Site No. 50-10-37-7214). Both the Tomonari-Tuggle and the Hammatt and Folk studies recommended that an intensive archaeological survey of the parcel be conducted, followed by systematic mapping and testing.

The other two studies consisted of recent inventory surveys by Pearson and Ladefoged (1990) of Parcel 34, and another by Athens (1991) of the large Mauka Land area. Both of these studies indicated the generally low density occurrence of primarily agricultural features sporadically throughout the area. However, there were also several lava tube sites, terrace platforms, historic sites dating to the late 19th and early 20th centuries, enclosures, and many walls (see especially Athens 1991). Athens' project, being a Phase I survey, did not include subsurface testing. However, Pearson and Ladefoged did conduct testing, and they reported on a single radiocarbon date of 370 ± 60 years B.P. (corrected for isotopic fractionation). This date is from a shallow cultural deposit inside a small lava tube shelter (Site 14647).

The results of archaeological projects conducted in the Kona area can be synthesized to form an overall settlement pattern context for the Parcel 33 project area and surrounding areas. Tuggle (1990) notes that the coastal zone of Azabu-Kona Resorts, which is quite close to the project area, contained permanent residential features, burials, and religious structures. Schilt (1984) found that the kula section of the

Kona Field System contained both permanent and temporary residential features, burial and refuge caves, and a variety of agricultural features including low walls across swales, terraces, and mounds. Hammatt and Folk (1980) and Tomonari-Tuggle (1985) document religious features in the *kula* zone. In the upper elevations of the Kona Field System, Kawachi (1989) recorded permanent residential features with a variety of agricultural features that were intermittently irrigated by rainfall runoff.

As the Parcel 33 project area is situated within the *kula* zone of the Kona Field System, it should contain many of the archaeological features associated with this zone. These should include an emphasis on agricultural features (small terraces, modified boulder outcrops, and other similar features arranged in irregular patterns), and possibly some evidence of temporary residential sites and use of lava tubes for shelters. Historic cattle walls may also be present. Major residential features, intensive cultivation features (in the sense of irrigation agriculture or regular field systems), major religious monuments, and the like should be rare or absent in this relatively dry and very rocky *kula* area.

FIELD METHODOLOGY

The intensive survey of the archaeological resources was conducted in several distinct steps. Systematic pedestrian transect surveys had already been conducted during Phase I to identify sites (Fortini & Van Dyke 1990). The initial Phase II effort was to relocate these sites. However, some of the remains described in the Phase I report could not be definitely relocated. Not surprisingly, the intensive search for these sites resulted in the discovery of additional features under the thick vegetation. Following extensive vegetation clearance at a number of features, an overall site location map was prepared. Subsurface test excavations were then conducted at two features.

The archaeological remains were described according to an explicit classification system. State site numbers were assigned to spatially distinct architectural remains. Contiguous or related components were recorded in accordance with their assigned feature numbers within the designated site.

In order to determine the precise morphology of the sites, vegetation was cleared using cane knives and sickles. Once free of vegetation, a tape and compass were used to plot the sites on a site location map (Fig. 4). A detailed map was prepared of Site 15154 (Fig 5).

Standard recording and excavation procedures were employed throughout the subsurface testing phase. Excavations were conducted according to the natural stratigraphy of the test unit. Because of the paucity of cultural materials, screening was not deemed necessary. Only one shallow soil layer was identified in the generally rocky terrain. Standard excavation forms were used for recording all observations.

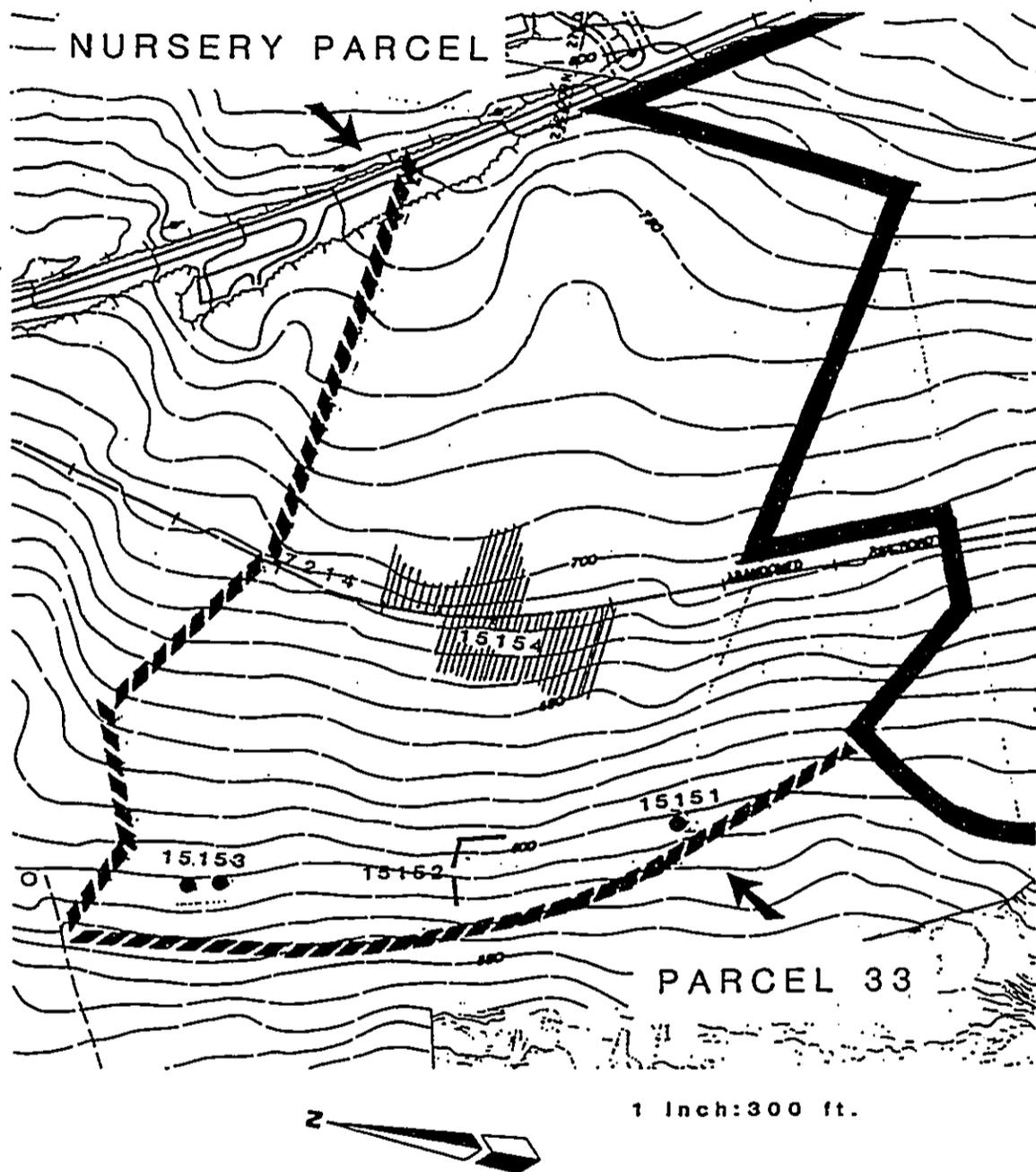


Figure 4. Location of sites in the Project Area.

SITE DESCRIPTIONS

The IARII survey team observed and recorded four archaeological sites in the project area. In 1990 the Phase I survey team recorded a large site covering the southern portion of Parcel 33. The Phase II survey team were unable to relocate many of the features described in the Phase I report. Features in the northeastern part of this site were recorded as part of the next site to the north after vegetation clearing made it obvious that these features were related. The Phase I report also records several wall remnants in the northern section of the parcel, but on closer inspection during the Phase II work, these features were considered to be the remnants of old lava flows which created low wall-like outcrops running along the slope from east to west.

Because most of the features were not tested, their functional classification is based solely upon their structural and construction characteristics and not upon materials collected during subsurface testing.

In the following section each archaeological site is individually described. The largest site, 15154, also has descriptions for each of its component features. The State of Hawai'i site numbers referred to below are all prefixed by 50-10-37-. The number -50- refers to the State of Hawai'i, -10- to the Island of Hawai'i, and -37- to the U.S.G.S. quadrangle map sheet where the site is located. The following descriptions include the site's dimensions, construction style and technique, the presence of surface midden, and possible site function.

Site 7214: Railroad Berm.

This site, previously recorded and assigned a State site number, forms the east boundary of Parcel 33 (see Figs. 1 and 2). It was built by the West Hawaii Railroad in the early 20th century. This short-lived line, which extended some 11 miles from Holualoa to Keopuka was apparently intended to connect sugar plantations in North and South Kona. The only known station was at the Kona Mill (see Tomonari-Tuggle 1985:214, Conde and Best 1973:87).

The berm is currently densely overgrown with vegetation. However, the carefully faced lava cobble structure is entirely intact, though no ties or rails remain to be seen. The height of the berm on its downslope side at Site 15154 is 4 m (see Photo 1). At the south end it is approximately level with the ground

surface, at the north end it cuts into the bedrock lava so that it reaches as much as 2 meters below the ground surface.

Site 15151

Site 15151 is a small lava tube located in the southwest corner of the parcel directly above Kealii street. The entrance faces east and is 1.5 m wide and 1.2 m high. The tube extends back for 3.5 m, where it pinches out except for a small opening on the north side. This small opening is 60 cm in diameter and opens into a small chamber 4 m long, 3 m wide and 2 m high at the highest point in the northeast corner of the chamber. In the back of this small chamber on the northeast side a smaller tube that is 50 cm in diameter extends back 3 m. The opening of this smaller tube is 1.7 m high on the back wall of the chamber, and below this opening there is a shallow soil deposit 5 cm deep at its deepest. On the surface of this soil deposit were found small sea urchin test fragments weighing 4.1 grams, and a cowrie shell fragment weighing 7.0 grams along with many small land snail shells. It is doubtful that these land snail shells constitute midden. It is likely that they, along with the small amount of marine shell, washed in through the small tube at the back of the cave.

Site 15152

Site 15152 consists of three cattle ranching wall remnants located in the south central portion of the parcel, approximately 25 m east of Kealii street. The first wall segment, or Feature 1, is 20.5 m long, 1 m or 4 courses wide, and 1 m or 7 courses high. It runs on an axis of 85/265 degrees for 13.7 m and then changes direction to an axis of 101/281 degrees for 6.8 m. This segment is tumbled at both ends and may have once continued in both directions and connected to Feature 2. What remains of Feature 1 is in good condition (see Photos 2 & 3).

Feature 2 lies 40 m east and uphill of Feature 1. It is 11.8 m long, 90 cm or 4 courses wide, and 1.1 m or 6 courses high. This wall segment runs at an axis of 95/275 degrees and connects to Feature 3 at its east end. Feature 2 is tumbled at the western end where it may have been destroyed by a bulldozer.

Feature 3 is connected to and approximately perpendicular to Feature 2, running on an axis of 171/351 degrees for 19.7 m. It is 80-90 cm wide and 1.1 m or 5 courses high. The condition of this segment is fair; it is tumbled at its southern end where it may also have been destroyed by a bulldozer.

Site 15153

This site consists of two mounds located in a *kukui* nut grove in the northern part of the parcel approximately 100 m west of the railroad berm. Feature 1 is an oval-shaped mound 3 m long, 2 m wide, and 1 m high. It is built of a'a cobbles and small to large boulders and is in fair condition (see Photos 4 & 5).

Feature 2 is also an oval mound measuring 2.5 m in length, 1.6 m wide and 80 cm high. It is built of the same materials as Feature 1 but is in poorer shape.

Site 15154

This is the largest site on this parcel and it also extends east into the adjacent parcel (the Nursery Parcel). The site has been divided into four complexes, which are separated from each other by short distances. Complexes A and B are located east of the railroad berm in the Nursery Parcel and are described in a separate report for that parcel; however a map of the whole site is included here (Fig. 5) to show the extent of the site and the relationship between the four complexes.

Site 15154 is mainly agricultural in function, although two structures on the Nursery Parcel may have been used as temporary habitation or storage structures. Complexes C and D consist of agricultural features constructed of modified natural outcrops on weathered lava flows. The following is a description of each feature within the two complexes.

Complex C

This complex consists of two large terraces and several smaller ones with associated planting areas and walls. A very thin deposit of loamy silt is found throughout this area. Refer to Figure 5 for locations of each feature.

Feature 25:

This is a large terrace/enclosure located in a *kukui* grove directly west and downslope of the railroad berm. The terrace was formed by building a retaining wall 8 m long from north to south and 110 cm high. This wall is constructed of small to medium sized boulders stacked along the slope and nicely faced. The facing can still be seen along most of the wall, which is in good condition. This wall connects with Feature 37. The northern boundary of the enclosure is a modified outcrop and the southern

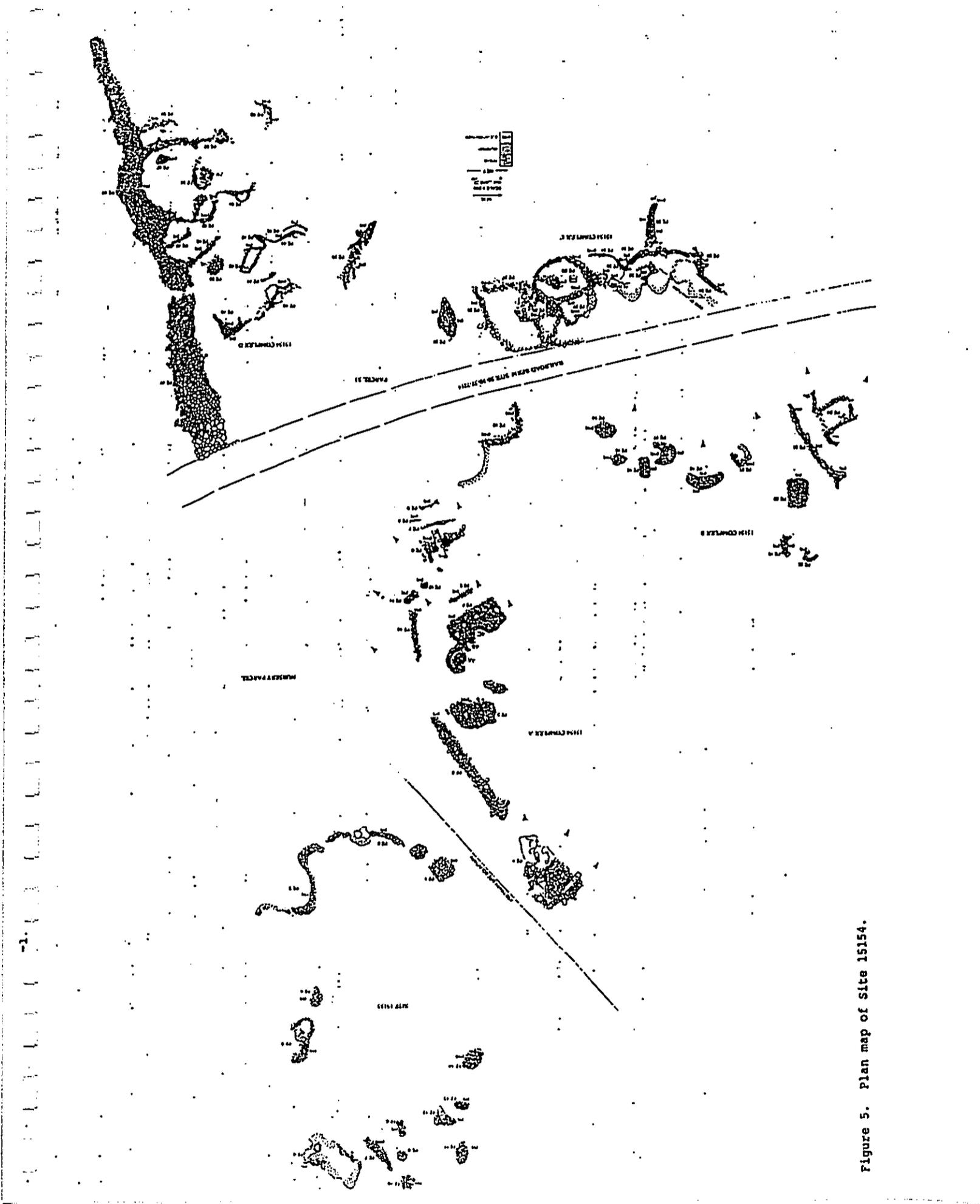


Figure 5. Plan map of Site 15154.

CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

DOCUMENT CAPTURED AS RECEIVED

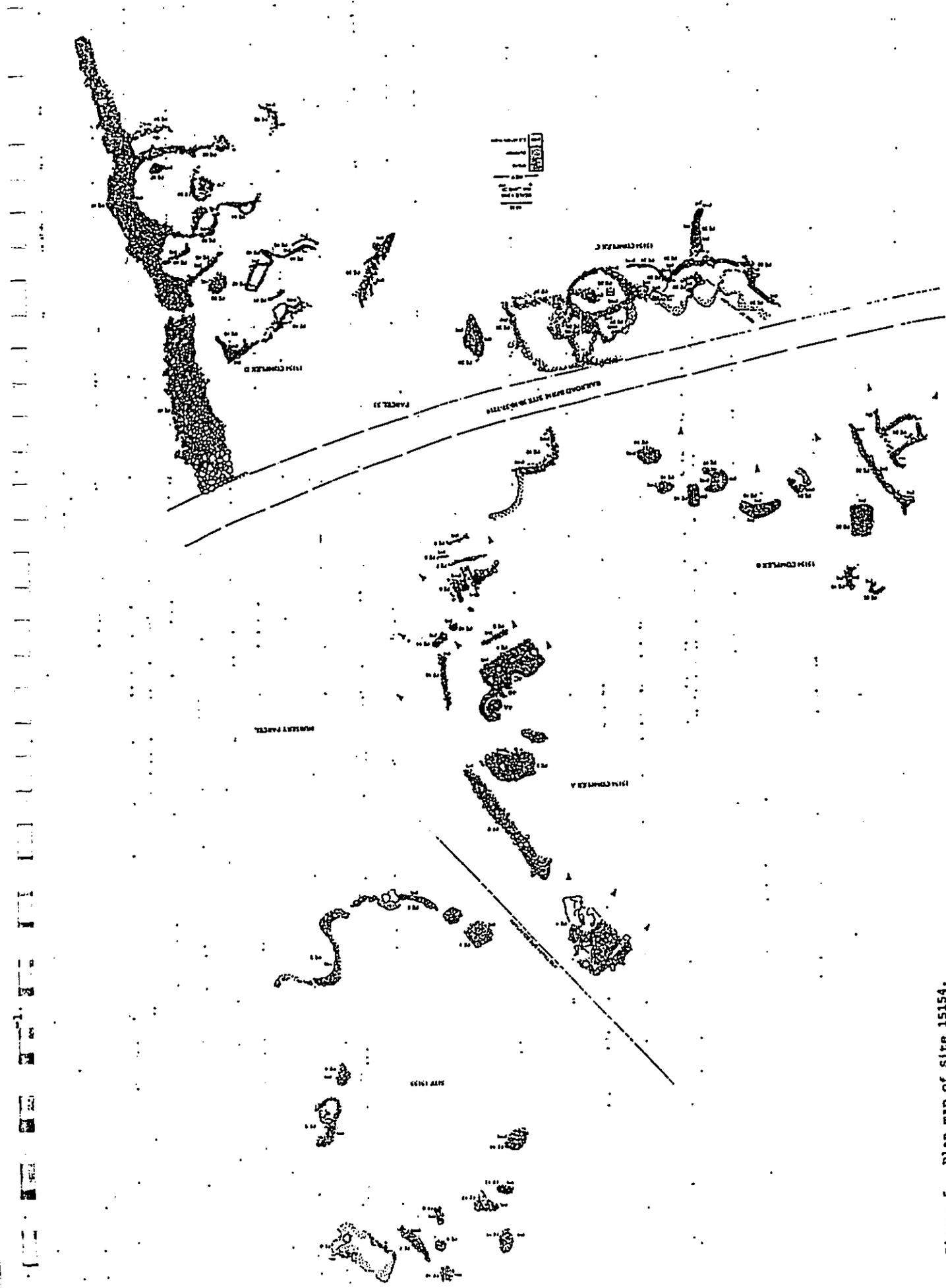


Figure 5. Plan map of Site 15154.

boundary is a low wall 7 m long which runs along the slope from east to west. The back wall of the enclosure is similar in construction to the front retaining wall and is also the retaining wall for Features 26 and 27.

Feature 25a:

This is a small mound made up of medium to large boulders on the outside core filled with cobbles; built on Feature 25. This mound is 2.5 m long from east to west, and 2 m wide along its north/south axis and has a height of 70 cm.

Feature 26:

Feature 26 is a C-shape modified outcrop with small boulders placed across the opening of the "C" which encloses a small terraced planting area. The retaining wall of this feature is part of the back wall of Feature 25. The C-shape outcrop is 60 cm high, 170 cm long, and with the terrace wall, encloses an area 170 cm in diameter. The retaining terrace wall is 30 cm high on the inside.

Feature 27:

Feature 27 is also a C-shaped modified outcrop enclosing a small terraced planting area. The retaining wall is also part of the back wall of Feature 25. Feature 27 is 2 m wide east to west, and 3.3 m long north-south. The height of the modified outcrop is 120 cm and the inside of the terrace wall is 40 cm high. This feature was constructed by removing rocks from below the natural outcrop to create a small clear area for planting. The removed rocks are incorporated into the outcrop and the retaining wall to protect the soil in the planting area from erosion.

Feature 28:

Feature 28 is also a C-shaped modified outcrop and retaining terrace wall enclosing a planting area. Construction method is the same as Feature 27 with the dimensions of 150 cm north-south and 100 cm east-west; the height of the modified outcrop is 130 cm, and the terrace wall is 50 cm on the inside or uphill side. This retaining wall is also the back wall of Feature 30.

Feature 29:

This feature is also a planting area and is similar to Feature 28. It is 1 m in diameter. The height of the modified

outcrop is 90 cm and that of the terrace or retaining wall 10 cm. This retaining wall is also the back wall of Feature 30, which is directly below or downhill of Feature 29.

Feature 30:

Feature 30 is a small (4 m north-south by 3 m east-west) terrace constructed by modifying an existing lava flow edge to form the retaining wall on the downslope side of the feature and removing rocks from the center of the feature to create a clear area for planting. These rocks were also used to build the back wall of the terrace. This back wall is 90 cm high and the lower retaining wall is 110 cm high at the highest, although it is tumbled in many places and is in poor condition.

Feature 31:

Feature 31 is another terrace downslope of Feature 30. Its construction method and materials are the same as that feature. The terrace wall is 6 m long north to south and 110 cm high at its highest.

Feature 32:

Feature 32 is a small C-shaped planting area built on the flat area of Feature 34. This structure is constructed of small to medium sized boulders stacked to form a C-shaped wall. This wall may have been faced on both sides originally, but the only facing left is on the east side; the rest has collapsed. The wall is 80 cm high, and the feature measures 2 m east to west by 4 m north to south.

Feature 33:

Feature 33 is a small C-shaped planting area built into the terrace wall of Feature 34. Its dimensions are 160 cm northeast to southwest and 60 cm northwest to southeast.

Feature 34:

Feature 34 is a large terrace situated north of Features 6 and 7, and directly west of the railroad berm; in fact the construction of the berm may have destroyed the eastern part of the terrace. The terrace is 18 m long north to south and about 1.0 to 1.3 m wide east to west. The terrace retaining wall is built of small to medium sized boulders and is 2-3 courses or 90 cm high, and 1.2 m wide.

Feature 35:

Feature 35 is a linear alignment west of Feature 34. It is built along the gentle east-west slope. This alignment is 7 m long and 1.8 m wide. Constructed of cobbles and small to medium sized boulders, it is faced on the north and south sides where it is 80 cm high, and the west side, where it is 110 cm high.

Feature 36:

Feature 36 is part of an old lava flow which has been modified into a linear alignment or low wall running along the slope from northeast to southwest south of Feature 25. The east end has been destroyed by the railroad berm. The remaining portion of the alignment is 10 m long, 1.3 m wide, and 60-70 cm high; it was probably higher in the past as it is presently in poor condition with a lot of tumble. Feature 36 may also be the southern wall of a large enclosure in which Feature 25 is situated in the northwest corner and Feature 37 is a continuation of the western wall. The east end of this possible enclosure may have been destroyed by the railroad berm.

Feature 37:

Feature 37 is a modified outcrop which also forms a very rough terrace retaining wall. It is continuous with the west wall of Feature 25 but not as well constructed. It has medium to large boulders piled on top of an already existing ledge and rocks removed from both sides. The length of this feature from the southwest corner of Feature 25 is 10 m; its width, including tumble, is 2 m. It is 120 cm at its highest. As noted above, this feature may be part of the western wall of a large terrace enclosure (see Fig. 5).

Feature 38:

Feature 38 is part of an old lava flow which has been modified into a linear alignment running east to west along the slope. It is located 4 m south of Feature 36. This Feature is 7 m long, 2 m wide, 20 cm high on the north side, and 80 cm high on the south side.

Complex D

Feature 39:

Located 20.2 m south of Feature 36, Feature 39 is the edge of an old lava flow which has been modified to form a terrace retaining wall. The modified section of the outcrop is 12 m

long, 2.2 m wide, and 1.1 m at the highest. The outcrop has been modified by stacking cobbles and medium to large a'a boulders against the slope and on the outcrop, creating a facing.

Feature 40:

Feature 40 is a modified outcrop from which rocks have been removed from some parts and added to others to create a facing and four small C-shaped planting areas. The length of this modified outcrop is 8 m long; it has a 290/110 degree axis. The facing is 1.2 m high on the west side and 1.5 m on the east side.

Feature 41:

Feature 41 is a small linear alignment built across the slope south of Feature 40. It is constructed of small-to-large boulders with few cobbles and is 3 m long by 1.5 meters wide.

Feature 42:

Feature 42 is a small U-shaped enclosure built on a terrace for which Feature 43 is the retaining wall. The open end faces west, and the north, south, and east walls are built of nicely stacked and faced small boulders (Photos 6 & 7). The enclosure measures 3 m from the outside of the north wall to the outside of the south wall, 1.67 m from the inside of the north wall the inside of the south wall, and 3.5 m from east to west. The walls are 80 cm high.

Feature 43:

Feature 43 is a terrace facing directly west of and connected to Feature 42. This terrace wall also includes a C-shaped planting area at its north end. The terrace facing was created by stacking cobbles and small boulders against an existing low outcrop. The wall is approximately 4 m long north to south, and 1.8 m wide east to west. The width of the C-shape planting area is 1.5 m.

Feature 44:

Feature 44 is a terrace located north of Feature 43. The retaining wall of this terrace is built of small, medium, and large boulders stacked and faced. This wall is 8 m long north to south, 80 cm wide, and 85 cm high.

Feature 45:

Feature 45 is another terrace wall directly west of Feature 44. This wall is built of small to medium sized boulders stacked

to form a small terrace running north-south for 4.2 m. The wall itself is 60 cm wide and 70 cm high.

Feature 46:

Feature 46 lies southeast of Feature 40 and may have been connected to it originally. This feature is a mound with a C-shaped planting area on the west side. This mound is built of cobbles and small to medium boulders; it is 3 m long on a north-south axis, and 2.7 m wide in the center. The west side of the mound is faced and is 1.2 m high, while the east side is sloping and is 80 cm high.

Feature 47:

Forming the southern boundary of the site, Feature 47 is a large modified lava flow and possible *kuaiwi* (traditional Hawaiian agricultural walls that run parallel with the slope--see Kirch 1985:228). This feature joins the railroad berm 30 m south of Feature 25 and runs downhill, or east to west, for 64 m; it is 3 m wide. It consists of small to large boulders with many boulders having been removed from the north and south sides and piled on top to increase its height. The height varies along the length of the feature, the south side being 85 cm on average while the north side 95 cm on average. Features 48, 49, 50, 52 and 54 all connect with this feature.

Feature 48:

Feature 48 is a terrace wall which connects with Feature 47 at its southeast end. The wall extends 7 m from the southeast to the northwest and is 1 m wide. Constructed of stacked small to medium sized boulders, it is 90 cm high on the downhill or west side.

Feature 49:

Feature 49 is another terrace wall which is also connected to Feature 47 at its southeast end and runs parallel to and west of Feature 48. This wall is built of small to large boulders and is 5 m long, 1 m wide, and 90 cm high on the west side.

Feature 50:

Another terrace connected to Feature 47, Feature 50 is parallel to Feature 49 and is 7 m long, 5 m wide, and 1 m high.

Feature 51:

Feature 51 is a terrace wall with an enclosed planting area behind it to the north of Feature 50. The terrace wall is built

of stacked medium and large boulders, is 7 m long and 1.2 m high, and is faced all along its length on the west or downhill side. The small enclosed area is 3 m in diameter.

Feature 52:

Feature 52 is another terrace wall connecting to Feature 47 at its southern end. This wall runs 14 m on a north-south axis and is 3 m wide. Built of small to medium sized boulders and some cobbles, it may have originally been faced on the west or downhill side. The rocks are now tumbled all along its length and the wall is now 110 cm high.

Feature 53:

Lying north-northwest of Feature 52, Feature 53 is an outcrop which has been modified to form a small terrace. Constructed of small to large boulders added to existing bedrock, it is 5 m long northeast to southwest and 1 m wide. This feature may have originally been faced all along its length but is in poor condition with facing intact only on the southwest end where it is 1.3 m high.

Feature 54:

Lying west of Feature 52, Feature 54 is another terrace wall connecting to Feature 47. This terrace wall is in very poor condition with much tumble of the small and medium boulders from which it was constructed. Its dimensions are 5.6 m long north-south, 1.2 m wide, and 80 cm high.

Feature 55:

Feature 55 is a mound located east of Feature 48 and between Features 42 and 47. It is constructed of stacked small-to-large boulders and cobbles and may be core filled. The mound is 3.5 m long southeast to northwest, 2.2 m wide, and 1.4 m high.

Feature 56:

Feature 56 is a C-shaped terrace wall which lies between Feature 50 and 52. Unlike the other terraces in this complex which are built across the slope, this terrace wall is built along the slope. The construction method and materials are the same as the other terraces. It is 4 m long east to west, 3.2 m wide, and 1.3 m high.

Feature 57:

Feature 57 is a small mound located east of Feature 52 and north of Feature 47. This mound is a pile of small to large boulders measuring 1.9 m in diameter and 1.25 m in height.

TEST EXCAVATIONS

One controlled test pit (TP) totaling 0.3 cubic meters was excavated at Feature 25. The location is indicated on the Figure 5 site map. No cultural remains were recovered from this test pit. The surface deposit is very shallow, bedrock being encountered at 30 cm below surface.

Feature 25 was chosen because it is the largest and best preserved feature of complexes A and B. The test pit was located on the flat area of the terrace and close to Feature 25a, which is a small mound. This was considered the area most likely to yield cultural remains if any were present.

The test pit measured 1 m² at the surface and had a maximum depth of 30 cm below the surface. The soil in the pit was a very loose and dry loamy silt with numerous small to medium sized roots.

Excavation was carried out with a trowel. No screening was undertaken partly due to the lack of time, but mostly due to the paucity of cultural materials in the unit. In this sense, the excavation was very similar to test excavations conducted in features directly to the east of the railroad berm in the Nursery Parcel into which Site 15154 extends.

In addition to this test pit, Feature 1a, which is a small mound on the terrace of Feature 1, was dismantled. One small cowrie shell fragment weighing 29.4 grams was found close to the center below the rocks of the mound. No other cultural material was in evidence.

DISCUSSION AND CONCLUSION

The intensive survey of the study area resulted in the identification of 4 sites with 39 features. One test pit was excavated and one mound was dismantled at one of the sites. The archaeological sites in the study area reflect both past agricultural and ranching activities with one site possibly being used as a temporary shelter.

Agricultural Sites

Two of the sites appear to have been used for agricultural purposes. Features include walls, terraces, mounds, enclosures and many planting areas. These features have been classified as agricultural based upon surface observations and past archaeological research on the Kona Field System (Schilt 1984:170-235). The Kona Field system covers an estimated 139 km², extending approximately 29 km along the coast and 5 km inland from Kailua Bay to Kealakekua (Kirch 1985). In well preserved portions of the field system above Kealakekua Bay, stone and earth walls run both perpendicular and parallel to the slope, defining long, rectangular fields (Cuddihy & Stone 1990). The project area is located in a zone of the Kona Field System called the *kula* lands which extends from the coast to approximately 500 ft above sea level (Kelly 1983:47). In this zone sweet potato and *wauke* (*Broussonnetia papyrifera*) were cultivated wherever there was sufficient soil. An historic account by the Reverend William Ellis (1979:31-32) notes that the *kula* lands:

...were cultivated to a considerable extent; small gardens were seen among the barren rocks on which the houses are built, wherever soil could be found sufficient to nourish the sweet potato, the watermelon, or even a few plants of tobacco, and in many places these seemed to be growing literally in the fragments of lava, collected in the small heaps around their roots.

The location of the low walls in a portion of the *kula* lands that contains soil and in an area where Land Commission Awards in the vicinity (Native Register vol. 8:429, 467; Native Testimony vol. 4:651, 652) document farming some seventy years after contact, suggests that these walls are remnants of a

traditional Hawaiian agricultural system that was in use during the mid 18th century and very likely was used in the prehistoric period.

Sites Associated with Ranching

One of the sites documented is classified as associated with ranching. The functional classification has been determined solely upon the structural characteristics of the walls. These walls are over 1 m in height, 0.5 m in width, and may have been more extensive before they were destroyed.

Grazing animals were introduced to Kona in 1794 by Captain Vancouver. Soon thereafter, ranching was established as a means for provisioning ships. "Landowners with large parcels of kula lands used them for grazing cattle and horses" (Kelly 1983:79). Walls used in cattle ranching have distinctive characteristics. During an interview with Marion Kelly (1983:111) concerning ranching in the early 1900s, former cattle rancher Joe Gomes stated that:

Most of the walls have been here since the land was made into kuleana. Most walls were built by Hawaiians. Some were built for ranches. Walls about three feet high can keep donkeys penned. The usual wall is 4.5 feet high and keeps cattle in.

The walls in Parcel 33 tend to fit this description. They are the right size and are located in the appropriate geographic zone of the Kona Field System. Furthermore, cattle ranching is still practiced in fields adjacent to Parcel 33. All these factors strongly suggest that these walls have been used in ranching activities.

Lava Tube Site

One lava tube was located. As mentioned in the site description, one sea urchin test and a cowrie shell fragment were found in the inner chamber of this lava tube. The small size of the chamber and the difficulty of entering it along with the absence of any other cultural remains seem to suggest that these shells were not the result of *in situ* human activities but may have washed in from a different location.

Site 7214: Railroad Berm

As previously discussed, this site was part of the West Hawaii Railroad, which was constructed early in the present century. The cobble berm, which is all that remains (the railroad ties and rails are no longer present), exhibits a high degree of structural integrity, though it is densely overgrown with vegetation. The berm is entirely intact throughout its course along the east boundary of Parcel 33.

SITE SIGNIFICANCE AND RECOMMENDATIONS

The agricultural features in the study area are similar to prehistoric and early historic agricultural remains distributed from near the coast to over 2,500 ft above sea level in North Kona. That area encompasses what has come to be called the Kona Field System, which has been variously defined (see Schilt 1984, and Kirch 1985). Whether the Keauhou Resort lands fall within this traditional agricultural field system is unclear (see discussion in Athens 1991:20-23). Nevertheless, the traditional agricultural remains of the Keauhou Resort are an important component of the archaeological remains in this area.

Preliminary significance assessments for the sites in the study area have been determined based on National Register of Historic Places and the State of Hawaii Register criteria. Site 15154 appears to be significant solely in terms of criterion D; that is, the site is likely to yield information important to the understanding of Hawaiian prehistory and history. While the type of features found in this site are of interest, their significance appears to lie only in their scientific information content and research value. It appears that this type of site is commonly found in many places along the North Kona coast. Since this site is not unique and does not possess special characteristics of a distinct type, it would not be significant under criterion C, which is the only other criterion for which it might be considered.

Prior to any adverse impacts, it is recommended that further excavation be undertaken at this site in order to obtain information on site chronology and further details on construction characteristics. At this time it is unclear whether the remains are prehistoric or historic Hawaiian agricultural features.

Sites 15152 and 15153 are also considered significant under criterion D because of their information content and scientific research value. However, information collected during the present survey is sufficient to mitigate adverse impacts and no further investigations are recommended. These sites include the historic ranch walls (Site 15152) and the two mounds of Site 15153.

The lava tube--Site 15151--is not considered significant. Field investigations suggest that this location was not used culturally, and it has no paleontological or other deposits of scientific interest.

The railroad berm, Site 7214, is significant under criteria A, C, and possibly E. Criterion A refers to sites that are associated with events that have made an important contribution to the broad patterns of history. The railroad berm, embodying as it does, tangible evidence of Hawai'i Island's former plantation economy and largely agrarian lifestyle, would appear to fall under this criterion. With respect to criterion C--sites that embody the distinctive characteristics of a type, period, or method of construction--the berm, designed for a narrow gauge railroad, certainly evokes images of a bygone era and way of life. With respect to criterion E--sites that have important historical and cultural value to an ethnic group of the state--the railroad may be regarded as such by present and former plantation laborers and their descendants. It is likely that many people now living in the area would consider the berm as part of their heritage and identify with the former economy and lifestyle that it represents.

Because the berm can be considered significant for multiple criteria, and also because the berm exhibits a high degree of structural integrity and could be restored (and possibly used as a walkway or jogging trail) relatively easily, it is recommended that it be preserved *in situ* along with connecting sections in undeveloped parcels to the south at Keauhou Resort.

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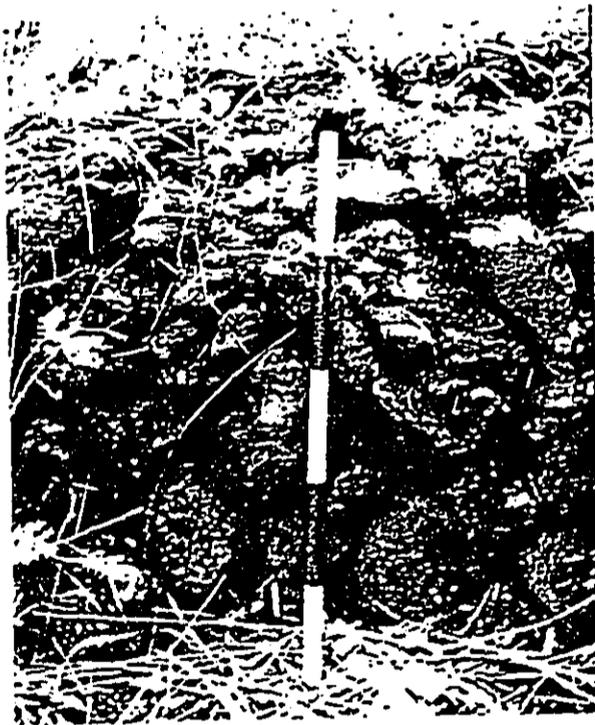
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Photo 1. Railroad
berm at site
15154 complex D,
north of Feature
47.



Photo 2. Site 15152,
Feature 1. View
to the North.



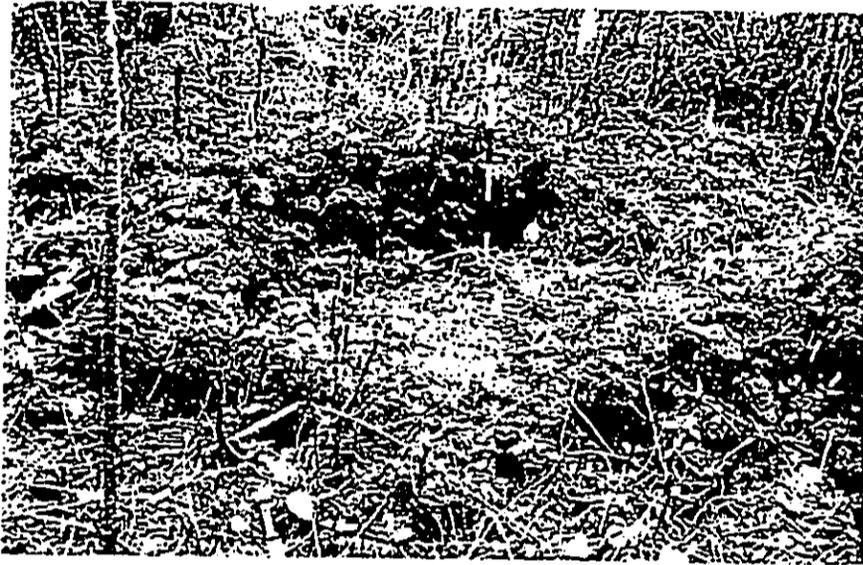


Photo 5. Site 15154 complex D, Feature 42.
View to Southwest.



Photo 6. Site 15154 complex D, Feature 42.
View to Southeast.

APPENDIX B

ADDENDUM TO FINAL ARCHAEOLOGICAL INVENTORY SURVEY
REPORT FOR DEVELOPMENT PARCEL 33 AND CORRESPONDENCE
WITH HAWAII ISLAND BURIAL COUNCIL

International Archaeological Research Institute, Inc.

PREHISTORIC & HISTORIC INVESTIGATIONS • CULTURAL RESOURCES ASSESSMENTS & PLANNING • PALEOENVIRONMENTAL STUDIES

September 9, 1991

Mr. Joseph K. Spencer, III
Kamehameha Investment Corp.
78-6831 Alii Drive, Suite 234
Kailua-Kona, Hawaii 96740-2413

SUBJECT: Addendum to Final Archaeological Inventory Survey Report for Parcel 33,
Keauhou Resort, North Kona, Island of Hawai'i.

Dear Mr. Spencer:

This letter is written as an Addendum to our previously submitted archaeological inventory survey report, *Archaeological Inventory Survey of Development Parcel 33, at Keauhou Resort, Keauhou, North Kona, Island of Hawai'i*, by Michel R. Lutfy and J. Stephen Athens (Aug. 1991). Following submittal of this report, a crew clearing vegetation for topographic survey transects in the parcel reported to your office the discovery of a small lava tube containing a burial which evidently had not been noted during our earlier fieldwork. Because of the extremely dense vegetation in Parcel 33, it is not surprising that a new site was found.

On August 23rd, the finder of the site, Able Aquino, took me and another archaeologist, Greg Burchard (director of the Mauka Land project), to visit the site. The tube, designated as Site 50-10-37-16045, is located approximately 35 meters east (upslope) of Keali'i Street, which forms the western boundary of the parcel, and near (approximately 30 meters north of) its intersection with Kaluna St. (see attached location map). When the site was visited, a small cluster of previously unrecorded agricultural features were also noted immediately south of the tube site. These agricultural features, including several platform mounds and terrace structures, are designated on the map as Site 50-10-37-16,046

The tube site has a small entrance, approximately 1.0 x 0.60 m. The vegetation surrounding the tube includes guinea grass, *koa-haole* trees, vines, air plants, and a medium-sized monkey pod tree. The terrain is generally very rocky. The lava tube itself averages about 2.5 to 3 m wide and 0.70 to 1.20 m high, heads in an upslope direction, and curves toward the north at a roughly 25 degree angle approximately 20 m from the entrance. The ground surface of the tube was virtually entirely rock. No evidence of habitation or midden refuse was observed anywhere within the tube.

Approximately 12 m from the entrance there is a pile of basalt cobbles that nearly blocks the tube, though barely enough space is present to crawl over it along its south edge. This is almost certainly a cultural feature. It may have been built to seal off access to the rest of the tube. It could also be a burial feature itself, though there was no direct indication of this.

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SAIPAN: 1000 ... 772-1221

CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

DOCUMENT CAPTURED AS RECEIVED

International Archaeological Research Institute, Inc.

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The tube site has a small entrance, approximately 1.0 x 0.60 m. The vegetation surrounding the tube includes guinea grass, *koa-haole* trees, vines, air plants, and a medium-sized monkey pod tree. The terrain is generally very rocky. The lava tube itself averages about 2.5 to 3 m wide and 0.70 to 1.20 m high, heads in an upslope direction, and curves toward the north at a roughly 25 degree angle approximately 20 m from the entrance. The ground surface of the tube was virtually entirely rock. No evidence of habitation or midden refuse was observed anywhere within the tube.

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page 2
Sept. 9, 1991
Mr. Spencer

Further into the tube, some 30 meters from the entrance, there are two burials (not one as originally reported to us), which are situated on a shelf-like side chamber that is about 2 m deep. Rocks partly blocked the view of the bones, though they were obviously in a very disturbed condition. The skulls, appearing to be partly fragmented, were lying side by side. It is possible that the burials are secondary interments. A few small bones (phalanges, etc.) were observed on the tube floor below the chamber, obviously having eroded from their original location. It seems unlikely that there has been prior human disturbance to the bones, though this cannot be entirely ruled out. No artifacts or other materials were noted around the burials or anywhere else in the tube. It was not possible to examine the bones in order to obtain information on age and sex of the burials (other than that they obviously were not infants or children). It is believed that the burials are likely to be prehistoric in age, and therefore must be from individuals of Hawaiian ancestry.

The tube continued deeper for an undetermined distance, though only about 10 m was explored beyond the burials due to greatly reduced ceiling height (which lowered to ca. 50 to 60 cm beyond the burials).

Regarding significance of the two sites, the lava tube (Site 16,045) would fall under both criteria D and E of the Hawaii Register significance criteria. These criteria indicate that the site is likely to yield important information for research purposes (D), and that the site has important cultural value to an ethnic group in the state (E).

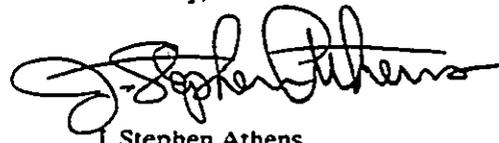
Regarding the agricultural site (Site 16,046), this site is significant under criterion D because of its information content and research value.

Prior to any development or ground disturbance within the parcel, it is recommended that the burial tube be mapped. Every effort should be made to preserve the burials *in situ* and leave them undisturbed within the tube. This can be done by sealing the tube entrance following mapping. Should development plans make the preservation of these burials difficult or impossible, then procedures for disinterment and reburial will have to be initiated in accordance with state law.

With respect to recommendations for impact mitigation for the agricultural site, it should also be mapped and recorded as appropriate. A sample of the features should also be excavated. Development activities within the site area can then proceed.

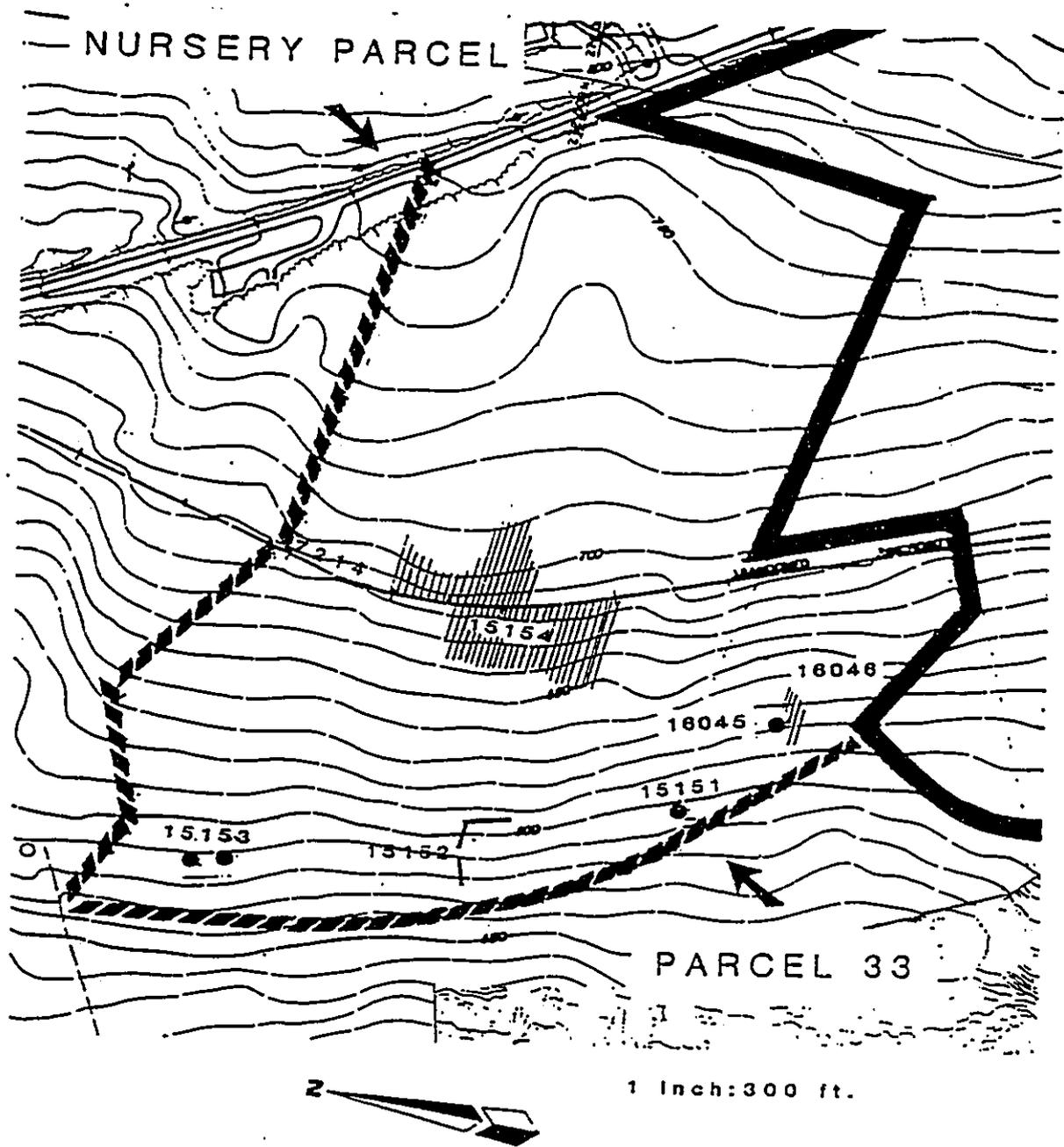
Should you have any further questions regarding the above, please do not hesitate to give me a call.

Sincerely,



J. Stephen Athens

General Manager and
Senior Archaeologist



Map Showing Archaeological Site Locations at Parcel 33, Keauhou Resort

International Archaeological Research Institute, Inc.

PREHISTORIC & HISTORIC INVESTIGATIONS • CULTURAL RESOURCES ASSESSMENTS & PLANNING • PALEOENVIRONMENTAL STUDIES

SELT, COLLINS & ASSOCIATES

February 27, 1992

Mr. Joseph K. Spencer III
Kamehameha Investment Corporation
78-6831 Alii Drive
Kailua-Kona, Hawaii 96740-2413

SUBJECT: Maps and Summary Description of Lava Tube Burial Cave Site 50-10-37-16045,
Crown Lands of Keauhou, North Kona, Hawai'i Island.

Dear Mr. Spencer:

This letter report is to inform you of the results of our recent mapping project for the burial cave located on Parcel 35. As you recall, the cave (now recorded as Site 50-10-37-16045) was originally located by Mr. Able Aquino while supervising vegetation removal for a land survey of the parcel. At your request, Stephen Athens and I inspected the site in early September of last year. The letter report of that preliminary investigation (by J. Stephen Athens dated September 9, 1991) indicated presence of two burials in a chamber approximately 30 meters upslope from the present entrance and a stacked rock mound (potentially a second burial feature) circa 12 meters from the entrance. The letter report also indicated that the site meets Hawaii Register archaeological site significance criteria both for its research potential (Criterion D) and for its cultural importance to an Hawaiian ethnic group (Criterion E).

The present project was designed to provide more refined spatial and content information on Site 16045. Our general goals were to examine the stacked rock feature for burial remains, and to provide plan and cross-section views of the section of the lava tube cave encompassing the mound and burial features. The information is intended to assist KIC with development plans for Parcel 35 and to comply with Hawaii State Burial Law by providing 1) more precise information on the number of burials in the affected portion of the cave; and 2) information useful in estimating the probability that the remains could be protected through construction avoidance of the overlying surface or by the cave's natural subsurface depth. Results of this effort and our recommendations are summarized below.

Field Procedures

Fieldwork on the cave site took place on February 17 and 18, 1991. Work was completed by myself and staff archaeologist Coral Rasmussen, with assistance from Mr. John Goebel. The effort is divisible into three basic steps: 1) preparing plan view and profile illustrations of the section of the lava tube containing the mound and burial chamber; 2) calculating the depth of the tube below modern ground surface; and 3) sampling the mound to search for possible burial remains.

All interior and exterior maps were keyed to a datum point set in the tube entrance at a position that allowed its use from both above and below the modern ground surface. The plan view interior map was prepared using compass and chain techniques emanating from datum. Tape lines were stretched from datum to map Stations A, B and C as shown by the reference line on Attachment A's plan view map. Azimuth angles from true north were determined using sighting compasses. Backsight checks of all angles were taken to enhance accuracy and to control for local magnetic

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SAIPAN: Lower Base Professional Center, P.O. Box 1837, Saipan, MP 96950 Telephone: (670) 322-3830, 322-4370 Facsimile: (670) 322-4251

anomalies.¹ The tube limits illustrated on the attached map mark the place at which the floor shifts from a predominantly horizontal to vertical orientation. All measurements were made at right angles to the tape lines at intervals not exceeding three meters. Ms. Rasmussen prepared the map as measurements were taken, adjusting the illustration as necessary to account for irregularities in the cave walls. The plan view map on Attachment A, then, is essentially a *floor plan* of the portion of the lava tube containing the mound and burial chamber. The lava tube itself continues an unknown distance both up and down slope (east and west). It also contains branches near the center of the illustrated portion of the cave and at the head of the burial chamber. The height of these branches, however, ranged from only 25 to 45 cm (10 to 18 inches) where terminated on the map. Due to these constrictions, it is likely that the mapped cave section contains all cultural features accessible through the present entry.

Measurements for the cross-section profile were also keyed to the site datum and map stations shown on Attachment A. The datum line was arbitrarily assigned zero elevation. All subsequent measurements were made relative to this point. Initially, a line level was strung from datum and measurements were taken to determine maximum floor depth and ceiling height respectively. Subsequent level lines were attached to each of the three map stations. Height and depth measurements were taken from these in circa three meter intervals and were tied to the datum starting point. As with plan view procedures described above, profile illustrations were completed as measurements were taken in order to cross-check the readings and to improve accuracy of the final profile.

The second objective was to plot surface elevations relative to the cave ceiling. This provided both an estimate of cave depth and a surface visible indication of the orientation of the tube. The modern ground surface measured 0.7 m (2.3 feet) directly above datum at the tube entrance. Transit, chain and stadia rod were used to take subsequent measurements from datum.² Angles and distances were adjusted to directly overlie to the reference line and map stations shown on the Attachment A plan view. Attachment B shows the horizontal orientation of the lava tube on a recent Parcel 35 map provided by Casseras Surveys, Inc.³ Vertical measurements were taken at regular intervals from each of the measuring stations. All elevations were adjusted to site datum to allow direct comparison with interior ceiling and floor depths. The resulting profile is displayed in the cross-section view of cave and surface slope on Attachment A. It clearly shows the shallow overall depth of the cave, and particularly fragile ceiling at the entrance, above Feature 1 and near the burial chamber.

Our final objective was to determine the function of the rock mound (Feature 1) upslope from the cave entrance. After photographing and drawing the mound's western profile, we removed its northwestern quarter and inspected the fill for human bone or other cultural debris. Small and medium sized mammal bone was widely dispersed at low density throughout the fill material. We found no evidence of human bone or other remains that would suggest burial function for the feature. We did,

¹Angles and distances are as follows: from Datum to Station A, 11 m at 93° Azimuth; Station A to Station B, 14.8 m at 99° Azimuth; Station B to Station C, 12 m at 124° Azimuth. Figures apply to both surface and subsurface measurements.

²Transit techniques are clearly more accurate than the compass and chain system used in the cave interior. While compass was better suited to the small size of the tube interior, using the transit on the surface helped avoid compounding horizontal error. In my opinion, the resulting measurements are reasonable representations of cave depth and orientation. These measurements and illustrations, however, should be taken as estimates. If site avoidance is selected as an option to preserve the burial cave, adequate buffering space should be planned to fully accommodate cave boundaries and to guard against potential damage from construction in the near site vicinity.

³The orientation of the cave was also flagged on the surface. This should ease relocation and potential creation of an avoidance zone around the immediate lava tube area. However, since flagging may draw attention to the tube, it should be removed as soon as practical.

however, note that the pile extended into a circa 60 cm (24 inch) diameter hole in the lava tube ceiling. Above the natural ceiling of the tube, the opening was covered with piled cobbles and relatively loose fill. It is possible that the sealed hole was either the original or a second entrance into this portion of the cave. Given the apparent absence of burial remains in the mound feature, its most plausible function was to block the burial portion of the tube from the present entrance and/or to seal the second entrance directly above the mound itself. The mound, the burial chamber, and general characteristics of the lava tube site are described briefly below.

Lava Tube and Features

As illustrated on the attached maps, the Parcel 35 burial cave is a relatively small lava tube section approximately 40 m (131 feet) long. Floor width ranges between about 1 and 4 m (3.3 to 13.1 feet) and height ranges from 0.45 m to 2 m (1.5 to 6.5 feet). The tube arches upslope to the southeast at an overall 9° slope. The entrance itself is a relatively small, 1 m diameter, break in a shallow lava tube bubble. Photo 1 shows the surface opening from the northwest (immediately below the meter scale in photo center). Dense surface stands of *koa-haole* (*Leucaena glauca*), air plant (*Bryophyllum pinnatum*), and grass illustrate how thoroughly such small cave entrances may be concealed under dense vegetative cover.



Photo 1. Lava Tube Entrance Viewed Upslope to the Northeast

Profuse rock scatter immediately inside of the entrance suggests that it may have once been sealed, but has since broken down through natural weathering or human assisted means. The stacked rock mound nearly blocks the lava tube 11 m (36 feet) upslope from the entrance. Gaps between the cave walls and mound allow uncomfortable passage around either side. Photo 2 shows the lower cave interior and mound prior to testing for burial remains. The test removed the northwest quarter of the mound shown at the lower left portion of the mound in the photograph. Faintly visible immediately above the mound's peak stone is the outline of a possible second cave entrance. Tightly packed surface cobbles still hide the opening. Absence of burial remains, location in the lower tube and position under the second entrance suggest that the mound served to block off the burial chamber further upslope.



Photo 2. Rock Mound Feature and Lower Lava Tube Interior.



Photo 3. Burial Chamber; Lava Tube Continues Upslope to Photo Right.

The burial chamber itself (Photo 3 above) is situated an additional 22 m (72 feet) beyond the mound. The chamber is part of a small side passage branching to the east from the main tube. The general entrance to the passage constricts slightly then opens to a circa 1.2 x 1 x 1.1 m high (3.9 x 3.3 x 3.6 foot) chamber (behind the horizontal stone above the meter scale in Photo 3). The branch tube continues at greatly reduced height (about 25 cm or 10 inches) in an easterly direction from the rear of the chamber. The main lava tube continues upslope to the southeast of the burial chamber. The size of the tube decreases substantially beyond the burial chamber. The mapped portion of the cave extends an additional 5 to 10 m into this passage before being terminated due to restricted ceiling height.

Most of the human remains are located within the burial chamber proper. However, a light scatter of small bone fragments and several phalanges were found on the cave floor in front of the chamber. The burial disturbance probably is the result of rodent, mongoose or other small animal activity in the cave. Quick visual inspection of the chamber suggests that it contains the incomplete remains of two individuals. Two skulls with most of the cranial vaults intact lie side by side surrounded by a larger mixed bone concentration containing mandible, vertebrae, scapula, rib, pelvis, long bone, and phalange fragments. Photo 4 is a closeup of the burial chamber. It clearly shows the two skulls and much of the associated bone concentration. Remains appear to be incomplete, suggesting that the burials may be secondary interments. There was no evidence of other cultural debris or grave offerings. As indicated in the previous report, it is likely that the burials are prehistoric, and therefore are individuals of Hawaiian ancestry.



Photo 4. Closeup of the Burial Chamber and Remains

Recommendations

Assuming construction plans are permitted on Parcel 35, there are three potential options to mitigate or avoid damage to Site 16405 burial remains: 1) sealing the lava tube with the burials in place in hopes that natural cave depth and strength can withstand construction stress; 2) sealing the cave with burials in place coupled with construction redesign to avoid direct and indirect impact to the

tube; and 3) removal and reinterment of burial remains in accordance with Hawaii State Burial Law procedures. The results of the present mapping effort indicate that only the second and third alternative have merit. Overall shallow depth and weakness of the lava tube suggest that it could not withstand road or facilities construction on the overlying surface. In several locations, the lava tube ceiling lies within 20 cm (8 inches) of the modern ground surface. Particularly vulnerable is the vicinity of the present entrance, the ceiling above the mound and the area of the burial chamber itself. Near the mound, at an area that may once have served as an entrance, only piled rocks cover openings into the cave. In one location, light can be seen through the rubble. Here, even the relatively light surface disturbance involved with clearing brush for the surface transit lines caused dirt and debris to fall into the cave. In light of these observations, it is most unlikely that the cave could withstand even moderate construction stress. It is highly probable that failure to remove the burials or to alter construction plans to avoid the overlying surface would result in damage both to the cave and its contents.

The second option of altering construction plans to avoid direct impact to the cave's overlying ground surface may warrant further consideration. Attachment B shows the orientation of the burial chamber in relation to the most recent topographic map of the modern ground surface. It also indicates what we believe would be a minimal buffer area needed to protect the cave. If construction plans can be modified to avoid this area, and if the cave can be adequately sealed and protected from vandalism, it may be possible to protect the associated burial remains in place. Such protection is generally the preferred option. If construction plans can be revised in a fashion that effectively avoids damage to the cave, it is recommended that approval be sought from the Historic Preservation Division of the Department of Land and Natural Resources (DLNR) and Hawai'i Island Burial Council for *in situ* preservation. Please note, however, that structural weakness of portions of the cave ceiling was apparent during the mapping process. It is possible that subsurface vibration from construction in the general area could collapse portions of the tube even while avoiding the immediately overlying surface. Accordingly, if the second non-removal option is selected and approved, the boundaries should be held as far from the lava tube location as possible to minimize the danger of damage. Map Attachment B shows a minimum buffer size of 35 feet (10.7 m) around all sides of the burial cave. It is unlikely that a smaller buffer would satisfactorily protect the structural integrity of the cave. In addition, the cave should be sealed and perhaps camouflaged as necessary to minimize the possibility that vandals or curious cave explorers would disturb the burial remains.

The third option involves removal and reinterment of burial remains in accordance with Hawaii State Burial Law. In the event that *in situ* preservation is not possible, a burial removal and reinterment plan must be developed and approved by DLNR and the Burial Council. Procedures typically involve an attempt to locate lineal descendants, appropriate documentation of burial remains, removal of remains from the burial chamber and finally reinterment at an approved site. Assuming approval of mitigation procedures, burial relocation should proceed in advance of any construction that would potentially damage the physical integrity of the cave.

The above recommendations conclude the burial cave report. I hope that the maps and summary discussion have been of some help in formulating plans for Parcel 35 while preserving the integrity of the cave's burial remains. Perhaps the primary point to be emphasized is the fragile nature of parts of the lava tube ceiling. Preservation in place (Option 2) is a generally desirable course of action, but one that should be followed *only* if sufficient protection can be guaranteed for the cave structure. I fear that extensive blading or modification of the landform surrounding the cave could cause portions of the tube to collapse. If adequate buffer space can be provided and if terrain modification in the area is not too extensive, then preservation may be the best option. If there is

reasonable doubt that sufficient protection is possible, then mitigation through removal and reinterment should be pursued.

Thank you for the opportunity to work with you again. We will be happy to assist in coordination with the appropriate local and state agencies, and with developing a burial mitigation plan if necessary. If you have further questions or if we can be of further assistance, please do not hesitate to contact me or Steve Athens at our Honolulu offices.

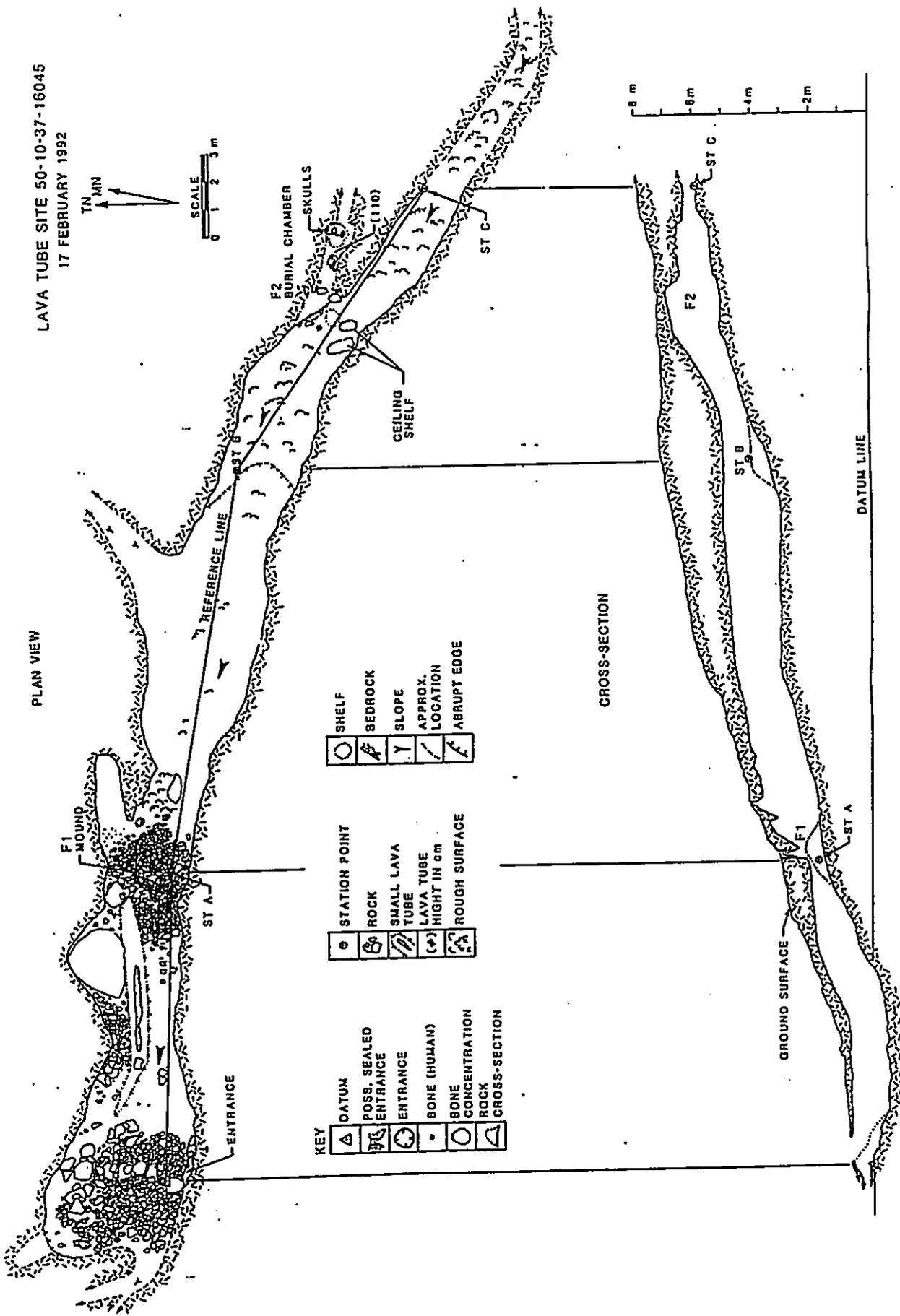
Sincerely,



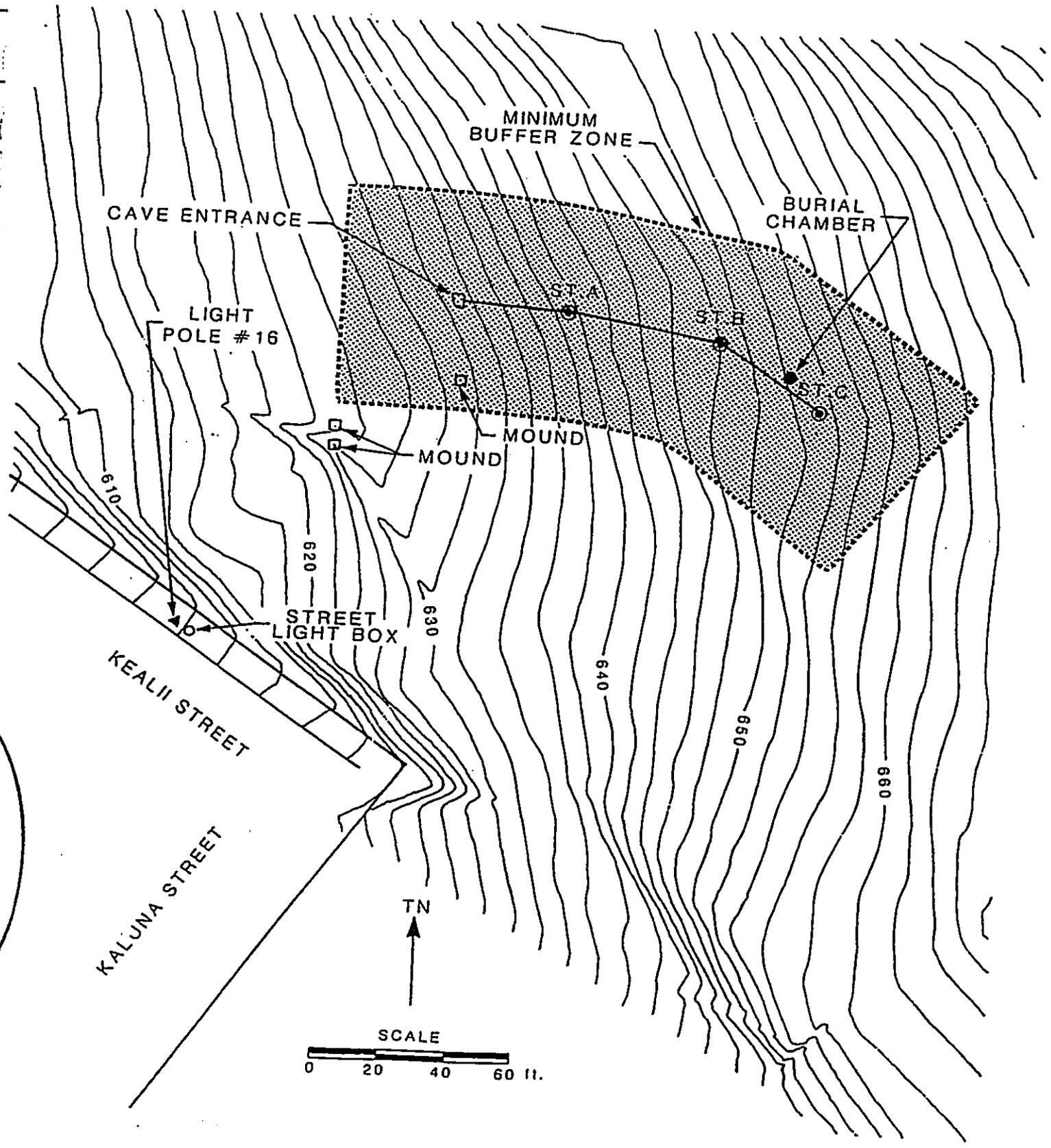
Greg C. Burchard
Associate Archaeologist

cc: Glen T. Koyama; Belt, Collins & Associates

LAVA TUBE SITE 50-10-37-16045
17 FEBRUARY 1992



Attachment A. Plan and Cross-Section Views of Lava Tube Burial Cave Site 50-10-37-16045



Attachment B. Sub-Surface Position of Burial Cave Site 50-10-37-16045 in Relation to Parcel 35
 Surface Contours (drafted from Cassera Surveys, Inc. base map)

JOHN WAIKEE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

June 2, 1992

Mr. Joseph K. Spencer, III
Kamehameha Investment Corporation
78-6831 Ali'i Drive
Kailua-Kona, Hawai'i 96740-2413

Re: Hawai'i Island Burial Council Decision Relating to Treatment
of Hawaiian Cave Burials Located at Tax Map Key 7-8-10:50
Keauhou, Kona, Hawai'i

Dear Mr. Spencer:

At its May 21, 1992 meeting, the Hawai'i Island Burial Council (Council) considered whether to preserve in place or relocate Hawaiian skeletal remains identified during the archaeological inventory survey conducted by International Archaeological Research Institute, Inc.

The Council determined that the skeletal remains shall stay in place in the lava tube, and the tube collapsed following appropriate treatment of the burials including the site being covered with pohaku to prevent damage. Moreover, the Council recommended the lava tube be filled in. The State Historic Preservation Division (SHPD) hereby concurs with these recommendations.

The next step is to arrange a visit to the lava tube in order to properly care for the remains prior to collapse. Please follow up with my staff to set a date.

In addition, enclosed for your review is a draft *In Situ* Burial Agreement. As part of the preservation plan, the SHPD wishes to pursue this agreement which provides perpetual protection for the burial sites located in the preserve. Please have your staff review the document and provide SHPD with comments.

Once SHPD and Kamehameha Investment Corporation (KIC) agree to the language of the agreement, the document will then be reviewed by the Department of the Attorney General. Upon approval, two originals will be sent to KIC for signature. Both agreements will then be submitted to the Chairperson of the Board of Land and Natural Resources for signature. Thereafter, the agreements will be recorded at the Bureau of Conveyances. Following recordation, one original will be transmitted to KIC for its records.

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER, II
DONA L. HANA'IKE

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
CONSERVATION AND

ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES

FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
DIVISION

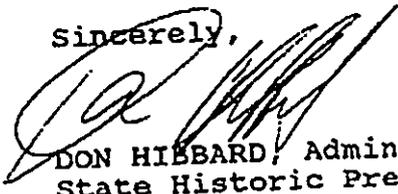
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Spencer Letter
June 2, 1992

Page Two

I thank you in advance for your cooperation in this matter. If there are any questions, please contact Edward Halealoha Ayau, Esq. at 587-0010.

Sincerely,



DON HIBBARD, Administrator
State Historic Preservation Division

enclosure

cc: Hawai'i Island Burial Council
Office of Hawaiian Affairs

WHEREAS, the parties desire to enter into this Agreement to leave *in situ*, the unmarked burial sites containing the skeletal remains of ancestral Hawaiians.

NOW THEREFORE, in consideration of the above and the terms and conditions contained herein, the parties agree as follows:

1. Landowner agrees to allow a burial site containing the skeletal remains of ancestral Hawaiians to be left *in situ* in Landowner's property.
2. Landowner, upon recommendation from the Department of Land and Natural Resources and the Hawai'i Island Burial Council, agrees to establish a permanent _____ foot buffer zone around the burial sites. Notwithstanding burial site maintenance activities, no other physical actions shall take place within the delineated buffer zone.
3. Landowner, upon recommendation from the Department of Land and Natural Resources and the Hawai'i Island Burial Council, agrees to landscape the area in and around the burial sites.
4. Landowner and the Department of Land and Natural Resources, upon recommendation from the Hawai'i Island Burial Council, shall determine whether the burial sites shall be physically marked. Where it is determined that the burial sites shall be so marked, the parties shall come to agreement as to the manner by which to do so.
5. Landowner agrees to treat the exact location of the burial sites as confidential information as provided by section 6E-43.5, Hawai'i Revised Statutes. Landowner agrees to identify the location of the burial sites on a map and provide such information to the Department of Land and Natural Resources, Division of Historic Preservation.
6. Landowner agrees to provide identified descendants wishing to visit the burial sites with a right of access. Such right of access shall be subject to the rules and policies of Landowner.
7. Landowner covenants and agrees not to willfully disturb in any manner, or allow the disturbance of in any manner, the repose of the human skeletal remains interred at the property. The obligations imposed by these restrictive covenants shall be effective in perpetuity and shall be deemed to run as a binding servitude with the property, and shall extend to and be binding upon Landowner, its successors and assigns.

8. In the event Landowner learns that the human skeletal remains contained in the burial sites, or any part thereof, are unearthed by natural causes or otherwise, the Landowner agrees to immediately notify the Department of Land and Natural Resources. The Landowner agrees not to handle the human skeletal remains in any manner. The Department of Land and Natural Resources, upon recommendation of the Hawai'i Island Burial Council, shall take proper action to secure the remains in place.

9. Both Landowner and the Department of Land and Natural Resources shall comply with all local, state and federal laws concerning reinterment.

IN WITNESS WHEREOF, the STATE OF HAWAI'I, by its Board of Land and Natural Resources, has caused the seal of the Department of Land and Natural Resources to be hereunto affixed and the parties hereto have caused this Agreement to be executed as of the day, month, and year first above written.

STATE OF HAWAI'I

By _____
Chairperson, Board of Land and
Natural Resources

By _____
Member, Board of Land and
Natural Resources

LANDOWNER - KAMEHAMEHA
INVESTMENT CORPORATION

By _____
Its President

APPROVED AS TO FORM:

Deputy Attorney General

Dated: _____

STATE OF HAWAII)
) SS.
 COUNTY OF .)

On this day of , 19 , before me
 appeared , to me
 personally known, who, being by me duly affirmed, did say that he
 is the of
 a corporation authorized to conduct business in the State of
 Hawaii, and that the seal affixed to the instrument is the
 corporate seal, and that the instrument was signed and sealed in
 behalf of the corporation by authority of its board of directors
 or trustees, and acknowledged the instrument
 to be the free act and deed of the corporation.

 Notary Public, State of Hawaii

My commission expires: _____.

APPENDIX C

SUPPLEMENTAL INFORMATION REGARDING STATE HISTORIC
PRESERVATION DIVISION AND COUNTY DEPARTMENT OF WATER
COMMENTS

Stephen K. Yamashiro
Mayor



Virginia Goldstein
Director

Norman Olesen
Deputy Director

JUL 27 1993

County of Hawaii

PLANNING DEPARTMENT

25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252
(808) 961-8288 • Fax (808) 961-9615

July 27, 1993

Mr. Glen Koyama
Belt Collins and Associates
680 Ala Moana Blvd., First Floor
Honolulu, HI 96813

Dear Mr. Koyama:

Change of Zone Application
Request: Unplanned to RS-15
Special Management Area Use Permit Application
Request: 45-lot Residential Subdivision
Applicant: Kamehameha Investment Corporation
Tax Map Key: 7-8-10: Portion of 50

This is to acknowledge receipt of your letter dated June 8, 1993, accompanied by 6 copies of a draft Environmental Assessment for the proposed 45-lot single family residential subdivision and its relevant actions before the Planning Commission as described above. Please accept our apologies for our delay in responding to your submittal.

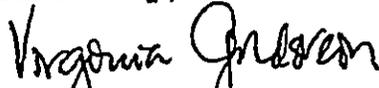
We have reviewed the draft Environmental Assessment and provide the following comments for your response:

1. The project site is located within the Kahalu'u Historic District, which was the basis for triggering the need for this office to comply with the requirements of Chapter 343, Hawaii Revised Statutes. However, there was little discussion of the proposed development and its relationship with the significance of the Kahalu'u Historic District. Please provide further discussion on this matter.
2. We are concerned about the proximity of the proposed development to the Kahalu'u Shaft. Please provide additional information about the nature and location of the 4 Kahalu'u wells and transmission facilities and its relationship to the proposed development.

We would appreciate your response to these two items as an addendum to the draft Environmental Assessment. Upon submittal of the additional information and acceptance by this office, we may file the draft Environmental Assessment with the Office of Environmental Quality Control (OEQC) for publication within its bulletin as prescribed by Chapter 343, HRS and Chapter 200, Title 11, Hawaii Administrative Rules.

In the meantime, please contact Rodney Nakano or Daryn Arai of this office should you have any questions.

Sincerely,



VIRGINIA GOLDSTEIN
Planning Director

DSA:mjh
LKIC04.dsa

cc: West Hawaii Office
OEQC
Mr. Wallace Tirrell-KIC

BCA

BELT COLLINS
& ASSOCIATES

Engineering • Planning
Landscape Architecture

JV
TP

680 Ala Moana Boulevard, First Floor, Honolulu, Hawaii 96813-5406
Phone: (808) 521-5361, Fax: (808) 538-7819
Hawaii • Singapore • Australia • Hong Kong • Thailand • Saipan

March 28, 1994
94P-193 (043-1101)

Ms. Virginia Goldstein, Director
Planning Department
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Ms. Goldstein:

**Change of Zone Application and
Special Management Area Use Permit Application
Proposed 45-Lot Residential Subdivision in Area 35
The Crown Lands of Keauhou, TMK 7-8-10: Portion of 50**

Pursuant to your letter of July 27, 1993, we requested comments on the proposed project from the State Historic Preservation Division and the County Department of Water Supply. We recently received their comments and are submitting, as suggested by your staff, the same in the form of a supplement to our original project description and environmental assessment (see enclosure).

We trust this submittal will complete your preliminary review of the project and that the environmental assessment for the proposed subdivision can now go to the Office of Environmental Quality Control for publication.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Glen T. Koyama

cc: Denise Hill, Kamehameha Investment Corporation

Enclosure: Supplement to Project Description and Environmental Assessment

SUPPLEMENT TO
PROJECT DESCRIPTION
AND ENVIRONMENTAL ASSESSMENT
The Crown Lands of Keauhou, TMK 7-8-10: Por. 50

The following is an update of the Project Description and Environmental Assessment for the proposed 45-lot residential subdivision in The Crown Lands of Keauhou in North Kona, Hawaii. This update is the result of agency comments on a July 27, 1993 letter by the County Planning Department which requested additional information on the project's water and archaeological resources.

WATER

The Department of Water Supply (DWS), County of Hawaii, has indicated there is water available for the project site. In a March 9, 1994 letter to Belt Collins & Associates (now known as Belt Collins Hawaii), DWS confirmed that 64 units of water had been allocated to the property (see Attachment A).

Additionally, DWS indicated that it does not have a problem with the proposed development provided it occurs outside of the easements for pipeline, road, and tunnel purposes. As described in the environmental assessment, the proposed 45-lot subdivision will not extend into any of the easements described above. Further, in response to DWS other concerns, the proposed subdivision will not involve blasting during construction and its generated sewage will be discharged into Keauhou's existing wastewater treatment facility near Heeia Bay.

ARCHAEOLOGICAL SITES

A number of archaeological studies were conducted throughout The Crown Lands of Keauhou over the past 20 years. Many of the early studies (during the 1970's) focused on specific development sites within the resort and involved literature research and/or reconnaissance surveys. The first large-scale study was performed in 1980 by Archaeological Research Center Hawaii, Inc. (ARCH) as part of a rezoning process for about 700 acres in Keauhou's mauka lands. That study was conducted as a reconnaissance survey. It described the Kahalu'u Historic District, which is on the National Register of Historic Places, and Area 35 (the project site) which is partially encompassed within the historic district.

In 1985, in compliance with County of Hawaii Ordinance No. 820, Condition M, for the rezoned 700 acres and as a follow-up to the 1980 ARCH study, a cultural resource management plan was prepared by Paul H. Rosendahl, Ph.D., Inc. and

submitted to the County and State for review. The plan reviewed existing archaeological studies and identified the extent of cultural resources in the area, provided guidelines for additional studies, and discussed alternatives for future management of the cultural resources.

In the parcels assessment section of the cultural resource management plan, Area 35 (identified in the plan as Site 33) was described as having a high density of archaeological sites and that the features appear to be primarily agricultural in nature. The resource management plan acknowledged that very little study was conducted in the area, and thus, recommended that a reconnaissance survey be carried out as part of the development planning process. Also, if results warrant, follow-up systematic mapping and excavation should be done.

Subsequently, as part of the planning process for Area 35, Kamehameha Investment Corp., the property owner, commissioned International Archaeological Research Institute, Inc. (IARI) to conduct a detailed study of Area 35. The intent of the study was to follow-up on the 1985 cultural resource management plan and to meet the recommended requirements for inventory level surveys as established by the State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources. Upon the study's completion, IARI submitted the findings to the SHPD and County Planning Department for review. When a burial feature was discovered on the property, KIC approached the Hawaii Island Burial Council and presented data on the burial and potential mitigative measures. Area 35 eventually underwent data recovery and a final report is in preparation.

Recently, the project applicant was asked by the County Planning Department (via the July 27, 1993 letter) to provide additional information on the Kahalu'u Historic District, its archaeological importance to the area, and how the proposed subdivision would impact the district. Attached, as Attachment B, is a letter by IARI addressing these questions, and SHPD's letter which comments on IARI's response (Attachment C). In summary, SHPD's letter states:

"... the fact that part of your project area lies within this (Kahalu'u Historic) district makes little difference to our office's historic preservation review. Since so much land alteration has occurred within the district, we simply look at what is present in each parcel and view mitigation concerns (either data recovery or preservation) in the context of the larger Kahaluu-Keauhou settlement picture."

SHPD further states:

"For Parcel 35, survey work identified a few sites significant solely for their information content (informal agricultural features primarily), a lava tube segment with two burials that also had traditional cultural significance as a burial location, and a railroad berm. Mitigation agreements were developed to preserve the railroad

berm as-is and to preserve the cave with the burials (meeting traditional cultural concerns) and to data recover information from the other sites in relation to database needs and research questions of the Kahaluu and Keauhou area. The fieldwork for the data recovery work has been concluded, and the report is soon to be submitted to our office. The interim protection measures from the berm and cave have yet to be worked out. With the fulfilling of these mitigation commitments, we believe that historic preservation concerns for the project will have been adequately met. The fact that some of the sites are in the historic district does not affect this consideration."

Area 35 has undergone intensive archaeological study and has been subject to extensive government review. Similar to other sites within The Crown Lands of Keauhou, KIC is committed to working with the County Planning Department, State Historic Preservation Division and Hawaii Island Burial Council to address cultural concerns raised during the project planning of Area 35 and other properties within the resort.

**Prepared by:
Belt Collins Hawaii
March 28, 1994**



RECEIVED

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII
25 AUPUNI STREET • HILO, HAWAII 96720 LI A 8 28
TELEPHONE (808) 969-1421 • FAX (808) 969-6996

March 9, 1994

Mr. Glen T. Koyama
Belt Collins & Associates
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

PROPOSED REZONING (45-LOT SUBDIVISION) - AREA 35
THE CROWN LANDS OF KEAUHOU
TAX MAP KEY 7-8-10:50 (PORTION)

This is a follow-up on your request for comments on the subject matter. We apologize for not responding earlier.

First of all, it is confirmed that 64 units of water is allocated to Keauhou Resort through the development of the Keei Well No. 4. Water for the proposed subdivision will be from this allotment. Therefore, relative to water availability, we have no objections to the proposed rezoning and subsequent subdivision. Subdivision approval will subject to the requirements of the County's Subdivision Code and the Department's Rules and Regulations.

Regarding the subdivision's proximity to the Department's Kahaluu Shaft, we have no objections provided development occurs outside of easements for pipeline, road, and tunnel purposes. Further, blasting shall be prohibited when constructing the subdivision and sewage disposal shall be into the area's sewer treatment plant.

H. William Sewake
H. William Sewake
Manager

QA

... Water brings progress...

International Archaeological Research Institute, Inc.

PREHISTORIC & HISTORIC INVESTIGATIONS • CULTURAL RESOURCES ASSESSMENTS & PLANNING • PALEOENVIRONMENTAL STUDIES

RECEIVED
1993 SEP -3 A 11: 59

September 2, 1993

Glen Koyama
Belt, Collins and Associates
680 Ala Moana Blvd., Suite 200
Honolulu HI 96813

SUBJECT: Relationship of KIC Development Parcel 35 to the Kahalu'u Historic District

Dear Mr. Koyama:

This letter is intended to provide background on the relationship between Kamehameha Investment Corporation's (KIC) Development Parcel 35 (previously labeled Parcel 33) and the larger Kahalu'u Historic District which borders, and partially overlaps, the Parcel on the east. The Kahalu'u District as shown on map Figures 1 and 2 was nominated to the National Register of Historic Places in 1974 (Newman 1974). The primary motivation for nomination of the Kahalu'u District was the presence of a relatively high density of temple complexes (*heiau*), 'Ohi'a cave, and other impressive prehistoric and historic structural remains in the vicinity of Kahalu'u Bay. Newman (1974:2-4) notes that

The historic district is most noteworthy because of the concentration of some ten major Hawaiian heiau within the area. Hawaiian heiau are massive structures of stacked stone constructed and dedicated to the worship and propitiation of the Hawaiian gods. It is very unusual, and highly significant, that so many major heiau are to be found in this rather small area. ...

...The district is also remarkable for a number of other historic places and remains, such as an old stone church behind Kahalu'u Bay; a breakwater built by the chief, Kalai'kini, that encloses part of the Bay; portions of the ancient Hawaiian field system in the upland area, numerous habitation areas, caves, walls, burial platforms, wells, midden sites, enclosures, and petroglyph fields. ...

District boundaries, then, apparently were selected to include the primary concentration of religious and residential structures near Kahalu'u Bay, the lower portion of 'Ohi'a Cave, and a sample of inland features as known at the time the district nomination was prepared. Figure 1 shows the Kahalu'u District boundaries as proposed in the original nomination form (Newman 1974) and their relationship to Parcel 35. Figure 2 shows District and Parcel 35 boundaries superimposed on a development map of the area. Shaded areas within the District and elsewhere have already been developed.

Recent archaeological studies focusing on Parcel 35 (especially Lutfy and Athens 1991, and Burtchard in prep.) document a low to moderate density of features typical of mid-elevation prehistoric localities inland of Kahalu'u and Keauhou Bays (see Jensen and Walker 1993, and Burtchard 1993). Most of the archaeological remains in Parcel 35 are included within Sites 50-10-30-15154, 16045 and 16046 situated immediately east of the Kahalu'u District boundary and west of the West Hawai'i Railroad berm. The basic character of features at these sites was described briefly in a letter report to Hawai'i State Historic Preservation Division (SHPD) archaeologists. That report

summarizes recent data recovery and inventory survey procedures on Parcel 35 and is included here as Attachment A. These sites will be discussed more thoroughly in the full project report (Burtchard in prep.). Essentially, they are dominated by agricultural terraces, mounds and enclosures, with a low density of short-term residential features. In addition, Site 50-10-30-16045 has a small lava tube cave segment containing two human burials. There are no religious or high labor investment residential structures similar to those emphasized in the Kahalu'u District nomination.

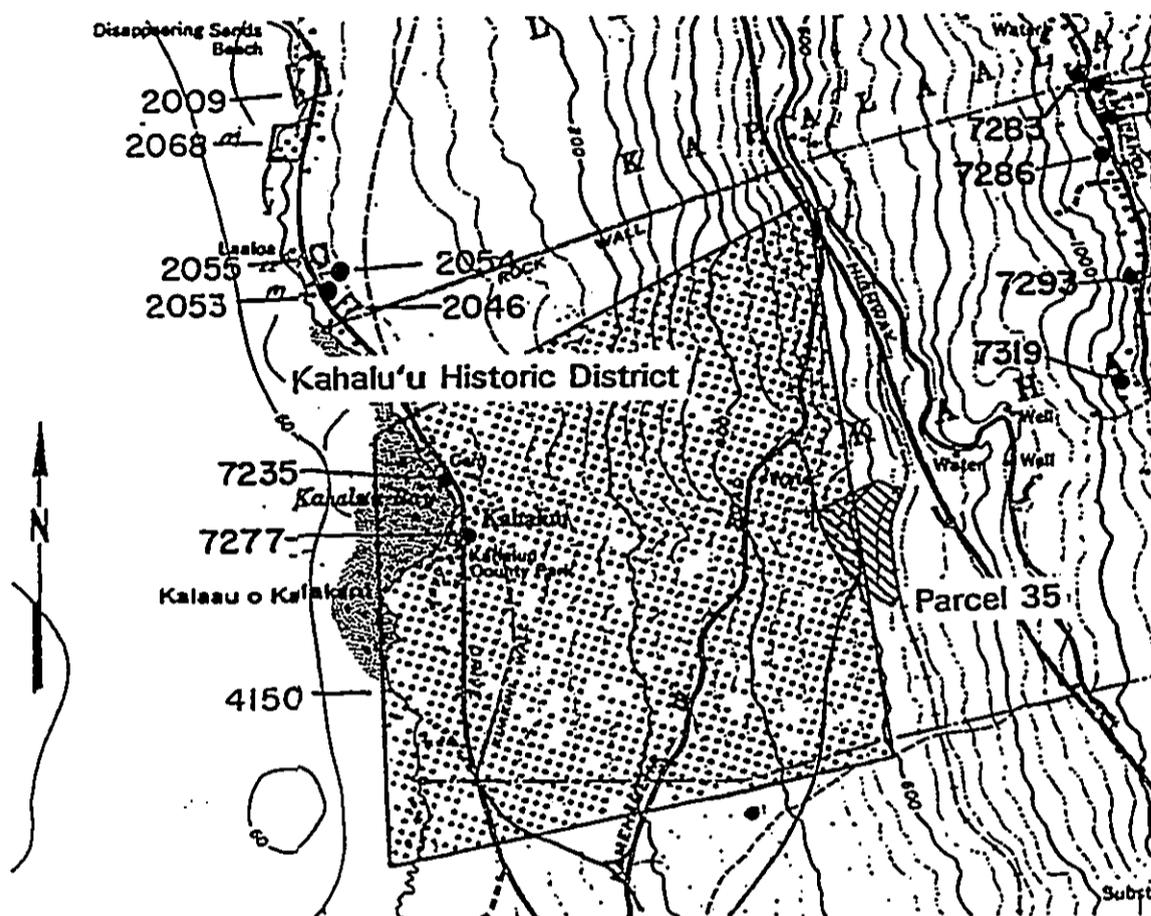


Figure 1. The Kahalu'u Historic District

It is important to recognize that Parcel 35 sites do indeed reflect mid-elevation features alluded to in Newman's nomination form. In my opinion, however, several factors combine to suggest that Parcel 35 has marginal bearing on the character of the larger Kahalu'u Historic District. Archaeological features here do not reflect the density, construction investment, or (with the exception of the burial cave) heritage significance of the structures situated nearer Kahalu'u Bay which were the primary focus of the nomination. In addition, it should be noted that the three primary site complexes lie just outside the District boundaries to the east. Finally, as Figure 2 indicates, substantial construction activity has already been approved and completed within the District; including the substantial Keauhou Estates development lying directly between Parcel 35 and the remainder of the Historic District downslope. While this construction, in itself, does not make the Parcel 35 features any less important, it severs them from their broader land-use context.

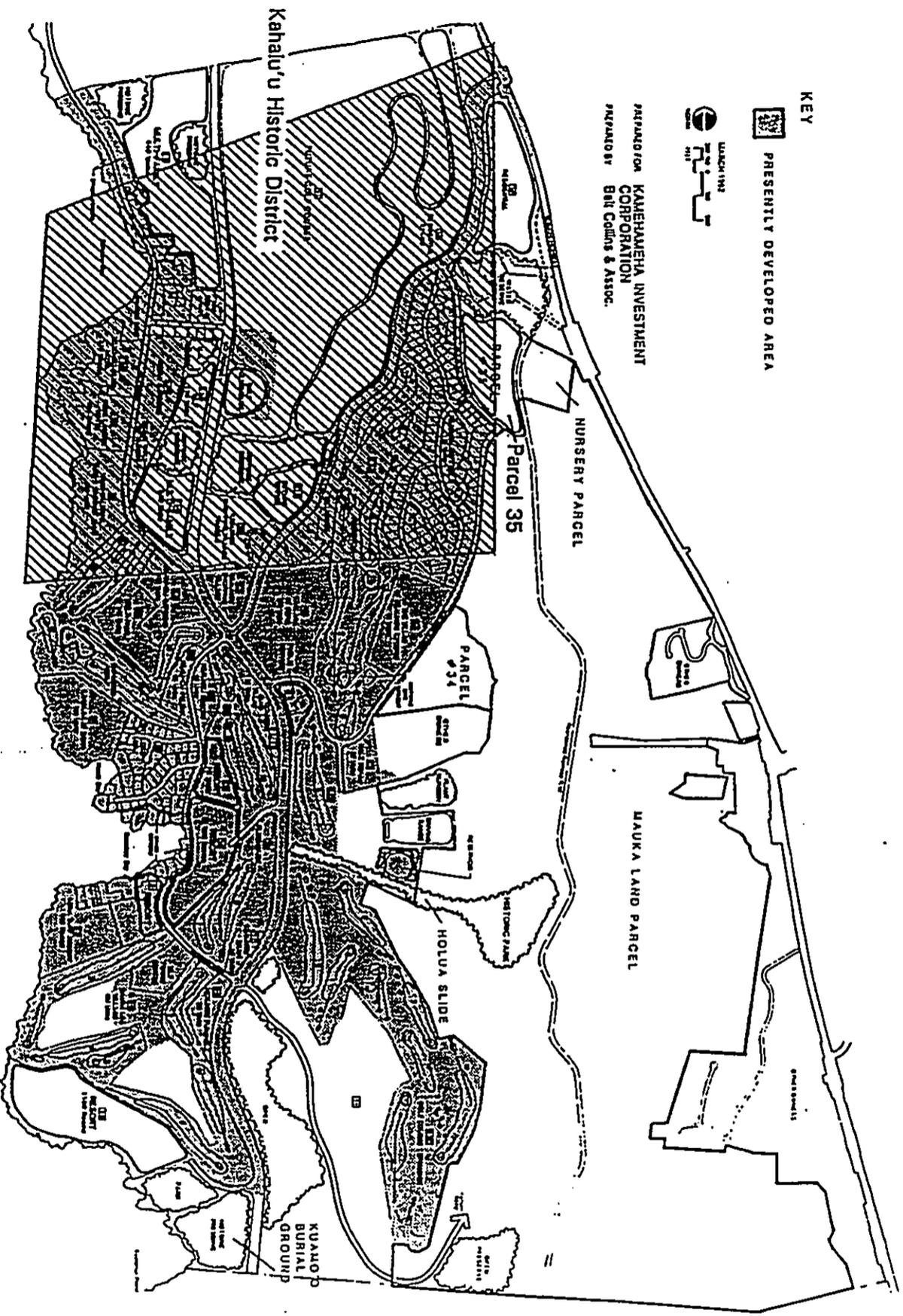


Figure 2. Kahalu'u Historic District, Development Parcels and Existing Construction in the Kahalu'u-Keahou Area

The Kahalu'u Historic District remains an important place in Hawaii's past. Efforts to preserve and interpret cultural remains within its boundaries warrant continuing support. Parcel 35's location at the extreme eastern boundary of the District, its physical separation by existing development, and its low to moderate feature density (for which data recovery and burial treatment plans have already been approved and completed) limit the impact of development on the remnant integrity or significance of the larger District *per se*. In my opinion, preservation, research and interpretive efforts would be more productively directed toward surviving features downslope of Kamehameha III road (see Figure 2).

I hope the comments above help clarify the relationship of KIC's Parcel 35 to the broader Kahalu'u Historic District. If you have further questions or concerns, feel free to contact me at the Honolulu office.

Sincerely,



Greg C. Burtchard

cc: Denise Hill, Kamehameha Investment Corporation, Kailua-Kona
Joseph Spencer, Kamehameha Investment Corporation, Kailua-Kona

References Cited:

Burtchard, Greg C.

1993 *Population and Land Use on the Keauhou Coast, the Mauka Land Inventory Survey, Keauhou, North Kona, Hawai'i Island; Part I: Narrative*. Volume one of two prepared for Kamehameha Investment Corporation, Kailua-Kona, Hawai'i. International Archaeological Research Institute, Inc. Honolulu.

in prep. *Inventory Survey and Data Recovery at Development Parcel 35, Keauhou, North Kona, Island of Hawai'i*. Report in preparation for Kamehameha Investment Corporation, Kailua-Kona, Hawai'i. International Archaeological Research Institute, Inc. Honolulu.

Jensen, Peter M. and Alan T. Walker

1993 *Archaeological Inventory Survey, Azabu Keauhou Resort, Mauka Parcel Project Area; Land of Kahalu'u, North Kona District, Island of Hawai'i*. Report prepared for Belt, Collins & Associates, Honolulu. Paul H. Rosendahl, Ph.D., Inc. Hilo, Hawai'i.

Lutfy Michel R. and J. Stephen Athens

1991 *Archaeological Inventory Survey of Development Parcel 33, at Keauhou Resort, Keauhou, North Kona, Island of Hawai'i*. Report prepared for Kamehameha Investment Corporation, Kailua-Kona, Hawai'i. International Archaeological Research Institute, Inc. Honolulu.

Newman, T. Stell

1974 National Register of Historic Places Inventory - Nomination Form. Kahaluu Historic District. Hawai'i Division of State Parks, State Historic Preservation Division. Honolulu.

ATTACHMENT A

June 11, 1993

Ross Cordy & Kanalei Shun
State Historic Preservation Division
Department of Land and Natural Resources
33 South King Street, 6th Floor
Honolulu, Hawai'i 96831

SUBJECT: Completion of Archaeological Data Recovery and Inventory Survey, Development Parcel 35, Crown Lands of Keauhou, Keauhou, North Kona, Hawai'i Island.

Dear Mr. Cordy and Mr. Shun:

This letter is to inform you officially that we have completed inventory survey and archaeological data recovery field procedures on Keauhou Development Parcel 35. Fieldwork took place between May 4 and May 15, 1993. Field procedures included 1) inventory survey of a ca. 3.1 acre land near the water storage facility at the northern end of Parcel 35; 2) data recovery at Site 50-10-30-15154; and 3) inventory survey documentation of Site 16045. These procedures were consistent with general provisions of the Data Recovery Plan (Listen and Burtchard 1993) as modified in a letter to your office (dated April 30, 1993). Specific procedures varied somewhat from the original plan to better accommodate the actual character of archaeological remains encountered in the field. These changes were approved in a telephone call to your office (Cordy) on May 6 while the field project was still ongoing.

Basic procedures and initial results may be summarized as follows:

1) Inventory Survey of 3.1 Acre Tract and Documentation of Site 50-10-37-16046

This tract was added to the larger Parcel 35 land area following completion of the original inventory survey reported by Lutfy and Athens (1991) --see Map Attachment A. The area was surveyed on May 4 and 5 by two field archaeologists walking 15 to 20 m interval transects. During the survey, a single agricultural complex of approximately 30 features was identified immediately downslope of the railroad berm. This agricultural complex has been numbered 50-10-37-16406.¹

It is important to note that, with the help of a clearing crew made available by the client, we were able to complete full inventory survey procedures rather than simple Phase I documentation as originally planned. Major vegetation was removed from site features on May 7 and 10. On May 11, we excavated 22 ten liter constant volume test units placed to examine subsurface remains in association with prominent site features.

Particular attention was paid to features most commonly associated with residential activities --terrace platforms, enclosures and so on. All fill was screened through 1/8 inch mesh hardware cloth and examined for culturally relevant debris, particularly marine shell and basaltic glass. Test units were

¹Please note that Site number 16046 originally was applied to surface features in the vicinity of a small lava tube burial cave (Site 16045). During the present inventory survey, the surface features were found to be quite extensive, completely surrounding the cave site. Accordingly, the original site number 16045 is now applied to both the cave and its overlying surface feature. Site number 16046 is now applied to the newly documented site in the northwest corner of Parcel 35 (see map Attachment A).

uniformly sterile with the exception of a single volcanic glass flake in the vicinity of what appears to be an agricultural terrace.

Field mapping and documentation was completed on May 14. Features were mapped using compass and tape procedures. General cultural and environmental site characteristics were described, and individual features documented and photographed.

Full documentation and results will be included in the Parcel 35 inventory survey/data recovery report. While Site 16046 qualifies as a significant cultural property under SHPD Criterion D, present inventory survey procedures appear to be sufficient to mitigate its research value. Accordingly, no additional data recovery excavation will be recommended for the site. Your office, of course, will have final word on this matter.

2) Data Recovery at Site 10-50-37-15154

Site 15154 is a large agricultural and possibly short-term residential locality situated in the center of the Parcel both upslope and downslope of the railroad berm. Field data recovery procedures for the Parcel 35 portion of the site were consistent with those specified in the data recovery plan. Specifically, we completed the following:

- 1) excavation of 46 ten liter constant volume test units divided between two feature clusters documented in the original inventory survey;
- 2) excavation of four 1 x 1 m and two 0.5 x 1 m data recovery units, emphasizing residential features as indicated by structural morphology and positive constant volume tests results;
- 3) excavation and profile documentation of two 0.5 x 2 m stratigraphic units;
- 4) quarter section disassembly of mound Feature 55 to search for possible burial remains (none found); and
- 5) removal and construction documentation of a portion of the wall surrounding enclosure Feature 25.

Fill was field screened through 1/8 inch mesh and the contents transported to IARII Honolulu facilities for final screening, sorting and content analysis. Since site 15154 had been mapped and documented during inventory survey (Lutfy and Athens 1991), map work was limited to minor corrections of the original. Upgraded maps and analytical results will appear in the data recovery report. In my opinion, procedures at 15154 are adequate to meet data recovery obligations for the portion of the site falling within Parcel 35 boundaries (see map Attachment A).

3) Inventory Survey at Site 50-10-37-16045

As noted above, site number 16045 originally was applied to a small burial cave only. The contents of this cave have been documented through a series of letter reports to your office and full burial treatment procedures completed in accordance with Hawai'i State Burial law. Surface features in the near vicinity of the cave entrance originally were given site number 16046. Aided by more thorough site clearing, we found that these ca. 40 agricultural terraces, mounds and enclosures completely surround the cave entrance and overlying terrain. Because of the spatial association of the cave and surface features, the entire area is identified by the original 16045 designation. Both cave and surface feature components will be described in the final report.

During the present project, surface features were cleared, mapped and tested in manner identical to procedures employed at 14046 described above. Chain and compass techniques were used to locate and measure features; 22 constant volume test units were used to examine potential

association of features with subsurface cultural remains (all negative); and the site and features were described and photographed. In addition, three potential burial features were partially disassembled to check for human remains (none were found) and examine interior construction. A ten liter test unit was excavated in sediments under one of these—small platform Feature 1. Charcoal and burnt *kukui* were recovered from the unit. Gail Murakami has examined the wood and found no recently introduced species. Since the sample has been well armored by the feature, it is reasonable to conclude that it will help establish a basal date for the site. Accordingly, it will be submitted for radiocarbon assay and the results discussed in the final report.

None of the constant volume test units (with the exception of the test unit under platform Feature 1) recovered culturally relevant materials. Given the absence of cultural remains in these units, absence of burial remains under small platform Feature 1 or other examined site features, and thoroughness of current site documentation, I will recommend that inventory survey level procedures are sufficient to mitigate the research significance of Site 19045. Procedures to accommodate the particular heritage value of the burial cave component have been completed and approved previously. Again, the final decision rests with SHPD.

We presently are continuing with final analyses, and map and report preparation for Parcel 35. As suggested on the phone, inventory survey and data recovery procedures and recommendations will be presented in separate sections. Because of the unusual combination of inventory survey and data recovery obligations, Parcel 35 has been a bit more complex than usually anticipated for an effort of its scale. I believe, however, that procedures outlined above will prove sufficient to satisfy SHPD and county cultural resource obligations for the Parcel. These points will be made in greater detail in the report itself.

I appreciate the advise and assistance SHPD has offered throughout the project. If you have questions or comments, or if we can be of further assistance, do not hesitate to call.

Sincerely,

Greg C. Burtchard
IARII Associate Archaeologist

cc., Joseph K. Spencer, Kamehameha Investment Corporation, Kailua-Kona

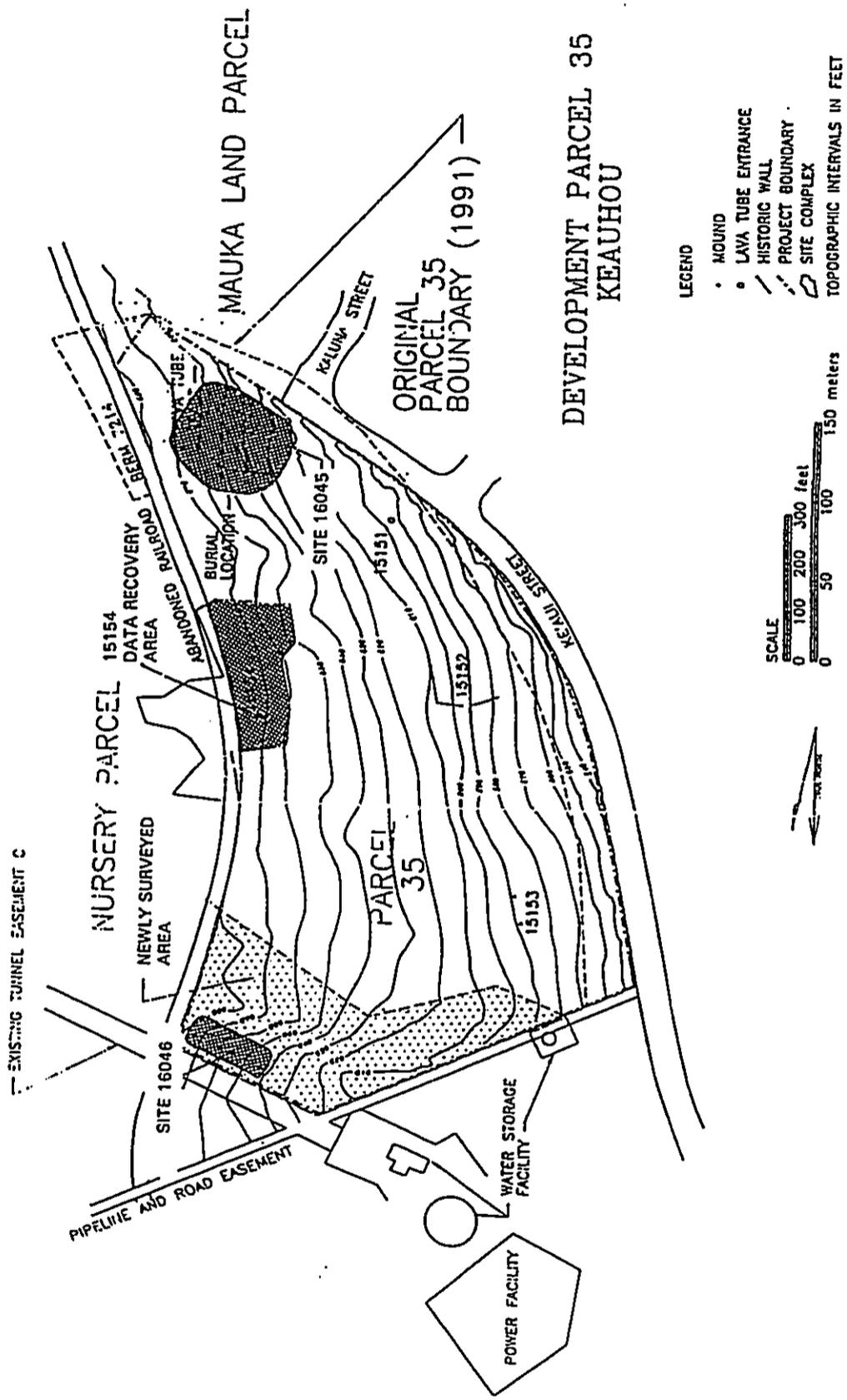
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Lutfy, Michel R. and J. Stephen Athens

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JOHN WAINEE
GOVERNOR OF HAWAII

COPY



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January 20, 1994

Mr. Glen Koyama
Belt Collins & Associates
680 Ala Moana Boulevard, First Floor
Honolulu, Hawaii 96813-5406

LOG NO: 9751
DOC NO: 9401KS07

Dear Mr. Koyama:

**SUBJECT: Completion of Archaeological Data Recovery and Inventory Survey,
Development Parcel 35, Crown Lands of Keauhou
Keauhou/Kahaluu, North Kona, Island of Hawaii
TMK: 7-8-10: 050**

Thank you for letter of October 8, 1993, submitting your consulting archaeologist's September 2, 1993, letter on the "Relationship of KIC Development Parcel 35 to the Kahalu'u Historic District". You asked for our comments on this letter.

Parcel 35 is partly within the east end of the district, as shown in Figure 1 of the letter. Our office has received a letter from Greg Butchard of your archaeological consulting firm of International Archaeological Research Institute notifying us that the data recovery and inventory survey of a small section (3.1 acres) of the subject development parcel has been completed. A segment of this project was field inspected in November last year by our staff members, Ross Cordy and Kanalei Shun.

As Mr. Butchard's letter indicates, part of Parcel 35 and some of its sites are clearly within the boundaries of the Kahaluu Historic District. We readily admit that this district - created in the early 1970s - is an awkward one, with its boundaries arbitrarily formed and with several different historic themes and no clear itemization of sites. Perhaps, in an ideal situation the district should be dissolved and new ones established. For example, the royal center at Kahaluu with its traditional places, heiau, and residential structures is one theme. (This theme could include the agricultural fields which supported the royal center's residents, which would result in a district extending far up the mountain. Or this theme could be more focused on sites near the shore. The district also could be a set of discontinuous land parcels as opposed to one solid block. We are not sure which solution is best without more consideration.) It will be extremely time-consuming to try to change the district and realign its boundaries, as submittals to our Review Board would be needed and approvals from the National Register of Historic Places - all involving extensive prior staff research. It could be considered, particularly if the major landowner would wish it. However, at this point in time, the district borders are set, and as your consultant's letter shows, again, some of Parcel 35's sites are within the district.

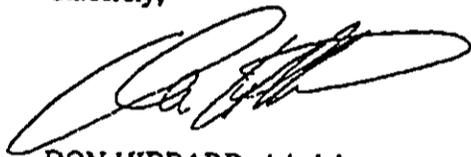
G. Koyama
Page 2

For practical purposes, however, the fact that part of your project area lies within this district makes little difference to our office's historic preservation review. Since so much land alteration has occurred within the district, we simply look at what is present in each parcel and view mitigation concerns (either data recovery or preservation) in the context of the larger Kahaluu-Keauhou settlement picture. For Parcel 35, survey work identified a few sites significant solely for their information content (informal agricultural features primarily), a lava tube segment with two burials that also had traditional cultural significance as a burial location, and a railroad berm. Mitigation agreements were developed to preserve the railroad berm as-is and to preserve the cave with the burials (meeting traditional cultural concerns) and to data recover information from the other sites in relation to database needs and research questions of the Kahaluu and Keauhou area. The fieldwork for the data recovery work has been concluded, and the report is soon to be submitted to our office. The interim protection measures for the berm and cave have yet to be worked out. With the fulfilling of these mitigation commitments, we believe that historic preservation concerns for the project will have been adequately met. The fact that some of the sites are in the historic district does not affect this conclusion.

Thus, we believe that historic preservation concerns related to the permit application are being sufficiently met. The data recovery fieldwork is complete. Once the interim protection measures for the cave and railroad berm are agreed upon and are in place, then from our viewpoint landscape modification could begin at your convenience with the County's approval. The report detailing the results of the fieldwork and data analyses has yet to be submitted to our office for review; a condition of the mitigation plan is that an acceptable report will be submitted. Our office's acceptance of this report will finalize the archaeological data recovery investigations for the project area. Long-range preservation plans for the cave and berm will be needed after construction is complete, to cover such tasks as basic maintenance checks.

If you should require further assistance in the interim, please contact Kanalei Shun at 587-0007.

Sincerely,



DON HIBBARD, Administrator
State Historic Preservation Division

KS:amk

c: Virginia Goldstein, Planning Department
Joseph Spencer, KIC
Greg Burtchard, IARII