September 5, 1990

Dr. Bruce Anderson
Acting Director
Office of Environmental
Quality Control
465 South King Street
Room 104
Honolulu, Hawaii 96813

Dear Dr. Anderson:

Subject: Environmental Impact Statement for Honokohau Industrial Park/LUC Docket No. A89-643

This is to confirm the acceptance of the subject EIS by the State Land Use Commission through its Decision and Order dated May 10, 1990. A copy of this document was transmitted to you earlier.

Sincerely,

ESTHER UEDA
Executive Officer

EU:to
ENVIRONMENTAL IMPACT STATEMENT

April 1990

HONOKOHAU INDUSTRIAL PARK

Honokohau, North Kona, Hawaii

TMK 7-4-08:25 and 49
ENVIROMENTAL IMPACT STATEMENT

FINAL

April 1990

Prepared for:
Robert S. McClean
Trustee of the Robert S. McClean Trust

For Submittal to:
Hawaii Land Use Commission

Prepared by:
Heber Hastert & Kimura, Planners

Mark H. Hastert, Principal-in-Charge

HONOKOHAU INDUSTRIAL PARK

Honokohau, North Kona, Hawaii
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CHAPTER 1

INTRODUCTION AND SUMMARY
1.1 INTRODUCTION

This environmental impact statement (EIS) is prepared pursuant to Chapter 343 Hawaii Revised Statutes (HRS), as amended, and Subchapter 6, Section 15-15-50, Hawaii Land Use Commission (LUC) Rules. The EIS is to support the request for approval in coast to amend the State Land Use District boundaries from Conservation and Agricultural to Urban on all 89.5 acres of land within TMK parcels 7-4-08: 26 and 49 at Honokohau, North Kona, Island of Hawaii, State of Hawaii, and reclassify the 45.5-acre Increment I to the Urban District, as presented in this report consistent with provisions covering incremental districting (LUC Rule 15-15-78) discussed in Section 3.1.3.2. The EIS presents information required by Chapter 200 of Title 11, Administrative Rules, entitled "Environmental Impact Statement Rules" prepared by the State Department of Health.

The proposed action is being requested in order to comply with Condition #9 of Conditional Use Permit No. - HA 1873 (7/7/86) of the Board of Land and Natural Resources (BLNR) covering 3.5 acres in the northwest corner of the subject property. Said condition, as modified, required the petitioner to submit a petition to the Land Use Commission by June 13, 1989 to redesignate the 3.5-acre area covered by the Permit to "another zoning district more appropriate for the type of use". Furthermore, this request would allow for zoning consistent with Conditional Use Permit No. HA-637 (2/14/75) of the BLNR covering all 89.5 acres of the subject property. This permit allows for industrial activities including the quarrying of rock and production of concrete and related materials.

The project site is located about three miles north of Kailua-Kona, approximately 1,000 feet mauka of the Queen Kaahumanu Highway east-northeast of the Honokohau Small Boat Harbor (Figure 1). The makai 74.6 acres of the project site lie within the General Subzone of the State Conservation District. The mauka 14.9 acres are in the State Agriculture District.

1.2 DEFINITION OF TERMS

Petition Area: The 89.5-acre petition area covers two parcels: TMK 7-4-08:26 which covers 54.7 acres and TMK 7-4-08:49 which covers 34.8 acres.

Petitioner: The petitioner is Robert S. McClean, Trustee of the Robert S. McClean Trust, sole owner of the subject property and a resident of Kailua-Kona, Hawaii. The petitioner's residential address is 77-344 Sunset Drive, and mailing address is P.O. Box 3000, Kailua-Kona, Hawaii 96745-3000.

Petition Request: The petitioner requests the Land Use Commission to approve the entire 89.5-acre petition area for future urban development and to redesignate the 45.5-acre first increment from the State Conservation District to the State Urban District. This action is proposed in compliance with Condition #9 of Conditional Use Permit No. - HA 1873 (7/7/86) and for use of the site for various industrial activities as discussed in Section 2.4.
1.3 DEVELOPMENT SUMMARY

Petitioner/Landowner: Robert S. McLean, as Trustee of the Robert S. McLean Trust
P.O. Box 3000
Kailua-Kona, Hawaii 96745-3000

Petition Area: 89.5 acres (45.5 acres in Increment I)

Location: Honokohau, North Kona District, Island of Hawaii

Tax Map Key: Zone 7, Section 4, Plat 08, Parcels 26 and 49

State Land Use District: Conservation and Agricultural

County of Hawaii General Plan: Urban Expansion Area

County Zoning: Open and Unplanned

Existing Uses: Project site is presently used for quarrying of rock, operation of ready-mix concrete batch plant and production of concrete, sale and loading of aggregates, sale of concrete blocks, machinery repair facilities, boat storage and repair and equipment storage. Approximately 25 acres of the site have been heavily graded and/or excavated. Remainder of the site is covered by rough a'a and pahoehoe lava flows.

Proposed Uses: Production and sale of concrete and concrete products; boat storage, sales and repair; lumber and hardware sales; automotive sales, service and repair; storage of trucks, buses and construction equipment; self-storage facilities; offices and storage areas for contractors; and, nurseries and other light industrial uses.

Proposed Action: The petitioner requests the State Land Use Commission to approve the entire 89.5-acre petition area for future urban development and to redesignate the 45.5-acre first increment from the State Conservation District to the State Urban District.

1.4 ALTERNATIVES CONSIDERED

The evaluation of alternatives to the proposed project included no action and alternative uses (see discussion in Chapter 5). The proposed use of the petition area was determined to be the most appropriate alternative based on the following factors: 1) The petitioner's objective of maintaining existing uses (except quarrying) within the petition area; 2) The present demand for industrial land in the Kona area for activities that are proposed herein; and 3) Ongoing State, County, and private development plans being proposed for the general Kona area.

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1.5 SUMMARY OF PROBABLY IMPACTS

Regional Land Use

The region between Kailua-Kona and Keahole Airport bisected by the Queen Kaahumanu Highway is undergoing transition from an undeveloped open space corridor to a wide range of urban uses as a result of significant historic and anticipated growth in the West Hawaii economic base. Major resorts, light industrial subdivisions and planned residential communities have been and will be developed within the corridor. Regional public facility improvements planned for the area include major expansion of the Keahole Airport, a new regional wastewater treatment plant, and the widening of the Queen Kaahumanu Highway. State and County regional planning efforts have identified this region as the primary growth center for the Kona area. A notable exception to the projected transition is represented by the proposed development of a National Historic Park, located along the coastline between the Honokohau Small Boat Harbor and the proposed Kohanaiki Resort.

The petition request to reclassify the subject site to the Urban District is viewed as being consistent with the overall development pattern of the region. Mitigative measures proposed herein regarding the management of operations, siting of structures and activities, visual buffering, hazardous material handling and storage, and wastewater/storm drainage systems will serve to minimize potential adverse impacts on adjacent lands and the general area (Section 4.1.2).

Flora and Fauna

Based on a review of biological surveys conducted in the area, no endangered animal or plant species appear to inhabit the project site. As a result, the proposed action is not expected to adversely impact flora and fauna populations in the area (Section 4.1.4).

Historical and Archaeological Resources

An archaeological inventory survey was conducted for the petition area by Paul H. Rosenbahl, Ph.D., Inc. The survey identified a total of 60 sites. Fourteen of the sites (which consisted of pahoehe excavations, cairns, a rock concentration, a faced mound, a wall, a rock overhang, and a modified outcrop) provided sufficient data during the survey and no further study is recommended. The remaining 46 sites have been determined to require additional data collection. Of this total, 36 sites are considered to be significant solely for their information content. The other 10 sites also have possible cultural significance. Nine of these sites may contain burials and are tentatively recommended for preservation "as is" pending further data collection results. One site, a kerbstone trail section, is not assessed as an excellent example of a site type and is not recommended for preservation (Section 4.1.5).

Air Quality

The major sources of pollutants are increased emissions from construction machinery and fugitive dust emissions from exposed ground, earth moving, and vehicular movement along unpaved roads. Long-term air quality could improve with the elimination of quarrying operations (Section 4.1.6).
Traffic

The proposed project is estimated to generate a total of 2,285 weekday vehicle trips to or from the planned uses, when fully developed in 1995. The development would increase traffic volumes entering/exiting the project access road by 234 and 246 vehicles during the morning and afternoon peak hours, respectively. Traffic turning left from the Access Road would experience delays equivalent to Level of Service "F" conditions during both peak periods, which would warrant mitigative actions. Development of the 44-acre Increment II area would generate about 2,760 vehicle trips to or from the project on a typical weekday (Section 4.3.1).

Water

The net increase in demand for potable water in Increment I of the petition area is estimated at approximately 2,000 to 2,500 gpd. Water use within the area will remain at existing levels until new sources are developed or otherwise approved by the County Department of Water Supply. New source development would be required to service Increment II. (Section 4.3.2)

Wastewater

Wastewater disposal within Increment I is expected to be in the range of 5,000 to 6,000 gallons per day. Disposal is proposed to be provided by cesspools, except in a small portion of the makai area where septic tanks may be required. All disposal facilities will be in conformance with applicable State and County regulations. Contaminants introduced by water percolating downward from the project would be diluted and dispersed in the flow of groundwater toward the shoreline. Adverse impact on nearshore and groundwater resources is expected to be minimal from the proposed project (Sections 4.1.9 and 4.3.3).

Storm Drainage

Surface water runoff from the site will be altered. The extent of change will ultimately depend upon the amount of paving and other impermeable surfaces that will occur with the area and the actual configuration of the storm drainage system. Proposed uses in Increment I are estimated to generate a potential surface water runoff of approximately 100 cubic feet per second (cfs) for a 10-year storm. Adverse impact on nearshore and groundwater resources is not expected to occur from storm drainage (Sections 4.3.4).

Power/Communications

Hawaii Electric Light Company estimates the electrical load from Increment I to be approximately 3,753 KVA. New transmission and distribution facilities would be required to accommodate the new load in the petition area. Hawaiian Telephone Company would continue to service the site via its existing line along the Access Road. (Section 4.3.3)

1.6 SUMMARY OF MITIGATING MEASURES

Noise

All development will be designed and constructed to comply with governmental standards. Particular attention will be given to the siting of uses and structures
along the petition area boundary with the Kealakehe area where residential uses are proposed. Uses which are likely to generate higher levels of noise will be located away from residential areas. Lease conditions and/or use covenants will be used to ensure that future residents at Kealakehe are protected from undo noise or other detrimental business activities in the petition area (Section 4.1.7).

Visual/Scenic Impacts

A buffer area with landscaping improvements (similar to those proposed for the parcel makai of the subject property) will be maintained along the property boundary and potential roadways, where appropriate, in order to minimize visual impacts of the industrial activities on adjacent future uses (Section 4.1.8).

Storm Drainage

The on-site drainage system will consist of catch basins and County standard drywells designed to retain storm waters within the site. Drainage runoff will be bermcd or curbed such that runoff from individual sites will be contained within the site. Drywells will be added under all terminal catch basins in order to enhance percolation and filtration of storm water into the substrata, rather than have the storm water surface flow towards the ocean (Section 4.3.4).

Industrial Materials/Wastes

Any industrial wastes generated by activities within the petition area will be collected and handled according to applicable Federal, State and County government regulations. Maintenance work on machinery and equipment will be performed on concrete decks, as will the washing down of any equipment. All environmentally harmful materials used in cleaning mechanical parts or for hand washing purposes will be used in contained areas with concrete floors and will be kept in appropriate containers (Section 4.1.11).

Traffic Impacts

By 1995, the traffic turning left to travel south from the project site on Queen Kaahumanu Highway would likely have to be accommodated through a road connection to Kealakehe Parkway, and the use of the traffic signal or grade-separation at its intersection with Queen Kaahumanu Highway. Therefore, the following measures are proposed: 1) Initially, permit left-turns to be made both into and out of the project access roadway (Access Road) at Queen Kaahumanu Highway. Construct a left-turn storage lane on Queen Kaahumanu Highway for southbound vehicles turning into the Access Road; 2) When the mauka extension of Kealakehe Parkway is completed, construct a frontage road or direct roadway connection from the petition area to Kealakehe Parkway for use by exiting southbound project traffic; and 3) Upon completion of item 2, provide signing and channelize the Access Road intersection with Queen Kaahumanu Highway to prohibit left turns. An alternative to the last proposal would be to close the Access Road. The location of the Increment II area, and the volume of trips generated, indicate that this area should be directly connected by an access road to Kealakehe Parkway and/or to future north-south roadways mauka of Queen Kaahumanu Highway. (Section 4.3.1).
1.7 RELATIONSHIP OF LAND USE PLANS AND POLICIES

A discussion of the relationship to land use plans and policies is presented in Chapter 3. The proposed action is consistent with all relevant public goals, objectives, policies, plans and controls, except for the necessary zoning, subdivision and building permits of the County of Hawaii. These permits and others as may be deemed necessary by the County will be the subject of subsequent applications pending reclassification of the site.

1.8 NECESSARY PERMITS AND APPROVALS

The petitioner intends to proceed with change of zone applications and other necessary permits and approvals as may be required by the County of Hawaii pending favorable action of the Land Use Commission regarding the subject petition.
CHAPTER 2

DESCRIPTION OF PROPOSED PROJECT
This chapter describes the proposed Honokohau Industrial Park. The discussion begins with an overview of the project location, which is followed by a discussion of the existing uses at the site. A overview of the development objectives is then presented, leading to the discussion of the petitioner's proposed use of the property. The chapter concludes with the rationale for the proposed uses.

2.1 LOCATION

The petition area is located about three miles north of Kailua-Kona, four miles south of Keahole Airport, and approximately 1,000 feet mauka of the Queen Kaahumanu Highway east-northeast of the Honokohau Small Boat Harbor.

2.2 EXISTING USES

Makai portions of the petition area (Figure 2) are presently used for operations of West Hawaii Concrete that include quarrying of rock, operation of a ready-mix concrete batch plant and production of concrete, sale and loading of aggregates, sale of concrete blocks, machinery repair facilities, a test lab, equipment storage and office space. The area also has 3.5 acres utilized for boat storage and repair. Approximately 25 acres of the site have been heavily graded and/or excavated. The remainder of the site is covered by rough a'a and pahoehoe lava flows.

2.3 DEVELOPMENT OBJECTIVES

The Honokohau Industrial Park is intended to address the current and future demand for industrial acreage and related uses in the Kona region. Specific development objectives of the petitioner are to:

- Continue existing operations at the site, except for quarrying;
- Provide land for light industrial activities which generally require larger lots and open storage areas; and
- Supply land for business activities which provide support services to civic and retail uses in the area.

2.4 PETITIONER'S PROPOSED USE OF THE PROPERTY

The petitioner seeks incremental districting of the subject property to develop the site for light industrial and commercial/service-related uses. Figure 3 provides an overview of the conceptual development of the 45.5-acre Increment I. The following discussion describes the specific uses being proposed.

Concrete Operations. The petitioner proposes to include approximately 11 acres for West Hawaii Concrete to continue: 1) the production and sale of ready-mix concrete, concrete products, and related activities of concrete pumping, repair and maintenance, and 2) the short-term production and sale of quarry products, and related activities of repair and maintenance.
Honokohau Industrial Park
EXISTING USE/SITE CONDITIONS
Honokohau, North Kona, Hawaii
In the short-term, the existing quarry in the petition area is expected to be an important source of raw materials for the construction industry in Kona. However, as new activities locate within the petition area and development occurs on surrounding lands, the petitioner intends to eliminate quarrying operations at the site. Prior to discontinuation of this activity, the quarry area would be layered and sculptured in order to improve the general characteristics of the site and maximize the amount of land that would be available for new activities.

**Marine Industrial.** Approximately 5 acres will be provided for the continuation of the storage, construction, repair and maintenance of boats and other marine-related activities, and the potential sale of boats and related marine products.

**Lumber/Hardware Operations.** Approximately 8.5 acres are intended for the sale of lumber, hardware and other construction materials and services, and the manufacture of lumber products (e.g., trusses, cabinets, furniture).

**Storage Operations.** Approximately 2 acres are proposed for the development of self-storage facilities.

**Automotive Operations.** Approximately 6 acres are proposed for the development of an automotive repair and service center, and an automotive sales lot for new and/or used cars.

**Equipment Storage.** Approximately 3 acres are proposed for the storage of trucks, buses and construction equipment.

**Contractor Operations.** Approximately 3 acres are intended for office and storage facilities for contractors and small businesses that do not require retail space and exposure.

**Nursery Operations.** Approximately 5 acres are intended for the production and sale of nursery products.

**Roadways.** Approximately 2 acres of land will be required for onsite roads which will have a minimum right-of-way of 60 feet.

The activities discussed above and their location within Increment I are subject to future revision, in so far as other types of light industrial uses could be included. Beyond those activities which currently exist within the petition area, the determination at this point in time of additional activities to be included is largely based on discussions with business operators in the area who have indicated an interest in acquiring space from the petitioner. Ultimate development of the area and the specific types of uses will depend on market forces in the region. Nevertheless, Increment I of the petition area is intended to provide space for light industrial activities which generally require larger lots and open storage areas.

Increment II of the petition area is proposed to be developed for commercial and service-related uses. This would include uses intended to support proposed civic activities at Kealakehe, along with uses that would support the general economic development of the region. Specific types of activities could include low-scale offices, restaurants and other related commercial operations, as well as wholesale services to retail businesses (e.g., wholesalers to restaurants), businesses which produce local consumer goods (e.g., bakeries, print shops), business services which support the local building industry, light manufacturing, etc.
2.5 PROJECT RATIONALE

The basic rationale for development of Increment I is the existing lack of available land in the Kona area for industrial development, particularly for those types of uses described above. At present, two areas provide the only supply of industrial acreage in the Kona area. One is the Kona Industrial Subdivision adjacent to Kailua-Kona. This area, which is 100 percent developed, has provided land for industrial activities for many years. However, because of the growth and popularity of the Kona area, land prices in the subdivision (along with prices throughout the entire region) have increased to the point that a number of industrial users have relocated elsewhere. Today, a majority of activities in the Kona Industrial Subdivision are, in reality, commercial and retail operations rather than industrial.

In the near future, the Queen Liliuokalani Trust (landowner of the Kona Industrial Subdivision and surrounding lands) plans to begin development of 100 acres adjacent to its existing industrial subdivision. This area can be expected to satisfy some of the demand for industrial activities, but is not likely to be suitable for the type of operations proposed for Increment I at the Honokohau Industrial Park. According to Mike Mackin, Commercial and Industrial Real Estate Specialist in the Kona area, "prices for land within the expansion area near Kailua-Kona are not expected to be conducive to warehousing, automotive operations, open storage, and other activities requiring larger lots" (personal communication, January 8, 1990).

The second industrial area is the Kaloko Light Industrial Subdivision, located approximately one mile north of the petition area. This area consists of 194 one-acre lots. All lots within the Kaloko subdivision have been sold, and approximately 50 percent have been developed. Because of the size of the lots and conditions which encumber their use (including restrictions limiting open storage), land within the Kaloko Light Industrial Subdivision is also not conducive for uses proposed in Increment I of the petition area.

The petitioner has maintained quarrying and concrete operations, contractor storage yards, and similar activities within the petition area since 1975. His business expertise, knowledge of the industrial land market in the Kona area, and contacts with other business operators provide the basis for the conceptual development of Increment I. According to Mr. Mackin, "there are no lots of one acre or more in the Kona area available for industrial development" (ibid). This fact, along with the previous discussion, supports the petitioner's proposed land uses within Increment I.

The rationale for the development of the mauka 44-acre Increment II is strongly influenced by State, County, and private land use plans which are being proposed in the area. In particular, ongoing government planning efforts (discussed in Chapter 3) are directing urban expansion and growth of regional activities to the general vicinity of the petition area. Based on the petitioner's determination of the most appropriate uses that would be compatible with development in Increment I, and conceptual land use and roadway plans for the area, the petitioner proposes to provide land in Increment II for commercial and service-related activities as described earlier.
CHAPTER 3

RELATIONSHIP OF THE PROPOSED PROJECT TO EXISTING PUBLIC PLANS, POLICIES AND CONTROLS
This chapter analyzes the relationship of the proposed Honokohau Industrial Park with existing State and County public plans, policies, and controls as required by Section 11-200-17(h) of the Department of Health Chapter 200 Environmental Impact Statement Rules.

3.1 STATE

3.1.1 Hawaii State Plan

The Hawaii State Plan (Chapter 226, HRS, as amended), represents public consensus regarding expectations for Hawaii’s future. First enacted in 1978, the plan establishes a set of goals, objectives and policies which serve as long-range guidelines for the growth and development of the State. As the result of a mandated two-year comprehensive review process, the 1986 Legislature updated the State Plan to reflect changes in public priorities.

A review of the overall themes, goals, objectives, policies and priority guidelines of the recently revised State Plan was made to determine the consistency of the proposed action with the Plan. The analysis indicates that the proposed action is in conformance with the State Plan.

3.1.2 State Functional Plans

The Hawaii State Plan directs the appropriate State agencies to prepare functional plans for their respective program areas. The plans set forth "...the policies, statewide guidelines, and priorities within a specified field of activity, when such activity is proposed, administered, or funded by any agency of the State" (Section 226-2 (10), HRS). Each functional plan contains objectives to be achieved and policies to be pursued within the specified areas. The Hawaii State Plan directs that "...County general plans and development plans shall be taken into consideration in the formulation and amendment of the state functional plans" (Section 226-52(a)(por. 3), HRS)

To date, twelve Functional Plans have been adopted by Legislative Resolution. All twelve plans were reviewed to determine consistency with the proposed action. Relevant plans examined included the State Conservation Land Functional Plan and the State Historic Preservation Functional Plan prepared by the State Department of Land and Natural Resources, the State Health Functional Plan prepared by the State Department of Health, and the State Tourism Plan prepared by the Department of Planning and Economic Development. The review analysis indicated that the proposed action is in general conformance and does not conflict with objectives, policies and implementing actions of the twelve plans.

3.1.3 State Land Use Law

All lands within the State have been classified into one of four land use districts, Urban, Rural, Agricultural, and Conservation, by the State Land Use Commission pursuant to Chapter 205, HRS. The makai 74.6 acres of the petition area lie within the State Conservation District (Figure 4). The remaining 14.9 acres lie within the
Agricultural District. Urban Districts encompass large tracts of land makai of the Queen Kaahumanu Highway in the vicinity of the petition area. A 10-acre parcel of land makai of the petition area owned by Isemoto, SJA and Taylor was reclassified from Conservation to Urban in April 1989. Approximately one mile north of the petition area lies the Kaloko Light Industrial Subdivision which was reclassified from the Conservation District to the Urban District in 1985. Other lands in the vicinity of the petition area are in the Conservation and Agricultural Districts.

The State Land Use Commission Rules, adopted September 1986, require that an application for a boundary amendment show that it is "reasonable, not violative of Section 205-2 HRS and consistent with the policies and criteria established pursuant to Sections 205-16, 205-17 and 205A-2, HRS" (Hawaii Land Use Commission Rules, Section 15-15-77). In reviewing petitions for reclassification of district boundaries, the commission must specifically consider four criteria. The criteria are presented below, followed by a brief discussion of each criterion.

1. "The extent to which the proposed reclassification conforms to the applicable goals, objectives, and policies of the Hawaii State Plan and relates to the applicable priority guidelines of the Hawaii State Plan and the adopted functional plans;"

Comment: As discussed in Section 3.1.1 and 3.1.2 of this report, the proposed action is consistent with the goals, objectives and policies of the Hawaii State Plan and the guidelines of the State Functional Plans.

2. "The extent to which the proposed reclassification conforms to the applicable district standards;"

Comment: The applicable standards for the Urban District are found in Section 15-15-18 of the Land Use Commission Rules. These are reprinted and discussed below.

In determining the boundaries for the Urban District, the following standards will be used:

A. It shall include lands characterized by a "city-like" concentration of people, structures, streets, urban level of services and other related land uses;

B. It shall take into consideration the following specific factors:

  o Proximity to centers of trading and employment facilities except where the development would generate new centers of trading and employment;
  o Substantiation of economic feasibility by the petitioner;
  o Proximity to basic services such as sewers, water, sanitation, schools, parks, and police and fire protection; and
  o Sufficient reserve areas for urban growth in appropriate locations based on a ten year projection;

C. It shall include lands with satisfactory topography and drainage and reasonably free from the danger of floods, tsunami and unstable soil conditions and other adverse environmental effects;
D. In determining urban growth for the next ten years, or in amending the boundary, lands contiguous with existing urban areas shall be given more consideration than non-contiguous lands, and particularly when indicated for future urban use on State or County General Plans;

E. It may include lands in appropriate locations for new urban concentrations and shall give consideration to areas of urban growth as shown on the State and County General Plans;

F. It may include lands which do not conform to the standards in paragraphs (1) to (5):
   - When surrounded or adjacent to existing urban development; and
   - Only when such lands represent a minor portion of this District;

G. It shall not include lands, the urbanization of which will contribute towards scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services;

H. It may include lands with a general slope of twenty percent or more which do not provide open space amenities or scenic values if the Commission finds that such lands are desirable and suitable for urban purposes and that official design and construction controls are adequate to protect the public’s health, welfare and safety, and the public’s interests in the aesthetic quality of the landscape.

Comment: The petition request meets the Urban District standards. The petition area is located strategically between Kailua-Kona and the Keahole Airport within an area proposed as Urban Expansion Area in the recently revised Hawaii County General Plan (November 1989). Urban District lands are located adjacent to the makai property boundary (property owned by Isomoto/SJA/Taylor was granted urban districting in April 1989), on much of the lands makai of the Queen Kaahumanu Highway and within one mile to the north. Additionally, State and Queen Liliuokalani Trust development plans are expected to create urban areas south of the petition area at Kealakehe and Keahou. A significant amount of the petition area is currently used for urban industrial activities and land in the Kona region suitable for the proposed uses is in limited supply.

3. “Impact on Areas of Statewide Concern.”

A. Preservation or maintenance of important natural systems or habitats.

Comment: There are no native or endangered species’ habitats within the vicinity of the proposed project site (Section 4.1.2).

B. Maintenance of valued cultural, historical, or natural resources.

Comment: An archaeological inventory conducted in the petition area identified a total of 60 sites. Data collected from 14 of these sites is considered sufficient and further analysis is not required. Further data collection is recommended for the remainder of the sites. A data recovery plan will be prepared and implemented for sites that are not ultimately recommended for preservation and interpretation. One site along the southern boundary of the petition area is assessed as significant for
information content, as an excellent example of site type, and as possibly culturally significant. Further data collection, including test excavations, and preservation with interpretive development is recommended for this site.

C. Maintenance of other natural resources relevant to Hawai'i's economy, including, but not limited to, agricultural resources.

Comment: The proposed action will not cause the loss of any prime agricultural land or ongoing agricultural activities.

D. Commitment of state funds and resources

Comment: No direct State funds or resources are required for the development of the petition area.

E. Provision for employment opportunities and economic development.

Comment: The proposed action will contribute to the diversification of the economic base of the County and the Kona region and will provide a variety of jobs to island residents.

F. Provision for housing opportunities for all income groups, particularly the low, low-moderate and gap groups.

Comment: No housing is being proposed within the petition area.

4. In establishing the boundaries of the districts in each county, the Commission shall give consideration to the General Plan of the County in which the land is located.

Comment: As noted in Section 3.2, the recently revised Hawai'i County General Plan (November, 1989) designates the area as Urban Expansion Area.

3.1.3.1 Conservation Lands

All uses within the State Conservation District fall under the jurisdiction of the State Department of Land and Natural Resources (DLNR) and are subject to the Administrative Rules of the DLNR providing for land use within the Conservation District pursuant to Section 183-41, HRS, as amended.

The makai 74.6 acres of the petition area (encompassing all of the Increment I acreage) currently lie within the General Subzone of the Conservation District. The objective of the general subzone is to "... designate open space where specific conservation uses may not be defined, but where urban uses would be premature" (Section 13-2-14 (a), Administrative Rules). The boundaries of the general subzone generally encompass "... lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use; and lands suitable for farming, flower gardening, operation of nurseries or orchards, grazing; including facilities accessory to these uses when said facilities are compatible with the natural physical environment" (Section 13-2-14 (b)(1)(2), Administrative Rules).

The petitioner was granted a Conservation District Use Permit (CDUP) by the State Board of Land and Natural Resources (BLNR) on February 14, 1975 to allow for industrial activities including the quarrying of rock and production of concrete and
related materials. The petitioner was granted a second CDUP by the Board on July 7, 1986, allowing for boat storage and marine repair and maintenance activities. A condition of the CDUP required the petitioner to submit a petition to the Land Use Commission by June 13, 1989 to redesignate to area covered by the second permit "to another zoning district more appropriate for the type of use." Copies of both permits are attached as Appendix A.

3.1.3.2 Project Phasing and Incremental Districting

Full development of the 89.5-acre petition area will take as much as ten years or more to complete. Increment I, the 45.5-acre makanal half of the site, is expected to be absorbed within five years after the date of final zoning approval of the property by the County.

Land Use Commission Rules pertaining to incremental districting allow for the reclassification of larger tracts of lands under certain conditions described below:

15-15-78 Incremental Redistricting. (a) If it appears to the Commission that full development of the total premises cannot substantially be completed within 5 years after the date of the final county zoning approval and that the incremental development plan submitted by the petitioner can be substantially completed, and if the Commission is satisfied that all other pertinent criteria for redistricting the premises or part thereof to urban are present, then the Commission may:

(1) Grant the petitioner's request to reclassify the entire property to urban; or

(2) Redistrict to urban only that portion of the premises which the petitioner plans to develop first and upon which it appears that total development can reasonably be completed with five years after the date of the final county zoning approval. At the same time, the Commission will indicate its approval of the future redistricting to Urban of the total premises requested by the petitioner, or so much thereof as shall be justified as appropriate therefore by the petitioner, such approval to indicate a schedule of incremental redistricting to Urban over successive periods not to exceed five years each. The commission may reclassify the subject property to urban, if it finds such a change is justified (Hawaii Land Use Commission Rules).

3.1.4 West Hawaii Regional Plan

The West Hawaii Regional Plan, a regional planning effort coordinated by the Office of State Planning, was finalized in November 1989. The State's interest in formulating and implementing a plan for the West Hawaii region were to:

- Coordinate State activities in the region in order to respond more effectively to emerging needs and critical problems;
- Address areas of State concern;
- Coordinate the Capital Improvements Program within a regional planning framework; and
- Provide guidance to State land use decision-making processes.

The plan is intended to complement the County of Hawaii's General Plan and Community Development Plans.
The planning area of the regional plan includes the judicial districts of North Kohala, South Kohala, and North Kona, in which the petition area is located. The plan specifically recognizes the North Kona region to be a primary growth center in the future. As such, the plan identifies the Kailua-Kona to Keahole Airport area as a "subregional planning area." (Figure 5) This area is intended for the expansion of uses which "support resort development, housing development, industrial development, agricultural development, and a host of ancillary services." Figure 5 shows the petition area is located near the center of the subregional planning area.

The above analysis indicates the proposed action would be in conformance with the intent of the West Hawaii Regional Plan.

3.1.5 Kealakehe Planned Community Development Plan

On December 15, 1989, the Board of Directors of the Housing Finance and Development Corporation approved a plan for development of State lands at Kealakehe, North Kona, Island of Hawaii. The plan encompasses 840 acres of State land, and up to 450 acres of land to the south owned by the Queen Liliuokalani Trust. The petition area is adjacent to the northern boundary of the Kealakehe Planned Community.

As shown in Figure 6, the primary focus of the approved plan is to provide housing. Depending on the final density of development, a total of approximately 5,400 housing units could be provided within the planning area (HFDC Fact Sheet, December 15, 1989). This housing is intended to be developed around a "Village" concept, similar to the Kapolei Planned Community on Oahu. Other planned uses at Kealakehe include a civic center, golf course, commercial areas, schools (including a new high school), recreational areas, and church/daycare facilities.

Key roadway plan elements include one mauka-makai parkway (120 foot right-of-way), a mid-level parkway (120 foot right-of-way) aligned parallel to Queen Kaahumanu Highway along the mauka boundary of the petition area, and a second mid-level roadway (60 foot right-of-way) located near the existing housing area in the mauka Kealakehe area.

As currently approved, the Kealakehe Community Plan proposes residential uses for most of the land adjacent to the petition area. The first phase of development is expected to include construction of the golf course, 90 acres of residential land adjacent to the existing mauka residential community, and the mauka-makai parkway. The marketability and timing of future phases of development is still uncertain. However, construction is expected to proceed from mauka areas to makai. Therefore, development of lands adjacent to the petition area is not likely to occur within the near future. Conceivably, the actual market for this property could change in the future, with the result being development of uses other than residential. Nevertheless, construction and operation of businesses within the petition area will include mitigative measures to avoid and minimize potential impacts on residential areas resulting from activities in the petition area. (See discussion in Chapter 4 for an analysis of the potential impacts and mitigating measures of the proposed project.)
Honokohau Industrial Park
WEST HAWAII REGIONAL PLAN
Honokohau, North Kona, Hawaii
3.1.6 Environmental Impact Statements (Chapter 343, HRS)

Section 343-5 (a)(2), HRS notes that any uses proposed on lands classified within the Conservation District are subject to the provisions of Chapter 343, HRS. Section 343-5 (c), HRS states that applications proposing actions subject to Chapter 343, HRS "shall prepare an environmental assessment of such proposed action at the earliest practicable time to determine whether an environmental impact statement shall be required."

An environmental assessment (Helber Hastert & Kimura, Planners, May 1989) was duly submitted to the State Land Use Commission. After a review of the assessment, the LUC instructed the petitioner to prepare an EIS for the proposed action.

3.2 COUNTY

3.2.1 County General Plan

The Hawaii County General Plan is the policy document for the long range comprehensive development of the island of Hawaii. The plan contains goals, policies and standards concerning 13 elements (i.e., economic, energy, natural beauty, transportation, etc.), as well as a series of land use maps referred to as General Plan Land Use Pattern Allocation Guide (LUPAG) maps. LUPAG maps delineate 12 different land use categories throughout the County. The current LUPAG map designates the project area as Conservation.

On November 14, 1989, the Hawaii County Council approved a revised Hawaii County General Plan. Although the final text of the General Plan has yet to be published, the petition area is designated as "Urban Expansion Area" according to Keith Kato, a planner for the Hawaii County Planning Department (personal communication, January 4, 1990). This designation is described in the August 1987 draft of the revised General Plan as an area which "allows for a mix of high density, medium density, low density, industrial and/or open designations in areas where new settlements may be desirable, but where the specific settlement pattern and mix of uses have not yet been determined" (page XIII-8).

The above analysis indicates the proposed action is in conformance with the revised Hawaii County General Plan.

3.2.2 Keahole to Kailua Development Plan

The County of Hawaii initiated a planning study in July 1988 to create a plan for development of the Keahole to Kailua-Kona area, with the emphasis being on implementing future development. The goal of the plan is "to develop a mixed residential, commercial, resort, industrial and recreational community, with approximately 8,000 or more residential units, in a functional, attractive, and financially viable manner." To this end, the plan intends to be a tool for the implementation of the County General Plan.

In September 1989, the County published the Draft Keahole to Kailua (K to K) Development Plan. This was followed by a public review period, during which time the County conducted four major meetings and presentations, and held meetings and discussions with landowners, developers, State agencies, and spokespersons from the local community. Based on this process, a revised Land Use/Roadway Plan was
developed and presented to the Planning Commission during a public hearing on March 1, 1990.

Figure 7 shows the revised land use plan as currently proposed by the County. Increment I of the petition area is designated as Limited Industrial. Increment II is proposed for regional center uses. The regional center proposed in the plan is a new urbanized area, distinct from the existing urban center at Kailua-Kona. This area is expected to accommodate projected regional activity growth requirements and avoid serious congestion problems that could adversely impact the character of the existing urban area to the south. The new regional center is envisioned to become the center for government, finance, and a variety of service and retail commercial activities.

The above analysis indicates the proposed project is very much in conformance with the intent of the Draft Keahole to Kailua Development Plan.

3.2.3 County Zoning

The petition area is currently zoned Open and Unplanned as are most of the Conservation lands in the area between Kailua-Kona and Keahole Airport. The Kaloko Light Industrial Park, located approximately one mile north of the project site, is zoned Light Industrial (ML-1a, Limited Industrial (1-acre lots)).

The petitioner will request a change of present zone designation to a more appropriate industrial zone at a future date.

3.2.4 Special Management Area

The project site does not lie within the Special Management Area as defined by the County of Hawaii, and therefore does not require a Special Management Area Use Permit.
CHAPTER 4

DESCRIPTION OF THE AFFECTED ENVIRONMENT, PROBABLE IMPACT, AND MITIGATING MEASURES
This chapter describes the physical and socio-economic environment in which the proposed project is situated, and the existing conditions of public facilities and utilities in the area. Discussions of "probable impacts" are confined primarily to those expected to occur during operations of Increment I, and where available, Increment II. In certain cases, a discussion is presented of the "cumulative impacts" resulting from the combined effects of development of the proposed project and surrounding lands. Where appropriate, measures are proposed to mitigate adverse impacts.

4.1 PHYSICAL ENVIRONMENT

4.1.1 General

Topography, Physiography, Geology. The petition area ranges in elevation from approximately 85 feet at the makai boundary to 350 feet at the mauka property line. The terrain is an undulating surface of pahoehoe and a'a lava with little soil cover. Average slope is 7.0 percent with a range of 0 to 25 percent.

Climate. Coastal areas of North Kona have a semi-tropical, semi-arid climate. The average annual temperature is 72 degrees Fahrenheit with an average high of 83 degrees Fahrenheit, and an average low of 67 degrees Fahrenheit. Average annual precipitation in Kailua-Kona is 25 inches. The geographic distribution of precipitation closely resembles the topographic contours: a high rainfall belt lies between the 3,000 and 12,000 foot elevations on the leeward slopes of Hualalai and Mauna Loa, with zones of decreasing annual rainfall at lower elevations near the coast and at higher elevations above the rain bearing tradewind regimes.

The North Kona coastal region is largely sheltered from the predominate tradewind system by the land masses of Mauna Loa, Mauna Kea and Hualalai. The prevailing pattern is onshore winds in the morning and early afternoon, often collecting in a cloud bank at higher elevations, then becoming offshore breezes in the late afternoon and evening. Typically wind velocities range between 3 to 14 knots. Relative humidity is also generally stable year round, daily average ranging from 71 to 77 percent.

4.1.2 Regional Land Use

The region between Kailua-Kona and Keahole Airport bisected by the Queen Kahumanu Highway is undergoing transition from an undeveloped open space corridor to a wide range of urban uses as a result of significant historic and anticipated growth in the West Hawaii economic base. Major resorts, light industrial subdivisions and planned residential communities have been and will be developed within the corridor. Regional public facility improvements planned for the area include major expansion of the Keahole Airport, a new regional wastewater treatment plant, and the widening of the Queen Kahumanu Highway. As noted in Chapter 3, State and County regional planning efforts have identified this region as the primary growth center for the Kona area. Figure 8 shows the petition area is located near the center of this major growth corridor. A notable exception to the projected transition is represented by the proposed development of a National
Honokohau Industrial Park
REGIONAL MAP
Honokohau, North Kona, Hawaii

Figure: 8
Historic Park, located along the coastline between the Honokohau Small Boat Harbor and the proposed Kohanaiki Resort. A review of surrounding existing and proposed land uses is presented below.

Honokohau Small Boat Harbor. The Honokohau Small Boat Harbor is located approximately one mile west-southwest (makai) of the project site on a portion of the State-owned lands of Kealakeko. This is the only protected harbor in the North Kona area and has become a major contributor to the North Kona economic base in terms of revenues generated by the region's famous sport fishing industry. The harbor presently provides slips for 162 boats. Adjacent shore facilities include boat launch ramps and launch/retrieval cranes, boat repair yard and related facilities, fueling dock, administration office, commercial/retail facilities, restrooms and appurtenant surface parking lots. The 1970 master plan for the harbor prepared by Daniel, Mann, Johnson and Mendenhall calls for an ultimate 455 slips to be developed on the 65.5 acre harbor site (25.1 acres of water, 40.4 acres of land).

Proposed Kaloko-Honokohau National Historic Park (NHP). The National Park Service (NPS) has recently acquired c. 650 acres of land directly makai and to the northwest of the project site with the intent of developing a National Historic Park. The Park boundaries include the 20-acre Aimakapa Fishpond, a brackish water pond and wetland providing habitat for endangered Hawaiian waterbirds, migrant waterfowl and shorebirds. Also within the proposed park boundaries lie the Aiopio Fishtrap and several anchialine ponds near the coastline.

The 1975 Draft EIS for the NHP indicates that the "primary purpose of the park will be the preservation of the Hawaiian culture..." (NPS 1975: p. 1). Estimates of visitor capacities made in the EIS identify a daily capacity of 1,500 visitors and a "projected annual visitation" of 500,000 visitors (ibid: p. 6). A tentative description of proposed facilities includes the following: "a parking area for 200 to 250 cars and buses will be constructed adjacent to Queen Kaahumanu Highway... Immediately makai from this will be an orientation structure, and an administrative office totalling 10,000 square feet. The entire area occupied by the parking, orientation structure, and associated roads and walks will be about 5 acres or less..." (ibid).

Kohanaiki Resort. A major integrated resort development is proposed for an oceanfront site located two miles to the northwest of the proposed project. At full-buildout, the 470-acre Kohanaiki Resort will contain three hotels, a marina, golf course, and condominium and residential developments. The developers of the resort have received approvals from the State Land Use Commission (reclassification from Conservation to Urban) and the Hawaii County Council (General Plan amendment to Intermediate Resort and rezoning for the proposed uses). Present plans call for construction of major project infrastructure, one or two hotels, the golf course, some condominiums, and possibly the marina within the next 2-3 years.

O'oma. Approximately 300 acres or coastal land north of Kohanaiki are proposed for future urban development. The O'oma area is tentatively proposed to include an economy hotel and related commercial activities, a research center, business park uses, a golf course, and possibly residential uses. This area is still designated as Conservation land.

Natural Energy Laboratory of Hawaii/Hawaii Ocean Science and Technology Park (NELH/HOST Park). The State of Hawaii is operating and developing a major marine-related 869-acre research/light industrial park on lands located immediately south and west of the Keahole Airport at Keahole Point. The 322-acre NELH
facility has been operating since 1974 and is currently about 25 percent occupied. The 547-acre HOST Park was dedicated in July 1989. The park currently has no tenants but approximately 50 percent of the land is spoken for. A bill before the 1990 Legislature is expected to request approval to merge NELH and HOST Park under one Board of Directors in order to streamline operations.

Keahole Airport. Located approximately four miles to the north, the Keahole Airport consists of a modern terminal complex and a single 6,500 foot runway. The airport has recently undergone a master plan update program which recommended major expansion plans for the facility including strengthening of the existing runway and lengthening to 11,000 feet as well as extensive new terminal facilities.

Kaloko Light Industrial Subdivision. Approximately one mile to the north of the project site is the Kaloko Light Industrial Subdivision consisting of 194 fee simple lots of one acre minimum size.

Lanihau Property. Lanihau Corporation owns a 650-acre parcel of land adjacent to the northern boundary of the project area. Lanihau also owns a small 9.9-acre parcel to the west fronting on Queen Kaahumanu Highway. Both of these parcels are presently vacant.

Adjacent Industrial Operations. In April 1989, the Land Use Commission approved Urban District designation for a 9.9-acre parcel immediately west of the petition area fronting on Queen Kaahumanu Highway. This parcel (owned jointly by Isemoto Conants but Company, SIA Partnership, and March E. Taylor) is being used for construction baseyard operations. Planned uses in the future include truck equipment storage and an automotive service center.

Kealakehe Planned Community. The State of Hawaii owns approximately 1,540 acres of land within the Kealakehe area immediately south of and adjacent to the petition area. As discussed in Section 3.1.5, the Board of Directors of the Housing Finance and Development Corporation recently approved a plan for development of 840 acres of State land mauka of Queen Kaahumanu Highway and up to 450 acres of Queen Liliuokalani Trust (QLT) land to the south of Kealakehe. The concept for development of this area is similar to the Kapolei Planned Community on Oahu, and construction is expected to take place over a 20-year period. Conceptually, approximately 3,900 residential units are proposed at Kealakehe. Other planned uses at Kealakehe include a civic center, golf course, commercial areas, schools (including a new high school), recreational areas, and church/daycare facilities.

Approximately 700 acres of State land is located makai of Queen Kaahumanu Highway. The future Kealakehe Wastewater Treatment Plant will be located within this area. Plans for this area in the past have proposed expansion of the harbor, resort uses, golf course, and other urban activities. There are currently no approved plans for this area.

Kealakehe Landfill, Police Substation, Amfac Distribution Center and Kona Animal Pound. A mixture of municipal, light industrial and commercial uses are presently located approximately three-quarters of a mile to the south of the site along the Queen Kaahumanu Highway frontage of the State-owned Kealakehe parcel.

Queen Liliuokalani Trust. Queen Liliuokalani Trust owns a significant amount of land within the Keahuolu ahupua'a adjacent to Kailua-Kona. As noted above, State plans for development at Kealakehe could include approximately 450 acres of land.
owned by QLT makai of Palani Road. In August of 1989, QLT petitioned the Land Use Commission for an amendment of the State Land Use District Boundary on 1,135 acres of land from Conservation and Agricultural to Urban. Uses envisioned for land mauka of the Queen Kahumanu Highway include regional commercial activities, offices, and other activities related to the civic center proposed at Kealakeke. Makai of the highway, a 100-acre expansion of the existing industrial subdivision could possibly begin development in 1990.

Probable Impacts

As noted, the project site lies in a major urban growth corridor extending from Kailua-Kona north to the Keahole Airport. The revised Hawaii County General Plan recognized this and correspondingly has identified the area in the vicinity of the project site as "Urban Expansion Area" (see discussion in Section 3.2.1). This designation "allows for a mix of high density, medium density, low density, industrial and/or open designations in areas where new settlements may be desirable, but where the specific settlement pattern and mix of uses have not yet been determined." The petition request to reclassify the subject site to the Urban District is viewed as being consistent with the overall development pattern of the region. Notwithstanding this, implementation of the proposed action may foreclose other land use options within the project site and in the vicinity.

Cumulative Impacts

Development of the petition area will be complimentary to and provide services for urban expansion in the Kailua-Kona to Keahole Airport region. Such urban expansion will provide employment and housing opportunities to meet projected growth in the area, and will require significant investments in public facilities and services including water, sewer, roads, electrical and communication facilities.

Mitigative Measures

Mitigative measures proposed herein regarding the management of operations, siting of structures and activities, visual buffering, hazardous material handling and storage, and wastewater/storm drainage systems will serve to minimize potential adverse impacts on adjacent lands and the general area.

4.1.3 Natural Hazards

Natural hazards which could affect the site include earthquakes and volcanic activity. The entire island of Hawaii is susceptible to earthquakes originating in fault zones under and adjacent to it. Two fault zones, the Kealakekua and Kaloho faults, are located in South Kona, well south of the petition area. The island of Hawaii is classified as a Zone 3 area for the purpose of structural design. The classification system is based on a scale of 0 to 4, increasing in level of risk due to seismic occurrence and danger. The Hawaii County Building Code requires that all new structures be designed to resist forces that might be expected in Zone 3 areas.

The petition area is located on the western slope of Hualalai, one of five volcanos comprising the island. Hualalai is one of three volcanos which have been active in historic times. The last active period of eruption occurred circa 1800. The northwest rift zone at about the 1,600-foot elevation (in the vicinity of the Puhi o Pole Cinder Cone, just makai of the Mamalahoa Highway) produced a lava flow which extended to the shoreline just north of Keahole Point.
**Probable Impacts**

The occurrence of a natural disaster such as an earthquake or volcanic eruption would pose a risk to life and property within the petition area.

**Mitigation Measures**

The petitioner will require that all structures within the property will be located, designed, and constructed to conform with local building standards and regulations for potential seismic activity.

**4.1.4 Flora and Fauna**

Information for this section has been augmented from recent flora and terrestrial faunal surveys conducted in the vicinity of the petition area (Char and Associates, 1980). A biological field inspection of the project site was not conducted.

Much of the project site (that area which has not been subjected to mechanical modification) is comprised of one principal vegetation zone: scrub vegetation. This zone consists of a mixture of grass and shrub species with scattered trees of kiawe (*Prosopis pallida*). Ground cover varies from 40 to 60 percent on pahoehoe flows, and only five to ten percent on the rough, clinkery a‘a flows.

Fountain grass (*Pennisetum setaceum*) is the most abundant species in the vegetation type area. Locally common are pili grass (*Heteropogon contortus*) and Natal redtop (*Rhynchosporium repens*), although in some areas the grass cover may be composed equally of the three species. 'ilima (*Sida fallax*) and 'uhaloa (*Waltheria indica var. americana*) are the most commonly encountered shrub. Maiapilo (*Capparis sandwichiana var. zoharyi*) may form localized patches in some area. Other species occasionally observed in this vegetation type include partridge pea (*Cassia lechenaultiana*), indigo (*Indigofera suffruticosa*), hosi (*Morinda citrifolia*), Christmas berry (*Schinus terebinthifolius*) and kiu (*Acacia farnesiana*).

Kiawe may form small clumps composed of a few trees, eight to twelve feet tall. Shrub such as 'ilima, indigo, and 'uhaloa form a dense scrubby layer beneath these trees. Ferns and a few annual species may be found in the cracks and crevices of the pahoehoe lava where it is damper and shadier.

The presence of mammals such as the mongoose (*Herpestes auropunctatus*), house mouse (*Mus musculus domesticus*), black rat (*Rattus rattus*), polynesian rat (*Rattus exulans hawaiensis*), and feral cats (*Felis catas*) is possible. Bird surveys conducted in the area have indicated the presence of at least two endangered species. These include the endangered Hawaiian stilt (*Himantopus himantopus knudseni*) which is known to be present in the pond areas along the Koloko and Honokohau coastline and the Hawaiian owl (*Asio flammeus sandwichensis*), which is known to be present in upland areas such as the project site.

**Probable Impacts**

None of the above listed plants are included in the U.S. Department of the Interior Fish and Wildlife Service's proposed endangered and threatened species plant list. The majority of the plant species listed are not native to the Hawaiian islands and have been brought here intentionally or accidentally after western contact. All of
the plant species are either abundant or locally common in the area and removal of
them would not constitute significant impact to the plant colonies.

Because the site is arid with no bodies of water and few trees, save for the Kiauea
scrub, development of the site will not impose a significant impact to the endangered
bird populations in this region.

**Cumulative Impacts**

Development proposals by QLT and HFDC in the vicinity of the petition area could
urbanize as much as 2,400 acres in the future. Additional expansion of urban uses in
the region as currently proposed by the County's Keahole to Kailua Development
could add substantially to this figure. Prior to public approvals for development,
inventories of existing natural resources should be conducted to ensure that valuable
wildlife habitats or native plant species located within an area are preserved.

### 4.1.5 Historic/Archaeological Resources

An archaeological inventory survey has been conducted for the petition area by Paul
H. Rosendahl, Ph.D., Inc. The survey field work was conducted on September 6 and
November 20 to December 7, 1989. The survey report is attached as Appendix B and
is summarized below.

The archaeological inventory survey identified a total of 60 sites within the petition
area (Figure 9). The type of sites found indicated that this area had been used for a
variety of purposes including habitation, agriculture, quarrying, and possibly burials.
Fourteen of the identified sites (which consisted of pahohoe excavations, cairns, a
rock concentration, a faced mound, a wall, a rock overhang, and a modified outcrop)
provided sufficient data during the survey and no further study is recommended.
These sites lacked cultural deposits and portable remains, and were measured,
mapped, described, photographed, and plotted. One site (Site 12991, faced mound)
was also excavated.

The remaining 46 sites will require additional data collection. Of this total, 36 sites
are considered to be significant solely for their information content. The remaining
10 sites (indicated by larger site numbers in Figure 9) also have possible cultural
significance. Nine of these sites may contain burials. The remaining site (Site 13006,
a kerbstone trail section) is assessed as significant for information content and
cultural value. Because the kerbstone trail is a typical example and is only a
remnant, the site is not assessed as an excellent example of a site type.

**Probable Impacts**

Many of the identified archaeological sites are located in the central portion of
Increment II and near its mauka boundary. Development of Increment II, including
possible roadway alignments, could affect archaeological sites.

**Cumulative Impacts**

A substantial amount of data covering archaeology in North Kona has been collected
as a result of proposals for land development. This body of information has helped
to shed light on the extent to which prehistoric and historic sites could be disturbed.
At the same time the data base has created opportunities for the effective
management of significant resources. Some of the showpieces of Hawaiian prehistory
have been preserved in West Hawaii, including the City of Refuge, Puukohola Heiau National Historic Site, and Lapakahi State Historic Park. Continued inventory of historic resources will allow better identification of examples that are unique and which contain high cultural significance so that preservation programs can be coordinated on a regional basis.

Mitigation Measures

The archaeological consultant recommends archaeological data recovery of 37 sites (including the trail which is in poor condition) and preservation “as is” of the nine possible burial sites after fieldwork to determine if they are in fact burials. It is anticipated that an immediate condition of Land Use Commission approval would be a requirement for preparation of a formal written mitigation plan—containing data recovery, burial treatment, and preservation elements as appropriate—to be reviewed and approved by DLNR. In the event that any previously unidentified sites or remains are encountered during construction and site work phases, work in the immediate area will cease until the State Historic Preservation Officer has been notified and is able to assess the impact and make further recommendations for mitigative actions, if warranted.

4.1.6 Air Quality

Currently within the petition area, a limited amount of air pollution is generated by quarrying activities and vehicular traffic associated with operations of West Hawai‘i Gypsum. Blasting at the quarry site, which occurs about once a week when operations are underway, creates dust pollution for brief periods. Cement dust at the batching plant is controlled at the point of transfer from trucks to a hopper within a bag house which is regulated by a permit from the State Department of Health. Other potential sources of pollution (i.e., rock crushing plant, traffic in some unpaved areas) are controlled by frequent water spraying.

For the general Kona area, since there are no large stationary point sources of pollution or heavy vehicular traffic, it can be inferred that the region experiences a high level of air quality (with the exception of periodic volcanic eruptions which significantly impact air quality in the area). Air circulation patterns on the leeward side of the island are self-contained because the area is sheltered from the full impact of the northeast tradewinds. Land-sea breezes dominate the wind regime: east-southeast winds prevail during the early morning and evening hours while west-northwest sea breezes occur during the remainder of the daylight hours.

Probable Impacts

Short-Term Impacts. The major sources of pollutants are expected to be increased emissions from construction machinery and fugitive dust emissions from exposed ground, earth moving, and vehicular movement along unpaved roads.

Long-Term Impacts. The elimination of quarrying activities is expected to improve general air quality conditions within the site. Long-term impacts are principally associated with vehicular emissions, although the proposed uses are not expected to be significant contributors to vehicular traffic.
**Cumulative Impacts**

Air quality is especially susceptible to the impact of cumulative development. Traffic generated by proposed developments discussed earlier could significantly increase air pollutants in the region.

**Mitigation Measures**

The impacts on air quality due to site disturbance would be temporary. Methods used to control the amount of airborne particulates will include regular watering of disturbed areas and providing landscaping where appropriate.

4.1.7 Noise

The existing industrial uses in the petition area and on land makai of the site and vehicular traffic moving along the Access Road and on the Queen Kaahumanu Highway are the predominant noise sources in the area.

**Probable Impacts**

Short-term noise impacts will occur during the initial construction period, generally associated with clearing, grubbing, grading, and building construction activities. The proposed light industrial, commercial, and service-related land uses, along with related traffic that is generated, will contribute to the existing noise environment in the immediate area. However, noise levels are expected to be remain well within acceptable standards. The elimination of quarrying on the site is expected to have a significant positive impact on the ambient noise quality in the area.

**Mitigative Measures**

All development will be designed and constructed to comply with governmental standards. Particular attention will be given to the siting of uses and structures along the petition area boundary with the Kealakehe area. Uses which are likely to generate higher levels of noise will be located away from State land. Additionally, the use of lease conditions and/or use covenants will serve to protect future residents of Kealakehe from undue noise or other detrimental business activities in the petition area.

4.1.8 Visual/Scenic

The principal views in the vicinity of the petition area are available to motorists travelling along the Queen Kaahumanu Highway and for residents living in mauka areas. From the highway, the landscape is dominated by the black and brown expanse of lava in the foreground with the slopes of Hualalai occupying the predominant mauka view. Views towards the coast from the highway corridor are of the rugged lava coastline with the blue expanse of the Pacific Ocean beyond. Driving from the Keahole Airport into Kailua-Kona, one encounters a number of developments along the roadway corridor, including the Keahole Agricultural Park, the NELH access road entry gate and guard house, the Kaloko Light Industrial Park, the Honokohau Small Boat Harbor entrance and metal buildings and structures located within the Kona Industrial Subdivision. From the existing residential communities in the mauka areas, major view planes extend from the Kohala Mountains in the north to the South Kona area to the south.
Probable Impacts

The petition area is situated 1,000 feet mauka of the Queen Kaahumanu Highway. Development within the site will be lowrise and is not expected to interfere substantially with existing views from the highway corridor or from mauka residential areas. Proposed residential development to the south of the site could be impacted by proposed uses.

Cumulative Impacts

Urban expansion within the region will irretrievably alter the predominantly natural state of the environment to a man-made environment.

Mitigation Measures

The development will conform to applicable County regulations which govern permissible building heights, bulk, and setbacks. In the event of development on surrounding lands, a buffer area with landscaping improvements (similar to those proposed for the parcel makai of the subject property) will be maintained along the property boundary, where appropriate, in order to minimize impacts of the industrial activities on other uses (i.e. residential) that may occur in the future. Similarly, landscaping will be provided along future roadways, particularly along potential major roadways such as the north-south parkway.

4.1.9 Nearshore Water Resources

Anchialine ponds are found in four major concentrations within shoreline areas in the vicinity of the petition area. This includes an area northwest of Kaloko Fishpond (Kaloko), an area just north of the Honokohau Harbor at Malii Point (Malii), an area just south of the harbor (Kealakehe), and finally, an area of scattered ponds north of Aimakapa Fishpond (Honokohau). While the Kaloko and Aimakapa fishponds may have significance as cultural and wildlife areas, neither are anchialine ponds by the strict definition of the term. Rather, they are former embayments which have been closed off at their mouths by natural or human activities. The closure at the mouth of Kaloko pond is sufficiently porous that the conditions within the fishpond are more nearly marine than brackish; the closure at Aimakapa is fronted by a well-developed sand beach, and water within it is more nearly fresh.

The biological conditions within the anchialine ponds and the two fishponds were surveyed as part of a larger survey of the ponds of the Kona coast (OF Consultants, 1982). Greatly different biological communities were found within the four pond areas, and significant differences were also seen within areas. The results of this survey are provided in Appendix F.

Probable Impacts

A Hydro-Geologic Impact Assessment was conducted in order to evaluate the potential impacts from the proposed project on groundwater and nearshore waters (see Appendix E). The assessment concluded that only ponds in the Malii and Kealakehe areas are located in the potential impact area from the proposed project. Within these areas, there is little likelihood of significant environmental impact. The predominant chemical addition to the groundwater flow will be dissolved nutrients (nitrogen and phosphorus), the principal "contaminants" in liquid percolating from
cesspools. These chemicals are already found in high concentration in undisturbed 
groundwater and the small additions from the project site will not have a negative 
impact on nearshore aquatic resources. (Also see Sections 4.3.3 and 4.3.4 for related 
discussions.)

Cumulative Impacts

Cumulative impacts on nearshore waters resulting from the proposed action and 
related projects could lead to higher levels of sedimentation, changes in groundwater 
discharge especially in nutrient loads resulting from irrigation and fertilization of 
golf courses and landscaped areas in the region, and possible changes in marine 
ecosystems. Significant impacts are expected to be mitigated through the use of 
proper construction practices, installation of a wastewater treatment system, and 
frequent monitoring of coastal waters.

4.1.10 Industrial Materials/Wastes

Industrial materials (i.e. fuel oil, gasoline, lube oil) stored at the site are contained 
within well-controlled areas above ground. There is no underground storage of 
materials, nor any plans to create any such facilities. There are no industrial wastes 
stored at the site.

Probable Impacts

The petitioner will notify tenants of Federal hazardous waste regulations set forth in 
Title 40 of the Code of Federal Regulations Parts 260-270. Any industrial wastes 
generated by activities within the petition area will be collected and handled 
according to these Federal regulations, plus applicable State and County government 
regulations. Maintenance work on machinery and equipment will be performed on 
concrete decks, as will the washing down of any equipment. All wash water will be 
channeled into grease traps where any oil or grease will be contained. These traps 
will be periodically cleaned and the accumulated oil (along with additional oil 
accumulated from other sources) will be disposed of in accordance with EPA rules. 
Wash water from the concrete operations will also be channeled into appropriately 
designed traps. Materials collected by this system can be recycled into the concrete 
operations. All environmentally harmful materials used in cleaning mechanical parts 
or for hand washing purposes will be used in contained areas with concrete floors 
and will be kept in appropriate containers. These management practices and 
procedures will contain impacts of industrial wastes within the petition area.

4.2 SOCIAL ENVIRONMENT

4.2.1 Population

The 1980 U.S. Census reported a resident population of 13,748 persons in the North 
Kona District, most of which was centered around the town of Kailua-Kona. This 
1980 population figure represented an increase of 185 percent over population of 
4,832 reported in 1970. The 1988 State of Hawaii Data Book estimates that the 
population in the area had increased to 20,500 as of July 1987, an increase of 49 
percent between 1980 and 1987. Population projections prepared by market analysts 
for resort projects in the area (Hallstrom Appraisal Group, Inc., 1985) indicate a 
potential resident population of 32,500 in 1995. Although this acknowledges a 
slowing of the growth rate experienced during previous years, the Kona region is 
expected to continue to be one of the fastest growing areas in the State.

4-12
The historic and projected rapid rates of growth have significantly increased demand for light industrial space within the Kona area. In order to maintain levels of service, new light industrial areas must be developed to accommodate the growing population of the West Hawaii Region.

**Probable Impacts**

The proposed action is seen as responding to increases in population and not contributing to the population growth per se. The proposed action will have an insignificant impact on population.

### 4.2.2 Economy

Through the early years of Statehood diversified agriculture formed the economic base of the region. However, the importance of diversified agriculture to the region has been eclipsed by the growth of the visitor industry and associated service related jobs. In 1950, 52 percent of the employed persons of Kona listed farm laborer, farm manager, or farmer as their primary occupation. By 1980, only 8 percent of the labor force held agriculturally related jobs (Kona Regional Plan, 1983). Today tourism is the primary economic activity of the North Kona District, supplanting agriculture as the number one revenue generating activity. In 1970, there were approximately 1,752 visitor accommodation units in the Kona area, representing 50 percent of the Big Island visitor units. By 1980, the Kona area supported a total of 3,774 visitor units, increasing by an average growth of 7 percent per year. According to the Hawaii Visitors Bureau, the visitor plant inventory (visitor accommodations in hotels and condominiums) totaled 4,708 units in 1987. The significant growth and development of new visitor units has shifted north to the South Kohala District. Nonetheless, growth in South Kohala has a major impact on the economy of the Kona District.

Other local service industries, such as retailing, real estate and financial services, have benefited from the income introduced by the expanding visitor industry. Property values in general have increased significantly over the past decade, the result of the increased demand of investment from the visitor, resident and retiree populations.

Consistent with the changing economic base and growing population of the North Kona District, new service industries such as contracting, warehousing and storage and moving services are expanding to meet added demands for their services.

**Probable Impacts**

The use of the site for light industrial and commercial and service-related purposes will contribute to the diversification of the economic base and will provide needed space in the short-term for light industrial operations which require larger parcels of land and open storage areas.

### 4.3 PUBLIC FACILITIES AND SERVICES

This section describes the existing conditions of public facilities and utilities in the North Kona area. Public facilities are those systems which are provided, staffed, and maintained by governments to serve the public health, safety, and welfare. Public utilities are distributed services (e.g., electricity, water, communications) that
are provided either by a public agency directly or by a publicly regulated company. Project impacts are discussed primarily in terms of anticipated requirements generated by the development. Mitigation measures are proposals for how this demand may be satisfied.

4.3.1 Traffic

Approximately 20 acres of the project site is occupied by a quarry operation, concrete plant, and storage areas. A two-lane paved roadway provides access from Queen Kaahumanu Highway to these activities, with the Access Road approach to Queen Kaahumanu Highway controlled by a stop sign. This intersection is located approximately 800 feet north of the Kealakehe Parkway intersection with Queen Kaahumanu Highway.

Queen Kaahumanu Highway is a two-lane State arterial roadway. It is a limited access roadway, with all cross street and driveway approaches between Kailua and Keahole Airport currently controlled by stop signs.

The most recent State Department of Transportation machine count on Queen Kaahumanu Highway made at Kealakehe Parkway on May 9-10, 1988, recorded about 11,100 vehicles per day. Current peak hour volumes, based on a count made by Wilbur Smith Associates on January 11, 1990, total about 1,000 vehicles in the 7:00 to 8:00 AM morning commute period and 1,300 vehicles in the 3:15 to 4:15 PM afternoon peak period.

At present, an estimated 150 vehicles use the Access Road on a weekday. This includes traffic from the petition area and the 10-acre industrial area to the west. Approximately 40 to 45 vehicles use the road during the morning and afternoon peak hours.

The traffic volumes and 45 miles per hour speed limit along Queen Kaahumanu Highway limit the number of gaps available for traffic turning left out of the project site Access Road, which results in delays for these vehicles. An analysis was made of the conditions for vehicles turning left from the road using the methodology in the Highway Capacity Manual, which rates the expected delays for vehicles exiting from a stop sign-controlled roadway between Level of Service "A" (little delay) to "F" (extreme delay meriting mitigative actions). This analysis indicates that the traffic exiting the Access Road experiences Level of Service "D" (long delays) during morning and evening peak hours.

Probable Impacts

The 45.5-acre Increment I of the Honokohau Industrial Park is estimated to generate a total of 2,285 weekday vehicle trips to or from the planned uses, when fully developed in 1995 (see Appendix C). The development would increase traffic volumes entering/exiting the project access road by 234 and 246 vehicles during the morning and afternoon peak hours, respectively.

Approximately 70 percent of the project traffic is estimated to travel to/from the Kailua direction, with the remainder travelling to/from the Keahole direction. The resultant increases in peak hour traffic on Queen Kaahumanu Highway at the project access road would be:

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Traffic turning left from the Access Road would experience delays equivalent to Level of Service "F" conditions during both peak periods, which would warrant mitigative actions.

Traffic from the petition area would also have an impact on traffic on Queen Kaahumanu Highway. Slow-moving traffic exiting the project Access Road would often result in slowing of through traffic on Queen Kaahumanu Highway, and would increase exposure potential for traffic accidents.

Development of the 44-acre Increment II area would generate about 2,760 vehicle trips to or from the project on a typical weekday. Approximately 500 vehicle trips would be generated in the morning and afternoon peak hours. Development of a large portion of the area with retail-type uses, such as home improvement centers, could significantly increase vehicle traffic above these levels.

**Cumulative Impacts**

According to counts made by the State Department of Transportation, during the period from 1984 to 1988, traffic on Queen Kaahumanu Highway increased by 11.2 percent, and traffic on Kealakehe Parkway to Honokohau Harbor increased by 12 percent. Assuming these rates continue from 1990 to 1995, traffic would increase on these roadways by 70 and 76 percent, respectively. With the addition of the State's Kealakehe project and the small industrial project makai of the petition area, the combined increase from general corridor growth and the two nearby projects would be 77 to 78 percent on Queen Kaahumanu Highway. These volumes would be enough to exceed the existing highway design capacity during peak hours.

**Mitigative Measures**

If the State installs a traffic signal at the Kealakehe Parkway intersection, it would likely increase gaps in traffic flow on Queen Kaahumanu Highway at the Access Road and temporarily improve exiting conditions. The State would be expected to deny any installation of a traffic signal at the Access Road intersection due to its closeness to the Kealakehe Parkway intersection.

By 1995, the traffic turning left to travel south from the project site on Queen Kaahumanu Highway would likely have to be accommodated through a road connection to Kealakehe Parkway, and the use of the traffic signal or grade-separation at its intersection with Queen Kaahumanu Highway. Therefore, the following measures are proposed:

- Initially, permit left-turns to be made both into and out of the project access roadway at Queen Kaahumanu Highway. Construct a left-turn storage lane on Queen Kaahumanu Highway for southbound vehicles turning into the project access road.
When the mauka extension of Kealakehe Parkway is constructed, construct a
frontage road or direct roadway connection from the project access road to
Kealakehe Parkway for use by exiting southbound project traffic.

Upon completion of item 2, provide signing and channelize the Access Road
intersection with Queen Kaahumanu Highway to prohibit left turns. Continue
to permit left turns into the Access Road, and both right turns into and out of
the access road. An alternative to this action would be to close the Access
Road and direct all traffic onto Kealakehe Parkway.

Impact of the project on the volume-to-capacity ratios for a signal-controlled
intersection of Queen Kaahumanu Highway and Kealakehe Parkway is as follows:

<table>
<thead>
<tr>
<th>Volume to Capacity Ratio</th>
<th>Morning Peak Hour</th>
<th>Afternoon Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without New Point Access Road to Kealakehe Parkway:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Lane Queen Kaahumanu Highway</td>
<td>.81</td>
<td>1.26</td>
</tr>
<tr>
<td>4-Lane Queen Kaahumanu Highway</td>
<td>.52</td>
<td>.76</td>
</tr>
<tr>
<td>With New Point Access Road to Kealakehe Parkway:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Lane Queen Kaahumanu Highway</td>
<td>.80</td>
<td>1.26</td>
</tr>
<tr>
<td>4-Lane Queen Kaahumanu Highway</td>
<td>.54</td>
<td>.82</td>
</tr>
</tbody>
</table>

The location of the Increment II area, and the volume of trips generated, indicate
that this area should be directly connected by an access road to Kealakehe Parkway
and/or to future north-south roadways mauka of Queen Kaahumanu Highway. The
State's Kealakehe Community Development Plan and the County's Keahole to Kailua
Development both propose roadway alignments that would satisfy this requirement.

4.3.2 Water

The Hawaii County Department of Water Supply maintains the North Kona water
system serving the area between Keahole Airport to the north and Kealakekua to the
south. This system is supplied by four wells and a shaft located at Kahalu'u, situated
between Kailua and Keauhou Bay at the 600 foot level, one to one-and-a-half miles
inland from the coast. A 16-inch transmission main runs north along the Queen
Kaahumanu Highway decreasing to a 12-inch main between the Honokohau Small
Boat Harbor and the project site. The transmission line terminates at a 0.3 million
gallon reservoir located directly mauka of the Keahole airport.

The petition area is currently serviced by a 2-inch meter and transmission line which
runs along the Access Road. Current water usage within the petition area (which is
almost exclusively related to West Hawaii Concrete operations) is approximately
13,000 gallons per day (gpd) according to the County Department of Water Supply
(Quirino Antonio, personal communication, January 11, 1990). An estimated 75
percent (or 9,750 gal.) of the daily water usage is used for concrete batch plant and
office operations of West Hawaii Concrete. The remaining 25 percent (or 3,250 gal.)
of the water is used in the quarry area for dust control. The petitioner also has
obtained one (1) unit (600 gpd) of water from the Red Hill Joint Venture.
Probable Impacts

Estimated future water demand for Increment I is approximately 15,150 gpd. This would be a net increase over current consumption levels of about 2,150 gpd. The County Department of Water Supply has indicated that daily water usage above current levels would probably require additional source development.

Cumulative Impacts

The development of projects as currently proposed by various plans for the Kona region will require extensive development of new water sources, along with necessary storage facilities, transmission lines, booster pumps, and distribution facilities.

Mitigative Measures

The Division of Land and Water Development (DOWALD) at DLNR will soon begin drilling a test well in an area mauka of Mamalahoa Highway. Results from this well will determine the potential of the aquifer to provide additional source development. As wells are developed in the future, they will be turned over to the County Department of Water Supply. The Draft Keahole to Kailua Development Plan proposes a regional water plan which identifies future transmission line alignments to accommodate future urbanization in the area. Proposed alignments in this plan would provide service to the petition area. The petitioner proposes to participate in the development of this system.

Until new sources are developed, the County Department of Water Supply will allow the petitioner to maintain water use within the petition area at current levels (approximately 13,000 gpd). Along with conservation measures and water use agreements with lessees, water consumption in the petition area will remain at existing levels unless otherwise approved by the County Department of Water Supply.

4.3.3 Wastewater Disposal

Methods of liquid waste disposal used in the Kona area include private cesspools, septic tanks, and municipal/private treatment plants. The existing municipal wastewater system services only the primary Kailua-Kona area. The nearest connection to the petition area is within the Kona Industrial Subdivision. Revised Department of Health regulations will prohibit the continued installation of cesspools in areas mauka of the Underground Injection Control (UIC) line (located at approximately 550-foot elevation east of the petition area) and below 100-foot elevation. Areas above and below this region are considered to be critical wastewater treatment areas. Individual wastewater systems constructed in accordance with Administrative Rules, Title 11, Chapter 62, "Wastewater Systems" will be required for any new construction that is not tied into the municipal system in these areas. As noted in Section 4.1.1, the petition area ranges in elevation from approximately 85 feet at the makai boundary to 350 feet at the mauka property line. Only a small makai portion of the petition area is therefore located in future restricted zones.

Plans are currently underway to construct a new wastewater treatment plant to service the Kona area. This facility is to be located on State land in the makai area of Kealakehe, approximately one mile from the petition area. A construction contract was recently awarded and site preparation has been initiated (Dennis Reid, Construction Manager, R.M. Towill, Corp., personal communication, January 18,
Completion of the project is estimated for July 1, 1991. Capacity estimates for the first phase of the new facility are 2.8 mgd average daily flow. Since the Kealakehe facility is planned to replace the existing Kona Wastewater Treatment Plant, the new facility will likely be near capacity when it opens, and unable to accommodate additional growth in the area (ibid). The proposed site for development does have sufficient land for expansion and the long-term design of the facility is proposed to have a capacity of 7.8 mgd.

**Probable Impacts**

The estimated generation of domestic wastewater from Increment I of the proposed project is approximately 5,000 to 6,000 gpd. The maximum per lot is estimated at approximately 1,000 gpd, with most lots being in the 200 to 500 gpd range. A summary findings of the hydro-geologic impact assessment (see Appendix E) indicate the project is likely to impact the groundwater body and receiving waters of groundwater discharge in the following ways:

- Wastewater discharged from project cesspools and disposal wells will influence the receiving groundwater's chemistry, particularly as localized increases in the concentration of certain inorganic constituents.
- The movement of these contaminants will be along prevailing flow paths of the groundwater body toward shoreline discharge.
- Lateral movement of these contaminants by mixing and dispersion can be approximated by a cone which widens with distance from their point of introduction toward the shoreline.
- For the anticipated quantities of wastewater percolating into underlying groundwater, and considering the concentration of contaminants and the effects of dispersion and dilution, the concentrations of contaminants in groundwater near the shoreline will be relatively low. These contaminants will be rapidly dissipated after mixing into nearshore waters.
- The effect of Honokohau Harbor to concentrate discharge of groundwater into it is a significant factor. It is likely to narrow the width of the discharge cone. In fact, most introduced contaminants are likely to be discharged into the harbor itself.
- It is unlikely that the contaminants will travel as far north to reach Aimakapa Fishpond. In the unlikely event that some of these do enter the pond, it would amount to an extremely small fraction of the total contaminant load at a very low concentration.

**Cumulative Impacts**

The impact of cumulative development in the region will require additional expansion of the proposed wastewater treatment plant at Kealakehe and development of transmission lines to service expanded urban areas.

**Mitigation Measures**

Wastewater disposal within the petition area is proposed to be provided by cesspools, except in portions of the makai area where such facilities are prohibited. However,
due to the growing concern in West Hawaii regarding the quality of coastal waters, the petitioner will continue to evaluate the benefits and feasibility of alternate disposal systems (such as septic tanks and small on-site package plants) which could further minimize potential adverse impacts from the proposed project on coastal areas. All disposal facilities will be in conformance with applicable State and County regulations.

Uses within the petition area will be connected to the municipal sewer system when such system is available. Dry lines will be installed at the appropriate time.

4.3.4 Storm Drainage

As discussed previously, the North Kona area is considered dry and arid with light rainfall. Presently there are no established drainage ways or structures located on the project site. The natural drainage consists of rainfall percolating through the layers of very porous lava to the underground water table. There is no recorded flooding in this area. According to a letter from the Army Corps of Engineers (September 14, 1989), the property is located in Zone "X", an area determined to be outside the 500-year flood plain, by the Flood Insurance Rate Map, Panel 692, dated September 16, 1988.

Probable Impacts

Surface water runoff from the site will be altered. The extent of change will ultimately depend upon the amount of paving and other impermeable surfaces that will occur within the area and the actual configuration of the storm drainage system. Based on the proposed uses in Increment I, surface water runoff was estimated by Leo Fleming, the consulting civil engineer, to be approximately 100 cubic feet per second (cfs) for a 10-year storm (see Appendix D). Drywells constructed to County standards will be provided within various parcels and along roadways as required. Grease and oil traps will be located, where appropriate, and the contents of the traps will be handled and disposed of in accordance with EPA rules.

Mitigative Measures

The on-site drainage system will consist of catch basins and County standard drywells designed to retain storm waters within the site. Drainage runoff will be bermed or curbed such that runoff from individual operations will be contained within the site. Drywells will be added under all terminal catch basins in order to enhance percolation and filtration of storm water into the substrata, rather than have the storm water surface flow towards the ocean. Specific design and percolation analyses will be completed prior to the siting and installation of final drywell systems.

4.3.5 Electrical Power and Communications

Hawaii Electric Light Company (HELCO) currently maintains a 69 KV transmission line within a power line corridor paralleling the mauka side of the Queen Kaahumanu Highway. A 12 KV line terminates at a power pole approximately 300 feet south of the properties makai of the project site.

At present, HELCO does not service the petition area. All electricity on the site is supplied by generators. The largest electrical requirement on the site is to operate
crushers associated with the quarry operation. A 500 KW generator is used to provide power for this facility.

The Hawaiian Telephone Company transmits telephone communications from base exchanges to telephone substations located in service areas. Consumers are then serviced from these substations by land lines. The petition area is serviced by a line running along the Access Road.

Probable Impacts

The Hawaii Electric Light Company (HELCO) estimates the electrical load from Increment I to be approximately 3,753 KVA (see letter dated March 20, 1990 in Chapter 8). HELCO concludes that "the existing transmission and distribution facilities will not be able to accommodate this new load and new electrical facilities will be required." Little direct impact to existing utility customers is expected since excess electrical capacity if available at the present power plant (Mr. Melvin Yamaki, personal communication, March 21, 1990).

Hawaiian Telephone Company would continue to service the site via its existing line along the Access Road.

Cumulative Impacts

In a letter dated November 16, 1989 from HELCO to the County Planning Director (see Chapter 8 for a copy of the letter), HELCO concludes that two or more additional 69 KV lines will be required in the Kona area to support the County's proposed plan for the area. Full development of the plan would exceed the capacity of the existing power plant and a new plant would have to be constructed.

Mitigative Measures

In order to minimize the estimated future demand for electrical power within the petition area, the petitioner proposes to continue the use of generators to provide power for operations of West Hawaii Concrete. Additionally, energy conservation features such as fluorescent lighting in buildings and sodium lighting in parking lots and along roadways will be incorporated within the project to reduce peak demand. Beyond these measures, the petitioner will participate in the funding of transmission and distribution facility improvements.

4.3.6 Police, Fire and Emergency Services

Police protection for the North Kona area is provided by the Hawaii County Police Department operating from its new regional headquarters on a 10-acre site in Kealakeke, approximately one-half mile south of the project area.

The Hawaii County Fire Department provides fire protection services to Big Island residents. Fire stations are located in the Kona area at Captain Cook and Kailua-Kona. The Kailua-Kona station is located on Palani Road above the Queen Kahanamoku Highway intersection, approximately three miles from the project site (approximate response time of 5 minutes).

Emergency ambulance services are provided by the State Department of Health. Advanced life support ambulance units are located at the Lucy Henriques Medical Center in Waimea, the Kailua-Kona Fire Station and at the Captain Cook Fire
Station. The Kona Hospital houses a basic life support ambulance unit. The Kailua-Kona fire station is equipped for offshore emergencies.

Probable Impacts

The development of the petition area, such as proposed herein will marginally increase demand for police, fire and emergency services.

Cumulative Impacts

Future regional development will require significant increases in personnel and facilities to provide adequate police, fire, and emergency services for the Kona region.

4.3.7 Solid Waste Disposal

The County operates 28 solid waste transfer station chutes at 21 locations around the island, including a new Kailua transfer station which opened in 1986. Refuse collected at these stations is transferred to one of the two active landfill sites: Hilo or Kealakehe (located approximately one half mile south of the project site). Refuse collected by private contractors cannot be deposited at the refuse transfer stations; instead it must be trucked to one of the two landfill sites. Hazardous waste and sludge are not accepted at any of the County landfills.

The Kealakehe landfill, which presently serves the North and South Kona Solid Waste District, is nearing capacity. The County has recently selected a new landfill site located approximately 15 miles north of the airport at Puuwaawaa. A date for opening the new landfill has not yet been set. After its opening, the Kealakehe landfill would be closed and used only as a solid waste transfer station.

Probable Impacts

Individual users of the property will arrange for collection and disposal of solid wastes. The Kealakehe landfill will be used for disposal until the new disposal facility becomes operational.
CHAPTER 5

ALTERNATIVES TO THE PROPOSED PROJECT
Chapter 200 of Title 11, Environmental Impact Statement Rules (Subsection 17(f)), requires a discussion of "any known alternatives... which could feasibly attain the objectives of the action." The rules further specify that the alternatives be explored and evaluated in light of enhancement to the environmental quality or the avoidance or reduction of adverse environmental effects.

The evaluation of alternatives to the proposed project included no action and alternative uses.

5.1 NO ACTION

The no action alternative would continue most of the existing uses on the petition area pursuant to Permit No. HA-637. Advantages associated with this alternative include the economic "savings" incurred from the deferment of on-site and off-site infrastructure improvements required for the proposed operations within the petition area, and the retention of the remainder of the site in its natural state for an undetermined period of time.

One disadvantage of the no action alternative involves the requirement for the petitioner to submit a petition to the Land Use Commission by June 13, 1989 to redesignate a portion of the petition area to a more appropriate zoning district (See Appendix A). A second disadvantage is the limited supply of land available in the Kona area for the proposed uses in the petition area. Existing industrial areas in Kona, including the Kona Industrial Subdivision and the Kaloko Light Industrial Subdivision, do not currently provide lots of over one acre in size. Other factors which make these areas not conducive to activities proposed within the petition area (particularly those within Increment I) include their lease price and restrictions on open storage. Additionally, the above conditions would create an extreme hardship on the boat storage and marine repair and maintenance activities allowed under CDUA Permit No. HA-1873. Space for these types of activities at Honokohau Harbor is occupied, thus highlighting the need for retaining and increasing the acreage within the petition area for such uses.

5.2 ALTERNATIVE USES

As discussed in Section 3.2.1, the revised County General Plan identifies land in Kona, including the petition area, as Urban Expansion Area. This designation "allows for a mix of high density, medium density, low density, industrial and/or open designations in areas where new settlements may be desirable, but where the specific settlement pattern and mix of uses have not yet been determined." In Section 3.2.2, a review of the County of Hawaii Draft Keahole to Kailua Development indicates the petition area is proposed for Regional Center and Urban Expansion uses. Within the context of these plans, alternative land uses considered for the petition area included higher density industrial and regional center activities.

5.2.1 Higher Density Industrial

The discussion in Section 2.5 noted that the supply of available industrial land (for lease or sale) in the Kona area is extremely limited. Development of the petition
area could address this situation by providing smaller lots for a higher density of
development. The advantage of this action is that more individual businesses could
be provided land in the petition area than what is currently being proposed.
Furthermore, higher density development could possibly bring a greater return of
investment for the petitioner. Disadvantages would include a higher level of traffic
and greater demand for sewer, water, and other types of public infrastructure.

5.2.2 Regional Center Activities

The rapid rate of growth in Leeward Hawaii, and the Kona region in particular, has
increased demands for region-serving activities and civic functions that cannot be
adequately satisfied by many existing facilities. In accordance with the Draft
Keshole to Kailua Development Plan, an alternative development scenario for the
petition area could provide a variety of uses such as civic/public buildings and uses,
including State offices, County offices, and a judiciary complex, related business and
financial office buildings, and/or retail commercial facilities.

One advantage of this alternative would be the development of uses that are more
aesthetically and environmentally sensitive to the natural surroundings. The
development of an office park or retail commercial facilities would also likely bring
a greater return on investment to the petitioner. A final advantage would be the
conformance of this alternative with the K to K Development Plan. Disadvantages
of this alternative are its failure to meet the development objectives of the
petitioner, it would create a much greater impact on all infrastructure facilities in
the area, it would not satisfy the market for industrial land that the petitioner seeks
to address, and it would not be in conformance with the approved Kaalakehi
Planned Community Development Plan which locates civic activities along Queen
Kaahumanu Highway.

5.3 SUMMARY

Given the petitioner's objective of maintaining existing uses within the petition area,
the demand for industrial land in the Kona area for activities that are proposed by
the petitioner, and additional development plans that are being proposed for the
general Kona area, the proposed use of the petition area is believed to be the best of
the alternatives considered.
CHAPTER 6

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS
OR RESOURCES/AND RELATIONSHIP
BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT
AND MAINTENANCE AND ENHANCEMENT
OR LONG-TERM PRODUCTIVITY
This Chapter summarizes information presented elsewhere in this report in terms of two requirements of the Environmental Impact Statement Rules. The petitioner is required to discuss: 1) the irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented; and, 2) the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity. These statements are discussed below.

6.1 IRREVERSIBLE AND IRRERTRIEVABLE COMMITMENTS OF RESOURCES

Chapter 200 of Title 11, Environmental Impact Statement Rules (11-200-17 (k)) requires the identification of unavoidable impacts and the extent to which the action makes use of non-renewable resources during phases of the action, or irreversibly curtails the range of potential uses of the environment..."

The construction and long-term operation of the light industrial and commercial service-related uses proposed herein will permanently and irretrievably commit money, time and physical resources. The proposed urban uses will displace the open space currently provided by much of the site (although the perimeter of the site will be landscaped to minimize visual impacts on the proposed Kealakehe Planned Community planned for development immediately to the south). Development of the proposed action will foreclose alternative land uses including other urban uses. Other unavoidable impacts include increased traffic and increased demand on groundwater resources.

6.2 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Chapter 200 of Title 11, Environmental Impact Statement Rules (11-200-17 (j)) requires a brief discussion of the "extent to which the proposed action involves tradeoffs between short-term losses and long-term losses or vice-versa, and a discussion of the extent to which the proposed action forecloses future options, narrows the range of beneficial uses of the environment, or poses long-term risks to health or safety..."

Short-term tradeoffs related to the proposed action are generally associated with the urbanization process. The project area presently consists of quarrying operations, a ready-mix concrete batch plant and related operations, boat storage and repair operations, and vacant land. Much of the site provides an open space amenity to residents of the Kona area. The proposed action will commit the site to particular urban uses (light industrial and commercial) thereby "narrowing the range of [potential] beneficial uses" and possibly foreclosing future options. The construction and operational phases of development will involve greater environmental impacts than are currently generated by the site (i.e., increased water demand, wastewater, traffic, etc.). The open space currently afforded by the site will be altered by the proposed development.

Long-term losses/tradeoffs relate to policy objectives of Hawaii residents as expressed through their elected representatives. The North Kona region is widely
recognized as entering into a major growth period with the proposed development of a number of major destination resorts and the increased accessibility of the region via commercial aircraft utilizing the Kcakole Airport. To keep up with this growth and attendant demand for services, suitable areas for support/service industry need to be identified and developed so that present and future residents of the Kona area can share in the economic prosperity associated with a growing urban area.
CHAPTER 7

PARTICIPANTS IN THE CONSULTATION PROCESS
AND COMMENTS RECEIVED DURING
THE PREPARATION OF THE DRAFT EIS
This chapter presents an overview of those who participated in the preparation of the Draft EIS, agencies and organizations which were consulted during the preparation of the Draft EIS, and all comments received and responses sent relative to the preparation of the Draft EIS.

7.1 PARTICIPANTS IN THE DRAFT EIS PREPARATION PROCESS

This Draft EIS was prepared for Robert S. McClean, Trustee of the Robert S. McClean Trust by Helber Hastert & Kimura, Planners. The following list identifies individuals and organizations who were involved in the preparation of the report and respective contribution.

Helber Hastert & Kimura, Planners

Mark H. Hastert       Principal-in-Charge and Project Manager
David R. Curry       Project Planner and Principal Author
Toshiko Matsushita   Graphic Artist

Technical Consultants

Paul Rosendahl, Ph.D. Archaeology
Tom Nance            Hydrology
David Ziemann        Oceanography
Terry Brothers       Traffic

7.2 CONSULTED PARTIES AND COMMENTS RECEIVED DURING THE PREPARATION OF THE DRAFT EIS

By a letter dated August 3, 1989, the Hawaii State Land Use Commission determined that the proposed Honokohau Industrial Park would require the preparation of an environmental impact statement pursuant to Chapter 343, HRS. The Environmental Impact Statement Preparation Notice (EISP) for the Honokohau Industrial Park was published in the OECQ Bulletin by the Office of Environmental Quality Control on August 8, 1989. The 24 agencies and organizations listed below were sent copies of the OECQ notice together with a copy of the EISP, and a cover letter explaining the process and soliciting comments. A total of 17 agencies/organizations responded to the request for comments and are identified in the list below with an asterisk (*). Copies of the correspondence with them are reproduced on the following pages.

Federal Agencies

* U.S. Department of Agriculture, Soil Conservation Service
* U.S. Department of Interior, Fish & Wildlife Service
* U.S. Army Corps of Engineers
  National Park Service

7-1
State Agencies

* Department of Accounting and General Services
* Department of Business and Economic Development
* Department of Education
* Department of Health
* Department of Land and Natural Resources
* Department of Transportation
* Housing Finance and Development Corporation
* Office of State Planning
* Office of Environmental Quality Control
* U.H. Environmental Center

County Agencies

* Mayor's Office
* Planning Department
* Public Works Department
* Department of Water Supply
* Department of Parks and Recreation
* Office of Housing and Community Development
* Police Department
* Fire Department

Public Utilities

* Hawaii Electric Light Company
* Hawaiian Telephone Company
August 1, 1989

Dear Sir/Per:

Environmental Impact Statement Preparation Notice

Honokohau Industrial Park, Honokohau, North Kona, Hawaii

TEK 7-4-GS 36 and 49

Robert S. McLean, Trustee of the Robert S. McLean Trust (hereinafter referred to as "petitioner") seeks incremental rezoning of a 60.6-acre parcel of land located approximately 3 miles south of Kealakekua on the Island of Hawaii, north of the Honokohau Small Boat Harbor, approximately 1,000 feet west of the Queen Kapiolani Highway. The petitioner proposes to develop the site in two increments. Conceptual development of the 45.5-acre Increment I is intended to provide space for light industrial activities which generally require larger lots and open storage areas. The 15-acre Increment II is intended to be for the development of urban uses consistent with the Hawaii County General Plan.

The proposed action requires a petition be filed with the State Land Use Commission to rezone the parcel from the State Conservation and Agricultural Districts to the Urban District. The State Land Use Commission has determined that an Environmental Impact Statement (EIS) will be required to support the petition, in accordance with Chapter 343, Hawaii Revised Statutes (HRS). Our firm has been retained to assist the petitioner in this process.

The official EIS preparation notice for the Honokohau Industrial Park was published in the August 8, 1989 issue of the Office of Environmental Quality Control (OEQC) Bulletin. A copy of that notice is enclosed. The publication in the OEQC Bulletin begins a 30-day public review period which is scheduled to end on September 6, 1989. We look forward to receiving any comments you may have within this time period.

To aid in your evaluation of potential project-related issues, we have also enclosed a more detailed project overview notice. We would appreciate your assistance in this process by reviewing the enclosed materials and:

1. Submitting any written comments or concerns relative to the proposed action; and/or,
2. Identifying any individuals within your organization whom we may contact to discuss the project further.

Thank you for your cooperation.

Sincerely,

HELMER, HASTERT & KIMURA, PLANNERS

David R. Curry
Project Planner

DRC/H
Enclosures

cc: Robert Snoukafl
CHAPTER 343, HRS
ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISPN)
HONOKAAI INDUSTRIAL PARK
Kona, North Kona, Island of Hawaii

I. Introduction

This environmental impact statement preparation notice is prepared pursuant to Chapter 343, HRS following a determination by the State Land Use Commission that an environmental impact statement is required to accompany a petition requesting approval in concept to amend the State Land Use District boundaries from Conservation and Agricultural to Urban on all 89.5 acres of land within the subject parcel, and reallocate the 43.5-acre Increment I to the Urban District consistent with provisions covering incremental districting.

The proposed action is being requested in order to comply with Condition #9 of Conditional Use Permit No. HA 1873 (7/24/80) of the Board of Land and Natural Resources (BLNR) covering 3.5 acres in the northwest corner of the subject property. Said condition, as modified, requires the petitioner to submit a petition to the Land Use Commission to reallocate the 3.5-acre area covered by the Permit to another zoning district more appropriate for the type of use. Furthermore, this request would allow for zoning consistent with Conditional Use Permit No. HA-637 (7/24/77) of the Board of Land and Natural Resources (BLNR) covering all 89.5 acres of the subject property. This petition allows for industrial activities including the quarrying of rock and production of concrete and related materials.

II. Development Summary

Petitioner/Landowner: Robert S. McClain, as Trustee of the Robert S. McClain Trust
P.O. Box 2000
Kailua-Kona, Hawaii 96743-2000

Petition Area: 89.5 acres (43.5 acres in Increment I)

Location: Honokaa, North Kona District, Island of Hawaii

Tax Map Key: Zone 7, Section 4, Plat 06, Parcels 26 and 49

State Land Use District: Conservation and Agricultural

County of Hawaii General Plan: Conservation (proposed revisions to the Hawaii County General Plan in 1987 recommend a change in designation to Urban Expansion Area.)

Kona Regional Plan: Open

Zoning: Open and Unplanned

Existing Use: Project site is presently used for quarrying of rock, operation of ready-mix concrete batch plant and production of concrete, sales and loading of aggregates, sale of concrete blocks, machinery repair facilities, boat storage and equipment storage. Approximately 25 acres of the site have been heavily graded and/or excavated. Remains of the site is covered by rough volcanic lava flows.

Proposed Uses: Production and sale of concrete and concrete products; boat storage, sales and repair; lumber and hardware sales; automotive sales, service and repair; storage of trucks, buses and construction equipment; self-storage facilities; offices and storage areas for contractors; campgrounds and other light industrial uses.

Proposed Actions: The petitioner requests the State Land Use Commission to approve the entire 89.5-acre petition area for future urban development and to redesignate the 43.5-acre Increment I to the State Conservation District to the Urban District.

III. Background

The project site is located about three miles north of Kailua-Kona, approximately 1,000 feet north of the Queen Kaahumanu Highway northeast of the Honokaa Small Boat Harbor (Figure 1). The mauna 14.6 acres of the project site lie within the General Subzone of the State Conservation District. The mauna 14.6 acres are in the State Agricultural District.

IV. Existing Conditions

Portions of the petition area are presently used for operations of West Hawaii Concrete that include quarrying of rock, operation of a ready-mix concrete batch plant and production of concrete, sales and loading of aggregates, sale of concrete blocks, machinery repair facilities, a test lab, equipment storage and office space. The area also has 2.5 acres utilized for boat storage and repair. Approximately 25
area of the site has been heavily graded and/or excavated. The remainder of the site is covered by rough a'a and pahoehoe lava flows.

The site is basically surrounded by undeveloped property. Lands in Kealakehe to the south are owned by the State. The Housing Finance and Development Corporation (HFDC) has recently initiated efforts to develop a master plan for these State lands in Kealakehe. The master plan is intended to have a major component of affordable residential housing, in addition to commercial areas and areas for public use. lands on the remaining three sides of the petition area are privately owned. A 9.9-acre site on one side of the property was recently granted Urban District designation by the Land Use Commission. Although vacant, this parcel has been built on and is planned for industrial and commercial operations and an automobile service and repair business.

V. Proposed Action

The petitioner desires incremental development of the subject property to develop the site for light industrial uses (Figure 3). Conceptual development of the 45.3-acre parcel is envisioned as follows:

- Rental of approximately 11 acres to West Hawaii Concrete to continue: 1) the production and sale of ready-mix concrete, concrete products, and related activities of concrete pumping, repair and maintenance, and 2) the production and sale of quarry products, and related activities of repair and maintenance.

- Rental of approximately 5 acres for the sale of boats and marine products and the construction of the storage, construction, repair and maintenance of boats and other marine-related activities.

- Rental of approximately 8.5 acres for the sale of lumber, hardware and other construction materials and services, and the manufacture of lumber products (e.g., trusses, cabinets, furniture).

- Rental of approximately 2 acres for the development of self-storage facilities.

- Rental of approximately 6 acres for the development of an automotive repair and service center, and an automotive sales lot for new and/or used cars.
The activities and their location as shown in Figure 2 are subject to future revision, in so far as other types of light industrial uses could be included. The proposal of new activities beyond those which currently exist is based on expressions of interest from operators of those types of activities in acquiring space from the petitioner. Ultimate development of the area and the specific types of uses will depend on market forces in the region. However, Increment II of the petition area is intended to provide space for light industrial activities which generally require larger lots and open storage areas.

The entire 44-acre Increment II is intended to be for the development of urban uses consistent with the Hawaii County General Plan and Sub-Regional Plan now being prepared by the County and its consultants.

VI. Alternatives Considered

The only alternative considered to the proposed action was the no-action alternative. This was determined to be undesirable because of the condition imposed by the Land Board requiring the petitioner submit a petition to the Land Use Commission requesting the rezoning of a portion of the subject property to the Urban District. The limited supply of land available in the Kona region to meet the current demand for the proposed uses in the petition area also made the no-action alternative undesirable.
VII. Summary of Probable Impacts

Flora and Fauna

Based on a review of biological surveys conducted in the area, no endangered animal or plant species appear to inhabit the project site. As a result, the proposed action is not expected to adversely impact flora and fauna populations in the area.

Historical and Archaeological Resources

Identified archaeological sites do not appear significant beyond their informational content. However, additional archaeological survey work will be conducted in the petition area in order to better document the identified sites, to check for additional sites that may be present, to positively identify burial sites and to determine the significance of each site within the area.

Public Facilities and Services

Traffic. The proposed action will generate additional vehicular traffic onto the Access Road (a paved roadway which provides access to the petition area) and Queen Kakahana Highway. Level of Service (LOS) at the Access Road intersection is presently LOS B. A service level of LOS E could be reached by 1993. The petitioner requests to participate in a traffic monitoring study with the Department of Transportation and neighboring property owners. When conditions warrant intersection improvements, the petitioner proposes to participate in his appropriate share of the funding and construction of both on-site and off-site transportation improvements necessitated by the proposed action.

Water. Projected potable water demand for Increment 1 would be 13,000 gallons per day (gpd). Water rights amounting to 5,600 gpd have been purchased by the petitioner from the Red Hill Joint Venture. The petitioner will eventually need to purchase additional water rights and upgrade the existing line in conjunction with the approval of the County Department of Water Supply.

Power/Communications. The petitioner has requested to participate in proposed improvements to the electrical service system that would provide service to the property within the petition area by extending the 12 KV line through a 300-foot long utility easement over the adjacent State lands to the south. Hawaiian Telephone Company would continue to service the site via its existing line along the Access Road.

VIII. Agencies to be Consulted During EIS Preparation

A. Federal Agencies
1. U.S. Department of Agriculture, Soil Conservation Service
2. U.S. Department of Interior, Fish & Wildlife Service
3. U.S. Army Corps of Engineers
4. National Park Service

B. State Agencies
1. Department of Accounting and General Services
2. Department of Business and Economic Development
3. Department of Education
4. Department of Health
5. Department of Land and Natural Resources
6. Department of Transportation
7. Housing Finance and Development Corporation
8. Office of State Planning
9. Office of Environmental Quality Control
10. UH/Ekolu Environmental Center

C. County Agencies
1. Mayor's Office
2. Planning Department
3. Public Works Department
4. Department of Water Supply
5. Department of Parks and Recreation
6. Office of Housing and Community Development
7. Police Department
8. Fire Department

D. Public Utilities
1. Hawaii Electric Light Company
2. Hawaiian Telephone Company
Mr. David R. Curry
Helsel, Hastert & Kimura, Planners
Governor Center, P.O. Tower
733 Bishop Street, Suite 2500
Honolulu, Hawaii 96813

Re: Environmental Impact Statement Preparation Notice for Hauhaua Industrial Park, Honolulu, North End, Hawaii TMD 7-4-80-25 and 49.

Dear Mr. Curry:

We have reviewed the referenced notice which was forwarded to us with your letter of August 21, 1989. To the best of our knowledge, there are no species present within the project area which are listed or eligible for listing as threatened or endangered by the Fish and Wildlife Service.

We recommend that the environmental impact statement being prepared for the proposed action discuss potential impacts of construction and operation of industrial facilities on groundwaters, and subsequent secondary effects upon coastal ponds and nearshore marine waters. This discussion should address the impact of petroleum and pesticides use, leaching (e.g., from treated lumber), and accidental spills within the project area upon groundwaters.

Thank you for providing this opportunity to comment.

Sincerely,

Ernest Kosaka
Field Office Supervisor
Environmental Services

November 17, 1989
Mr. Ernest Kosaka, Field Office Supervisor
Office of Environmental Services
U.S. Department of the Interior
Fish and Wildlife Service
300 Ala Moana Blvd.
P.O. Box 20167
Honolulu, Hawaii 96820

Dear Mr. Kosaka:

Environmental Impact Statement Preparation Notice (EISP:N)
Hauhaua Industrial Park, Honolulu, North End, Hawaii
TMD 7-4-80-25 and 49

Thank you for your letter of August 24, 1989 regarding the EISP:N for the referenced project. Your concern regarding the potential for contamination of groundwaters, and subsequent secondary effects upon coastal ponds and nearshore marine waters are noted and will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HESSEL, HASTERT & KIMURA, PLANNERS

David R. Curry
Project Planner

cc: Robert S. McClean
Robert J. Simek
Elder Oede, Land Use Commission
DEPARTMENT OF THE ARMY
U.S. Army Engineers District, Honolulu
FT. SHAWNEE FORT, HONOLULU 808-484-1100

Planning Branch

September 14, 1989

Halber, Hastert & Kimura, Planners
Attention: Mr. David R. Curry
775 Bishop Street, Suite 2090
Honolulu, Hawaii 96813

Dear Mr. Curry:

Thank you for the opportunity to review the Environmental Impact Statement Preparation Notice for the Honolulu Industrial Park, North Kona, Hawaii (TMK 7-4-69: 36 & 49). The following comments are provided:

a. A Department of the Army Permit will not be required for this project.
b. The project is located in Zone "x", an area determined to be outside the 100-year flood plain, by the Flood Insurance Rate Map, Panel 692, dated September 16, 1988.

Sincerely,

Koek, Kung
Chief, Engineering Division

Mr. Kiok Cheung, Chief
Engineering Division
Department of the Army
U.S. Army Engineering District, Honolulu
Building 320
Honolulu, Hawaii 96854-4440

Mr. Kiok Cheung

Environmental Impact Statement Preparation Notice (EISPNI)
Hanahtoul Industrial Park, Hanahoua, North Kona, Hawaii
TMK 7-4-69: 36 and 49

November 17, 1989

Mr. Kiok Cheung

Dear Mr. Cheung:

Thank you for your letter of September 14, 1989 regarding the EISPNI for the referenced project. The information you provided is appreciated and will be included in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HELBER, HASTERT & KIMURA, PLANNERS

David R. Curry
Project Planner

Robert S. McClure
Robert J. Smolnitski
Esther Mills, Land Use Commission
Mr. David R. Curry  
Helber, Haste & Kimura  
733 Bishop Street, Suite 2590  
Honolulu, Hawaii 96813

Dear Mr. Curry,

Subject: Honokohau Industrial Park  
Honokohau, North Kona, Hawaii  
EIS Preparation Notice

Thank you for the opportunity to review the subject document. We have no comments to offer.

Should there be any questions, please contact  
Mr. Cedric Takimoto of the Planning Branch at 348-7192.

Very truly yours,

[Signature]

STATE PUBLIC WORKS ENGINEER  

November 17, 1989

Mr. Terence Tominga, State Public Works Engineer  
State Department of Accounting and General Services  
Division of Public Works  
P.O. Box 110  
Honolulu, Hawaii 96810

Dear Mr. Tominga:

Environmental Impact Statement Preparation Notice (EISP)  
Honokohau Industrial Park, Honokohau, North Kona, Hawaii  
TMR 7-4-68 34 and 49

Thank you for your letter of August 24, 1989 regarding the EISP for the referenced project. Although you have no comments at this time concerning the project, we appreciate the time you and your staff spent reviewing the EISP.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HELBER, HASTERT & KIMURA, PLANNERS

[Signature]

David R. Curry  
Project Planner

DRC/f

cc: Robert S. McClain  
Robert J. Smolaski  
Esther Uels, Land Use Commission
August 25, 1989

Mr. David R. Curry
Project Planner
Held, Hastert & Kimura
Planners
Governor Center
P.O. Box 2590
733 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Curry:

Thank you for the opportunity to comment on the Environmental Impact Statement Preparation Notice, Honokohau Industrial Park, TMK 7-4-08: 26 and 49. The Department of Business and Economic Development has no pertinent comments to offer at this time.

Sincerely,

for Roger A. Ulveling
Mr. David R. Curry
Project Planner
Helber, Hastert & Kimura
723 Bishop Street, Suite 2500
Honolulu, Hawaii 96813

Dear Mr. Curry:

SUBJECT: Environmental Impact Statement Preparation Notice
Hoomakaha Industrial Park, Hoomakaha, North Kona, Hawaii
TDM: 7-6-09, 34 and 49

Our review of the proposed industrial park indicates that it will have negligible impact on our area schools.

Thank you for the opportunity to comment.

Sincerely,

Charlie T. Togetsu
Superintendent

cc: Mr. R. Basu
Dr. A. Garza

Ms. Togetsu

November 17, 1989

Mr. Charles T. Togetsu, Superintendent
Department of Education
State of Hawaii
P.O. Box 3350
Honolulu, Hawaii 96804

Dear Mr. Togetsu:

Environmental Impact Statement Preparation Notice (EISP)
Hoomakaha Industrial Park, Hoomakaha, North Kona, Hawaii
TDM: 7-6-09, 34 and 49

Thank you for your letter of August 30, 1989 regarding the EISP for the referenced project. We note that the project will have negligible impact on schools in the area and appreciate the time you and your staff spent reviewing the EISP.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HELBER, HASTERT & KIMURA, PLANNERS

David R. Curry
Project Planner

cc: Robert S. McClanahan
Robert J. Banderaki
Ester Ueda, Land Use Commission

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER
Mr. David R. Curry, Project Planner  
Heller, Nasturt & Horner, Planners 
733 Bishop Street, Suite 2300  
Honolulu, Hawaii 96813  

Thank you for the opportunity to review the subject document. We have examined the preparation notice and have the following comments to offer:

Drinking Water

1. The EIS must adequately address the issue of providing potable water for the planned project. The preparation notice indicates that the developer still needs to purchase additional water rights and upgrade the existing water line. The developer should be reminded that any new potable water source(s) and distribution system will be subject to the Department's Administrative Rules, Title 14, Chapter 20, "Potable Water Systems."  

2. Section 11-30-30 of Chapter 30 requires that all new sources of potable water serving a public water system be approved by the Director of Health prior to their use. Such an approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set forth in Section 11-30-19.

3. Section 11-30-30 of Chapter 30 requires that new or substantially modified distribution systems for public water systems be approved by the Director. However, if the water system is under the jurisdiction of the County of Hawaii, the Department of Water Supply will be responsible for the review and approval of the plans.

4. The EIS must also address wastewater and stormwater disposal. A more detailed location map(s) will be required to determine the location of the project site with respect to the Underground Injection Control (UIC) line which delineates underground sources of drinking water.

Wastewater Disposal

We recommend that no individual wastewater system be constructed in accordance with Administrative Rules, Title 14, Chapter 88, "Wastewater Systems" and dry sewer lines also be constructed for future connection to the municipal sewer system as conditions of approval.

Hazardous Waste

The "tight industrial" tenants to be located in the "Increment 1" phase commonly generate solid wastes that are hazardous. The developer/owner is recommended to notify his tenants of current federal hazardous waste regulations set forth in Title 40 of the Code of Federal Regulations Parts 265-270.

Solid Waste

The EIS should address the used oil and lead-acid battery statutes and the possible environmental impact from the automotive service, repair and storage activities proposed at the park.

Underground Storage Tank

The proposed actions described in the notice, such as the repair and maintenance facilities for marine-related activities and the automotive repair and service center, usually involve the installation of underground storage tanks, systems used for petroleum product storage.

The petitioner should be aware that the U, S, Environmental Protection Agency's final technical rules and regulations for underground storage tanks (USTs) containing petroleum and hazardous substances were published in the Federal Register on September 22, 1988 and became effective on December 23, 1988. These rules and regulations set forth specific requirements that must be undertaken by owners and operators for UST installation, operation, release detection, release response and corrective action. We are enclosing a copy of the EPA's final technical rules and regulations for the petitioner's information and use (Attachment A).

The petitioner should also realize that the federal financial responsibility requirements for USTs containing petroleum became effective on January 31, 1989 Federal Register 16-26-89 (see Attachment B). A copy of these federal regulations are also enclosed for the petitioner's reference.

The petitioner should review the attached federal UST rules and regulations carefully. Any possible impacts due to a release of regulated substances from such tank systems should be addressed in the draft environmental
statement. This discussion should include all provisions which shall be
undertaken by the petitioner in order to comply with the federal RST rules
and regulations. The petitioner should also contact the appropriate County
Fire Department regarding any county regulations applicable to RST systems.

Sincerely,

BRUCE R. ANDERSON, PH.D.
Deputy Director for
Environmental Health

November 17, 1989

Dr. John C. Lewis, Director
Department of Health
State of Hawaii
P.O. Box 5274
Honolulu, Hawaii 96820

Attn: Bruce S. Anderson, PH.D.

Dear Dr. Lewis:

Thank you for your letter of October 4, 1989 regarding the RSTPM for the
referenced project. Your comments concerning the availability of potable
water, wastewater disposal, handling of solid and hazardous wastes, and
guidelines for underground storage facilities are noted and will be discussed
in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land
Use Commission and the Office of Environmental Quality Control (OEQC) in
January 1990. Your letter, together with this response, will be published as
part of the Draft EIS.

Sincerely,

HELBER, HASTERT & KIMURA, PLANNERS

David R. Curry
Project Planner

cc:
Robert S. McLean
Robert J. Smolenski
Easter Udall, Land Use Commission
Mr. David R. Curry
Project Manager
Hanna, Weilert & Elam (HWE)
Planners
Governors Center, PIF Tower
723 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Curry:

SUBJECT: Environmental Impact Statement Preparation Notice

Honolua Industrial Park, Honokohau, North Kona, Hawaii; TCEQ 7-4-38; 26 & 49

Thank you for giving our Department the opportunity to review this matter. We have reviewed the materials you submitted and have the following comments.

The applicant already has determined that an archaeological inventory survey of unaltered (non-bulldosed and non- quarry) lands is needed. We are waiting for the findings of the survey, and we recommend that the findings be submitted to our Department for review as soon as the survey report is concluded.

The industries now operating on this site have been subject to several approved Conservation District Use reviews (RA-637, RA-1073, and RA-2219) since 1975. No adverse environmental impact has been reported from the existing activities.

However, we suggest that the petitioner discuss with the DEIS, what precautions or mitigation measures are planned to be taken to prevent petroleum products, detergents, cement by-products, and other contaminants associated with industrial development, from impacting the aquatic environment, especially during storm runoff.

Thank you again for your cooperation in this matter. Please feel free to call Jay Leahey at our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.

Very truly yours,

William W. Paty

This text is a letter from the Department of Land and Natural Resources of Hawaii, addressed to Mr. David R. Curry, regarding an Environmental Impact Statement preparation notice for the Honolua Industrial Park in Honokohau, North Kona, Hawaii. The letter thanks Mr. Curry for giving the department the opportunity to review the matter and provides feedback on the submitted materials, including recommendations for the archaeological inventory survey and suggestions for mitigation measures to prevent contaminants from impacting the aquatic environment during storms.
January 9, 1990

Mr. William W. Paty, Chairperson
Board of Land and Natural Resources
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Paty:

Environmental Impact Statement Preparation Notice (EISPIN)
Haokee工業 Park, Hamakua, North Kona, Hawaii
TMK 7-4-08: 38 and 49

Thank you for your letter of November 17, 1989 regarding the EISPIN for the referenced project. Your comments concerning mitigation measures related to hazardous materials impacts on the aquatic environment are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HELBER, HASTERT & KIMURA, PLANNERS

[Signature]

David R. Curry
Project Planner

DRC/H

cc: Robert S. McClearn
    Robert J. Smociski
    Easter Udani, Land Use Commission
Dear Mr. Curry,

Thank you for your letter of August 21, 1990 requesting our comments on the subject. The project is still under review and will be completed in the next year. U.S. Army engineers have been assigned to examine the project and will provide their comments to the U.S. Army Engineers. The project is scheduled to be completed in the next year. Projects, such as this, do have a significant impact on the community. However, we will continue to work with the U.S. Army and the community to ensure a safe and efficient project. If you have any further questions or concerns, please do not hesitate to contact me.

Sincerely,

[Signature]

[Name]

[Title]
September 9, 1989

Mr. David R. Curry
Helber, Haster & Kimura Planners
723 Bishop Street, Suite 2990
Honolulu, Hawaii 96813

Dear Mr. Curry:

Re: Environmental Impact Statement Preparation Notice for Honokohau Industrial Park

I apologize for the late response and thank you for the opportunity to review the subject EIS preparation notice.

The Housing Finance and Development Corporation is proposing to develop a master planned community on lands adjacent to the proposed project. Conceptually, approximately 3,900 residential units, 60% of which would be offered at affordable levels, are planned for development in the proposed Kailua Industrial Park. The NFDC has recently commenced with the master planning of the entire project and we will be taking into consideration the uses on private lands adjacent to our project. Plans are also underway for the development of approximately 40 acres of land which is adjacent to the existing Kailua House lots and which is presently designated for urban use and zoned residential.

We are very concerned with the industrial use of lands adjacent to our proposed community, which will be primarily residential. We therefore request that the environmental impact assessment address the impacts of the proposed industrial park on the Honokohau Planned Community. For example, the assessment should evaluate such negative impacts as dust, noise, traffic, hazardous waste, etc. which may result from industrial operations.

Sincerely,

David H. Curry
Executive Director

November 13, 1989

Mr. Joseph Cassatt, Executive Director
Housing Finance and Development Corporation
Department of Budget and Finance
Sevea Waterfront Plaza, Suite 500
200 Ala Moana Boulevard
Honolulu, Hawaii 96813

Dear Mr. Cassatt:

Environmental Impact Statement Preparation Notice (EISP)
Honokohau Industrial Park, Honokohau, North Kona, Hawaii

TMK 7-4-B: 36 and 49

Thank you for your letter of September 9, 1989 regarding the EISP for the referenced project. We note your concern on NFDC's proposed development at Kailua. Your concerns about the potential of the proposed industrial park to impact upon the Honokohau Planned Community will be addressed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HIBEL, HASTER & KIMURA, PLANNERS

David R. Curry
Project Planner

cc: Robert S. McGlasson
Robert J. Smidt
Esther Ueda, Land Use Commission
September 13, 1989

Mr. David R. Curry
Helber, Nastert & Kimura, Planners
723 Bishop Street, Suite 3500
Honolulu, Hawaii 96813

Dear Mr. Curry:

Subject: Environmental Impact Statement Preparation Notice - Honolulu Industrial Park, TMK 1-4-08: 26 and 49
Honokaa, North Kona, Hawaii
Proposal to reclassify approximately 49.5 acres from the State Conservation and Agricultural Districts to the Urban Land Use District

The compatibility of the proposed uses with existing and proposed land uses of the surrounding area should be thoroughly discussed. The EIS should also address the impacts that the project may have on groundwater and ocean water quality and the adequacy of infrastructure to support the proposed development.

Thank you for the opportunity to comment.

Sincerely,

[Signature]

HAROLD S. HAMANO
Director

November 17, 1989

Mr. Harold Namamoto, Director
Office of State Planning
Office of the Governor
State Capitol
Honolulu, Hawaii 96813

Dear Mr. Namamoto:

Environmental Impact Statement Preparation Notice (EISPN)
Honokaa Industrial Park, Honokaa, North Kona, Hawaii
TMK 1-4-08: 26 and 49

Thank you for your letter of September 13, 1989 regarding the EISPN for the referenced project. Your comments concerning the compatibility of the proposed uses and potential impacts of the project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQCC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HELBER, HASTERT & KIMURA, PLANNERS

David R. Curry
Project Planner

[Signature]

cc: Robert S. McLean
Robert J. Seidenschwarz
Esther Ueda, Land Use Commission
September 1, 1989

Mr. David R. Curry
Hilber, Hasting & Kimura, Planners
Governor Center, PFI Tower
733 Bishop Street, Suite 2500
Honolulu, HI 96813

Dear Mr. Curry:

Environmental Impact Statement (EIS) Preparation Notice
Honokohau Industrial Park
Honokohau, North Kona, Hawaii

Thank you for soliciting our comments for the Environmental Impact Statement which you will be preparing for the proposed Honokohau Industrial Park at Honokohau, North Kona.

Since the Planning Department is involved in both the State Land Use Boundary Amendment petition for this project and is also working on a detailed regional development plan for the surrounding area, I have asked Planning Director, Duane Kauha, to coordinate our response and to serve as the contact person for further discussions on this project.

Aloha,

Bernard K. Akana
MAYOR

cc: Planning Director

November 16, 1989

Honorable Bernard K. Akana, Mayor
Office of the Mayor
County of Hawaii
200 Kamehameha Avenue
Hilo, Hawaii 96720

Dear Mayor Akana:

Environmental Impact Statement Preparatory Notice (EIS/PN)
Honokohau Industrial Park, Honokohau, North Kona, Hawaii
TM 7-4-01A: 26 and 49

Thank you for your letter of September 1, 1989 regarding the EIS/PN for the referenced project. Although you have not commented at this time concerning the project, we appreciate the time you and your staff spent reviewing the EIS/PN.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HILBER, HASTERT & KIMURA, PLANNERS

November 17, 1989

Honorable Bernard K. Akana, Mayor
Office of the Mayor
County of Hawaii
2209 Bishop Street
Hilo, Hawaii 96720

Dear Mayor Akana:

Environmental Impact Statement Preparatory Notice (EIS/PN)
Honokohau Industrial Park, Honokohau, North Kona, Hawaii
TM 7-4-01A: 26 and 49

Thank you for your letter of September 1, 1989 regarding the EIS/PN for the referenced project. Although you have not commented at this time concerning the project, we appreciate the time you and your staff spent reviewing the EIS/PN.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HILBER, HASTERT & KIMURA, PLANNERS

David R. Curry
Project Planner

cc: Robert S. McCrea
    Robert J. Smola
    Esther Ueda, Land Use Commission
September 7, 1989

Mr. David Curry
Kalmar, Ester & Kimura, Planners
Gravoisor Center, 4th Tower
700 Bishop Street, Suite 2500
Honolulu, HI 96813

Dear Mr. Curry:

EIS Preparation Notice
Honokohau Industrial Park, Kona North Kona
EIS Boundary Amendment Petition (ARA-643)
Robert S. McClean, Trustee of Robert S. McClean Trust

In addition to those items which were enumerated during the State Land Use Commission hearing by both the State Office of Planning and County Planning Department, the traffic analysis in the EIS should determine when improvements to Queen Kapiolani Highway would be needed and should also consider alternative access routes.

Please contact Norman Hayashi of my staff should you wish to discuss this project further.

Sincerely,

DOANE KAHUNA
Planning Director

VKG:lv

August 9, 1989

Mr. Robert J. Smolenski
1117 Davies Pacific Center
841 Bishop Street
Honolulu, HI 96813–1970

Dear Mr. Smolenski:

State Land Use Boundary Amendment (LUCC ARA-643)
Petitioner: Robert S. McClean as Trustee of the Robert S. McClean Trust
Request: Conservation to Urban

For your information and appropriate action, we are transmitting comments received from the Department of Water Supply relating to the above-described petition. Given the lack of water to service the proposed project, please inform us of your plans to obtain the necessary water.

Should you have any questions concerning this matter, please feel free to contact the Planning Department.

Sincerely,

DOANE KAHUNA
Planning Director

CR#:lv
Enclosure
November 17, 1989

Mr. Dan Kanno, Director
Planning Department
County of Hawaii
23 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Kanno:

Environmental Impact Statement Preparation Notice (EISP)
Hoa'ikahalulu Industrial Park, Honaunau, North Kona, Hawaii
TMX 7-68-38 and 49

Thank you for your letters of August 9 and September 7, 1989 regarding the EISP for the referenced project. Your comments concerning the availability of potable water and the potential traffic impacts of the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HELBER, HASTERT & KIMURA, PLANNERS

David R. Curry
Project Planner

DRC/II
cc: Robert S. McClean
    Robert J. Snelick
    Esther Udoe, Land Use Commission
Department of Public Works

August 30, 1989

Mr. David Curry
RELBR HASTERT & KUMRA PLANNERS
733 Bishop Street, Suite 2590
Honolulu, HI 96813

SUBJECT: RISP FOR HONANOAD INDUSTRIAL PARK

Our comments on the RISP boundary amendment were:

1. Building shall conform to all requirements of code and statutes pertaining to building construction.
2. All development generated runoff shall be disposed on site and shall not be directed toward any adjacent properties.
3. Applicant shall be informed that if drywells are included in the subject improvements, Chapter 13, Underground Injection Control (UIC), Administrative Rules, Dept. of Health, prohibit any person from operating, constructing or modifying an injection well (drywell) unless authorized by a permit issued by the Director of Health, State of Hawaii.
4. Provide a county deductible access road meeting commercial standards. The minimum right-of-way is 60'.
5. Provide intersection improvements at the Queen Kuhio Highway, i.e., channelization.
6. We prefer a grade separated intersection but this may be an excessive request since the applicant does not own the metal property across the Queen Kuhio Highway.

Robert X. Yanaba, Division Chief
Engineering Division

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief

November 17, 1989

Mr. Hugh Y. Oto, Chief Engineer
Department of Public Works
County of Hawaii
3300 Kamehameha V. Highway
Hilo, Hawaii 96720

Dear Mr. Oto:

Thank you for your letter of August 30, 1989 regarding the RISP for the referenced project. Your comments concerning the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Robert X. Yanaba, Division Chief
TO: Planning Department
FROM: H. William Sewaka, Manager
SUBJECT: STATE LAND USE BOUNDARY AMENDMENT
APPLICANT - ROBERT S. McCLEAN
TAX MAP KEY 7-4-06126 AND 49

Please be informed that the Department's existing water system facilities cannot support the proposed subdivision at this time. Extensive improvements and additions, including source, storage, transmission, booster pump, and distribution facilities, must be constructed. Currently, sufficient funding is not available and no time schedule is set.

Should you have any questions, please contact us at 963-1421.

William Sewaka
Manager

November 17, 1989

Mr. H. William Sewaka, Manager
Department of Water Supply
County of Hawaii
23 Aspual Street
Hilo, Hawaii 96720

Dear Mr. Sewaka:

Environmental Impact Statement Preparation Notice (EISPAN)
Honeahin Industrial Park, Honokohau, North Kona, Hawaii
THK 7-4-06126 and 49

Thank you for your letter of August 3, 1989 regarding the EISPAN for the referenced project. Your comments concerning the existing water system facilities in West Hawaii are noted. The availability of potable water to the project will be discussed in the Draft EIS.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HELBER, HASTERT & KINURA, PLANNERS

David R. Choy
Project Planner

cc: Robert S. McClean
    Robert J. Silva
    Easter Ueda, Land Use Commission

... Water brings progress...
August 25, 1989

Mr. David R. Curry
Project Planner
Hilbert, Hastert & Kimura Planners
735 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Subject: Honokohau Industrial Park, North Kona - EIS/PA

Dear Mr. Curry:

We have reviewed the subject EIS/PA and foresee no impacts on the County's park system.

Thank you for the opportunity to review the report.

Sincerely,

Larry Tanisato
Director

November 17, 1989

Mr. Larry Tanisato, Director
Department of Parks and Recreation
County of Hawaii
25 August Street
Hilo, Hawaii 96720

Re: Environmental Impact Statement Preparation Notice (EIS/PA)

Honokohau Industrial Park, Honokohau, Kona, Hawaii

Dear Mr. Tanisato:

Thank you for your letter of August 25, 1989 regarding the EIS/PA for the referenced project. We note that the project would not impact on the County's park system and appreciate the time you and your staff spent reviewing the EIS/PA.

For your information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

HILBERT, HAERT & KIMURA, PLANNERS

David R. Curry
Project Planner

cc: Robert S. McClean
    Robert A. Smitz
    Esther Ueda, Land Use Commission
August 30, 1989

Mr. David R. Curry
Project Planners
Halber, Hastert & Kimura, Planners
Government Center
PNI Tower
733 Bishop Street, Suite 2590
Honolulu, Hawaii 96813

Dear Mr. Curry:

Subject: Environmental Impact Statement Preparation Notice

Honokaa Industrial Park, Honokaa, H. Kona, HI

TMK: 7-4-08: 26 and 49

From the police viewpoint, a traffic concern exists at the entrance to Queen Kamehame Highway. An overpass and deceleration, acceleration, and dedicated left turn lanes should be required prior to approval.

Additionally, this project along with the many others in North and South Kona will further test police resources.

Submitted for your review and disposition.

Sincerely,

Chief of Police

August 30, 1989

Mr. Victor Vierra, Chief of Police
Hawaii County Police Department
349 Kapolei Street
Hilo, Hawaii 96720

November 14, 1989

Mr. Victor Vierra, Chief of Police
Hawaii County Police Department
349 Kapolei Street
Hilo, Hawaii 96720

Dear Mr. Vierra:

Environmental Impact Statement Preparation Notice (EISP)
Honokaa Industrial Park, Honokaa, North Kona, Hawaii
TMK 7-4-08: 26 and 49

Thank you for your letter of August 30, 1989 regarding the EISP for the referenced project. Your comments concerning the potential impacts of the proposed project are noted and, where appropriate, will be discussed in the Draft EIS.

For your Information, we expect to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in January 1990. Your letter, together with this response, will be published as part of the Draft EIS.

Sincerely,

Daniel R. Curry
Project Planner

David R. Curry
Planners

cc: Robert S. McGinn
Robert J. Socinski
Eyhia Ueda, Land Use Commission
CHAPTER 8

COMMENTS RECEIVED DURING THE PREPARATION OF THE FINAL EIS
Sixty (60) copies of the Draft Environmental Impact Statement (DEIS) were delivered to the Office of Environmental Quality Control (OEQC) on January 22, 1990. Notice of the DEIS was published in the January 23, 1990 issue of the OEQC Bulletin. Copies of the report were then distributed to interested public agencies, organizations, and individual listed below. As of March 23, 1990, a total of 19 comments (identified by an asterisk below) had been received. These comments along with responses are reprinted on the following pages.

**Federal Agencies**

- U.S. Department of Agriculture, Soil Conservation Service
- U.S. Army-DAFE (Facilities Eng.-USASCH)
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Navy
- U.S. Department of Interior, Fish & Wildlife Service
- Environmental Protection Agency

**State Agencies**

- Department of Accounting and General Services
- Department of Agriculture
- Department of Business and Economic Development
- Department of Defense
- Department of Health
- Department of Land and Natural Resources
- Department of Transportation
- Housing Finance and Development Corporation
- Office of State Planning
- Office of Environmental Quality Control
- State Energy Office
- State Archives
- U.H. Environmental Center

**County Agencies**

- Planning Department
- Public Works Department
- Department of Water Supply
- Department of Parks and Recreation
- Department of Research and Development
- University of Hawaii-Hilo Campus Library

**News Media**

- Honolulu Star-Bulletin
- Honolulu Advertiser
- Sun Press
- Hawaii Tribune Herald
- West Hawaii Today
Public Utilities

- Hawaii Electric Light Company

Libraries

- State Main Library
- Kaimuki Regional Library
- Kaneohe Regional Library
- Pearl City Regional Library
- Hilo Regional Library
- Wailuku Regional Library
- Lihue Regional Library
- Kailua-Kona Library
- U.H. Hamilton Library, Hawaiian Collection
- Legislative Reference Bureau
March 8, 1990

Mr. Warren M. Lee, State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 30004
Honolulu, Hawaii 96816

Dear Mr. Lee:

The subject of this letter is the Draft Environmental Impact Statement (DEIS) for the proposed quarry operation at the Hawaiian Industrial Park, North Kona, Hawaii. The DEIS was submitted by the U.S. Department of Agriculture for public review and comment. We are writing to express our concerns regarding the proposed project and to provide our comments on the DEIS.

A review of the DEIS reveals several areas of concern:

1. The proposal for the quarry operation is located near the Kekaha Kai State Park, a designated park and natural reserve. The project would require the removal of 350,000 cubic yards of rock, which would significantly impact the natural environment and the park's ecosystem.

2. The project would result in the destruction of several picnic areas and hiking trails, which would be detrimental to the park's visitors and the park's natural beauty.

3. The project would require the construction of a new road, which would impact the park's natural landscape and the park's visitors.

4. The project would result in the loss of several trees, which would impact the park's biodiversity and the park's natural beauty.

5. The project would require the removal of several boulders, which would impact the park's natural landscape and the park's visitors.

We strongly encourage the DEIS to be modified to minimize the impact on the park's natural environment and the park's visitors.

Sincerely,

[Signature]

[Name]

State Conservationist
We hope our responses have adequately addressed your concerns. For your information, we intend to file the Final EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

HELBER, HASTERT & KIMURA, PLANNERS

[Signature]
David R. Curry
Project Planner

cc: Esther Udde, Land Use Commission
    Dr. Merlie T. Miura, OEQC
    Robert McClain
    Robert Smoak
DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
ST. MARY'S MANEUVER

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
ST. MARY'S MANEUVER

Planning Division
February 22, 1990

Hawaii State Land Use Commission
Attn: Esther Ueda
325 Merchant Street, Room 104
Honolulu, Hawaii 96813

Dear Members of the Commission:

We have reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Honokohau Industrial Park, Honokohau, North Kona, Island of Hawaii. Our previous comments in response to the Preparation Notice (letter dated September 14, 1989) have been included in the DEIS. We have no additional comments.

Sincerely,

Clarence Fujii
Acting Director, Engineering

Copy Furnished:

Robert S. McClain
C/O David R. Curry
Heller Huestet & Kimura, Planners
733 Bishop Street, Suite 2508
Honolulu, Hawaii 96813

Marvin T. Miura, Ph.D.
Director
Office of Environmental Quality Control
465 S. King St., Room 104
Honolulu, Hawaii 96813

April 3, 1990

Mr. Clarence Fujii, Acting Director
Engineering Division
Department of the Army
U.S. Army Engineering District, Honolulu
Building 230
Honolulu, Hawaii 96818-5440

Attn: Planning Branch

Dear Mr. Fujii:

Draft Environmental Impact Statement (DEIS)
Honokohau Industrial Park, Honokohau, North Kona, Hawaii

THK T-4-08-34 and 49

Thank you for your letter of February 22, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

HEILER, HUESTET & KIMURA, PLANNERS

David R. Curry
Project Planner

Esther Ueda, Land Use Commission

GEOC
Robert McClain
Robert Skoczak

GEOC

733 Bishop Street, Suite 2508
Honolulu, Hawaii 96813

Phone 808-541-5021
Fax 808-541-0544
DEPARTMENT OF THE NAVY
COMMANDER
NAVAL BASE, PEARL HARBOR
PEARL HARBOR, HAWAII 96840-5020

State Land Use Commission
Attn: Esther Ueda
335 Merchant Street, Room 304
Hawaii, Hawaii 96813

Dear Ms. Ueda:

HONOKOHAU INDUSTRIAL PARK

The Draft Environmental Impact Statement for Honokohau Industrial Park has been reviewed, and we have no comments to offer. Since we have no further use for the document, it is being returned to the Office of Environmental Quality Control.

Thank you for the opportunity to review the draft.

Sincerely,

[Signature]
W. K. Lin
Assistant Base Civil Engineer
Office of the
Commander

Copy to:

✓ Robert S. McLean
DSC (W/DIS)
February 4, 1990
Mr. Teuna Tomioka, State Public Works Engineer
State Department of Accounting
and General Services
Division of Public Works
P.O. Box 159
Honolulu, Hawaii 96810

Dear Mr. Tomioka:

Draft Environmental Impact Statement (DEIS)
Hanakahi Industrial Park, Honolulu, North Korea, Hawaii
THK 7-4-02-28 and 49

Thank you for your letter of January 28, 1990 regarding the DEIS for the
renamed project. We appreciate the time you and your staff spent
reviewing the DEIS. Your letter, together with this response, will be
published as part of the Final EIS.

Sincerely,

HELBRE, HASTERT & KIMURA, PLANNERS

David K. Curry
Project Planner

cc: Esther Ueda, Land Use Commission
Robert McLean
Robert Smolenaki

State Land Use Commission
333 Merchant Street, Room 104
Honolulu, Hawaii 96813

Attention: Ms. Esther Ueda

Gentlemen:

Subject: Hanakahi Industrial Park
Draft DEIS

Thank you for the opportunity to review the subject
document. We have no comments to offer.

Should there be any questions, please contact
Mr. Cedric Takamoto of the Planning Branch at 348-7192.

Very truly yours,

TEUAK TOMIoka
State Public Works Engineer

cc: Mr. Robert S. McLean
Dr. Marvin T. Higa
Ms. Esther Heda
March 7, 1990
Page -1-

affect the existing water situation at the Ke-Aholo Agricultural Park. If there is adverse impact, we must insist that the applicant develop beforehand, or acquire through other means, the water supply necessary to meet the needs of the project.

When it becomes available, please send us a copy of the final EIS.

Thank you for the opportunity to comment.

Sincerely,

Yukio Kitagawa
Chairperson, Board of Agriculture

Attachment

cc: Harley Hattori and Kimura
Office of Environmental Quality Control
Office of State Planning (Attention: Land Use Division)
Hawaii County Planning Department
Agricultural Resource Management Division

Ms. Esther Heda
March 7, 1990
Page -1-

The Department of Agriculture has reviewed the subject document and offers the following comments.

Based on the information found in the subject document, the Ke-Aholo Industrial Park Agricultural Conservation to Urban (Robert S. Nohkin Trust) will require about 19,000 gallons of water per day (gpd), which surpasses the County's existing allowable water limits by 1,000 to 3,000 gpd (DEIS, Exhibit 4-21 and 4-23). This information is different from what is stated in the applicant's petition for state Land Use District Boundary Amendment (Land Use Commission docket number states that the projected water demand of Ke-Aholo would be 13,000 gpd).

With this new information, our finding that the applicant's resources of the area are no longer applicable. The Ke-Aholo the airport, is dependent upon the same water supply sources and further reduction of irrigation water supply, even over the short run (DEIS, page 3-9), could adversely affect existing and planned agricultural use within the Park.

The EIS should investigate the extent to which the approval and subsequent operation of the subject project will adversely...
Heller, Hasert & Kimura
Planners

April 3, 1990

Mr. Yukio Kitagawa, Chairperson
Board of Agriculture
State Department of Agriculture
1428 South King Street
Honolulu, Hawaii 96814-2512

Dear Mr. Kitagawa:

Draft Environmental Impact Statement (DEIS)
Kahului Industrial Park, Maui, Hawaii
TMK 7-4-06-26 and 49

Thank you for your letter of March 2, 1990 regarding the DEIS for the referred project. We appreciate the time you and your staff spent reviewing the DEIS.

Your comments are reproduced below followed by our response.

1. The DEIS should investigate the extent to which the approval and subsequent operation of the subject project will adversely affect the existing water situation at the Kahului Agricultural Park.

The County Department of Water Supply will allow the petitioner to continue water use within the project area at current consumption levels (personal communication, Mr. Quintanar, March 14, 1990). The DEIS notes that quarrying operations at the site will be eliminated in the short term. This will allow approximately 3,200 gallons of water per day to be used for other proposed activities. Along with conservation measures, water use agreements with current and potential lessees, the petitioner will maintain existing water consumption with no increment at existing levels unless otherwise approved by the Department of Water Supply. Therefore, no adverse impact will occur to the existing water supply at the Kahului Agricultural Park.

We hope our responses have adequately addressed your concern. For your information, we intend to file the Final EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

David R. Curry
Project Planner

cc: Esther Ueda, Land Use Commission
    Dr. Marvin T. Miura, OEQC
    Robert McLean
    Robert Smilinski

7311 King Street, Suite 1050
Honolulu, Hawaii 96819

Telephone (808) 941-2055
Facsimile (808) 941-2060
Mr. Marvin Mair
Office of Environmental Quality Control
455 South King Street, Room 104
Honolulu, Hawaii 96813

Re: Draft Environmental Impact Statement
Honekau Industrial Park
Honekau, North Shore, Island of Hawaii
DOE: 7-4-8026 and 49

Dear Mr. Mair:

The Department of Business and Economic Development supports the proposed development of light industry in such an area as this area needs infrastructure to support general business growth.

Enclosed is our copy of the Draft EIS for Honekau Industrial Park.

Sincerely,

Roger A. Uveling

Heller Hasting & Kimura
Planners

April 3, 1990

Mr. Roger A. Uveling, Director
Department of Business and Economic Development
State of Hawaii
P.O. Box 2389
Honolulu, Hawaii 96804

Dear Mr. Uveling:

Draft Environmental Impact Statement (DEIS)
Honekau Industrial Park, Honekau, North Shore, Hawaii
DOE: 7-4-8026 and 49

Thank you for your letter of January 30, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

HELBER, HASTERT & KIMURA, PLANNERS

David R. Curry
Project Planner

cc:
Esther Ueda, Land Use Commissioner
Dr. Marvin T. Mainer, ORQ
Robert McClesky
Robert Smeliac
January 26, 1990

Dr. Harvin T. Muras, Director
Office of Environmental Quality Control
465 South King Street, Rm 104
Honolulu, Hawaii 96813

Dear Dr. Muras:

Honokaa Industrial Park
North Kona, Hawaii

Thank you for providing us the opportunity to review the above subject project.

We have no comments to offer at this time regarding this project.

Sincerely,

Jerry R. Matsuda
Lieutenant Colonel
Hawaii Air National Guard
Contracting & Engineering Officer

February 8, 1990

Mr. Jerry R. Matsuda, Lieutenant Colonel
Hawaii Air National Guard
Contracting & Engineering Officer
Department of Defense
State of Hawaii
Office of the Adjutant General
3049 Diamond Head Road
Honolulu, Hawaii 96815-4495

Dear Dr. Muras:

Draft Environmental Impact Statement (DEIS)
Honokaa Industrial Park, Honokaa, North Kona, Hawaii
TMK 7-4-BH-36 and 49

Thank you for your letter of January 26, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

Heller, Hastert & Kimura, Planners

David R. Curry
Project Planner

cc: Esther Ueda, Land Use Commissioner
Robert McClean
Robert Shinsaki
These sites reflect a prehistoric settlement pattern of informal agricultural plots with a few temporary shelters and possibly a few scattered burials. We believe that sufficient information has been gathered to evaluate the significance of the sites, and we agree with the significance evaluations. Fourteen sites can be considered "no longer significant" as they are significant solely for their information content and an adequate amount of this information was recovered during the survey.

To ensure proper recording of this information in the Statewide Inventory of Historic Places, we need a non-reduced copy of the survey report, a FHIK list of photographs for the sites which are no longer significant, and copies of relevant FHIK sketch maps of any such sites which do not have maps in the report.

This means that only 46 significant historic sites are still in the project area. We agree 36 are significant solely for their information content and 10 for multiple criteria (1 trail area and 9 possible burials). It is important to realize that a number, if not all, of the possible burial sites might prove with further study not to be burials.

The archaeological report proposes the following general mitigation plan:

Archaeological data recovery of 37 sites, including the trail, which is in poor condition) and preservation in place of the 9 possible burial sites after fieldwork to determine if they are indeed burials. If any of the possible burial sites proved not to be burials, then they will be data recovered.

We agree with this general mitigation plan, since it conforms with our policy of preservation of burial sites in place when at all possible.

The Draft EIS does not quite use correct historic preservation wording. In essence, however, it says 46 sites are still significant (p. 4-7), and it appears to commit to FHIK's mitigation recommendations - data recovery of 37 and preservation of the 9 possible burial sites (p. 4-7 through 9). It correctly states that a condition should be attached to any LUC approval.

To ensure proper mitigation and "no adverse effect" to the 46 significant sites, we recommend the following condition be attached to any approved LUC petition:

"37 Significant historic sites shall undergo archaeological data..."
recovery. Nine sites, as possible burials, shall be preserved. However, if further evaluation of these nine sites indicates some are not burials, the non-burial sites shall undergo data recovery and the Historic Preservation Program (HPP) shall be so notified.

To ensure adequate mitigation, a detailed historic preservation mitigation plan (scope of work), consisting of an archaeological data recovery plan and a preservation plan, shall be submitted to the HPP for approval. The preservation plan must include acceptable buffers around the sites to be preserved. The HPP must verify successful execution of this plan prior to construction.

Furthermore, the industries now operating on this site have been subject to several approved Conservation District Use reviews since 1975. No adverse environmental impacts have been reported from the existing activities.

Mitigation measures to prevent potential impacts to the aquatic environment from drainage and storm runoff of petroleum products, detergents, caustic by-products and other contaminants associated with the proposed industrial development have been adequately described in the Draft EIS and should be incorporated into the project.

If you have any questions, please feel free to call me or Cathy Tilson at our Office of Conservation and Environmental Affairs at 548-7837.

WILLIAM W. PATZ
DAR, Historic Preservation Program

April 3, 1990
Mr. William W. Patz, Chairperson
Board of Land and Natural Resources
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809
Dear Mr. Patz:

Draft Environmental Impact Statement (DEIS)
Househau Industrial Park, Househau, North Kona, Hawaii
TMK 7-4-OH, Sl 26 and 49

Thank you for your letter of March 14, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your comments are reproduced below, followed by our response.

1. We request documentation be submitted to our office verifying that a petition to the Land Use Commission redesignating the 3-1/2 acre area to another zoning district occurred by June 15, 1989.

A petition was filed with the Land Use Commission on June 15, 1989 to redesignate the subject property to another zoning district. The petitioner will provide the necessary documentation of this action to DLNR.

2. To assure proper recording of [the findings of the archaeological inventory survey] in the Statewide Inventory of Historic Places, we do need a non-reduced copy of the report, a PHSSI list of photographs for the site which are no longer significant, and copies of relevant PHSSI sketch maps of any such sites which do not have maps in the report.

The petitioner acknowledges this request and will provide the necessary documentation to DLNR.

3. To assure adequate mitigation, a detailed historic preservation mitigation plan (scope of work), consisting of an archaeological data recovery plan and a preservation plan, shall be submitted to the HPP for approval.

The petitioner acknowledges and will comply with this request.
4. Mitigation measures to prevent potential impacts to the aquatic environment from drainage and storm runoff of petroleum products, detergents, cement by-products and other contaminants associated with the proposed industrial development have been adequately described in the Draft EIS and should be incorporated into the project.

Mitigation measures to prevent impacts on the aquatic environment as described in the EIS will be incorporated into the project.

We hope our response has adequately addressed your concerns. For your information, we intend to file the Final EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

HELBER, HASTER ET & KIMURA, PLANNERS

David W. Curry
Project Planner

cc: Esther Ueda, Land Use Commission
    Dr. Marvin T. Moore, OEQC
    Robert McClain
    Robert Smolenski
MEMORANDUM

TO: Dr. Marvin Miura, Director  
   Office of Environmental Quality Control

FROM: Director of Transportation

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT  
   HOMERAHU INDUSTRIAL PARK, NORTH KONA, HAWAII

THK: 7-4-89:20, 49

Thank you for your transmittal of January 24, 1990 requesting our review of the subject EIS.

We have the following comments:

1. The construction of the channelized intersection at the access connection should be coordinated with the Iseamoto-Taylor Subdivision.

2. The TIAE should be re-submitted for review and approval. It should be summarized and referenced in the EIS. The TIAE must include the following:
   a. Projected traffic for the Hona-Keauha Subdivision
e. Development TIAE.
   b. Projected traffic for the Iseamoto-Taylor Subdivision.
   c. Level-of-Service summary and calculations.

3. Queen Kaahumanu Highway will eventually be developed into a high-speed, four-lane divided freeway with interchanges, limited access, and frontage roads. The Hawaii Finance and Development Corporation (HFDPC) plans to move the proposed Kailakealani Parkway Hauke extension southward and connect it to the frontage road system. The TIAE should address these future developments and how the subject project will tie into the future highway system.
April 3, 1990

Mr. Edward Y. Hirasaki, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hirasaki:

Draft Environmental Impact Statement (DEIS)
Honolulu Industrial Park, Honolulu, North Ko'ou, Hawaii
TMK 7-4-0R 26 and 49

Thank you for your letter of March 23, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your comments are listed below followed by our response.

1. Construction of the channelized intersection should be coordinated with the Iwamoto-Taylor Subdivision.

The petitioner acknowledges this comment and will coordinate improvements along the access road with the Iwamoto-Taylor Subdivision.

2. The TIAR should be re-submitted for review and approval.

The Traffic Impact Assessment Report (TIAR) prepared by Wilbur Smith Associates, contains the requested information and will be re-submitted for your review and approval.

3. The TIAR should address traffic improvements planned by the State for Queen Kapiolani Highway and by HFDC for the Kahala area and how the subject project will fit into the future highway system.

The TIAR assumes that by 1995, State plans to widen Queen Kapiolani Highway to four lanes and HFDC plans to construct the Kahala extension of Kahala Parkway would be complete. The TIAR recommends that when the extension of Kahala Parkway is constructed, a frontage road or direct roadway connection from the petitioner's area to the Parkway be constructed for use by existing northbound project traffic.

4. The proposed development should be coordinated with HFDC which is planning some of the area's major roadways.

The petitioner acknowledges this comment and will coordinate roadway improvements with HFDC and the DOT Highways Division planning staff.

5. All work within the State highway right-of-way must be submitted to the Highways Division for approval. The applicant shall bear the costs for the improvements recommended to mitigate the traffic impacts.

The petitioner acknowledges the above conditions.

Heller, Hastert & Kinser
Planners

We hope our responses have adequately addressed your concerns. For your information, we intend to file the Final EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

David R. Casey
Project Planner

cc: Esther Ueda, Land Use Commission
Dr. Marvin Y. Ako, OEQC
Robert McClear
Robert Sandeckas

Heller, Hastert & Kinser
Planners

233 Bishop Street, Suite 2500
Honolulu, Hawaii 96813
Telephone 808-529-2365
Fax 808-529-2366
MEMORANDUM

TO: Ms. Esther Ueda
State Land Use Commission

FROM: Joseph H. Conant

SUBJECT: Draft Environmental Impact Statement for the Proposed Honokohau Industrial Park

We have reviewed the subject draft EIS and offer the following comments.

The concept development plan for the subject property indicates that less intensive industrial uses will be sited next to the proposed Kailua-Kona Planned Community. However, the statement is made that the "ultimate development of the area and the specific types of uses will depend on market forces in the region". Thus, despite the proposed mitigative measures, we are still very concerned with the industrial use of lands adjacent to residential uses within our proposed project. Furthermore, the concept development map for the proposed project sites a lumber/hardware operation along the Kealakekua side of the property. We believe that this type of establishment may adversely impact residents in proximity to the operation.

While the siting of structures and activities in the proposed industrial park is very important, of equal importance is the management of operations. We believe that proper lease conditions and/or use covenants should be required to ensure that residents are protected from any detrimental business activities or practices of lessees in the proposed industrial park. For example, if a new or used car dealership were to allow

prospective purchasers to test drive automobiles on minor collector streets within the planned residential community, the community association could be given the opportunity to work with the lessor to stop this practice for safety and "neighborly" reasons.

Thank you for the opportunity to comment.

Dr. Marvin Miura
Executive Director
April 3, 1990

Mr. Joseph Czarn, Executive Director
Hoover Planning and Development Corporation
Department of Budget and Planning
Seven Westfront Plaza, Suite 300
300 Ala Moana Boulevard
Honolulu, Hawaii 96813

Dear Mr. Czarn:

Draft Environmental Impact Statement (DEIS)
Hoakalei Industrial Park, Hoakalei, North Kona, Hawaii
TMK 7-4-26, 26 and 49

Thank you for your letter of March 8, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your comments are summarized below followed by our response.

1. Despite the proposed mitigation measures, we are still very concerned with the industrial use of lands adjacent to residential areas within our proposed project.

   At present time, the petitioner has determined that the most appropriate use for property in Increment II is to continue existing activities (except quarrying), and provide space for new activities that are compatible with them. According to the approved Keaaukei Planned Community Master Plan (December 1992), a site of approximately 5 acres for commercial use is planned near the intersection of Keaaukei Parkway and Keaaukei Highway. This area would incorporate approximately 50 feet (10 percent) of the boundary between Keaaukei and Keaaukei II of the petition area. It is our understanding that the remainder of land adjacent to Increment II will likely be developed into a residential use for as much as 10 to 20 years. In the future, changes in land use and value within the region could alter the present appropriate use of Increment II to one more compatible with residential activities.

   The conceptual development plan for Increment II is strongly influenced by NFD/O's plans for Keaaukei which includes significant residential development, along with a civic center, commercial, use school, high school, and golf course, and other urban amenities. With a major north-south roadway alignment as proposed by NFD/O, the petition area (particularly Increment II) provides an ideal location for commercial and service-related uses that could provide services to residents and businesses in Keaaukei and the region. Specific types of activities could include low-scale office, restaurants and other related commercial operations, as well as wholesale services to retail businesses (e.g., wholesalers to restaurant, businesses which produce local consumer goods (e.g., bakeries, print shops), business services which support the local building industry, light manufacturing, etc.

   We believe that measures discussed in the EIS, along with County zoning, subdivision, and building codes, would provide sufficient precautions relating to setbacks and buffering to mitigate adverse impacts between the two types of uses.

Sincerely,

[Signature]
David R. Curry
Project Planner

cc: Esther Ueda, Land Use Commission
    Dr. Marvin T. Miura, OIQC
    Robert McClear
    Robert Smolenski
March 6, 1990

Ms. Esther Ueda
Executive Officer
State Land Use Commission
315 Merchant Street, Room 104
Honolulu, Hawaii 96813

Dear Ms. Ueda:

Subject: Draft Environmental Impact Statement for the Proposed Hookahau Industrial Park, Consisting of 90.5 Acres in North Kona, Hawaii.

We have reviewed the Draft Environmental Impact Statement (EIS) for the proposed Hookahau Industrial Park to be located three miles north of Kahului, south of the Queen Kaahumanu Highway and east-northeast of the Hookahau Small Boat Harbor. The following comments are provided for your consideration.

The applicant, Robert S. McQueen, is requesting the Land Use Commission to approve the entire 90.5-acre petition area for future urban development and to rezone the 45.9-acre first increment (Increment I) from the State Conservation District to the State Urban District. The existing uses on Increment I include a quarry, rock crushing plant, boat storage/repair, test lab, and other light industrial operations. The proposed uses for Increment I include: the expansion of existing and new operations, and storage facilities; the development of automotive operations, nurseries, lumber/furniture operations, and other light industrial uses; and the addition of contract operations. The proposed uses in Increment II, which consists of the remaining 44 acres, would include commercial and service-related facilities such as offices, restaurants, wholesalers, and light manufacturing.

We have serious concerns regarding both the existing and proposed uses in Increment I. Such concerns include the effects of industrial wastes, groundwater contamination, and surface runoff on ponds in the vicinity of the petition area, Hookahau Small Boat Harbor, and the proposed Kailua-Hookahau National Historic Park; the sufficiency of existing roads to accommodate increased traffic; the availability of water for the project; and the compatibility with planned residential communities on adjacent properties.
Heller & Huitema

April 3, 1990

Mr. Harold Masunoto, Director
Office of State Planning
Office of the Governor
State of Hawaii
State Capital
Honolulu, Hawaii 96813

Dear Mr. Matsumoto:

Draft Environmental Impact Statement (DEIS)
Hoolulu Industrial Park, Hoolulu, North Kona, Hawaii
EIS 7-4-89 36 and 49

Thank you for your letter of March 6, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your comments are summarized below followed by our response:

1. We have serious concerns regarding both the existing and proposed uses in Increment 1. Such concern includes:

   a. The effects of industrial waste, groundwater contamination, and surface runoff on ponds in the vicinity of the project area, Hoolulu Small Boat Harbor, and the proposed Kailua-Hoolulu National Historic Park.

   Discussions of potential adverse impacts from proposed wastewater disposal, storm drainage, and the handling of industrial materials are presented in Sections 4.3.3, 4.3.4, and 4.3.10, respectively. In summary, the EIS concludes that cesspools and drywells are allowable and widely used disposal methods in the North Kona region, provided they are properly designed, constructed, operated, and maintained in accordance with State and County regulations. The EIS further concludes that these disposal methods, along with appropriately designed areas and facilities to contain industrial materials within the project area (which are also applicable to Federal, State, and County regulations), will provide sufficient mitigation to prevent any adverse impacts to areas other than the project area.

   Section 4.15 of the EIS also provides an overview of anchoring pond resources along the shoreline in the vicinity of the project area. The EIS concludes that only pews in the Kailua and Hoolulu areas are located in the potential impact zone from the proposed project. Within these areas, there is little likelihood of significant environmental impacts. Dissolved nutrients (e.g., nitrogen and phosphorus) in liquid percolating from cesspools are already found in undisturbed groundwater and any small additions from the project site will not have a negative impact on nearshore aquatic resources.

   We note that in a letter dated March 14, 1990 (included in Chapter 8 of the EIS), the Department of Land and Natural Resources states that "the industries now operating on this site have been subject to several approved Conservation District Commission reviews since 1973. No adverse environmental impacts have been reported from the existing activities."

   George Cruz, fisheries enforcement

   155 Hikapia Street, Suite 3A
   Hilo, Hawaii 96720
   Telephone: (808) 935-1555
   Facsimile: (808) 935-2060

   b. The sufficiency of existing roads to accommodate increased traffic.

   A major element of the State's plan for the Kailua area is the construction of a real-time, high-speed, four-lane divided freeway with interchanges, limited access, and frontage roads, and one or more north-south roadways as proposed in the County's Kailua to Kailua Development Plan.

   The discussion in Section 4.3.1 of the EIS identified the impact of the project on the volume-to-capacity ratios for a signal-controlled intersection at Kailua Highway and Kailua Parkway. If no improvements were made to existing roadways other than the construction of the Parkway, the level of service at the section during the afternoon peak hour would be level of service (LOS) A (low delay). During the afternoon peak hour, the LOS would be B (moderate delay). If the improvements were made to a 4-lane Highway, conditions at the intersection would be LOS A (low delay) in the morning peak hour, and LOS C (occasional delay) in the afternoon peak hour. Similar level of service conditions would result if a new access road from the project area to the Kailua Parkway were constructed.

   c. The availability of water for the project.

   The County Department of Water Supply will allow the petitioner to continue water consumption within the project area at current consumption levels, or approximately 13,000 gallons per day (personal communication, Mr. Quillen Antelo, March 14, 1990). The EIS notes that quarrying operations at the site will continue in the near term, but will be phased out in the future as development begins to occur. This will allow approximately 3,000 gpd to be used for other proposed activities. Along with conservation measures and water use agreements with residents and potential tenants, the petitioner will maintain water consumption within existing levels until otherwise approved by the County Department of Water Supply.

   d. The compatibility with planned residential communities as adjacent properties.

   Where appropriate, the EIS discussed mitigative measures designed to minimize adverse impacts that proposed uses may have on future residential development on surrounding lands. The EIS also notes that quarrying at the site will be phased out because of its incompatible nature with other activities. Beyond measures discussed in the EIS, County zoning, subdividing, and building codes provide sufficient protection relating to setbacks and buffering to mitigate adverse impacts between the two types of uses.

   The development of the site as described in the EIS does not necessarily foreclose options to redevelop the site for other urban uses at a later date, provided all relevant government regulations are met. At the present time, the petitioner has determined that the most appropriate use for the property is to continue existing activities, and provide space for new activities that are compatible with them.

   Sincerely,

   [Signature]
the future, however, changes in land use and value within the region could alter currently proposed uses to activities more compatible with residential activities.

2. The Draft EIS failed to address the real issues concerning the proposed uses in Increment II. The final EIS should provide discussion on this increment, such as it delineates plans, proposals, and operations for probable impacts on the environment, the water supply, and its reliability in the region.

Section 2.4 of the EIS presented a conceptual overview of proposed development in Increment II of the petition area. On a general level, Increment II is proposed to be developed for commercial and service-related uses. This would include uses intended to support proposed civic activities at Kahuku, along with uses that would support the general economic development of the region. Specific types of activities could include low-scale offices, restaurants and other related commercial operations, as well as wholesale services to retail businesses (e.g., wholesalers to restaurants), businesses which produce local consumer goods (e.g., bakeries, print shops), business services which support the local building industry, light manufacturing, etc.

Proposed development of Increment II is strongly based on current State and County plans being prepared for the general area, as well as the desire to promote uses that would be compatible with development of Increment I. The ultimate market for land in Increment II will be significantly affected by the location of future roadway improvements, the location of civic center activities, the availability of water, and other planning issues that are at this point unresolved. Therefore, it is extremely difficult to provide definite plans, proposals, and operations for Increment II. When the petitioner requests actual urban designation for the property within Increment II, a clearer understanding of the area's market should be apparent and a detailed discussion of proposed activities will be presented. As a result, however, impacts that can be expected to occur include the creation of jobs, increased traffic, demand for water, wastewater and electrical services, higher ambient noise levels, and alteration of the current character of the land as an urban use. These have been addressed at a general level in the EIS, and further information will be provided when Increment II is submitted to the Land Use Commission for approval at a later date.

Regarding the suitability of the proposed project in the region, Section 3.1.3 of the EIS discusses criteria used for reviewing petions for reclassification of district boundaries. The EIS concluded that the proposed project was consistent with goals, objectives, and policies of the Hawaii State Plan and guidelines of the State Functional Plans, satisfied the Urban District standards, would not impact on areas of statewide concern, and was consistent with the County General Plan for the area.
The draft EIS does not discuss the impacts on traffic flow on Queen Kaaamano Highway from the project. It only discusses the impacts on traffic leaving the project site. Slow moving traffic from the project site pulling across one lane of traffic into another has the potential to create accidents and to slow traffic down. This is especially true with commercial trucks, heavy equipment, and vehicles pulling trailers with boats. Since the proposed industrial park plan to include boat storage, bus storage, concrete manufacturing, quarrying, and lumber sales, such traffic can be expected. The final EIS should include an analysis of the impacts to traffic on Queen Kaaamano Highway and appropriate mitigation measures or alternatives.

Sincerely,

[Signature]

Kevin T. Muras, Ph.D.
Director, Office of Environmental Quality Control
April 3, 1990

Mr. Marvin T. Miura, Ph.D., Director
Office of Environmental Control
453 South King Street, Room 106
Honolulu, Hawaii 96814

Dear Mr. Miura:

Draft Environmental Impact Statement (DEIS)
Hanahau Industrial Park, Honolulu, North Kona, Hawaii
TMR 7-6-08 28 and 49

Thank you for your letter of March 3, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your comments are summarized below followed by our response.

1. Sewage disposal using cesspots will not be allowed in the project area under the new regulations in Chapter 61. Wastewater Systems of the Administrative Rules.

The analysis conducted for the Draft EIS found that since soon to be revised Department of Health regulations will prohibit use of cesspots in Kona below 100-foot elevations and above the Underground Injection Control (UIC) line. Following publication of the DEIS, this conclusion was verified by Mr. Harold Lee, Environmental Engineer for the Department of Health Wastewater Branch on March 14, 1990. Maps at the Wastewater Division show the UIC line is located below the parcel area at approximately 500-foot elevation. Thus, the elevation of the on a small number of the sites, cesspots would be an allowable wastewater disposal method.

The proposed increment 1 will generate relatively small amounts of wastewater effluent. Studies conducted for the project (Hydro-Geologic Impact Assessment and Ashkabian Pond Impact Assessment) indicate that the proposed action would not have a significant impact on the water quality of the region. Therefore, alternative wastewater disposal methods (e.g., septic tanks and small package plants) will be evaluated prior to construction.

2. There is no conflict in water availability for the first increment of the project. The final EIS should discuss the final water development by the developer of the project or by a joint venture with other developers. Also, the final EIS should discuss the water supply to the Ashkabian housing project or other developments in the area.

The County Department of Water Supply will allow the petitioner to continue water consumption within the project area at current consumption levels, or

Heller Hastert & Kimura, P.C.

3. The Draft EIS does not address the expected electrical load from the proposed project or the ability of Hawaii Electric Light Company to supply the additional load.

A review of the proposed project by the Hawaii Electric Light Company (HELCO) estimates the electrical load for increment 1 to be approximately 3,533 KVA. HELCO concludes that "existing transmission and distribution facilities will not be able to accommodate this new load and new electrical facilities will be required." In a follow-up communication with Mr. Marvin Yamaki, Director of Electric Operations with power needed for the project if proper connections to existing facilities were made. The petitioner will continue to utilise existing generation on site for fire fighting, and other conservation remains to reduce the peak demand at the site.

4. The Draft EIS discusses the impacts on traffic leaking the project site. The final EIS should include an analysis of the impacts to traffic on Queen Kaahumanu Highway.

The slow-moving traffic exiting the project area could result in slowing through traffic on Queen Kaahumanu Highway, and would increase exposure potential for traffic accidents. The EIS proposes that the left-turn movement from the project area onto Queen Kaahumanu Highway be prohibited. A roadway connection is proposed from the project to the planned extension of Kaahakole Parkway. It is assumed that a traffic signal will be installed at the Kaahakole Parkway intersection with Queen Kaahumanu Highway to facilitate the project.

We hope our responses have adequately addressed your concerns. For your information, we intend to file the Final EIS with the State Land Use Commission and the Office of Environmental Control (OEFC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

HElLer HASTERT & Kimura, PLaNnERS

David R. Curry
Project Planner

cc: Esther Lao, Land Use Commissioner
Robert McClellan
Richard Conforti

Heller Hastert & Kimura

(approximately 13,000 gallons per day. With the elimination of quarring operations at the site, the projected water demand for increment 1 is approximately 5,150 gallons per day. Potential losses, the petitioner will maintain water consumption within increment 1 at existing levels unless otherwise approved by the County Department of Water Supply.

Section 13.3 permits the County to develop a new area of Maneleka Highway in the near future. The total capacity of the proposed project area will be approximately 3,533 KVA. HELCO concludes that "existing transmission and distribution facilities will not be able to accommodate this new load and new electrical facilities will be required." In a follow-up communication with Mr. Marvin Yamaki, Director of Electric Operations with power needed for the project if proper connections to existing facilities were made. The petitioner will continue to utilise existing generation on site for fire fighting, and other conservation remains to reduce the peak demand at the site.

We hope our responses have adequately addressed your concerns. For your information, we intend to file the Final EIS with the State Land Use Commission and the Office of Environmental Control (OEFC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

HElLer HASTERT & Kimura, PLaNnERS

David R. Curry
Project Planner

cc: Esther Lao, Land Use Commissioner
Robert McClellan
Richard Conforti
January 26, 1990

State Land Use Commission
335 Merchant Street
Room 114
Honolulu, Hawaii 96813

Attention: Ms. Esther Ueda

Dear Sir:

Subject: Honokowai Industrial Park, North Kona, Hawaii

We wish to inform you that we have no comments to offer on the subject environmental impact statement.

Thank you for the opportunity to review the document.

Sincerely,

Maurice H. Kaya
Energy Program Administrator

cc: Mr. Robert S. McClean, Helber Hastert & Kimura, Planners
Dr. Marvin T. Kuro, Office of Environmental Quality Control

February 8, 1990

Mr. Maurice H. Kaya, Energy Program Administrator
Energy Division
Department of Business and Economic Development
State of Hawaii
335 Merchant Street, Room 110
Honolulu, Hawaii 96813

Dear Mr. Kaya:

Draft Environmental Impact Statement (DEIS)
Honokowai Industrial Park, Honokowai, North Kona, Hawaii
TMK 7-4-85-26 and 49

Thank you for your letter of January 26, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

HELBER, HASTERT & KIMURA, PLANNERS

David R. Burr
Project Planner

cc: Esther Ueda, Land Use Commission
Robert McClean
Robert Smolenski
Hazardous Materials Contamination

Industrial materials and commercial stockpiles of lumber products are to be stored in above ground containers (p. 4-15) and on various premises within the development. Reviewers would like to see more design details of storage facilities in order to be able to assess the capability of storage tanks to prevent spillage and leakage, and to assess the potential leaching of wood preservatives and insecticides into the environment.

Anchialine Ponds

Your major clusters of anchialine ponds are located along the shoreline within the potential drainage area of the proposed industrial park. The drainage from the project, especially that flowing through lava tube, could possibly contaminate these ponds ecosystems with harmful bacteria, pathologies, pesticides, and petroleum products resulting in changes of the ecosystems in the ponds (Appendix F, p. 2). Projects of this nature should include provisions for comprehensive management of wastewater and runoff to ensure that it does not contain potentially harmful pathogens or overload the groundwater with organic pollutants.

Water Supply

The County of Hawaii Department of Water Supply has informed Honolulu developers that their existing water systems facilities are not capable of supporting the proposed subdivision. We note that at present there is no assurance of sustainable new potable water sources or any plan for distribution if they are found (p. 4-22). Furthermore, potential and timing of such development is not clear. Should such a large project proceed without firm plans for a potable water supply?

Cumulative Impacts

We note that other significant developments, notably the Kealakehe Housing project, have been proposed for this immediate area. EIS rules specifically prescribe that "(b) interrelationships and cumulative environmental impacts of the proposed action and other related projects shall be discussed in the Draft EIS and (c) shall be as'. Given constraints on water supply and infrastructure, and in view of potential migration of dust from industrial activities into the housing area, our reviewers find the Draft EIS insufficient in the assessment of cumulative impacts, and we recommend that the document not be accepted until this deficiency has been satisfactorily remedied.
State Land Use Commission
March 9, 1990
Page 3

Volcanic Hazards

The volcano, Koolau, last erupted in 1801 and is technically an active volcano. Since it has the potential to affect the Koolau Industrial Park area, it would be appropriate to address this issue in the Draft EIS.

Thank you for the opportunity to comment on this Draft EIS. We hope that our comments will be helpful in preparing the final document.

Yours truly,

John T. Harrison, Ph.D.
Environmental Coordinator

Heller Hastert & Kinsure

April 3, 1990

Mr. John T. Harrison, Ph.D.
Environmental Coordinator
University of Hawaii Environmental Center
2500 Campus Road, Crawford 317
Honolulu, Hawaii 96822

Dear Mr. Harrison:

Draft Environmental Impact Statement (DEIS)
Koolau Industrial Park, Honolulu, North Kona, Hawaii
TMK 7-08: 36 and 49

Thank you for your letter of March 9, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your comments are summarized below followed by our response.

1. The Draft EIS does not provide enough information regarding mitigation plans for wastewater impacts on coastal waters and groundwater.

A discussion of potential adverse impacts from proposed wastewater disposal within the portion area is presented in Section 4.3.1. In summary, the EIS concludes that seepage removals an allowable and widely used disposal method in the North Kona region, provided they are designed, constructed, operated, and maintained in accordance with State and County regulations. A meeting held at the Department of Health Wastewater Branch (March 14, 1990), Mr. Harold Yue, an Environmental Engineer for the Department, agreed that seepage removals would be an allowable method of wastewater disposal within the project area. The EIS also states that seepage within the portion area will be connected to the municipal sewer system when such system is available.

We note that in a letter dated March 14, 1990 (see Chapter 8 of the EIS), the Department of Land and Natural Resources states that "the industrial and commercial portion of this site have been subject to several approved Conservation District Use applications since 1979. No adverse environmental impacts have been reported from the existing activities.""}

3. Industrial materials and commercial stockpiles of lumber products are to be stored in above ground containers and in various locations within the development. Reviewers would like to have more detailed details of storage facilities in order to assess the capability of storage tanks to prevent spills and leakage, and to assess the potential leaching of wood preservatives and insecticides to the environment.

As discussed in Section 4.1.10 of the EIS, any industrial materials used by activities within the portion area or waste generated by these activities will be collected and handled according to applicable Federal, State and County government regulations. Maintenance work on machinery and equipment will be performed on concrete decks, as will the washing down of any equipment. All waste water will be channelled into grease traps where any oil or grease will be retained. These traps will be periodically cleaned and the accumulated oil (along with additional oil


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Hawaii, Honolulu 96813

For more information call 848-545 1990

Oahu County 725 Bishop Street, Suite 1090
accumulated from other sources) will be disposed of in accordance with EPA rules. Wastewater from the concrete operations will also be discharged into appropriately designated traps. Materials collected by this system can be recycled into the concrete operations. All environmentally harmful materials used in cleaning mechanical parts or for hand washing purposes will be used in contained areas with concrete floors and will be kept in appropriate containers. At present, there are no plans for two such processing operations in the Hill area which operate within guidelines of the EPA. Land within the petition area would be used for the storage of lumber (after processing), building of trusses for houses and other small structures, and the wholesale cutting of hardwood and softwood contractors.

3. Drainage from the project could potentially contaminate subsurface pools along the shoreline. Practices for comprehensive management of wastewater and runoff are needed.

Responses to comments 1 and 2 above provide information contained in the EIS that describes measures that should be incorporated in the project. To protect against adverse impacts to groundwater and the aquatic environment along the shoreline. Appendices K and L in the EIS present assessment of the potential hydrogeological impacts of the proposed project and the resulting impacts that may be expected to occur within subsurface pools along the shoreline. These assessments concluded that only pools in the Mokihana and Kalakaua areas are located in the potential impact area from the proposed project. Within these areas, there is little likelihood of significant environmental impacts. Dissolved nutrients (e.g., nitrogen and phosphorus) in liquid precipitating from composts are already found in undisturbed groundwater and any additional impacts from the project site will not have a significant impact on coastal aquatic resources.

4. Should such a large project proceed without firm plans for a potable water supply?

The existing level of water consumption in the petition area is approximately 13,000 gpd. According to the County Department of Water Supply, this quantity of water would be available for use in the future for West Hawaii Estates or any other activity on the site. The EIS concludes that the estimated water demand is approximately 12,500 gpd at a consumption level of 1,500 gpd under existing conditions. However, in terms of the overall water consumption in the region, we believe this is a very small impact on existing water resources. Nonetheless, through the use of conservation measures and water usage agreements, the petitioner intends to minimize water consumption in the petition area at existing levels unless otherwise agreed to by the County Department of Water Supply.

The petition area is located near the center of an area proposed for major urban expansion in the future. The State has begun drilling wells to determine the potential of the aquifer in the areas meant of the project site. As wells are drilled, they will be turned over to the County Department of Water Supply. Current proposals in the County’s Kona to Kaloko Development Plan indicate extensive development of water mains to service the region, including the petition area.

Heller Haertel & Kimura
Planners

3. The interrelationships and cumulative environmental impacts of the proposed actions and other related projects, notably the Kailua Housing project, should be discussed in the EIS.

Chapter 3 of the EIS provides a detailed discussion of public issues in Kona, Section I.3.3 specifically discusses the Kaloko Planned Community Development Plan and the interrelationship of the proposed project with it. Sections I.2.2, 3 discuss the County’s Kaloko to Kaloko Development Plan. The revised version of this plan (March 1993) designates Increment I of the petition area Limited Industrial, and Increment II Regional Center. The proposed use of the subject property as described in the EIS is consistent with the County’s plan, and with mitigative measures described in the EIS, we also believe the project is very consistent with specific plans at Kailua.

Chapter 4 of the EIS discusses existing constraints on water supply and infrastructure and clearly notes that development of Increment II is dependent on new construction of wells, water and sewer lines, and other related improvements. Current State and County planning efforts discussed above are dealing with these issues. As a landowner, the petitioner seeks to participate in the process of developing necessary improvements which will meet the future growth requirements in the area.

The EIS has been revised to reflect your comments concerning a discussion of cumulative impacts.

6. The EIS should address the potential effects of a volcanic eruption.

The EIS has been revised to reflect this comment.

We hope our responses have adequately addressed your comments. For your information, we intend to file the Final EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

HELLER, HAERTEL & KIMURA, PLANNERS

David R. Currey
Project Planner

cc: Esther Udrea, Land Use Commission
Dr. Marvin T. Mira, OEQC
Robert McLean
Robert Smeyens
March 7, 1990

Ms. Esther Ueda

State Land Use Commission
333 Merchant Street, Room 104
Honolulu, HI 96813

Dear Ms. Ueda:

Comments - DEIS Bokihoau Industrial Park
Tax Map Key: 7-48-856 and 49

We have received the subject draft EIS and have the following comments to offer:

1. Page 3-3: The proposed quarrying and concrete operations and marine industrial uses are not permitted in light industrial zones.

2. Page 3-12: The General Plan LUPAC Map delineates 13 land use categories rather than 13; floodplain is not considered as one of the categories.

3. Page 3-13: Current zone for the petition area should also include Unplanned designation.

4. Page 4-9: Mitigative measures for archaeological resources should be discussed separately.

5. Page 4-11 (Visual Scenics): The EIS should address potential impacts to existing and future maka'akeha residential areas, proposed north-south pathway near top of subject site, and any mitigation measures proposed.

6. Page 4-11 (Wastewater Disposal): The EIS should address the installation of dry lines and inter-connection with the proposed Restacole STP.

Thank you for the opportunity to review and comments on the subject document. Should you have any questions, please feel free to contact Alice Kawaha of this office at 961-8288.

Sincerely,

Deane Rambda
Planning Director

cc: Robert E. McLean
    Martin T. Muro, Ph.D.
April 3, 1990

Mr. Danie Kauaha, Director
Planning Department
County of Hawaii
25 Aupuaa Street
Hilo, Hawaii 96720

Dear Mr. Kauaha:

Draft Environmental Impact Statement (DEIS)
Hana-Kailua Industrial Park, Hana-Kailua, North Kona, Hawaii
THK 7-03 3b and 49

Thank you for your letter of March 7, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your comments are reproduced below followed by our response.

1. The proposed quarrying and concrete operations and marina industrial uses are not permitted in light industrial zoned areas.

The petitioner acknowledges the above statement and will request future zoning appropriate for use within the site. Quarrying will be eliminated in the short term.


The EIS has been revised to reflect this comment.

3. Correct area for the petition area should also include Unplanned designation.

Section 1.3 provides a description of the current and the planned area. The discussion in Section 3.3.6 to which you refer, identifies the proposed zones for the area according to the revised County General Plan.

4. Mitigation measures for archaeological resources should be discussed separately.

The EIS has been revised to reflect this comment.

5. The EIS should address potential impacts to existing and future mauna residential areas, proposed north-south roadway near the top of the subject site, and any mitigation measures proposed.

In Section 4.1.7 of the EIS, a discussion of the potential visual impacts on future development on surrounding lands is presented. The EIS states that a buffer area with landscaping improvements will be maintained along the property boundary where appropriate. The EIS has been revised to include impacts on existing housing and the north-south roadway.

6. The EIS should address the installation of dry lines and later-connection with the proposed Kona Lake STP.

The discussion in Section 4.1.8 of the EIS states that uses within the petition area will be connected to the municipal sewer system when such system is available. The EIS has been revised to note that dry lines will be installed at the appropriate time.

7. Further substantiation for the projected groundwater "cone" should be discussed in the EIS. The Draft EIS does not provide any quantitative basis for the conclusion stated.

According to Tom Nason, the consultant who prepared the Hydro-Geologic Impact Assessment for the project, numerical modeling and other analytical techniques which are used to predict the flow of groundwater will represent the movement of stormwater and other injected fluids from the project site toward shoreline discharge as a streamline with no horizontal component of flow. In other words, the lateral movement by processes of diffusion and dispersion which are represented in the EIS do not have a quantitative substantiation. The processes are known to occur but cannot be reasonably modeled by numerical methods. In this case, the diffusion-dispersion cone has been represented by judgment alone. In all probability, it is wider than would actually occur. In the very limited field testing that has been done in Hawaii, none of this width have never been demonstrated. The flow of any potential pollutants from the project site is more likely to be concentrated in a narrower band.

We hope our responses have adequately addressed your concerns. For your information, we intend to file the Final EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

Heller, Haste & Kimura, Planners

David R. Curry
Project Planner

cc: Esther Ueda, Land Use Commission
Dr. Marvin T. Misur, OEQC
Robert McClean
Robert Smolenski
February 26, 1990

STATE LAND USE COMMISSION
ATTN: MS EUGENE TSUO
315 MERCHANT ST RM 104
HONOLULU HI 96813

SUBJECT: NOKOHOU INDUSTRIAL PARK - DEIS
N. Kona, HI

The following were our comments to the State Land Use Boundary Amendment:

1. Building shall conform to all requirements of codes and statutes pertaining to building construction.

2. All development generated runoff shall be disposed on site and shall not be directed toward any adjacent properties.

3. Applicant shall be informed that if drywells are included in the subject improvements, Chapter 22, Underground Injection Control Act (UIC), Administrative Rules, Dep't. of Health, prohibit any person from operating, constructing or modifying an injection well (drywell) unless authorized by a permit issued by the Director of Health, State of Hawaii.

4. Provide a County dedicatable access road meeting commercial standards. The minimum right-of-way is 96'.

5. Provide intersection improvements at the Queen Kamehameha Highway, i.e. channalization.

6. We prefer a grade separated intersection but this may be an excessive request since the applicant does not own the main property across the Queen Kamehameha Highway.

After reviewing the subject document, we have these comments:

1. A dry sewer system will be required.

2. What will the main extension of Keahamake Parkway be constructed? Traffic problems may develop if it takes too long to construct the Parkway.
April 3, 1990
Mr. Hugh Y. Ooi, Chief Engineer
Department of Public Works
County of Hawaii
2240 Address
Hilo, Hawaii 96720

Attn: Robert K. Yasuda

Dear Mr. Ooi:

Draft Environmental Impact Statement (DEIS)
Honokūwai Industrial Park, Honokūwai, North Kona, Hawaii

Thank you for your letter of February 26, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. You raised important questions and issues which have been addressed in the DEIS. Comments on the DEIS are reproduced below.

1. A dry sewer system will be required.

The petitioner acknowledges the above condition and will install dry sewer lines along with other infrastructure improvements.

2. What will the main access road of the project be called?

The petitioner is considering various names for the main access road, including “Makua-Maikal,” “Maikai-Maikal,” and “Maikai-Kealakekua.” The petitioner is committed to providing public access to the project. The consequences of the petitioner not providing public access will be addressed.

3. Who will construct and pay for the improvements at the project?

The petitioner is responsible for the construction and payment of the improvements at the project. The petitioner has committed to providing public access to the project.

4. Prohibitions of left turns are difficult to control. Can’t Queen Kauhāna Highway access be closed once the project is completed?

The petitioner is considering various options for controlling left turns at the Queen Kauhāna Highway access. The petitioner is committed to providing public access to the project.

5. What the developer contribute to the design and improvements to the Queen Kauhāna Highway?

Roadway improvements within the petition area will be coordinated with HFDC. The possibility of petitioner contributions to intersection improvements has not yet been addressed.

We hope these responses have adequately addressed your concerns. For further information, please contact the Kona Real Estate Co., Ltd. (KRECo) or the Office of Environmental Quality Control (OEQC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

Heller, Hastert & Kimura, Planners

David R. Curry
Project Planner

cc: Esther Udou, Land Use Commission
Dr. Marvin T. Aliu, OEQC
Robert McCloskey
Robert Smolenzki
STATE LAND USE COMMISSION
ATTENTION: MS. ESTHER USA
235 North Street, Room 104
Honolulu, HI 96813

HONOLULU INDUSTRIAL PARK
TAX APN # 7-6-40-2649

Thank you for giving us the opportunity to comment on the subject Environmental Impact Statement.

Water is not available to the proposed project as extensive improvements to our existing facilities are required. (Reference August 3, 1988 Department of Water Supply to Planning Department – Page 7-25)

Reference is made to Pages 4-21 and 4-22 of the report. Water is committed to the existing West Hawaii Concrete operations only. An additional water unit (600 gallons per day) was acquired by the applicant from the Hill Joint Venture. This unit cannot support Increment I or Increment II of the project. Water conservation measures and water usage agreements between the petitioner and potential lessees are not in our opinion a viable method to maintain daily water usage within the allowable limits.

There is an inconsistency in the report. Section 4.3.2 Water states that quarry operations will be phased out. However, elsewhere in the report there is a 7-year expansion plan in Increment I.

Should the petitioner wish to proceed with the development of Increment I and/or Increment II, a potable water source must be developed and necessary off-site and on-site improvements including storage, transmission pipelines, booster pumps, and distribution facilities must be constructed.

[Signature]

cc: Mr. Robert S. McLean

Marvin T. Hiro, Ph.D.

...Water brings progress...
3. In order to proceed with the development of Increment I and/or Increment II, a potable water source and related infrastructure must be constructed.

We believe that the above discussion indicates that water is available to allow development of Increment I to proceed. We cannot that new potable water sources would have to be developed in order to accommodate water demand within Increment II. It is our understanding that the State will soon begin the drilling of a test well in an area north of Mahalakahi Highway. The test results from this first well will determine the potential of the aquifer in this area to provide additional source development. The draft Kauai in Kailua Development Plan proposes a regional water plan which identifies future water main locations to accommodate future urbanization in the area between Kailua-Kona and the Kona Air Force. Proposed water main alignments in this plan would provide service to the pineapple area. The petitioner proposes to participate in the development of this system.

We hope our response has adequately addressed your concern. For your information, we intend to file the Draft EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

HEILBER, HASTERT & KIMURA, PLANNERS

David R. Cassy
Project Planner

cc: Esther Ueda, Land Use Commission
    Dr. Marvin Y. Matus, OEQC
    Robert McClean
    Robert Smolenaki
March 6, 1990

State Land Use Commission
Attn: Esther Ueda
335 Merchant St., Room 104
Honolulu, Hawaii 96813

Subject: Honolulu Industrial Park, North Kona, Hawaii-EIS
TML: 7-6-00/26 & 49

Dear Ms. Ueda:

Although we foresee no direct adverse impact on the County's parks system, the project site has been designated by the Kaunolu in Kailua Development Plan as an urban regional center and for urban expansion uses. As such, the proposed industrial use may conflict with the desired government, finance, and service/retail commercial uses.

This potential conflict of land uses should be resolved.

Thank you for the opportunity to review the EIS report.

Sincerely,

George Yoshida
Director

April 3, 1990

Mr. George Yoshida, Director
City and County of Honolulu
City & County Complex
Hilo, Hawaii 96720

Dear Mr. Yoshida:

Draft Environmental Impact Statement (DEIS) Honolulu Industrial Park, North Kona, Hawaii

Thank you for your letter of March 6, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS.

Your comments are summarized below followed by our response.

1. The proposed industrial use may conflict with the desired government, finance, and service/retail commercial uses as proposed in the County's Kaunolu in Kailua Development Plan. According to the revised Land Use Plan presented to the Hawaii County Planning Commission on March 1, 1990, the Draft Kaunolu to Kailua Development Plan designates Increment I of the project area as Limited Industrial. Increment II is designated as Regional Center. The petitioner proposes light industrial use within Increment I, and service/retail and commercial uses in Increment II. These proposals are compatible with the Kaunolu in Kailua Development Plan.

We hope our responses have adequately addressed your comments. For your information, we intend to file the Final EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

Hilger Hassert & Kihara, Planners

David R. Curry
Project Planner

cc: Esther Ueda, Land Use Commission
Dr. Marvin T. Maru, OEQC
Robert McLean
Robert Smolenski
March 20, 1990

State Land Use Commission
335 Merchant Street; Room 104
Honolulu, Hawaii 96813

Attention: Ms. Esther Ueda

Gentlemen:

Subject: Environmental Impact Statement
Proposed Kilauea Industrial Park
North Kona, Hawaii

I apologize for the late response to the EIS, however, we appreciate the opportunity to review and comment on it. The project is in the Kailua-Kona Development Plan proposed by the County of Hawaii Planning Department. Our comments were provided to Duane Kanuha, copy attached, which is relative to the overall project.

Specifically, for the Kilauea Industrial Park, we estimate the load to be approximately 1,252 kW. The existing transmission and distribution facilities will not be able to accommodate this new load and new electrical facilities will be required as outlined in our response to the County. The developer must contribute to the cost of these new facilities.

We encourage that energy conservation features suitable to reduce the peak demand be considered by the future subdivision. For example, fluorescent lighting should be used in buildings and sodium lighting specified for parking lots and roadways. Our Consumer Service is prepared to assist you in providing rate analysis and other recommendations involving heating and cooling needs of the tenants. Contact Tom Goya, Director of Customer and Consumer Service Administration Department at 969-0323.

If there are any questions on this, please call me at 969-0323.

Very truly yours,

Melvin S. Yamai
Electrical Engineer

cc: C. Nagata
H. Kamiguchi
T. Goya

An HEC Company

November 16, 1999

Planning Department
County of Hawaii
25 Aupuni Street, Room 109
Hilo, Hawaii 96720

Attention: Mr. Duane Kanuha, Planning Director

Gentlemen:

Subject: Kailua to Kailua Development Plan

Thank you for allowing us the opportunity to comment on the Keahole to Kailua Development Plan.

Based on the plan, we estimated an addition of approximately 100 MW of load. This will have a major impact on our system. Additional generation and transmission lines will be required.

Existing Conditions:

1. HEC has three (3) 69KV transmission lines serving Kona. One 69KV line is along the Hula Belt Highway from Kealakekua to Kailua and the other along Queen Kamanu Highway from Kealakekua to Kailua. The third line is along Kona Industrial Subdivision from South Point direction toward Kailua.

2. The three (3) 69KV transmission lines serve distribution substations which step the voltage down from 69KV to 12.47KV. The 12.47 KV overhead distribution line on Hawaii Belt Highway originates from a substation in Kona Industrial Subdivision on Kailua Street. There are six (6) substations on Queen Kamanu and Kailua Highways.

Proposed Conditions:

1. Ninety percent or 12,422 acres of the 14,000 acres of undeveloped land in the area are owned by several large landowners. The estimated load for the existing land use is 20 MW now and will be at least 100 MW when fully developed.

2. Preliminary analysis shows that two (2) or more additional 69KV lines will be required in the Kona area to support this added load. The routing and termination points of these lines will be dependent upon the location of major load centers and existing availability. Developers are required to contribute to the cost of these facilities and must provide the necessary lots for the substations, and easements for the transmission and distribution lines. One or more 69KV transmission line corridors will be required between Keahole and Kailua. Perhaps the
proposed Kailua bypass road could be used for one or two of these lines. The assumption should be a minimum of 15' wide per lane if located in private property.

In order for us to make a thorough study of the system improvements required, we would appreciate receiving a twenty (20) year load projection, time schedule, site and location of the loads.

Very truly yours,

Clyde H. Nagata, Manager
Engineering Department

CC: J. Oda
N. Kuwaki
D. Klyoski

Heller Hasteri & Kimura
Planners
April 3, 1990

Mr. Clyde H. Nagata, Manager
Engineering Department
Hawaii Electric Light Company, Inc.
P.O. Box 1027
Hilo, Hawaii 96720-1027

Dear Mr. Nagata:

Draft Environmental Impact Statement (DEIS)
Hanasahoe Industrial Park, Hanahoe, North Kona, Hawaii
THK 7-60: 28 and 49

Thank you for your letter of March 20, 1990 regarding the DEIS for the referenced project. We appreciate the time you and your staff spent reviewing the DEIS. Your comments are summarized below followed by our response.

1. We estimate the load (from the proposed project) to be approximately 3,753 KVA. The existing transmission and distribution facilities will not be able to accommodate this new load and new electrical facilities will be required. The developer must contribute to the cost of these new facilities.

The discussion in 4.3.5 of the EIS states that West Hawaii Congress operations will continue to use existing generation for electrical power. This could significantly reduce the potential demand estimated for phase II of the project. Nevertheless, the petitioner acknowledges that urban expansion in the area will require new transmission and distribution facilities and will participate in the funding of these improvements.

2. We encourage energy conservation features suitable to reduce the peak demand to be considered by the future developers.

The petitioner acknowledges this comment. The EIS has been revised to include language addressing this issue.

We hope our responses have adequately addressed your comments. For your information, we intend to file the Final EIS with the State Land Use Commission and the Office of Environmental Quality Control (OEQC) in the near future. Your letter, together with this response, will be published as part of the Final EIS.

Sincerely,

HELMER, HASTERI & KIMURA, PLANNERS

David R. Curry
Project Planner

cc: Esther Ueda, Land Use Commission
Dr. Marvin T. Mihura, OEQC
Robert McClung
Robert Smolenski
CHAPTER 9

REFERENCES


Coastal Zone Management. Hawaii Revised Statutes, Chapter 205A.

Hawaii State Plan. Hawaii Revised Statutes, Chapter 226.


Title 11, Administrative Rules, Chapter 200, "Environmental Impact Statement Rules."


APPENDIX A

CONSERVATION DISTRICT USE PERMITS
I. FINDINGS OF FACT

Applicant: F. M. Young and Associates

Owner of Fee: at the request of
Manfred Cieslik
Kailua-Kona, Hawaii

Use Requested: Excavation and Quarrying

Location: Nonokohau; THK: 7-4-08:26
Area of Parcel: 230 Acres
Area of Use: 91.7 Acres

Subzone: General Use, Section 2B(l)1(1) of Regulation No. 4.

Description of Area:

The site is located about 2.8 miles north of Kailua-Kona and 4.4 miles south of the entrance to Keahole Airport.

The site is presently vacant. North of the site is a quarry operated by Pacific Concrete and Rock Company. South of the site is a large State-owned parcel which is being planned for residential use.

The proposed quarry is to be about 1,000 foot mauka of Keahumanu Highway between the present 100 and 360 foot elevations.

The soil in this area is aa with scattered pahoehoe. Under the aa is pahoehoe. Beneath this is gray basalt. The parcel slopes at about 6%.

Vegetation is sparse and consists of dryland types such as kiawe, haole koa, christmas berry, etc.

Rainfall is about 25 inches.

Access to the parcel is by Keahumanu Highway. Power, water and telephone are available at the site.

Most of the proposed site is in Conservation (about 74.9 acres). A portion (about 14.6 acres) is in Agriculture. A more precise determination of the boundary between Conservation and Agricultural lands was sought from the Land Use Commission.
The EIS for this project includes a letter report of a walk through survey by Bishop Museum in which seven archaeological sites including calzes, lava tubes, platforms, house site and walls were found. The report says these sites were previously not recorded, and other sites may have been missed. It suggests a possible relationship of these sites to those in the coastal areas of Kaalakea to Kaloko. It strongly recommends that more thorough studies be made and says no evaluation can be made until the studies have been completed.

Description of Use:

The landowner, K. N. Young and Associates, proposes to let the applicant, Mr. Manfred Ciaslik, operate a quarry on the 19-1/2 acre site.

Access and utilities will be by a 60-foot right-of-way, about 1,070 feet long, from Kaaahumanu Highway.

The applicant proposes to use basalt and other material from the site for aggregate for use in highways, paving and buildings.
Approximately 2,000,000 cubic yards would be excavated, crushed, processed, stockpiled and removed. His grading plan indicates the material will be stripped from the site - in effect, leveling the site. Cuts of 15 feet or more are expected along the northern, southern and western faces of the site.

The applicant proposes to cover these cut faces with landscaping such as bougainvillea, willow and royal poinciana.

As part of the quarry operation, the applicant plans to have two buildings. One building would be the scale house and office building. It would be 15 feet high and be about 25 feet by 40 feet. The second building would be 25 feet high and be about 50 feet by 30 feet.

The applicant proposes to have a tenant, Shiel Pacific, a firm which presently operates a batching and tile-making storage yard in a residential section of Kailua-Kaneohe on Alii Drive.

During an interview with Mr. Ciaslik, on March 22, 1975, he indicated he had little need for washwater because the overburden was primarily lava. Dust would stay in the material or be controlled by sprinklers. He felt the site was isolated and thus would cause little dust or noise problems. He said the overburden would be used for fill or for roadway. He indicated he would like the use approved for 30 years because of fencing. He indicated the quarrying rate was difficult to schedule and that it would depend on growth in the area.

Comments Received:

By letter dated February 29, 1975, the Department of Water Supply asked how much water the project would require and what schedule was planned for the development. By letter dated March 17, the applicant advised that water needs, when the quarry is in operation, would not exceed 50,000 gallons a day on five day a week basis.

The applicant also advised quarry operation is to begin 30 days after approval is granted. Related operation such as batching would be moved to the site about six months after approval is granted with about three months being needed to become operational.
The proposed use will not require additional water resources except for landscaping needs.

There are areas of archaeological value on the quarry site. These sites should be salvaged.

The quarry will be located across the highway from a national historic landmark. Its ugliness will be reduced by the length of the setback and the masking afforded by the uneven lava terrain. Trucks entering and leaving the quarry will raise dust unless the entrance road is paved. Any roadway signs should be unobtrusive if not eliminated altogether.

The record contains a generalized grading plan (40 feet contour intervals). It shows there will be a slight departure from the natural grade except in the mauka sections. The side and rear cuts, however, will exceed the natural angle of soil response (40%).

The proposed use is desired by Kona businessmen because quarry services to the area may be improved and because Shield-Pacific's present operation on Alii Drive is a nuisance and should be relocated.

Staff recommends approval of this application subject to the following conditions:

1. The use shall be for 20 years but batching and tile storage activities may be continued after that time by the Board if it can be shown no nuisance exists at that time.

2. Shield-Pacific's operation on Alii Drive shall be fully terminated within one year of the date of this approval.

3. Blasting and operation of crushers, sorters, drills, and rock loaders shall be confined to the hours of 7:00 a.m. and 5:00 p.m. Mixers and aggregate and cement loaders shall be confined to the hours of 5:00 a.m. and 9:00 p.m.

4. All cut slopes shall not exceed 40%.  

5. The quarry operation shall be adequately screened and buffered by planting trees and bushes of sufficient width and height along the boundaries of the site, particularly the makai boundary. The plans to achieve this shall be prepared by a landscape architect for the Chairman's approval before the quarry operation commences. The trees and plants shall be planted within six months after the plan is approved and shall be maintained in a manner acceptable to the Dept. of Land and Natural Resources throughout the period of quarry operation on the subject site.

6. Entrance road leading to the quarry site shall be paved to a width of twenty (20) feet prior to commencement of quarry operation. Fugitive dust shall be controlled.

7. Detailed, time-phased quarrying plans shall be filed for the Chairman's approval before the proposed use commences.

8. A site plan identifying and showing the location of all buildings, structures and structural equipment, signs and utilities shall be filed for the Chairman's approval before the proposed use commences.
10. The applicant shall comply with Sections 2C and 2F of Regulation No. 4.

11. The applicant shall notify the Division of Forestry upon the commencement and at the completion of all work.

12. The applicant shall obtain approval from the County for any work to be performed within the Shoreline Setback Area.

13. The applicant shall take appropriate measures prior to and during construction of the project to minimize degradation of the offshore waters of the State.

14. Prior to commencing any work or activity on State-owned lands, proper clearances and permits shall be obtained from the Division of Land Management.

15. The applicant, its successors and assigns shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim or demand for property damage, personal injury and death arising out of any act or omission, and not occasioned through the fault of the State, of the applicant, its successors, assigns, officers, employees, contractors and agents under this permit and also any loss, liability, claim or demand for property damage, personal injury and death arising out of or relating to or connected with the granting of this permit, and not occasioned through the fault of the State.

16. That within sixty (60) days of official date of this request, the applicant shall submit to the Land Board, the necessary legal documents which would:

a. Assure the termination and relocation of Shield-Pacific, Ltd.'s operations along Alii Drive within one (1) year of official date of approval of this request;

b. Assure that the Shield-Pacific, Ltd.'s site along Alii Drive will then be used only for a use commensurate with its County zoning; and

c. Acknowledge the applicant's understanding that should any of the two above provisions not be complied with or implemented, the use shall be immediately and automatically terminated.

17. The Board shall have the authority to terminate the quarry operation on the subject site whenever the Board finds that (a) one or more of the above enumerated conditions is not being fully complied with; (b) the department has issued repeated warnings of the non-compliance of the condition(s); and (c) the applicant has not remedied the non-compliance within a period of three months.
DECISION AND ORDER

Based on the above Findings of Fact, it is the decision of the Board of Land and Natural Resources that the application for Excavation and Quarrying Operation Use be approved subject to the conditions as recommended by staff.

I hereby certify that the foregoing is the Findings of Fact and Decision and Order rendered by the Board of Land and Natural Resources on July 11, 1975.

Dated at Honolulu, Hawaii, this 28th day of July, 1975.

C. Cobb
CHRISTOPHER COBB
Chairman of the Board
Mr. Robert S. McClean
McClean Properties, Inc.
P.O. Box 3000
Kailua Kona, Hawaii 96745-3000

Dear Mr. McClean:

We are pleased to inform you that your Conservation District Use Application to develop a boat repair and storage at Honokohau, North Kona, Hawaii was approved on June 13, 1986, subject to the following conditions:

1. The applicant shall comply with all applicable statutes, ordinances, rules and regulations of the Federal, State and County governments, and applicable parts of Section 13-2-21, Administrative Rules, as amended;

2. The applicant, its successors and assigns, shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim or demand for property damage, personal injury and death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors and agents under this permit or relating to or connected with the granting of this permit;

3. If any unanticipated sites or remains of historic or prehistoric interest (such as shell, bone or charcoal deposits, human burials, rock or coral alignments, paving, or walls) are encountered during construction, the applicant shall stop work and contact the Historic Preservation Office at 348-7460 or 348-6408 immediately;

4. The applicant shall comply with all applicable Public Health Regulations;
5. Prior to the commencement of any construction, alteration, or repair of any building or other improvement, four (4) copies each of the final location map, plans, and specifications shall be submitted to the Chairperson, or his authorized representative, for approval of which three (3) copies will be returned;

6. Any work or construction to be done on the land shall be initiated within one (1) year of the approval of such use, and all work and construction must be completed within three (3) years of the approval of such use. Failure to comply with this condition shall render this application null and void;

7. The applicant must submit a contingency plan to handle fuel spills and waste oil disposal; the plan must also state the precautionary measures to be taken in the facility;

8. This permit shall authorize the use of 3-1/2 acre; any expansion beyond 3-1/2 acre shall require a separate application;

9. Within 2 years from the date of approval of this permit, the applicant shall submit a petition to the Land Use Commission to redesignate the 3-1/2 acre facility to another zoning district more appropriate for the type of use; and

10. Other terms and conditions as prescribed by the Chairperson.

Please acknowledge receipt of this permit with the above noted conditions in the space provided below. Please sign two copies. Retain one and return the other.
Mr. Robert S. McClean

Should you have questions on any of these conditions, please feel free to contact our Office of Conservation and Environmental Affairs staff at 548-7837.

Very truly yours,

SUSUMU ONO, Chairperson
Board of Land and Natural Resources

Receiver acknowledged:

Robert S. McClean

Applicant's Signature

cc: Oahu County Board Member
    Oahu District Land Agent
    C&G, Dept. Land Utilization
    C&G, Dept. General Planning
    DOH/OGQC/EC/BPFD/OMA
Archaeological Inventory Survey
Honokohau Industrial Park
(Parcel VII)
Land of Honokohau 2nd
North Kona District, Island of Hawaii

by
Theresa K. Dekum, M.A.
Supervisory Archaeologist

Prepared for
Heber, Hauver & Kinsler, Planners
Greenwave Center, PBI Tower
733 Bishop Street, Suite 1200
Honolulu, Hawaii 96813

January 1990

SUMMARY

At the request of Mr. David Curry of Heber, Hauver & Kinser, Planners, Paul H. Rosendaal, Ph.D., Inc. (PHRI) conducted an archaeological inventory survey of the c. 95-acre proposed Honokohau Industrial Park project area (also referred to as Parcel VII) located in the Land of Honokohau 2nd, North Kona District, Island of Hawaii (HNLSD 7-4-08.25.4).

The survey field work was conducted September 6 and November 20-December 7, 1989 and consisted of a 1256-square yard pedestrian survey, augmented with an aerial reconnaissance survey. During the survey, 56 sites were newly identified and eight previously identified sites were reclassified and were defined as six sites, for a total of 14 identified sites. One of the previously identified sites was listed on the State Inventory of Historic Places (Site 13181). All other sites (69%) were assigned SHIP numbers during this survey.

Analysis of survey findings indicates that the predominant feature types present in the project area are posthole excavations, modified excavations, and trenches and mounds (90% of the 209 identified features); these types are often the most part associated with agricultural activities. Features associated with excavation tended to be associated with relatively small precontact to historical sites identified in the project area.

Among the 60 sites identified within the project area, 14 are assumed to have historical value that has been missed during this survey, and no further work is deemed necessary. Further data collection only is recommended for 56 sites, which appear to have value only for information purposes. Further data collection and a provisional recommendation of preservation as a site are recommended for the site pending the identification of human skeletal remains in the site. Finally, a single site is assessed as significant for information purposes and for cultural value as a transportation route. Further data collection is recommended for this site.

*State Inventory of Historic Places (SHIP) site designation system: all five-digit site numbers prefixed by 30-10-27 (09)C* (site of Hawaii), 10-Island of Hawaii, 25 or 27AI051.5 square mile ("Kona, Hawaii").
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BACKGROUND

This report presents the results of an archaeological survey conducted at the proposed Ho'okaholua Industrial Park project area, on land of Ho'okaholua, 3rd, North Kona District, Island of Hawaii (HSM-2-8-16-0-28-60-0). The survey was coordinated by Paul H. Rosendahl, Ph.D., Inc. (PHR) on behalf of Ho'okaholua, Inc., through the Office of Historic Sites and Programs (H_DOH). The purpose of the survey was to provide information appropriate to the site and sufficient to prepare an environmental impact statement (EIS) that could be submitted in conjunction with a State Land Use Boundary Amendment application to the State Land Use Commission.

The survey fieldwork consisted of both aerial and pedestrian reconnaissance of the project area. The aerial reconnaissance was conducted on September 6, 1989 by Supervisory Archaeologist Thomas E. Dewar, Jr. The pedestrian reconnaissance was conducted November 4-7, 1989 by Supervisory Archaeologist Thomas E. Dewar, Jr. The project area was delineated through site visits to agents of the management company and to potential users of the site. The final site visit to define the project area was conducted on May 7, 1989, by Supervisory Archaeologist Thomas E. Dewar, Jr. The project area is approximately 15,000 acres.

An inventory report and general site assessment was prepared in conjunction with the project area was prepared by Rosendahl & Rosendahl 1992. This report contains the final report for the project area.

SCOPE OF WORK

The purpose of an inventory survey is to identify, describe, and evaluate the available archaeological significance present within a specific project area. An inventory survey was completed as a baseline level of archaeological investigation. It is necessary to determine if the site is worthwhile and is complete, in order to determine if the presence of archeological resources within an area may be present.

The inventory survey includes the entire area of the project area, and the total extent of the survey area is approximately 15,000 acres. The survey area includes areas that have been surveyed in previous years, and areas that have not been surveyed in previous years.

1. Conduct archaeological and historical documentation and evaluate the results of existing archaeological and historical research, historic documents and reports, ethnographic research related to the immediate area.

2. Conduct a 100% coverage, low-level (50-50 ft) archaeological reconnaissance in the survey area. The survey area includes areas that have been surveyed in previous years, and areas that have not been surveyed in previous years. The survey area includes areas that have been surveyed in previous years, and areas that have not been surveyed in previous years.

3. Conduct a 100% coverage, low-level (50-50 ft) surface survey in the survey area. The survey area includes areas that have been surveyed in previous years, and areas that have not been surveyed in previous years. The survey area includes areas that have been surveyed in previous years, and areas that have not been surveyed in previous years.

4. Conduct a 100% coverage, low-level (50-50 ft) surface survey in the survey area. The survey area includes areas that have been surveyed in previous years, and areas that have not been surveyed in previous years. The survey area includes areas that have been surveyed in previous years, and areas that have not been surveyed in previous years.

5. Analyze archaeological data and prepare appropriate reports.

Annual rainfall is approximately 30 in. (0.75 m). The average annual temperature is approximately 75°F (24°C). The average annual wind speed is approximately 15 mph (24 km/h). The average annual humidity is approximately 60%. The average annual solar radiation is approximately 2500 W/m².

The proposed Ho'okaholua Industrial Park project area contains evidence of Hawaiian cultural sites, including historic buildings, historic structures, and historic structures that have been identified in previous surveys. These structures are associated with the Hawaiian culture and are important to the cultural and historical significance of the project area.
Districts of North Kona, with its hau'a lava islands and coastal fishponds (Sprague 1986:321). However, it is a transitional area between these two contrasting environmental districts, Honokaa might possess a unique history of adaptation and use not readily characterized by the general patterns of either Kiawe or Kekaha.

There is little historic information concerning traditional Hawaiian land use for the island area of Honokaa. Informal documentary research by Ellis (1987) and more recently by Wainright (Appendix B) failed to locate references to indigenous or ancillary specific to the project area. Ellis, during his 1853 tour of Hawaii island, described the area to be referred to as the 'habitat of Kaua,' which may have included lower Honokaa. According to Ellis:

The overseas were cultivated in a considerable extent; small gardens were seen among the hau'a rocks as well as in the hau'a fields, where several wells were observed. (Ellis 1985:31).

Honokaa was described by Kelley (1937) as an area where 'the Kekaha district is unrepresented, ' and it is obvious that the area was not extensively cultivated. The area was noted for its forests of Kekaha and its abundant forests of kiawe. The area was described by Kelley (1937) as 'of comparatively small value.'

Figure 1. PROJECT AREA LOCATION MAP
ARCHAEOLOGICAL INVENTORY SURVEY
HONOKAA INDUSTRIAL PARK (PARCEL VII)
Land of Honokaa 2nd, North Kona District
Island of Hawaii (TMK:3-7-4-0-01W6,109)
FHIL Report 89-694
January 1990

Although there is some evidence in the archaeological record of limited land use, there is little evidence of agricultural activity based on the ground - the Hawaiian farmers were cultivating kula lands in the 18th century, but kula gardens were not cultivated in this area. The kula was given by the Board of Commissioners to the Honokaa, the owner of the plantation. The kula lands were used to cultivate exotic crops and produce for the market. The common laborer had limited access to grazing lands for his livestock, and in general the area was not extensively cultivated. However, it is clear that the area was not extensively cultivated in the early 19th century.

It was shortly after the systematic exploitation of kula lands as grazing land that Kukuii was discovered. This well was visible from the northern coast of Hawaii island, and was reputed to be a source of water. Kukuii was a sacred site, and its discovery opened up the area for further settlement. However, it is clear that the area was not extensively cultivated in the early 19th century.
According to an 1893 excavation by McDougal, there appears to have been no major posture demarcations between Hoopoeola, Kaukoula, and Kukamenua. McDougal recorded 3300 for 1.6 acres of Kaukoula land, which was valuable at that time because it owned land on both sides (Koahoula and Kaukoula) and "...it would take more than all it is worth to fence it in" (Quarrell Dept. Dec. 30th 1970).

Historical evidence indicates that there were few residential within the project area (or within most of the high lands of Honokohau Valley) during the latter part of the nineteenth century, since this area was mostly given over to ranching. Transportation through the valley was primarily between the residence in the valley and the road, was supplied by the remains of a nineteenth century kahakolu mail (Stee 1800) located during this survey.

The essential portions of Hoopoeola, 1st and 2nd contain the domestic remains of pre- and post-contact Hawaiian settlement. Among the domestic remains are three fishponds, a Hawaiian burial ground, two large post holes, the Koa canoe (see Clark report in Appendix B). A reconnaissance survey on coastal Hoopoeola, conducted by Emery and Sotuma (1971), located a wide range of site types, including bridge, house, canoe, burial, enclosures, ponds, postholes, walls, and platforms. These findings are summarized in the following sections.

Additional information regarding historic documentation is presented in Appendix B.

PREVIOUS ARCHAEOLOGICAL WORK

Coastal Hoopoeola

The early archaeological field investigations in Hoopoeola took place along the coast. These investigations, which included the recovery of artifacts from prehistoric, were limited to the areas near the coast. In the area known as Honokohau Kaloko, Sotuma (1910) described a single burial site on Kea Point, along the south shore of Ananuku Pond, as the boundary between Hoopoeola 2nd and Kaukoula. Sotuma referred to this place (same name) as one of the famous places in Kaukoula (Appendix B). This site was later described and mapped by Kekuanaoa (1903) as part of the Ananuku Pond no summer (Stee 1903 Sotuma Survey Site 512-11). In 1930, Sotuma conducted a survey of the three known canoes and identified sites in Hoopoeola (1934-47). Six of Sotuma's sites are comprised of a number of residential structures with associated post, wall areas, platforms, and enclosures. Sotuma also discovered a second site on the island of Kaukoula and Sotuma (1947). A single site (Stee 1903 Sotuma Survey Site 770) was identified. According to Sotuma, this site was located on Aikau Point in Honolulu with a small structure at Puaalau Bay.

INTRODUCTION

In addition to the fish trail, Southern located some features within Park Unit X, a portion of Nahaleuu Trail, a fish trail, platform and paved area, and five platforms informed to be buried. Most of the fish trail identified by Southern on cultural markers were documented during a survey, and a few of the fish trail remains were located. Southern suggests that the absence of human remains in the feature is an indication that they are of sufficient age (at least 250 years) to have provided time for complete disintegration of the remains (Southern 1971). A brief summary of the eleven sites identified by Southern within the project area follows (Southern 1971, 4-5).

Site 9 - A platform interpreted as a burial monument and a nearby several periods begin interpreted as a platform area.

Site 10 - A platform interpreted as a burial monument.

Site 11 - A circular platform interpreted as a burial monument.

Site 12 - A "single semicircular structure," or C-shaped structure.

Site 13 - The curved burial platform.

Site 14 - A lava rock cave with middle deposit.

Site 15 - A disturbed platform, interpreted as a possible burial monument.

Site 16 - A small platform that is "undoubtedly a burial;" a probable burial platform.

Site 17 - Another probable burial platform.

Site 18 - Two contiguous burial platforms, both disturbed; and

Site 19 - A small lava rock cave; no human remains.

Eight of the above eleven sites were located during this survey. Sites 9, 10, and 13 were not located. These sites were excavated by Southern in 1971, and have apparently been destroyed.

In 1958, Southern identified several features within Park Unit X, a portion of Nahaleuu Trail, a fish trail, platform and paved area, and five platforms identified to be buried. Most of the features identified by Southern on cultural markers were documented during a survey, and a few of the fish trail remains were located. Southern suggests that the absence of human remains in the feature is an indication that they are of sufficient age (at least 250 years) to have provided time for complete disintegration of the remains (Southern 1971). A brief summary of the eleven sites identified by Southern within the project area follows (Southern 1971, 4-5).

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Eight of the above eleven sites were located during this survey. Sites 9, 10, and 13 were not located. These sites were excavated by Southern in 1971, and have apparently been destroyed.
The following year, Sedentary conducted a reconnaissance
survey of a parcel immediately south of Portal 16
(Sedentary 1979). Three sites were located in this parcel,
including previously identified Hokuala II (Site 1), a
collapsed ruin (Site 2), and a low stone wall (Site 3). No
work was recommended in this parcel (Sedentary 1979).

A second reconnaissance survey was conducted of the
undersurface of Portal 16 in 1982 by HTOI (Rosenfeld
1982). Two sites were located during the survey, and
were assigned ISIP numbers. Site 10642 is described as
a complex of two rooms and an east wall, and appears to
coincide with Sedentary’s previously identified Site 1.
Site 10643 is a small coursed stone structure associated
with Ching and Rosenfeld’s previously identified Site 7.
Rosenfeld (1982) noted that these two sites were
proposed for future work, but no further work was
recommended (Rosenfeld 1982).

A number of reconnaissance and testing projects have
been conducted in the north of the project area, in the
districts of Kualakea and Kualoa (Ettosha 1973-1985;
Harner 1984-1985; Harman, Shulfer, and Nordvick
1987; Sedentary 1982; Rosenfeld 1982; Walker and Haun
1987; and Book 1987). These studies are summarized and
discussed in more detail in this project inventory report
(Damore 1990). The most recent work conducted in the
north (conducted in adjacent lands) was by 1990. In 1990,
239 survey units were conducted in an area on the
Kula Highway between the Kualoa and Hanalei Road.
A total of 239 sites with at least 1,374 component features
were identified in the Kualoa project area.

Additional findings and conclusions offered by Schulte
are considered in the following section.

RESEARCH PROBLEMS AND APPROACH

Selected research issues of importance (in further
archaeological investigations in Hanohaua, Kualoa,
and Kualoa) are presented here in order to provide an
overview of some of the research questions that the
researcher may want to address in the future. These issues
are: (1) the relationship between the different
architectural styles, (2) the relationship between the
different periods, (3) the relationship between the
different cultural groups, (4) the relationship between
the different social groups, and (5) the relationship
between the different economic activities.

Cultural History

Cultural history has so far been an important concern
for the archaeological investigations in the Kualoa area.
A preliminary research has been developed for the
Kualoa project area, and this research is the subject of
this study. The major results of this research are:
(1) the relationship between the different architectural
styles, (2) the relationship between the different periods,
(3) the relationship between the different cultural
groups, (4) the relationship between the different social
groups, (5) the relationship between the different
economic activities.

On the basis of the preliminary research, it is
concluded that the prehistoric period in the Kualoa
area was divided into two main periods: (1) the Proto-
Kualoa period, which lasted from approximately 4000 BC
to 1000 BC, and (2) the Iron Age period, which lasted
from approximately 1000 BC to the present day.

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general land use areas. Thus, the horizontal vision would coincide with the inland boundary of the grazing land, which would coincide with the main cause of the hilltops and homestead grooves, which were in turn continued to the hilltops itself.

Preliminary analysis of historic and archaeological data in Kekaha has established that the historic site for distinguishing traditional cultivation evidence does not permit an accurate location of the source areas. At Kekaha, the original boundary of the historic hillside grazing land is at least 200 ft lower in elevation than the lower edge of the area designated for native hilltop and homestead claims. It appears that archaeological data may provide a more accurate reflection of the traditional Environment-Ecological subsistence than nineteenth century land use patterns.

In addition, it remains to be demonstrated that the relatively extensive areas included in the hill subsidence in Kekaha and other nearby 'apalais' north of Kekaha are environmentally similar, with no archeological evidence that indicates traditional Hawaiian agricultural patterns.

One of the research goals for further study in Kekaha is to develop a more fine-grained model of land use, using the vegetation and arable areas and specific forest vegetation as indicators of environmental variability and potential functional adaptations. The approach to this problem is to use the survey data to calculate for Kekaha, Kealakekua, and Kauai as a technique for developing a formal typology of agricultural features and complex that will permit comparison of forest occurrence patterns and density along the coastline, as well as the land-use areas. Ideally, specific functions (i.e., likely locations and possible seasonal patterns) will eventually be assigned to the various types. These interpretations will be tested with existing data and additional data, to be collected during the field data collection phase.

FIELD PROCEDURES

Archeological reconstructions of the precontact period were conducted September 7, 1989, via helicopter, by Supervising Archeologist Thomas E. Sagne and Kenia Kauai, field archeologist. The survey was conducted at the nearest altitudes permissible, in overlapping swaths at least 340 ft.

The survey indicated that cultural features occurred on all and included various types of remains within the area, and that much of the surface at the entrance position of the prehistoric area was covered by houses disturbed by bulldozer grading. In addition, visibility of the surface from the air was not as

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In general, surface visibility was such that all or nearly all surface features could be located with reasonable accuracy c. 100 ft above the precontact surface. The features were either small, less than 1 ft in diameter, or small clusters, and some features are part of one continuous complex. Further work is underway to improve the accuracy of site boundary definitions.

Gables, Florida for radiometric age determinations, were screened through 154- and 156-inch mesh hardware cloth for collection of portable remains. All lithic, bone, and faunal materials collected from the 14 inch mesh samples were stored and weighed. Materials recovered from the 1-5 inch mesh were examined for artifacts, shell, and small mammal remains, and all shell was removed from the site. The bulk samples were transported to the Florida State laboratory where they were either prepared for shipment to the Center for Analysis.

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SURFACE FINDINGS

Prior to the present study, 11 archaeological sites had been located within the project area (Department 1975). Two of these sites (10 and 11) were included as features of a larger complex (Site 11101) that was located during a survey of an adjacent parcel in Kukak City (Department 1990). The remaining nine sites had not been located on the S205. Six of the nine sites were recorded during this survey and two were assigned SSP numbers. Southern's 196 and 197 were combined into one site because they were prominent to each other. In all, a total of 60 archaeological sites in the project area (Figure 1a, Table 2, as well). Of the 60, 27 (45%) remain of a single feature. All other sites consist of two to six features. Only two sites consist of more than one feature; in these cases, high feature count is attributable to numerous parallel excavations.

The overall distribution of sites and features across the project area shows a general pattern of increasing density with increasing elevation. There are currently no sites at elevations of 300 ft or less. Unfortunately, the site distribution data for elevations less than 200 ft is not significantly affected by differences. Twenty-eight sites are located between 200 and 300 ft AMSL, (above mean sea level), and 24 are above 300 ft AMSL. The upper 28 sites (greater than 300 ft AMSL) are located on the ridge of the 200-500 ft AMSL site, and 24 are in the highest 25% of the project area. In addition, over 90% of the 28 identified features occur in areas above 300 ft AMSL. Three of the four agricultural complexes with over 10 features are above 300 ft AMSL.

Features identified and recorded within the project area number 17 different formal categories. The occurrences (by site) and counts for these types are summarized in Table 3. Frequencies of formal categories closely indicate the predominance of probable occupation, modified camps, and rock mounds, pits, or structures, which together comprise 6% (17 of 270) of all features. Over half of the formal categories (54) are represented by less than 5% of the features. The predominance of a few categories and very few frequencies of several indicate that much of the activity conducted in the area was generally similar and probably within a relatively fixed functional range. Features represented in the various formal categories are summarized below, and occurrences are compared with findings from Kukak City and sometimes Kukak, immediately to the south.

Alignments

All of the identified alignments occur in complexes with four or more features, and at elevations greater than 200 ft. All alignments occur with terraces, and most also occur with either walls or eaves. In general, the alignments are less than 6 m long. One exception is a 6.5-m-long alignment at Site 1305, which may actually be a thirdbush. Most of these features are constructed as an incorporation of natural landscape features. Specific functions are difficult to determine; they appear to be present at times associated with agricultural activities.

Cairns

With one exception, the cairns identified may be characterized as generally small, informal mounds or stone component piles of slabs and cobbles with no core filling or face stones. A single cairn, located at Site 1296, consists of a single upright boulder 0.7 m high. Of the five cairns occur at isolated features (1299, 12998, 13001, 13009, and 13013). All of these cairns are present between elevations of 225 and 300 ft AMSL, and are distributed across the project area north to south. Four cairns occur in pairs at two sites which have no additional features (13004 and 13103).

Cairns at sites 12906, 12985, 13013, 13079, and 13090 occur in a north-south alignment at c. 230-235 ft AMSL. These features may have had a north-south footprint that is no longer distinguishable.

Caves

Among the five cave sites identified, four occur as isolated features, and one occurs with a terrace (or the cairn) and two modified cairns (Site 1304). The caves are widely dispersed across the project area, all are above 200 ft AMSL. All five of the caves exhibit soil deposits ranging in thickness from 0.03 to 0.31 m thick. Relatively sparse amounts of artifacts remain, such as shellfish, mussel shell, bird bone, and wood, which was observed in four of the caves. The Site 1301 cave appears to contain none of these materials, but does contain carbonized plant remains and wood.

Of the caves, Site 13019 (Department's Site 14), located near the southern boundary of the project area at 225 ft AMSL, may have been utilized the most extensively. This
### Table 3.

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<th>Site Number</th>
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<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alignment</td>
<td>12996(7), 12998(1), 12999(1), 13000(2), 13001(1)</td>
<td>7</td>
<td>(3.4%)</td>
</tr>
<tr>
<td>Cave</td>
<td>12997(1), 12999(1), 12999(1), 12999(1), 12999(1), 12999(1), 13000(1)</td>
<td>15</td>
<td>(7.3%)</td>
</tr>
<tr>
<td>Clear corridor</td>
<td>12998(1)</td>
<td>1</td>
<td>(0.5%)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>12999(1), 13000(1), 13001(1), 13002(1)</td>
<td>5</td>
<td>(2.4%)</td>
</tr>
<tr>
<td>Filmed crevice</td>
<td>12998(1), 13000(1), 13001(1), 13002(1)</td>
<td>5</td>
<td>(2.4%)</td>
</tr>
<tr>
<td>Kerbstone trail</td>
<td>12998(1)</td>
<td>1</td>
<td>(0.5%)</td>
</tr>
<tr>
<td>Modified correc</td>
<td>12998(1), 12999(1), 13000(1), 13001(1), 13002(1), 13003(1), 13004(1)</td>
<td>25</td>
<td>(12.1%)</td>
</tr>
<tr>
<td>Overhang</td>
<td>12998(1), 13000(1), 13001(1)</td>
<td>3</td>
<td>(1.5%)</td>
</tr>
<tr>
<td>Palaeo world</td>
<td>12997(2), 12998(1), 12999(1), 12999(1), 12999(1), 13000(1), 13001(1), 13002(1), 13003(1), 13004(1)</td>
<td>74</td>
<td>(35.8%)</td>
</tr>
<tr>
<td>Pits</td>
<td>12998(1)</td>
<td>4</td>
<td>(1.9%)</td>
</tr>
<tr>
<td>Platform</td>
<td>13000(1)</td>
<td>3</td>
<td>(1.5%)</td>
</tr>
<tr>
<td>Rock outcrop</td>
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<td>3</td>
<td>(1.5%)</td>
</tr>
<tr>
<td>Rock boundary</td>
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<td>25</td>
<td>(12.1%)</td>
</tr>
<tr>
<td>Terrace</td>
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<td>25</td>
<td>(12.1%)</td>
</tr>
<tr>
<td>Wall</td>
<td>12998(1), 12999(1), 13000(1), 13001(1)</td>
<td>4</td>
<td>(1.9%)</td>
</tr>
</tbody>
</table>

Grand Total: 207

(99.9%)
To date, no geomorphic documentation has been located for the Hoonahas valley section; the Kuskulana valley, however, is shown on a government survey map compiled by Tennon (1953). A section of Tennon's map reproduced in Hanna, Skidmore, and Butts (1987) shows the location of a house labeled "McDonald's?" in the center of Hoonahas Creek at an elevation of approximately 500 ft. Mc Douglas was a local person who somehow got his name on our map.

**Modified Outcrops**

Modified outcrops in the project area consist of natural phaneromorph deposits, lenses, and thin, calcareous layers of large grains and thick filaments with growth and small cobbles, usually producing a small, relatively leveled surface. The large grains are generally regraded around 90° and move into the crevices of the large area in the field or alignment. In some cases, the resulting feature is some kind of a lens in appearance, or may be very similar to a filled crence. Modified outcrops are distinguished from phaneromorph deposits in that the two are not in association. They may be deposited in association morphologically characterized.

As currently used, the modified outcrop category is relatively subjective and broad, a more precise means of defining these features is currently being examined.

Twenty-five modified outcrops at site sizes were identified within the project area. The largest percentage of features (15) occur at Site 12018, located near the southern boundary of the project area at 350 ft AHD. Altered modified outcrops are located primarily above 500 ft AHD, both lower and lower than this elevation, at 225 and 275 ft AHD.

**Phaneromorph Excavations**

The phaneromorph excavations in the project area consist of small lenses that have the surfaces broken, creating a crag where the gneiss is exposed. Depth of 0-4 m to 5-0 m. The blocks and pieces of phaneromorph blocks are usually regraded around the perimeter of the base in a circular alignment, and are usually near the base. In some cases, the large blocks are placed inside the base, along the side. The base is often partially filled with pieces of phaneromorph that are size-sorted (smaller pieces on the bottom, larger pieces on top). The gravels that occur in lower layers of these bases are often very angular and unmixed, and appear to be actively produced by crushing larger rocks. Sand is often mixed with the gravels, and the soil is not visible below the upper layers of larger rocks is removed. It is expected that the smaller anticlines of these deposits, such as fill fans, modifications of the interior and exterior, remain, depth and overall size, then probably less than that of the functional phaneromorph deposits.

Phaneromorph excavations within the project area are assumed to have functioned previously as agricultural features. They are referred to as "Phaneromorph" by Skidmore (1973). It was observed an unknown quantity in the project area during his survey, but means that "Phaneromorph was made to record such feature" (1973). It would be difficult to accurately characterize the pre-contact land use on Hoonahas, and adjacent regions, without a careful consideration of the functional and formal variation of these features.

Among the 71 identified phaneromorph excavations, five are small features, four are single features in association with other features, six are in association with other phaneromorph excavations. It appears that isolated phaneromorphs are relatively rare. The reason for this is that the boundary of these features (17) occurs at Site 12018, located near the southern boundary of the project area at 350 ft AHD. The second most frequently encountered (14) of phaneromorph excavations occurs at Site 12030, located near a distance (c. 100 ft) from Site 12018, which has a concentration of modified outcrops. The Site 12030 habitation area is located near two cemeteries.

Observations of phaneromorph excavations in Kuskulana and Kuskulana indicate that they were used more extensively in the upper elevations (above 350 ft) of these habitats. These features are present in Kuskulana, and to the east of the lake, all above 350 ft AHD, compared to the 500 ft AHD of the lakeshore. The phaneromorphs are found on both sides of the lake, on the south side of the lake at Site 12018, and on the east side of the lake at Site 12030. The phaneromorphs are found on the north side of the lake at Site 12030, and on the west side of the lake at Site 12018.

**Pavements**

Four pavement areas at four sites were identified within the project area. Four general types were present. The most common pavement was identified at Site 12030. Four pavement areas in the upper elevations contained small layers of ungraded, talcose deposits, and were located in the group of possible surfaces. The second group of pavements contained small layers of talcose and talcose deposits, and were located near the upper elevations. The largest layer is 3.3 ft by 3.6 ft in size. A single, shallow pavement, 1.45 ft by 4.5 ft, was also identified. No linear mounds were observed.

**Overhangs**

The three overhangs identified are widely distributed within the project area, and are at elevations of 120 ft, 220 ft, and 325 ft. Two of the overhangs are located near the lake, and are associated with phaneromorph excavations (Skidmore 1975). Only one of the overhangs (Site 12022) contains a cultural deposit; this deposit contains a second, more extensive cultural deposit, which is found at the base of the overhang, and is associated with the overhang.

**Terraces**

The 23 terrace features are all in elevations greater than 225 ft AHD. Five terraces are identified, three of which are located near the Charlo Stream (1301 and 1303). In general, the terraces are associated with modified outcrops, phaneromorph excavations, alignments, and rock piles. They are usually associated with small natural deposits on outcrops, and tend to be small. The terrace features are located in the project area, and are associated with the Charlo Stream (1301) and 1303). Nearly half of the terrace features have surface areas less than 10.0 sq m. The largest terrace feature is located near the Charlo Stream, and is 7.5 ft by 5.0 ft, and is 1.5 ft by 1.5 ft. Near the site of the terrace features have surface areas less than 10.0 sq m. Maximum height range from 0.1 ft to 1.0 ft, with a total of 0.6 ft.

No possible remains were observed on any of the terraces, and soil was observed on the surface of the terrace areas, which is disturbed. A soil pile is located on a possible burial terrace. The two possible burial mounds are of sufficient size to have functioned as habitation features (19.7 and 19.5 ft in diameter). The majority of the terraces are, however, too small for habitation; these may be similar to agricultural features.

The Hoonahas terrace appears to be generally smaller than terraces identified in Kuskulana. Among the 23 terrace features identified in Kuskulana, 7 are located near the Charlo Stream (1301 and 1303). The only site of the terrace features have surface areas less than 10.0 sq m, whereas 58% (13 of 19) of the measured Hoonahas terrace areas are less than 10.0 sq m. Likewise, four Kuskulana terrace areas have surface areas greater
Three 0.5 m levels were excavated at Site 13019, where two layers were encountered. The uppermost layer (perhaps 8-12 cm below surface: Level 1 and 2) consisted of dark gray fine silt with only occasional and numerous roots. Layer 3 consisted of light gray silt with greater charcoal and ranged in thickness from 0.5 to 0.6 m (Level 3).

SUBSURFACE FINDINGS

Surface strata were conducted in one of the previously identified sites (Henderson's Site 14, 2015-17 Site 13019) and at three newly identified sites (12991, 12991, and 12994). Three of the excavated cores were seen (12994) in a loose rock mound. Surface strata were collected from three core sites to three core sites (12991, 12994, and 12991). Porous remains other than charcoal were recovered from two of the cores (12991 and 13019; Table 4).

The soil mounds were 62 cm by 22 cm and were excavated to the base of the core. Deposits at Sites 12991 and 12994 were excavated in single levels. These deposits consisted of single layers of loose to moderately brown fine silt with numerous roots, and have maximum thicknesses of 0.23 and 0.57 m, respectively.

The relatively low quantities and variation of middle remains at the mounds, in comparison with the diversity of the deposits, indicates relatively low-intensity cave use.

SURFACE COLLECTION

A surface collection was conducted on the surface of Pensacola Cave, Site 12824. The collection is 29.41 cm long by 8.6 cm wide and 19.6 cm thick but with a 0.12 cm diameter. It is birdstone and is on all six faces. In addition to birdstone, shellfish (Tetragonisculus sp., Proloculus sp., and Eubranchus sp.), bird skull, and cremated bone were observed. No soil deposit was present at the cave.

AGE DETERMINATIONS

Five beta samples of shell and carbonized wood were submitted to Beta Analytic, Coral Gables, Florida for radiocarbon age determinations. The samples were obtained during unit 5 excavations at cave Sites 12991, 12994, and 12991. Single samples were taken from the first two sites, and three samples were taken from three of the three excavation levels at Site 13019 (Table 5). The remaining carbonized shellfish samples from Sites 12991 and 12994 are very similar, and it is likely the same midland blackens with radiocarbon measurements of AD 1650-1750 (Beta-34729) and 1650-1750 (Beta-34729), respectively. Similar ages for samples from the upper limit of the site from 12991 (Site 13019) extend into the midland era. The dates from the uppermost level of 13019 have two alternative radiocarbon ages of AD 1700-1800 or AD 1800-1900. Given the fact that the lower limit is very similar, it is likely that the most recent data are better suited for the Level 1 sample. This sample required extended analysis due to small size.

The sample obtained from Level 3 Site 13019 was also given extended analysis due to small size, and has an extremely high measured deviation of 200 years. The sample was analyzed at 15000.00 BP. The measured carbonized age ranges in two samples at AD 1550-1650. This range is sufficiently large to be of limited interpretive value, although it does indicate that a late Pre-Contact Period occupation.

The sample obtained from the Hendon site is very consistent with the dates recently reported from Hendon. A date of AD 1650-1750 was obtained from a sample collected by Henderson, Ghezzi, and Henderson at Site 11 in Hendon (Henderson et al. 1987:620). A carbonized sample excavated from the Hendon site is also consistent from a sample collected by Fuerst at a cave (Site 12818) in Hendon (Beta-31425). Nearly all of these dates support Scholl's conclusion that radiocarbon remains at the lower limit were north of Hendon, suggesting that they may be related to the late Pre-Columbian Period, after c. AD 1400 (Scholl 1987:276). The only problematic data regarding this model is the Site 13019, Level 3 date, which could represent pre-AD 1400 activities.

### Table 4

<table>
<thead>
<tr>
<th>Midden Remains</th>
<th>SITE 13019</th>
<th>SITE 12994</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cones</td>
<td>0.37</td>
<td>0.03</td>
</tr>
<tr>
<td>Cyprinidae</td>
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<td>0.37</td>
</tr>
<tr>
<td>Unidentified</td>
<td>0.37</td>
<td>0.37</td>
</tr>
<tr>
<td>Total</td>
<td>1.31</td>
<td>0.37</td>
</tr>
<tr>
<td>Shellfish</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Total</td>
<td>1.56</td>
<td>0.25</td>
</tr>
<tr>
<td>Midden bone</td>
<td>0.37</td>
<td>0.37</td>
</tr>
<tr>
<td>Total</td>
<td>0.74</td>
<td>0.37</td>
</tr>
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Table 5.

SUMMARY OF RADIOCARBON AGE DETERMINATIONS

<table>
<thead>
<tr>
<th>Provenience</th>
<th>C-14 Age (Yrs. B.P.)</th>
<th>C-14 Adj. Age (Yrs. B.P.)</th>
<th>*Calibrated Range Yrs. AD</th>
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<tr>
<td>SITE 12994</td>
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<td></td>
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</tr>
<tr>
<td>644 34927</td>
<td>TU-1,</td>
<td>6020 70</td>
<td>215</td>
</tr>
<tr>
<td></td>
<td>Layer 1,</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>0.5 cm bd</td>
<td></td>
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</tr>
<tr>
<td>SITE 12994</td>
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</tr>
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<td>0.7 cm bd</td>
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</tr>
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<td>641 34924</td>
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<td>1800 70</td>
<td>-233</td>
</tr>
<tr>
<td></td>
<td>Layer 1,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.5 cm bd</td>
<td></td>
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<td>SITE 12994</td>
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<td>642 34925</td>
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<td></td>
<td>30-35 cm bd</td>
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</tr>
<tr>
<td>SITE 12994</td>
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<td>600 200</td>
<td>-22.3</td>
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<tr>
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<td>Layer 1,</td>
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</tr>
<tr>
<td></td>
<td>25-31 cm bd</td>
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</tr>
</tbody>
</table>

*Calibrated according to Stuiver and Pearson (1979). Ranges are two standard deviations.

CONCLUSION

The 18 formal feature categories listed above may be seen as functionally correlated, or understood through a general functional group (Table 6). These groups are based on depositional and non-depositional data as compared with the findings from Kukakuk.

Agricultural features comprise nearly three-quarters of all identified features within the project area. These features occur most commonly in complexes and are most numerous in the upper elevations of the project area. The three largest agricultural complexes are above 300 ft AMSL, as are the majority of the palaeoexcavations and modified areas, the more frequently occurring agricultural features. Two large complexes (1501 and 1500), which together account for 41 agricultural features (27% of the group), are proximate to each other along the northern boundary of the project area. Located between these two complexes is the Site 13019 habitation area, which is within 10 m of the edge of the respective complexes. These three sites probably represent a single extensive agricultural complex.

Within the agriculture group, palaeoexcavations account for nearly half of the 154 features, followed by relatively equal proportions of rock walls (17%), stone (15%), and modified areas (13%). These proportions contrast with the agricultural group for Kukakuk and Kukakuk, which have nearly half (46%) of 735 features represented by rock walls, a third (22%) represented by palaeoexcavations, and comparable but small proportions represented by modified areas (12%) and stone walls (13%). Although palaeoexcavations are very common in both areas, the agricultural group at Kukakuk appears to be more dispersed than the group in the Kukakuk area. This difference is probably more a factor of environmental differences than differences in the north-south gradient.

Habitation features in Kukakuk are relatively few, and some of the features exhibit surface or sub-surface evidence of permanent habitation. The features most likely represent short-term structures and are associated with agricultural function in 80% of the sites. Very few excavations in Kukakuk were identified as habitations. In all cases, only a few features were excavated. A single radiocarbon date obtained from charcoal is a cave deposit in Kukakuk (Site 13128). This sample returned a modern date (Duchesne 1990).

Only one transportation feature was identified in Kukakuk. This transportation site is of incipient construction, but may be consistent with a Pre-Contact Period site. It is oriented in the same direction and located near the center of the project area. No transportation documentation has been located which indicates the usual vector of the trail, but it is likely that it extended as far as the main settlement of Matahuala on the west end of the Macquarie River, ca. 900 ft AMSL.

Transportation features are more common in Kukakuk, where transportation trails, meandering trails, and cleared fords (track 17) were identified. One feature in the general occurrence of trails in Kukakuk is the higher proportion of surface area covered in sand. Meandering trails are generally associated with this type, and many fords are often observable where they cross as fields.

A relatively wide range of formal types is included in the possible burial group. Some of these features (cisterns) were originally interpreted as burials by Forbush (1916) and could not be adequately reconstructed in the allotted field time for this project. The burial feature group is currently plotted in other functional groups, such as modified areas and paved areas, and were characterized as possible burials due to unique occupations or anomalies. In places of concern, it is likely that the number of possible burials may be underestimated due to small samples of surface area covered in sand and silt, and overall site size. Some of the possible burial features, if confirmed, could represent the less common occurrences associated with burial monuments.

The 14 features in the indeterminate group occur most frequently in association with agricultural features, although some may have functioned as temporary shelters. There are no possible features associated with these features.

No features definitively associated with roasting, such as hearths and kilns, were identified within the main project area, and no ceramics were found, except in occasional features, such as hearths or ditches. The features of principal interest in the project are those that can be placed in the possible burial feature group, which could otherwise represent some form of ceremonial function, in the absence of evidence indicating otherwise.
Table 6. FREQUENCY OF FORMAL FEATURE TYPES BY FUNCTIONAL CATEGORIES

<table>
<thead>
<tr>
<th>Feature Type</th>
<th>Count</th>
<th>% of Category</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Features</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Enclosures</td>
<td>4</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Irrigated areas</td>
<td>3</td>
<td>1.9</td>
<td>1.9</td>
</tr>
<tr>
<td>Modified mounds</td>
<td>25</td>
<td>16.2</td>
<td>16.2</td>
</tr>
<tr>
<td>Pottery collections</td>
<td>27</td>
<td>17.3</td>
<td>17.3</td>
</tr>
<tr>
<td>Terrace</td>
<td>20</td>
<td>13.0</td>
<td>13.0</td>
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<tr>
<td>Subtotal</td>
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<td>99.0</td>
<td>74.4</td>
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<tr>
<td>Subdivision Features</td>
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<tr>
<td>Curve</td>
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<td>10.0</td>
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<td>Enclosure</td>
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<td>Overhangs</td>
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<td>Kerbstone trail</td>
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<tr>
<td>Subtotal</td>
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<td>100.0</td>
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<td>Possible Rural Features</td>
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<tr>
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<td>0.0</td>
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<tr>
<td>Paved areas</td>
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<td>15.4</td>
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<tr>
<td>Platforms</td>
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<td>Total Number of Features</td>
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</table>

GENERAL SIGNIFICANCE, ASSESSMENTS AND RECOMMENDED GENERAL TREATMENTS

A summary of various general significance assessment is given in (Table 7) is used to facilitate DLRH's archaeological and cultural resource management planning. Significance categories are based on the National Register of Historic Places (NRHP) and the National Register Criteria for Evaluation. In the Code of Federal Regulations (CFR), Part 61, the term "cultural" is used to mean specific criteria for the following cues: "The cultural resource is an item or site which...". These criteria are outlined in the Code of Federal Regulations (CFR), Part 61, and are used to identify cultural resources of national significance. Sites are then evaluated using the following criteria: "Sites with cultural significance..."

Sites with potential cultural significance (Category C) are evaluated using guidelines prepared by the Advisory Council on Historic Preservation entitled "Guidelines for the Identification and Evaluation of Historic Resources" (AHP, August 1985). These guidelines define cultural sensitivity as...". The guidelines further specify that...". This sensitivity is determined by...". These guidelines are used in conjunction with a detailed examination of the site to determine cultural significance.

Sites with cultural characteristics (Category B) are evaluated using guidelines prepared by the Advisory Council on Historic Preservation entitled "Guidelines for the Identification and Evaluation of Historic Resources" (AHP, August 1985). These guidelines define cultural sensitivity as...". The guidelines further specify that...". This sensitivity is determined by...". These guidelines are used in conjunction with a detailed examination of the site to determine cultural significance.

SITES WITH POTENTIAL CULTURAL SIGNIFICANCE

- Sites with cultural characteristics (Category B) are evaluated using guidelines prepared by the Advisory Council on Historic Preservation entitled "Guidelines for the Identification and Evaluation of Historic Resources" (AHP, August 1985). These guidelines define potential sensitivity as...". The guidelines further specify that...". This sensitivity is determined by...". These guidelines are used in conjunction with a detailed examination of the site to determine potential cultural significance.

SITES WITH POTENTIAL CULTURAL SIGNIFICANCE

- Sites with cultural characteristics (Category B) are evaluated using guidelines prepared by the Advisory Council on Historic Preservation entitled "Guidelines for the Identification and Evaluation of Historic Resources" (AHP, August 1985). These guidelines define potential sensitivity as...". The guidelines further specify that...". This sensitivity is determined by...". These guidelines are used in conjunction with a detailed examination of the site to determine potential cultural significance.

No Further Work

Among the 50 sites assessed as being significant for information content, no further work is recommended for 14 sites. Included in this group are sites with known occupation dates (1929, 1932, 1938, 1945, 1957, 1960, 1962, and 1963), three isolated projectile collections (1931, 1932, and 1933), and a probable archaeological remains (1934). These sites have been reviewed, mapped, described, photographed, and plotted. Data collected from them during the previous survey is considered sufficient, and their preservation cannot be recommended under the federal or state preservation guidelines.

FURTHER DATA COLLECTION

- Thirty of the 50 sites assessed as being significant for information content are recommended for further data collection only. The majority of these sites are agricultural remains that contain additional information, which is needed for a clear understanding of the site's cultural significance. Additional data collection is recommended for these sites to provide a more complete understanding of the site's cultural significance.

Further data collection is also recommended for the remaining sites, which may contain additional information that is needed for a clear understanding of the site's cultural significance.
Table 7.

SUMMARY OF GENERAL SIGNIFICANCE ASSESSMENTS AND RECOMMENDED GENERAL TREATMENTS

<table>
<thead>
<tr>
<th>Site Number</th>
<th>Significance Category</th>
<th>Recommended Treatment</th>
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<tr>
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General Significance Categories:

A = Important for information purposes, further data collection necessary (90%+ research value);
X = Important for information purposes, no further data collection necessary (90% research value, 95%+one significant);
B = Excellent example of site type in local, regional, island, state, or national level (90%+interpretive value); and
C = Extremely significant (90%+research value).

Recommended General Treatments:

FDC = Further data collection necessary (detailed recording, surface collections, and limited excavations, and possibly subsequent data recovery/mitigation excavations);
NFW = No further work of any kind necessary, sufficient data collected, archaeological themes recommended, minimal preservation potential (possible inclusion into landscaping suggested for consideration);
FID = Preservation, with some level of interpretive development recommended (including appropriate related data recovery work); and
PAI = Preservation "as is" with no further work (possible inclusion into landscaping suggested for consideration).

* Site inventory of Historic Places (SHIP) numbers. SHIP numbers are five-digit numbers prefixed by 50-10-27 (20th Century Hawai'i, 10-th Century Hawai'i, 27=IHSB 7.3 series quad map "Kohala Pk, Hawaii").
Table 7. (cont.)

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* Provisional statement: definite assignment pending completion of further data collection.

The trail is represented by a relatively short linear section, although further work may result in the discovery of additional portions. The secure trail is currently known causes to be recommended for preservation. Further decision making regarding the trail and the recommended treatment is ongoing. The information presented is intended to provide guidance regarding trail preservation. The significance of the trail should be analyzed in the context of the project area. The recommended treatment is based on the significance of the trail within the project area.

Further Data Collection with Provisional Preservation "As Is"

The specific features at some sites are currently significant for information content and may also be found in similar human influences. These sites are recommended for further data collection, and the specific features are recommended for preservation "As Is". If they are found to contain burial, these features are recommended for additional data collection, and should be preserved for further data collection, and the specific features are recommended for preservation "As Is". If they are also found to contain burial, these features are recommended for additional data collection, and should be preserved for further data collection. These features are recommended for additional data collection, and should be preserved for further data collection.

Additional data collection may be warranted based on the significance of the trail within the project area. The evaluation and recommendations presented within this report have been based on an inventory survey of the project area. The data collection and analysis will be ongoing. The significance of the trail within the project area will be assessed in the context of future archaeological research and development activities. In such situations, archaeological assessments should be sought immediately.

A mitigation plan for sites, with archaeological analysis, should be worked out with DLNR-HSGS/PO. In addition, a search for direct local descendents should be undertaken, containing minimal to zero site impact. If direct local descendents are found, the archaeological analysis should be undertaken in their presence. Lastly, a plan for final disposition of the remains should be developed in accordance with Section 4 of Chapter 56E. It is recommended that this plan be shared with the project area. If this is not possible, they should be reburied in a nearby cemetery. A determination permit may be required from the State Department of Health.

As an important initial step prior to further data collection, it is recommended that all identified sites be recorded for further data collection. These records should be accessible to all interested parties, and should be made available for public review. The data collection and analysis will be ongoing. The significance of the trail within the project area will be assessed in the context of future archaeological research and development activities. In such situations, archaeological assessments should be sought immediately.
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Figure A.1. SITE 12976, FEATURE B, VIEW TO NORTH (PHRI Neg. 1230-24)
Figure A-3. SITE 12981. VIEW TO SOUTH. (PHRI Neg.1320-36)
APPENDIX A

Feature A consists of an eroding modified with excavated boulders to create a swimming area. The feature measures c. 3.0 m in diameter.

Feature D is located 15.0 m at E3 degrees from Feature A. The feature consists of a crescent soil area caused by excavating sand from a boulder exposure; the soil area measures 7.5 m in diameter by 0.7 m in depth. No probable artifacts or cultural deposits were present at the feature. Debris marks (not marks left by a bulldozer) were present on the exposure.

SITE NO.: 12865
SITE TYPE: Causeway
ELEVATION: 231 ft AMSL
VEGETATION: Various grasses, low bush
CONSTRUCTION: Fair/Poor (eroded)
INTEGRITY: Unchanged
PROBABLE AGE: Prehistoric or 18th century
FUNCTIONAL INTERPRETATION: Possible market
APPROXIMATE SITE AREA: 37.0 m E-W by 26.0 m N-S
DESCRIPTION: The site consists of a crescent of boulders and small cobbles marked 3.0 m high and 3.0 m in diameter, the site measures 26.0 m north-south and 17.0 m east-west. The site consists of a crescent of small boulders and large cobbles marked 3.0 m high and 3.0 m in diameter.

Feature A is located about 148 degrees at 260 degrees from Feature B. It is generally rectangular in plan view and consists of small boulders and cobbles. The feature measures 1.4 m in diameter by 0.5 m high.

Feature E is located 11.0 m west of Feature B. It is a crescent c. 0.7 m in diameter and consists of assorted cobbles. The cobbles may have been cleared to create a swimming area.

SITE NO.: 12866
SITE TYPE: Causeway
ELEVATION: 232 ft AMSL
VEGETATION: Various grasses, low bush
CONSTRUCTION: Fair
INTEGRITY: Unchanged
PROBABLE AGE: Prehistoric
FUNCTIONAL INTERPRETATION: Possible market
APPROXIMATE SITE AREA: 90.0 m E-W by 60.0 m N-S
DESCRIPTION: The feature is crescent shaped and consists of small boulders and cobbles marked 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter. The feature measures 0.5 m high and 0.3 m in diameter.
contains of three medium-sized mounds and about six small mounds piled to form a chain irregular in plan view. The cause may be the product of agricultural clearing.

SITE NO: 12991 (Figure A-7)
PHASE TEMP. SITE NO: T-36
SITE TYPE: Mound
ELEVATION: 267.9 AAGL
VEGETATION: Karst hard, various grasses
CONDITION: Excellent
INTEGRITY: Undisturbed
PROBABLE AGE: Protohistoric-Historic
FUNCTIONAL INTERPRETATION: Temporary habitation
APPROXIMATE DIMENSIONS: 2.0 m E-W by 1.24 m N-S by 0.8 m high
DESCRIPTION: Site 12991 is situated in the sandstone area, on a gentle southwesterly slope, in an area of paleosol
outcrops. The perimeter of the mound consists of large paleosol soils stacked three courses high. The mound's
interior is filled with rubble and pebbles and is mounded seven to eight courses high. The mound is faced and is
somewhat rectangular in plan view.

Because it was originally thought the mound may be a burial, a 1.0 x 1.0 m test unit was placed in the site. The test
yielded 2085 and a piece of old red flagging tape. No burial was found.

SITE NO: 12992 (Figure A-8)
PHASE TEMP. SITE NO: T-35
SITE TYPE: Terrace
ELEVATION: 266.1 AAGL
VEGETATION: Various grasses, inters
CONDITION: Good
INTEGRITY: Undisturbed
PROBABLE AGE: Protohistoric-Historic
FUNCTIONAL INTERPRETATION: Agricultural
APPROXIMATE DIMENSIONS: 3.0 m by 2.8 m by 0.1 m high

Figure A-6, SITE 12990

Figure A-7, SITE 12991
DESCRIPTION: Site 12992 is situated on a gentle slope in the vicinity of numerous oases. The site consists of a natural terrace formed and leveled with cobbles. The terrace may have formed naturally. Fossilized remains were found in the site.

SHIP: 12993
SITE TYPE: Termes
ELEVATION: 271 ft. AMSL
VEGETATION: Mountain grass, broom
CONDITION: Good
INTEGRITY: Uniform
PROBABLE AGE: Prehistoric
FUNCTIONAL INTERPRETATION: Possibly agricultural
APPROXIMATE DIMENSIONS: 12.19 m by 6.20 m
DESCRIPTION: Site 12993 is situated on a combination of undulating and smooth polished levels. The site consists of an encampment, and paleoearth mounds and boulders formed in the area in a semi-circle structure. This structure has an encampment. The site has two levels. On the upper level is a mound of paleoearth mounds, rectangular in shape. View. The lower level of the mound is in a linear arrangement 3.51 m long by 1.29 m wide. Present on the lower level is a 1.3 cm layer of silty clay. Numerous leaf, ball, and spiral shapes are present in the site.

SHIP: 12994
SITE TYPE: Termes
ELEVATION: 365 ft. AMSL
VEGETATION: Blackbush, kauri, fevergrass, lichen
CONDITION: Fair
INTEGRITY: Partially intact
PROBABLE AGE: Protohistoric
FUNCTIONAL INTERPRETATION: Temporarily inhabited
APPROXIMATE DIMENSIONS: 33.0 m by 3.35 m high
DESCRIPTION: Site 12994 is situated in the island area on a gentle southwest slope. The site consists of a natural terrace. Present within the site is a deposit of sandy soil mixed with charcoal and shell middens. Also present were kauri, shell middens, worked and unworked wood, a bird bone pin, wirewire point, an extended skeleton, and a cord shackle.

SHAPE: 12995
SITE TYPE: Termes
ELEVATION: 710 ft. AMSL
VEGETATION: Various grasses, lichen
CONDITION: Good
INTEGRITY: Uniform
PROBABLE AGE: Prehistoric
FUNCTIONAL INTERPRETATION: Possible habitation
APPROXIMATE SITE AREA: About 1.9 m in diameter
DESCRIPTION: This site occurred on a gentle slope and consists of a depression filled with caves. The arid nature of this site is highly significant. It is possible the site has been naturally formed.

SHAPE: 12996
SITE TYPE: Termes
ELEVATION: 313 ft. AMSL
VEGETATION: Kauri, fevergrass
CONDITION: Fair
INTEGRITY: Partially intact
PROBABLE AGE: Protohistoric
FUNCTIONAL INTERPRETATION: Temporarily inhabited
APPROXIMATE SITE AREA: 14.8 m by 11.0 m E-W
DESCRIPTION: This complex consists of a terrace (Feature A) and a cave (Feature B) formed on a sloping, paleoearth mound. Possibly remains found are to the southeast, kauri wood fragments, and bird bones.

Feature A is located 5.0 m southeast of Feature B on a paleoearth mound. The feature measures 4.5 m by 1.5 m and consists of a bed of shells and middens which show an encampment. A small portion of the southeast corner of the terrace is faced with flat boulders. Part of the terrace is collapsed. No cultural remains were found at the feature.

The Feature B cave consists of a paleoearth mound. The site is generally square in plan view and measures 8.0 m by 4.0 m E-W. Bones on the site are from rock alignments consisting of loosely arranged middens. Also present is a sand deposit about 5 cm thick. The deposit yielded kauri, bird bone, and charcoal.

SHAPE: 12997
SITE TYPE: Termes
ELEVATION: 710 ft. AMSL
VEGETATION: Various grasses, lichen
CONDITION: Good
INTEGRITY: Uniform
PROBABLE AGE: Prehistoric
FUNCTIONAL INTERPRETATION: Possible habitation
APPROXIMATE SITE AREA: About 1.5 m in diameter
DESCRIPTION: This site occurred on a gentle slope and consists of a depression filled with caves. The arid nature of this site is highly significant. It is possible the site has been naturally formed.

Figure A-8. SITE 12992. VIEW TO SOUTHEAST. (PHI2 Neg.1319-32)
Figure A.9. SITE 12994

SITE TYPE: Terme
ELEVATION: 308 ft AMSL
VEGETATION: Low brush
CONDITION: Fair
INTEGRITY: Unsound
PROBABLE AGE: Probable
FUNCTIONAL INTERPRETATION: Agriculture
DIMENSIONS: 3.0 m x 2.0 m
DESCRIPTION: Site 12994 is a surface site located on the north end of the project area. The site consists of a low mound with a circular depression filled with cobble and cobbles. The depression is about 0.8 m in diameter and has a slightly concave shape. The surface is covered with cobbles and stones. The mound is about 0.5 m high and consists of angular cobbles and small boulders. The mound may contain rocks cleared from an area due to use for agriculture.

The Feature A mound is about 1.5 m in diameter and consists of a low mound with a circular depression filled with cobble and cobbles. The depression is about 0.8 m in diameter and has a slightly concave shape. The surface is covered with cobbles and stones. The mound is about 0.5 m high and consists of angular cobbles and small boulders. The mound may contain rocks cleared from an area due to use for agriculture.

The Feature B mound is a large mound with a circular depression filled with cobble and cobbles. The depression is about 2.0 m in diameter and has a slightly concave shape. The surface is covered with cobbles and stones. The mound is about 1.0 m high and consists of angular cobbles and small boulders. The mound may contain rocks cleared from an area due to use for agriculture.

The Feature C mound is a large mound with a circular depression filled with cobble and cobbles. The depression is about 2.0 m in diameter and has a slightly concave shape. The surface is covered with cobbles and stones. The mound is about 1.0 m high and consists of angular cobbles and small boulders. The mound may contain rocks cleared from an area due to use for agriculture.

The Feature D mound is a large mound with a circular depression filled with cobble and cobbles. The depression is about 1.5 m in diameter and has a slightly concave shape. The surface is covered with cobbles and stones. The mound is about 0.8 m high and consists of angular cobbles and small boulders. The mound may contain rocks cleared from an area due to use for agriculture.
Figure A-10. SITE 13000, FEATURE B, VIEW TO NORTH. (FHRI Neg.1319-11)
The Feature A mound is oval in plan view and consists of three mounds stacked one on top of the other. It measures 3.0 m by 2.0 m by 0.5 m high and consists of a large number of small stones and cobbles. The mound is located on a north-south ridge.

**VEGETATION:** Open grassland.

**CONDITION:** Poorly maintained

**INTEGRITY:** Altered

**PROBABLE AGE:** Probable/Historic

**FUNCTIONAL INTERPRETATION:** Agriculture

**APPROXIMATE SITE AREA:** 100 sq m

**DESCRIPTION:** The mound is oval in plan view and consists of a large number of small stones and cobbles. The mound is located on a north-south ridge.

**SHIP NO:** 13006

**SITE TYPE:** Complex (2)

**ELEVATION:** 300.5 ft

**CONDITION:** Good

**INTEGRITY:** Unaltered

**PROBABLE AGE:** Probable/Historic

**FUNCTIONAL INTERPRETATION:** Agriculture

**APPROXIMATE SITE AREA:** 100 sq m

**DESCRIPTION:** The mound is oval in plan view and consists of a large number of small stones and cobbles. The mound is located on a north-south ridge.

**SHIP NO:** 13007

**SITE TYPE:** Complex (2)

**ELEVATION:** 300.5 ft

**CONDITION:** Good

**INTEGRITY:** Unaltered

**PROBABLE AGE:** Probable/Historic

**FUNCTIONAL INTERPRETATION:** Agriculture

**APPROXIMATE SITE AREA:** 100 sq m

**DESCRIPTION:** The mound is oval in plan view and consists of a large number of small stones and cobbles. The mound is located on a north-south ridge.

**SHIP NO:** 13008

**SITE TYPE:** Complex (2)

**ELEVATION:** 300.5 ft

**CONDITION:** Good

**INTEGRITY:** Unaltered

**PROBABLE AGE:** Probable/Historic

**FUNCTIONAL INTERPRETATION:** Agriculture

**APPROXIMATE SITE AREA:** 100 sq m

**DESCRIPTION:** The mound is oval in plan view and consists of a large number of small stones and cobbles. The mound is located on a north-south ridge.
SHIP NO: 13009  
PIRITEM: SITE NO: T-53  
SITE TYPE: Complex (16)  
ELEVATION: 322-320 ft AMSL  
VEGETATION: Basic, halophytic, sedge grass,  
CONDITION: Fair  
INTEGRITY: Unknown  
PROBABLE AGE: Prehistoric  
FUNCTIONAL INTERPRETATION: Agricultural  
APPROXIMATE SITE AREA: 100.0 ft by 40.0 ft  
DESCRIPTION: Site 13009 is unusual in the larger portion of the project area on a gentle slope. The site consists of a C-shaped mound (Figure A) and 15 mounds (undesignated).  
Figure A is located adjacent to a level area of soil. The feature measures 4.5 by 1.8 by 0.3 m (max.) and consists of roughly packed angular cobbles and a few boulders. Present to the east of the feature is a rock concentration about 1.8 m in diameter. The concentration consists of a single layer of angular cobbles.  
The 15 mounds are scattered over the site; the mounds measure an average of 1.5 m in diameter by 0.3 m in height. Some mounds are collapsed, others are up to four courses high.  
SHIP NO: 12010  
PIRITEM: SITE NO: T-56  
SITE TYPE: Blister  
ELEVATION: 305 ft AMSL  
VEGETATION: Snow grass, briers  
CONDITION: Good  
INTEGRITY: Unknown  
PROBABLE AGE: Prehistoric  
FUNCTIONAL INTERPRETATION: Possible agricul-  
DIMENSIONS: 1.5 m in opening  
DESCRIPTION: Site 13009 is situated downslope of a  
long rock wall. The site consists of a lava bluestone circle in  
plan view. Present on and along the perimeter of the bluestone  
area are boulders. No cultural remains were found at the site.  
SHIP NO: 13013  
PIRITEM: SITE NO: T-35  
SITE TYPE: Complex (3)  
ELEVATION: 345 ft AMSL  
VEGETATION: Forest growth, kashet  
CONDITION: Good  
INTEGRITY: Unknown  
PROBABLE AGE: Possibly historic  
FUNCTIONAL INTERPRETATION: Possible burial  
APPROXIMATE SITE AREA: 6.5 m by 3.0 m  
DESCRIPTION: Site 13013 is situated on a rock wall  
next to the main portion of the rock wall. The site consists of  
several small boulders which retain an inner core of boulders.  
The platform measures about 3.0 m by 3.0 m by 0.8 m in height.  
On the platform, among the stones, are some remains of  
boulders which retain an inner core of boulders. A small  
platform measures about 3.0 m by 3.0 m by 0.8 m in height.  
Figure A is located adjacent to a level area of soil. The feature measures 4.5 by 1.8 by 0.3 m (max.) and consists of roughly packed angular cobbles and a few boulders. Present to the east of the feature is a rock concentration about 1.8 m in diameter. The concentration consists of a single layer of angular cobbles.  
The 15 mounds are scattered over the site; the mounds measure an average of 1.5 m in diameter by 0.3 m in height. Some mounds are collapsed, others are up to four courses high.

Figure A-14. SITE 13006, VIEW TO NORTHEAST. (PHRI Neg.1318-13)
Figure A-15. SITE 13012

Figure A-16. SITE 13013

Figure A-17. SITE 13013

Figure A-18. SITE 13013

Figure A-19. SITE 13013

Figure A-20. SITE 13013

Figure A-21. SITE 13013

Figure A-22. SITE 13013

Figure A-23. SITE 13013

Figure A-24. SITE 13013

Figure A-25. SITE 13013
Figure D is situated about 10.8 m north of Feature A. It measures about 2.5 m long by 1.5 m wide. The feature consists of a single course of aligned irregular small boulders. The boulders touch each other loosely. Feature D may contribute to the northern extent of Feature A.

SHP NO: 13014
SITE TEMP: SITE NO: TDG
SITE TYPE: Complex (5)
ELEVATION: 341.3 ft.-AASHL
VEGETATION: Forest-woodland, birch, pine, black spruce
CONDITION: Poor-Good
INTEGRITY: Altered/Unspecified
PROBABLY AGE: Probable
FUNCTIONAL INTERPRETATION: Agricultural, possible burial, possible marker
APPROXIMATE SITE AREA: 10.8 m NW-SW by 3.0 m SW-NE
DESCRIPTION: Site 13014 is a complex situated in an area of scattered cobbles and small boulders along the shoreline. The site consists of three features (Feature A, D, and E), a filled feature (Feature B), a pond area (Feature C), a cairn (Feature F), and a modified feature (Feature G). The only cultural remains from the site were found as in Feature B (previous).

Feature A occupies an area that covers about 10.8 m by 5.0 m. The feature consists of a cairn, with the cairn consisting of a core of stone, forming a pedestal of a stone which contains a conical portion of the core. The core consists of a stone, forming a pedestal of a stone which contains a conical portion of the core. The core consists of a stone, forming a pedestal of a stone which contains a conical portion of the core.

Feature B is situated about 20.8 m at 184 degrees from Feature A. The feature measures 7.7 m by 4.5 m and consists of a linear feature course of 10.5 ft. Width. The feature consists of a linear feature course of a stone, forming a pedestal of a stone which contains a conical portion of the core. The core consists of a stone, forming a pedestal of a stone which contains a conical portion of the core.

Feature C is situated immediately north of Feature B. The feature measures about 3.8 m by 1.8 m by 0.6 m in height and contains a core of a well-paved cobbled and clinkers. The area is semi-circular in plan view. The feature may represent a burial.

Feature D is situated about 1.5 m north of Feature C. It measures about 4.7 m by 3.0 m and consists of a linear feature course of a stone, forming a pedestal of a stone which contains a conical portion of the core. The feature consists of a linear feature course of a stone, forming a pedestal of a stone which contains a conical portion of the core.

Feature E is situated about 11.5 m from Feature D. The feature is generally rectangular in plan view. It measures about 3.6 m by 3.0 m and consists of a bed of pebbles and cobbles placed between two pebbles. A portion of the northern side of the surface is marked.

The Feature F is situated about 11.5 m southeast of Feature E. The core measures about 1.2 m by 1.1 m by 0.3 m high. The surface is covered with a covering of pebbles and cobbles. The covering is C-shaped and consists of pebbles and cobbles which range from 0.0 m to 0.3 m in height. The covering forms a circular structure which contains a conical portion of the core. The core consists of a stone, forming a pedestal of a stone which contains a conical portion of the core.

Feature G is situated about 15.0 m south-southwest of Feature D. The feature measures 10.0 m by 9.0 m by 0.5 ft. The feature consists of an escarpment and a conical portion of the core. The escarpment forms a circular structure which contains a conical portion of the core. The core consists of a stone, forming a pedestal of a stone which contains a conical portion of the core.

Feature H is situated about 20.0 m north-southwest of Feature E. The feature measures 10.0 m by 10.0 m by 0.5 ft. The feature consists of a bed of pebbles and cobbles placed between two pebbles. A portion of the northern side of the surface is marked.

Feature I is situated about 15.0 m north-southwest of Feature H. The feature measures 15.0 m by 15.0 m by 0.5 ft. The feature consists of an escarpment and a conical portion of the core. The escarpment forms a circular structure which contains a conical portion of the core. The core consists of a stone, forming a pedestal of a stone which contains a conical portion of the core.
Figure A-17. SITE 13019. VIEW TO EAST. (PHRI Neg. 1317-19)
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<td>Located in a gravel pit on the southeast of the EELAN.</td>
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<td>43.6 m by 31.2 m</td>
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**Figure A-19. SITE 13204**
Figure A-1 is a site consisting of paleochoke cobbles and low-lying shell piled. A highwater has flattened the site on the east end. There is a scatter of marine shell (bivalve, quahog), and some still associated in fields of the paleochoke along the cliffs.

Figure A-2 is a paleochoke excavation. Paleochurch blocks are piled in a line (0.6 m long) around the site. Nearby is a curved alignment of rocks which may be related to the feature. No cultural remains were observed at the feature.

**SHIP NO. 1323**
**SITE NO.: T-75**
**SITE TYPE:** Paleochoke excavation
**ELEVATION:** 171.6 AMSL
**VEGETATION:** Xerophytic, fleshy, bunch grass, saxifrage
**CONDITION:** Good
**INTEGRITY:** Unaltered
**PROBABLE AGE:** Prehistoric/Historic
**FUNCTIONAL INTERPRETATION:** Agriculture
**APPROXIMATE SITE DIMENSIONS:** 20.0 m by 30.0 m
**DESCRIPTION:** This site is located on a small west-facing paleochoke slope, five feet from the edge. The excavation has been piled around it on all sides. No cultural remains were found at the site.

**SHIP NO. 1328**
**SITE NO.: T-75**
**SITE TYPE:** Complex (4)
**ELEVATION:** 171.6 AMSL
**VEGETATION:** Xerophytic, fleshy, bunch grass, saxifrage
**CONDITION:** Good
**INTEGRITY:** Unaltered
**PROBABLE AGE:** Prehistoric/Historic
**FUNCTIONAL INTERPRETATION:** Agriculture
**APPROXIMATE SITE DIMENSIONS:** 40.0 m by 60.0 m
**DESCRIPTION:** This site is located on a small west-facing paleochoke slope, five feet from the edge. The excavation has been piled around it on all sides. No cultural remains were found at the site.

**SHIP NO. 1329**
**SITE NO.: T-77**
**SITE TYPE:** Paleochoke excavation
**ELEVATION:** 106.0 AMSL
**VEGETATION:** Xerophytic, fleshy, bunch grass, saxifrage
**CONDITION:** Fair
**INTEGRITY:** Mostly unaltered; portions bulldozed
**PROBABLE AGE:** Prehistoric/Historic
**FUNCTIONAL INTERPRETATION:** Quarries
**APPROXIMATE SITE DIMENSIONS:** 55.0 m by 40.0 m
**DESCRIPTION:** This site is located on a paleochoke slope that drops gently to the southwest. The excavation consists of a long and two short areas. One of the short areas opens into a small flat, 2 - 3 m in area, and is cut into a rock cliff. The area is about 10 m by 15 m. A 14 inch deposit of fine brown soil is visible. No cultural deposits were found in the soil.

**SHIP NO. 1330**
**SITE NO.: T-78**
**SITE TYPE:** Complex (4)
**ELEVATION:** 106.0 AMSL
**VEGETATION:** Xerophytic, fleshy, bunch grass, saxifrage
**CONDITION:** Good
**INTEGRITY:** Unaltered
**PROBABLE AGE:** Prehistoric/Historic
**FUNCTIONAL INTERPRETATION:** Farming/-agriculture
**APPROXIMATE SITE AREA:** 1.0 m by 1.0 m E-W
**DESCRIPTION:** This site is located on a small west-facing paleochoke slope, five feet from the edge. The excavation has been piled around it on all sides. No cultural remains were found at the site.

**SHIP NO. 1331**
**SITE NO.: T-79**
**SITE TYPE:** Complex (4)
**ELEVATION:** 171.6 AMSL
**VEGETATION:** Xerophytic, fleshy, bunch grass, saxifrage
**CONDITION:** Fair
**INTEGRITY:** Unaltered
**PROBABLE AGE:** Prehistoric/Historic
**FUNCTIONAL INTERPRETATION:** Temp. habitation
**APPROXIMATE SITE DIMENSIONS:** 10.0 m by 11.4 m
**DESCRIPTION:** This excavation is located on a small west-facing paleochoke slope, five feet from the edge. The excavation has been piled around it on all sides. No cultural remains were found at the site.

**SHIP NO. 1332**
**SITE NO.: T-77**
**SITE TYPE:** Paleochoke excavation
**ELEVATION:** 106.0 AMSL
**VEGETATION:** Xerophytic, fleshy, bunch grass, saxifrage
**CONDITION:** Fair
**INTEGRITY:** Unaltered
**PROBABLE AGE:** Prehistoric/Historic
**FUNCTIONAL INTERPRETATION:** Agriculture
**APPROXIMATE SITE DIMENSIONS:** 10.0 m by 11.4 m
**DESCRIPTION:** This excavation is located on a small west-facing paleochoke slope, five feet from the edge. The excavation has been piled around it on all sides. No cultural remains were found at the site.
High. On the west inner corner is a 1.20 m opening in the wall. The opening is 0.75 m deep. The west wall is 1.50 m wide and is one to five courses high with a possible exterior 0.80 m wide on the south edge. The concrete base is 30 cm thick with a smooth finish. A small waterway was found in the concrete. The wall is four to five courses high, 0.70 to 1.00 m wide, and may also have been found on the concrete. There is a pale water仙, 1.0 m from the north wall, and possibly another 0.50 m below the concrete. Cultural remains at the site include the 0.30 m waterway base and 0.01 m by 0.01 m waterway vestigial base restricted found in the enclosure in its unique position.

**SHIP NO. 1109**
**SITE NO.: T46**
**SITE TYPE: Palaeohabitation**
**ELEVATION: 117.4 AMSL**
**VEGETATION: Kahili, bunch grass, cacti, lichen**
**CONDITION: Good**
**INTEGRITY: Unplowed**
**PROBABLE AGE: Palaeohabitation**
**FUNCTIONAL INTERPRETATION: Temp habitation**
**APPROXIMATE SITE DIMENSIONS: 2.50 m by 3.0 m high**
**DESCRIPTION:** Located on an inland palaeohabitation that is a small site, consisting of a small rock overhang on the side of a slope. The overhang is built on a palaeohabitation, and has a gradual slope in the back of it. A raised rock overhang on the floor yielded high net, charcoal, and marine shell remains. Elsewhere within the overhang, a golf ball was found.

**SHIP NO. 1123**
**SITE NO.: T42**
**SITE TYPE: Wall**
**ELEVATION: 117.4 AMSL**
**VEGETATION: Kahili, bunch grass, vines**
**CONDITION: Fair**
**INTEGRITY: Unplowed**
**PROBABLE AGE: Palaeohabitation**
**FUNCTIONAL INTERPRETATION: Indeterminate**
**APPROXIMATE SITE DIMENSIONS: 1.50 m by 1.50 m**
**DESCRIPTION:** Located on a southeast slope. This site is located on a section of relatively steeply sloping palaeohabitation. The site consists of a wall that was north-westerly for 1.5 m, followed northwards and continues for another 3.0 m. The wall is 1.5 m high, built with a mound and effect. It is possible that wall that has collapsed. Built with large boulders on the lower side, it is deformed with smaller boulders. It may have been built to prevent and on the side of the hill, but its function is indeterminate. No cultural remains were observed at the site.

**SHIP NO. 1131**
**SITE NO.: T77**
**SITE TYPE: Complex (4 Features)**
**ELEVATION: 115.6 AMSL**
**VEGETATION: Kahili, bunch grass, and bunch grass**
**CONDITION: Good**
**INTEGRITY: Unplowed**
**PROBABLE AGE: Palaeohabitation**
**FUNCTIONAL INTERPRETATION: Possible fuel**
**APPROXIMATE SITE DIMENSIONS: 40.0 m by 5.0 m**
**DESCRIPTION:** The site consists of four platforms. There are two platforms in Feature A and one each in Features B and C. Two marine shell fragments were observed in Feature A.

**Feature A** consists of two adjacent platforms measuring 14.00 m by 7.00 m by 1.50 m in maximum height. They are located on up a slope on the northwest corner of the site, and consist of small bunch grass and medium to large boulders. The north platform is roughly rectangular with a slightly flat and level surface, and is found on the 117.4, 117.7, and 118.5 sites. The south platform is slightly less defined and is found on the 117.7, 117.8, and 118.5 sites. The faces are three to six courses high (0.40 m to 1.25 m). The south and southwest sides are built against the second palace of the masonry. The dimensions are 3.5 m by 5.5 m by 3.5 m. The south platform is also roughly rectangular and is about 0.50 m lower on the masonry than the north platform. The surface is paved with large boulders and cobbles. The structure is found on the 117.7, 117.8, and 118.5 sides with small boulders from two to four courses high (0.50 m to 1.50 m). The dimensions are 3.0 m by 3.0 m by 3.0 m E-W. Two pieces of marine shell were found on this feature.

**Feature B** measures 6.50 m by 4.00 m by 1.50 m in maximum height. This D-shaped platform is located c. 20 m from Feature A and 223 degrees east. It consists of palaeohabitation and boulders. The south and west sides of the platform are faced, and range in height from 1.5 m at the west end to 0.5 m at the south end. The south side shows a relatively vertical brickwork face and has an average height of 0.90 m.

**Feature C** measures 5.00 m by 5.00 m by 1.50 m in maximum height. This D-shaped platform is located 12.5 m from Feature A and 223 degrees east. It consists of palaeohabitation and boulders. The south, north, and east sides of the platform are faced, and the western, southern, and a nearly vertical brickwork face. The south side ranges in height from 1.5 m to 0.75 m, and the west side ranges from 0.1 m to 0.5 m. A small rectangular depression 0.50 m by 0.40 m is located at the eastern end of the platform.
LIMITED HISTORICAL DOCUMENTARY RESEARCH
ARCHAEOLOGICAL INVENTORY SURVEY, HONOKAUA INDUSTRIAL PARK (PARCEL YII)
by Harold Wash Shigeta, A.I.

Hokua (formerly, "Hawke's Bay"). It is also known as Hokua on the Hanalei and Hauula sites. Although many archeological surveys have been conducted in Hokua, none have been completed in this area. For this reason, an extensive survey on this site is not given here. Some of the results of these surveys are presented to reflect possible similarities with Hokua.

Prehistoric references specific to Hokua are lacking. Of the Kona area in general, Handy and Handy offer the following:

The most intriguing mythological and legendary material relating to Kona are those of the old and even more anciently with Lono. The story of the origin of the Makahiki cycle has a strong undercurrent of Lono. Hawaiian legends tell us that Lono was a fisherman and that his story is often told by the elders, who relate it as a story of the ancient past. The legends of Lono's adventures are said to have occurred before men populated the earth. The legends, however, have been transmitted orally, and the details of their actual occurrence are uncertain. They are said to have been passed down to the people of Kona, Waimea, and Kealakekua by their ancestors. The legends recount the adventures of Lono, the god of the sea, as he traveled throughout the Hawaiian Islands, performing various acts of kindness and performing miracles. These legends are an important part of Hawaiian culture and are told to this day by the older generation.

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Today, the legends are passed down from generation to generation, often told by the older generation to the younger generation. The stories of Lono's adventures are a vital part of Hawaiian culture, and they continue to be told and passed down to future generations.

In their report on the Hokua area, Handy and Handy write:

The Hokua area, known as the site of the ancient fishponds, was once a place of great significance. The legends of Lono's adventures are said to have occurred before men populated the earth. The legends, however, have been transmitted orally, and the details of their actual occurrence are uncertain. They are said to have been passed down to the people of Kona, Waimea, and Kealakekua by their ancestors. The legends recount the adventures of Lono, the god of the sea, as he traveled throughout the Hawaiian Islands, performing various acts of kindness and performing miracles. These legends are an important part of Hawaiian culture and are told to this day by the older generation.
The two principal rooms were rectangular in shape, the larger one being 12 feet by 21 feet. The floors were covered with mats and the walls were covered with white paper. The rooms were well supplied with furniture, including a large sofa, two chairs, a table, and various other articles. The ceilings were high and the light was good. The rooms were well ventilated and the air was fresh. The houses were well built and the walls were thick, providing good insulation against the heat of the sun. The houses were surrounded by a garden, which contained a variety of plants and flowers. The garden was well tended and provided a pleasant and peaceful setting. The people were friendly and welcoming, and the entire experience was pleasant and enjoyable.
REFERENCES CITED

Board of Commissioners
1929 Indices of Visti made by the Board of Commissioners to Other Land Titles in the Hawaiian Islands. Honolulu.

Ching, F.W., and P.H. Rosenfeld

Clark, J.R.K.

Ena, W.

Emery, K.P. and L.J. Secker

Handy, E.S.C., and E.G. Handy

Ka Haka u Hawaii
1926 IN Emery and Secker

Kamakau, S.M.

Kasprzak, J.E.

Shiva, C.L.

Secker, L.J.
Table 2.
SUMMARY OF IDENTIFIED SITES AND FEATURES

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* State Inventory of Historic Places (SHIP) numbers. SHIP numbers are five-digit numbers prefixed by 50-10-02 (Hilo Islands of Hawaii; Island of Hawaii; 3419035 7.5 minute quad map ["Kahului Pt., Hawaii"]).

** Cultural Resources Management Value Mode Assessment —Nature: R = scientific research, I = interpretive, C = cultural, H = historical, M = moderate, L = low
—Field Work Task: DR = detailed recording (mapped drawings, photographs, and written descriptions), SC = surface collections, EX = limited excavation

**Number of component features within complex.
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<tr>
<td>13047</td>
<td>Terracing</td>
<td>Pass. habitation/ agriculture/burial</td>
<td>M</td>
<td>L</td>
<td>H</td>
<td>+</td>
</tr>
<tr>
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<td>Agriculture/ indomestic</td>
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<td>L</td>
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<td>+</td>
</tr>
<tr>
<td>-</td>
<td>Mod. ex.</td>
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</tr>
<tr>
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APPENDIX C

TRAFFIC IMPACT ASSESSMENT
WILBUR SMITH ASSOCIATES
HONOKOHAU INDUSTRIAL PARK
TRAFFIC IMPACT STUDY

Honokohau, North Kona, Island of Hawaii

Prepared for:

HELBER, HASTERT & KIMURA PLANNERS

By:

WILBUR SMITH ASSOCIATES

January 1990
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SUMMARY

The Honokohau Industrial Park is proposed for development on the 89.5 acre Robert S. McLean Trust Property located approximately 2.25 miles north of Kailua, in the North Kona district of Hawaii County. The property is located approximately 1,000 feet mauka of Queen Kaahumanu Highway.

Development of the property is proposed in two increments:

- Increment I is the makai 45.5-acre portion of the project site and is proposed for development with various industrial and service uses over the next five years, and
- Increment II is the mauka 44-acre portion, which is proposed for development with general light industrial and service uses over a longer time frame of 10 years or more beyond Increment I.

Existing Conditions

About 19.5 acres of the project site is occupied by a quarry operation, concrete plant, and storage areas. A two-lane paved roadway provides access from Queen Kaahumanu Highway to these activities, with the access road approach to Queen Kaahumanu Highway controlled by a stop sign. This intersection is located approximately 800 feet north of the Kealakehe Parkway intersection with Queen Kaahumanu Highway.

Queen Kaahumanu Highway is a two-lane State arterial roadway. It is a limited access roadway, with all cross street and driveway approaches between Kailua and Keahole Airport currently controlled by stop signs.

The most recent State Department of Transportation machine count on Queen Kaahumanu Highway made at Kealakehe Parkway on May 9-10, 1988, recorded about 11,000 vehicles per day. Current peak hour volumes, based on a count made by Wilbur Smith Associates on January 11, 1990, total about 1,000 vehicles in the 7:00 to 8:00 AM morning commute period and 1,300 vehicles in the 3:15 to 4:15 PM afternoon peak period.

At present, an estimated 150 vehicles use the project site access road on a weekday. Approximately 40 to 45 vehicles use the access road during the morning and afternoon peak hours.

The traffic volumes and 45 miles per hour speed limit along Queen Kaahumanu Highway limit the number of gaps available for traffic turning left out of the project site access road, which
results in delays for these vehicles. An analysis was made of the conditions for vehicles turning left from the access road using the methodology in the Highway Capacity Manual, which rates the expected delays for vehicles exiting from a stop sign-controlled roadway between Level of Service "A" (little delay) to "F" (extreme delay merit ing mitigative actions). This analysis indicates that the traffic exiting the access road experiences Level of Service "D" (long delays) during morning and evening peak hours.

1995 Conditions Without the Project

Traffic volumes are expected to significantly increase in the area without the Honokohau Industrial Park project. Peak hour volumes for 1995 were estimated to include:

- Traffic volumes along Queen Kaahumanu Highway and Kealakahe Parkway were increased from 11.2 and 12 percent per year, respectively, to reflect a continuation of these roadways' general traffic growth rates in recent years;

- Traffic from the Isemoto/SJA/Taylor project, planned for the 10-acre property between the Honokohau Industrial Park site and Queen Kaahumanu Highway, was added to the project site access road and to Queen Kaahumanu Highway; and

- Traffic from the initial 350-house increment of the State's Kealakahe housing project was added to area roadways.

The following assumptions were made for area roadways:

- No changes would be made to the project access road.

- The Kealakahe Parkway extension mauka to the State housing project would be built as a two-lane road by 1995.

- Separate left-turn and right-turn lanes would be added to all approaches of the intersection of Queen Kaahumanu Highway and Kealakahe Parkway.

- The State plans to widen Queen Kaahumanu Highway to four lanes with a divider median area, which could occur by 1995. The analysis considered conditions both with the existing two lanes and with planned four lanes.

The principal findings from the traffic analysis of 1995 conditions without the proposed project are as follows:

1. Peak hour traffic volumes on Queen Kaahumanu Highway would increase by about 78 percent above existing volumes at the project site access road, with an estimated two-way total
volume of 1,765 and 2,335 vehicles in the morning and afternoon peak hours respectively.

2. Volumes on the project access road would increase to 76 and 81 vehicles during the morning and afternoon peak hours, respectively.

3. Vehicles turning left from the project access road would experience increased delays, with Level of Service "E" and "F" conditions in the morning and afternoon peak hours, respectively.

4. Vehicles turning left from Kealakehe Parkway would experience Level of Service "F" conditions in both peak periods.

5. Traffic conditions on cross streets along this section of Queen Kaahumanu Highway would warrant installation of traffic signals or construction of a grade separation at Kealakehe Parkway.

6. If a traffic signal is installed at the intersection of Queen Kaahumanu Highway and Kealakehe Parkway, the estimated ratio of traffic volumes to the intersection capacity is as follows:

<table>
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<th>Width of Queen Kaahumanu Highway</th>
<th>Morning Peak Hour</th>
<th>Afternoon Peak Hour</th>
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<tr>
<td>2 lanes</td>
<td>.79</td>
<td>1.18</td>
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<tr>
<td>4 lanes</td>
<td>.51</td>
<td>.72</td>
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Afternoon peak hour volumes would exceed the intersection capacity if Queen Kaahumanu Highway remains two lanes.

1995 Conditions with Increment I

The makai 45.5-acre initial increment of the Honokohau Industrial Park is estimated to generate a total of 2,285 weekday vehicle trips to or from the planned uses, when fully developed in 1995. The development would increase traffic volumes entering/exiting the project access road by 234 and 246 vehicles during the morning and afternoon peak hours, respectively.

Approximately 70 percent of the project traffic estimated to travel to/from the Kailua direction, with the remainder travelling to/from the Keahole direction. The resultant
increases in peak hour traffic on Queen Kaahumanu Highway at the project access road would be:

<table>
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<th>North of Site</th>
<th>South of Site</th>
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<td>Morning Peak Hour</td>
<td>4.2%</td>
<td>9.1%</td>
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<td>Afternoon Peak Hour</td>
<td>3.3%</td>
<td>7.3%</td>
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Traffic turning left from the project access road would experience delays equivalent to Level of Service "F" conditions during both peak periods, which would warrant mitigative actions.

If the State installs a traffic signal at the Kealakahe Parkway intersection, it would likely increase gaps in traffic flow on Queen Kaahumanu Highway at the project site access road and temporarily improve exiting conditions. The State would be expected to deny any installation of a traffic signal at the project access road intersection due to its closeness to the Kealakahe Parkway intersection.

In 1995, the traffic turning left to travel south from the project site on Queen Kaahumanu Highway would likely have to be accommodated through a road connection to Kealakahe Parkway, and the use of the traffic signal or grade-separation at its intersection with Queen Kaahumanu Highway. Therefore, the following measures are proposed:

1. Initially, permit left-turns to be made both into and out of the project access roadway at Queen Kaahumanu Highway. Construct a left-turn storage lane on Queen Kaahumanu Highway for southbound vehicles turning into the project access road.

2. When the mauka extension of Kealakahe Parkway is constructed, construct a frontage road or direct roadway connection from the project access road to Kealakahe Parkway for use by exiting southbound project traffic.

3. Upon completion of item 2, provide signing and channelize the access road intersection with Queen Kaahumanu Highway to prohibit left turns from the access road. Continue to permit left turns into the access road, and both right turns into and out of the access road.

Impact of the project on the volume-to-capacity ratios for a signal-controlled intersection of Queen Kaahumanu Highway and Kealakahe Parkway is as follows:
Volume-to-Capacity Ratio

<table>
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<tr>
<th></th>
<th>Morning Peak Hour</th>
<th>Afternoon Peak Hour</th>
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<tr>
<td>A. Without New Project Access Road to Kealakehe Parkway:</td>
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<tr>
<td>2-Lane Queen Kaahumanu Hwy</td>
<td>.81</td>
<td>1.26</td>
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<td>4-Lane Queen Kaahumanu Hwy</td>
<td>.52</td>
<td>.76</td>
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<td>B. With New Project Access Road to Kealakehe Parkway:</td>
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<tr>
<td>2-Lane Queen Kaahumanu Hwy</td>
<td>.80</td>
<td>1.26</td>
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<tr>
<td>4-Lane Queen Kaahumanu Hwy</td>
<td>.54</td>
<td>.82</td>
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Assessment of Increment II

Development of the 44-acre Increment II area as a light industrial park would generate about 2,750 vehicle trips to or from the project on a typical weekday. Approximately 500 vehicle trips would be generated in the morning and afternoon peak hours. Development of a large portion of the area with retail-type uses, such as home improvement centers, could significantly increase vehicle traffic above these levels.

The location of the Increment II area, and the volume of trips generated, indicate that this area should be directly connected by access road to Kealakehe Parkway and/or to future north-south roadways mauka of Queen Kaahumanu Highway.
INTRODUCTION

The Honokohau Industrial Park is proposed for development on an 89.5-acre site in the North Kona District of Hawaii County. The site, owned by the Robert S. McLean Trust, is located mauka of the Queen Kaahumanu Highway approximately 2.25 miles north of Kailua (Figure 1). At present, a quarry operation, concrete batch plant, and storage areas are located within the project site.

The project area is proposed for development in two increments:

Increment I: This 45.5-acre makai portion of the site is proposed for initial development, which will likely extend over a five-year period. A mix of construction-related, storage, and automotive sales/repair uses have been identified for this 45.5-acre portion.

Increment II: This 44-acre mauka portion would be developed following completion of the Increment I area, with development extending an additional 10 or more years into the future. This area will likely be developed with light industrial uses, and may include services and retail activities.

This study assesses the access needs for the Increment I development, and analyzes its traffic impacts on the adjacent segment of Queen Kaahumanu Highway. For Increment II, this study estimates potential traffic generation and general access needs.
EXISTING CONDITIONS

The 89.5-acre site for the proposed Honokohau Industrial Park is located approximately 1,000 feet mauka of Queen Kaahumanu Highway in the Honokohau ahupua'a. The project site is approximately 900 feet in width and extends mauka for about 4,000 feet.

Existing uses on the site include a quarry, West Hawaii Concrete batch plant, a boat storage area, and construction-related storage, repair and office areas. These activities occupy approximately 19.5 acres located in the Increment I area of the site, while the remaining area is vacant. A single access road connects these activities to Queen Kaahumanu Highway.

The 10-acre Isemoto/SJA/Taylor property is located along the south side of the access road between the project site and Queen Kaahumanu Highway. This area presently contains several open storage areas for construction equipment and materials. The area north of the access road is a vacant portion of the Lanihau Corporation property.

The Honokohau Small Boat Harbor is located makai of Queen Kaahumanu Highway near the project site.

Existing Roadways

Queen Kaahumanu Highway is the major State highway connecting the Kailua area to the Keahole Airport, South Kohala resort areas, and Kawaihae area, and provides access to the properties along the coastal area of North Kona. It is a limited access highway designed for 70 miles per hour speeds. The highway is located within a 300-foot wide right-of-way through the project vicinity, except for a 80-foot wide segment south of the project access road. The highway provides one travel lane in each direction with a broad 6 to 10-foot wide paved shoulder area on each side.

The project access road is approximately 20-foot wide with unimproved shoulder areas. Along Queen Kaahumanu Highway, a 250-foot long taper section is provided both north and south of the access road to minimize disruption from the deceleration and acceleration of northbound vehicles turning to/from the access road. The access road approach is controlled by a stop sign.

The only nearby intersection along Queen Kaahumanu Highway is at Kealakehe Parkway, which is located about 800 feet south of the project site access road. Kealakehe Parkway is a two-lane roadway which provides access to the Honokohau Small Boat Harbor area. The Kealakehe Parkway approach is stop-sign controlled at its "tee"-type intersection with Queen Kaahumanu Highway.
The speed limit along this section of Queen Kaahumanu Highway is 45 miles per hour.

Existing Traffic Volumes

The State Department of Transportation (State DOT) conducts a 24-hour machine traffic count on a biennial basis at the Queen Kaahumanu Highway – Kealakehe Parkway intersection. The most recent count was made May 9–10, 1988 (Monday – Tuesday).

The 1988 State DOT count recorded a 24-hour volume of 11,135 vehicles, total for both directions, on Queen Kaahumanu Highway just north of Kealakehe Parkway, and 12,249 vehicles south of the Parkway. The two-way volume on the Kealakehe Parkway was 3,092 vehicles. The highest one-hour traffic period on Queen Kaahumanu Highway was 3:15 to 4:15 p.m. with 1,016 vehicles. The highest morning one-hour period occurred from 11:00 a.m. to 12:00 noon, with 922 vehicles. However, this study uses the 7:00 to 8:00 a.m. period as the "morning peak hour" for analysis purposes since the planned project uses would generate much higher volumes during the earlier morning commute hour. The 1988 volume for the 7:00 – 8:00 a.m. period was 781 vehicles, or 93.5 percent of the 11:00 a.m. – noon volume.

Wilbur Smith Associates made manual traffic counts along Queen Kaahumanu Highway near the project site during peak traffic periods on January 11, 1990. The resultant morning and afternoon peak commute hour volumes are depicted in Figure 2.

During the afternoon peak hour, traffic on Queen Kaahumanu Highway approximated 800 vehicles southbound towards Kailua and 500 vehicles northbound towards Keahole Airport. During the 7:00 to 8:00 a.m. period, volumes amounted to about 500 vehicles in each direction.

Current peak hour volumes on the project site access road are very low with total two-way volumes of about 40 to 45 vehicles during each peak hour period.

Current Traffic Conditions

An analysis was made of the project site access road conditions at the intersection with Queen Kaahumanu Highway. The analysis was made in accordance with the methodology prescribed for stop-sign controlled intersections in the Highway Capacity Manual.\(^1\) This procedure assesses the relative ease/difficulty

or delay involved in making the key left-turn and right-turn movements at an intersection. The relative delays for vehicles making these movements are described as Levels of Service "A" (little delay) to "F" (extreme delay), as described in Appendix A.

For the January 1990 traffic, the analysis indicates that the left-turn movement from the site access road onto Queen Kaahumanu Highway operates at Level of Service "D" (long delays) for both morning and afternoon peak periods. The right-turn movement out of the access road and the left-turn from southbound Queen Kaahumanu Highway into the site access road both operate at Level of Service "A".
1995 TRAFFIC CONDITIONS
WITHOUT HONOKOHU INDUSTRIAL PARK

Full development of Increment I portion of the project is expected to occur by 1995. Therefore, early 1995 is used as the time point for forecasting future area traffic volumes and conditions both with and without the Increment I development. Future 1995 conditions without Honokohau Industrial Park are presented as a base from which to identify the impacts of the proposed project.

Land Use Assumptions

The effects of additional developments and increased activity levels on 1995 area traffic volumes is reflected by the use of general growth factors, with the exception of traffic generated by two nearby projects: 1) the Isemoto/SJA/Taylor property, and 2) the State's Kealakehe housing project. The traffic forecasts reflect the following level of development by 1995:

1. Isemoto/SJA/Taylor Property - All 10 acres are assumed to be developed by 1995, including general contracting, trucking/hauling, and automotive service uses. Access to this property would continue via the existing shared access road with the McClean property.

2. State Kealakehe Housing Project - The State is currently planning an initial increment of 350 houses and new access road for the area mauka of Queen Kaahumanu Highway, which are included in the 1995 traffic estimates.

Anticipated Roadway Modifications

The State DOT is currently planning to widen Queen Kaahumanu Highway to a four-lane highway with divider median, and would like to have the widening underway before 1995. The timing of the widening of the Kailua-to-Kahole Airport section will largely be dependant upon State Legislature approval of funds for the widening project, as well as the resolution of what type facility and degree of access control should be provided in this developing area. For the purpose of this traffic impact study, conditions are considered both with a two-lane and with a four-lane roadway in 1995.
The State plans to extend the Kealakehe Parkway mauka of Queen Kaahumanu to serve its planned Kealakehe housing project. Eventually, this roadway would be extended mauka beyond the housing project to connect with Palani Road and the Hawaii Belt Road. Kealakehe Parkway would then function as an arterial roadway. For 1995, this study assumes that Kealakehe Parkway extends mauka as far as the housing project as a two-lane roadway.

The State DOT is preparing to add a left-turn storage lane on northbound Queen Kaahumanu Highway at the Kealakehe Parkway intersection. This study assumes that left-turn and right-turn lanes will be available on all four legs of this intersection, once the mauka extension of Kealakehe Parkway is constructed.

The intersection of the project site access road with Queen Kaahumanu Highway is assumed to remain unchanged from the existing layout.

1995 Traffic Without the Project

Queen Kaahumanu Highway has experienced large increases in traffic in recent years. The counts made by the State DOT on Queen Kaahumanu Highway at Kealakehe Parkway indicate an average increase in weekday traffic volumes of 8.2 percent per year from 1978 to 1984, and 11.2 percent per year from 1984 to 1988. Traffic on Kealakehe Parkway has increased by 12.0 percent per year between 1984 and 1988.

For this study, traffic was assumed to continue to increase by 11.2 and 12.0 percent per year on Queen Kaahumanu Highway and Kealakehe Parkway, respectively, from 1990 to 1995 as a result of general growth in the North Kona area. This would result in a 70 and 76 percent increase in traffic on these two roadways by 1995.

Also, traffic estimated for the Isemoto/SJA/Taylor project and the initial 350-house increment of the State Kealakehe housing project was added to the projected traffic volumes. Traffic estimates for the Isemoto project were obtained from the Isemoto/SJA Partnership Subdivision Environmental Impact Statement, dated August, 1988 and prepared by Helber, Hastert & Kimura, Planners. Traffic for the State housing project was estimated using standard trip generation rates(2) for single-family housing. Trips estimated for these two projects are:

---

<table>
<thead>
<tr>
<th>Project</th>
<th>MORNING PEAK HOUR</th>
<th>AFTERNOON PEAK HOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To Project</td>
<td>From Project</td>
</tr>
<tr>
<td>Isemoto/SJA/</td>
<td>23</td>
<td>13</td>
</tr>
<tr>
<td>Taylor</td>
<td>74</td>
<td>193</td>
</tr>
</tbody>
</table>

The resultant estimates of 1995 peak hour traffic in the vicinity of the project site, without the Honokohau Industrial Park development, are depicted in Figure 3. The combined increase from general corridor growth and the two nearby projects results in estimated traffic increases of 77 to 78 percent on Queen Kaahumanu Highway.

1995 Traffic Conditions Without the Project

The large increase in through traffic on Queen Kaahumanu Highway will reduce the gaps available for traffic turning left from cross streets and driveways in the area. The reduced gaps, plus increases in the number of vehicles turning left, would result in lengthy delays for vehicles turning left onto Queen Kaahumanu Highway. Estimated levels of service for these left-turn movements with existing stop sign controls, are:

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>MORNING PEAK HOUR</th>
<th>AFTERNOON PEAK HOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Site Access Road</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>Kealakahe Parkway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Makai Approach</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Mauka Approach</td>
<td>F</td>
<td>F</td>
</tr>
</tbody>
</table>

The severe delays at Kealakahe Parkway would occur whether Queen Kaahumanu Highway remains two lanes or has been widened to four lanes, and would warrant modifications to improve access onto Queen Kaahumanu Highway. Such modifications could include installation of a traffic signal at the intersection, or construction of a grade separation. Within the 1995 time frame, it is likely that installation of a traffic signal would be the method used to improve access onto Queen Kaahumanu Highway.

The quality of service at a traffic signal-controlled intersection is determined by the capacity and conflicting traffic volumes at the intersection. A level of service concept is the standard means of describing traffic conditions associated with various ranges of volume-to-capacity ratios, which indicate the proportion of an intersection's capacity that is being used by observed or estimated traffic volumes. The six levels of service (A through F) used to describe travel conditions at a
traffic signal-controlled intersection and the range of volume-to-capacity ratios for each are described in Figure 4.

The volume-to-capacity ratios for the Queen Kaahumanu Highway-Kealakahe Street intersection were estimated using the "planning analysis" methodology as described in the 1985 Highway Capacity Manual.(3) The analysis, summarized in the table below, indicates that estimated afternoon peak hour volumes would exceed the intersection capacity if Queen Kaahumanu remains two lanes in 1995.

<table>
<thead>
<tr>
<th>NUMBER THROUGH LANES ON QUEEN KAHAUMANU HIGHWAY</th>
<th>MORNING PEAK HOUR</th>
<th>AFTERNOON PEAK HOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Volume to Capacity Ratio</td>
<td>Level of Service</td>
</tr>
<tr>
<td>Two Lanes</td>
<td>.79</td>
<td>C</td>
</tr>
<tr>
<td>Four Lanes</td>
<td>.51</td>
<td>A</td>
</tr>
</tbody>
</table>

LEVEL OF SERVICE "A" - V/C = 0 TO 0.60
Describes operations with very low delay, i.e., less than 5 seconds per vehicle. This occurs when signal progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all.

LEVEL OF SERVICE "B" - V/C = 0.61 TO 0.70
Describes operations with delays in the range of 5 to 15 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS "A", causing higher levels of average delay.

LEVEL OF SERVICE "C" - V/C = 0.71 TO 0.80
Describes operation with delay in the range of 15 to 25 seconds per vehicle. Occasionally vehicles may wait more than one red signal phase. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

LEVEL OF SERVICE "D" - V/C = 0.81 TO 0.90
Describes operations with delay in the range of 25 to 40 seconds per vehicle. At LOS "D", the influence of congestion becomes more noticeable. Many vehicles stop, and the proportion of vehicles not stopping declines. Noticeable numbers of vehicles fail to clear signal during the first green phase.

LEVEL OF SERVICE "E" - V/C = 0.91 TO 1.00
Describes operations with delay in the range of 40 to 60 seconds per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Vehicles frequently fail to clear the signal during the first green phase.

LEVEL OF SERVICE "F" - V/C GREATER THAN 1.00
Describes operations with delay in excess of 60 seconds per vehicle. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection.

1995 TRAFFIC CONDITIONS
WITH HONOKOAU INDUSTRIAL PARK INCREMENT I

The 45.5-acre Increment I area of the Honokohau Industrial Park is expected to be developed and occupied by 1995. Access to the expanded development area would be provided by extension of the existing access road mauka to serve the new activities. The Increment I area is expected to contain the following uses:

<table>
<thead>
<tr>
<th>Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete Plant Area</td>
<td>4.0</td>
</tr>
<tr>
<td>Expanded Quarry</td>
<td>7.0</td>
</tr>
<tr>
<td>Equipment and Vehicle Storage</td>
<td>3.0</td>
</tr>
<tr>
<td>Office and Contractor Storage</td>
<td>3.0</td>
</tr>
<tr>
<td>Boat Storage/Repair</td>
<td>5.0</td>
</tr>
<tr>
<td>Self Storage</td>
<td>2.0</td>
</tr>
<tr>
<td>Nursery</td>
<td>5.0</td>
</tr>
<tr>
<td>Lumber Product Manufacture/Sales</td>
<td>8.5</td>
</tr>
<tr>
<td>Automobile Sales/Repair</td>
<td>6.0</td>
</tr>
<tr>
<td>Roadways</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45.5</strong></td>
</tr>
</tbody>
</table>

These acreages include the existing quarry, concrete plant, and storage activities.

Increment I Trips

Trip generation rates for the Increment I uses were developed from the ITE "Trip Generation" and from San Diego "Trip Generators" handbooks. The trip rates and estimated numbers of weekday trips for the planned land uses are summarized in Table 1.

The planned Increment I uses are estimated to generate 2,285 vehicle trips to or from the project on a typical weekday, for an increase of 2,135 trip ends over the 150 weekday trips at present. Morning peak hour traffic amounts to 274 vehicles entering or exiting the Increment I uses, while afternoon peak hour trips total 294 vehicles. This amounts to a net increase of 234 and 246 vehicles entering/exiting the project area in the morning and afternoon peak hours, respectively.

An estimated 70 percent of the trips are expected to travel to/from the Kailua direction, and 30 percent to/from the Keahole direction. This directional split is based on an afternoon peak period traffic count of traffic entering/exiting the Kaloko Industrial Park.
Table 1

ESTIMATED WEEKDAY VEHICLE TRIPS
Honokohau Industrial Park Increment I

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MORNING PEAK HOUR</th>
<th>AFTERNOON PEAK HOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To</td>
<td>From</td>
</tr>
<tr>
<td>TRIP RATES PER ACRE:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miniwarehouse</td>
<td>2.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Marine Storage/Repair</td>
<td>2.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Auto Sales/Service</td>
<td>7.2</td>
<td>3.6</td>
</tr>
<tr>
<td>Heavy Industrial</td>
<td>1.6</td>
<td>0.4</td>
</tr>
<tr>
<td>General Light Industrial</td>
<td>9.5</td>
<td>1.9</td>
</tr>
<tr>
<td>VEHICLE TRIPS: (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miniwarehouse</td>
<td>2.0</td>
<td>5</td>
</tr>
<tr>
<td>Marine Storage/Repair</td>
<td>5.0</td>
<td>12</td>
</tr>
<tr>
<td>Auto Sales/Service</td>
<td>6.0</td>
<td>43</td>
</tr>
<tr>
<td>Heavy Industrial (Quarry,</td>
<td>17.0</td>
<td>27</td>
</tr>
<tr>
<td>Concrete Products, Equipment,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage, Offices)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Light Industrial</td>
<td>13.5</td>
<td>128</td>
</tr>
<tr>
<td>(Nursery, Retail Lumber &amp;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lumber Products)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTALS</td>
<td>43.5</td>
<td>215</td>
</tr>
</tbody>
</table>

4 Sources for Trip Rates:

5 Includes trips from continuing uses currently in Increment I area.
Traffic Increases on Area Roadways

Projected 1995 peak hour traffic volumes along Queen Kaahumanu Highway near the project site are depicted in Figure 5. The estimated volumes on the project access road include vehicle trips to/from both the existing and new activities in the Increment I area, and to/from the Isemoto/SVA/Taylor property. The project would increase traffic volumes on the access road to 310 vehicles in the morning peak hour and 327 vehicles in the afternoon peak hour.

The proportional increases in traffic on Queen Kaahumanu Highway at the project access road would be as follows:

<table>
<thead>
<tr>
<th></th>
<th>North of Access Road</th>
<th>South of Access Road</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning Peak Hour</td>
<td>+ 4.2%</td>
<td>+ 9.1%</td>
</tr>
<tr>
<td>Afternoon Peak Hour</td>
<td>+ 3.3%</td>
<td>+ 7.3%</td>
</tr>
</tbody>
</table>

The volume and proportional increases would decrease with increasing distance from the project site.

Traffic Conditions With Increment I

Vehicles turning left from the project access road onto Queen Kaahumanu Highway would experience delays equivalent to Level of Service "F" conditions during both the morning and afternoon peak traffic periods. Future installation of a traffic signal at the Kealakahe Parkway intersection would group northbound traffic into "platoons" and increase the gaps in the traffic flow on Queen Kaahumanu Highway to temporarily improve conditions for traffic exiting the project access road. However, continued future increases in delays to left-turn traffic would eventually warrant mitigative measures.

Vehicles turning left from southbound Queen Kaahumanu Highway into the project access road would experience Level of Service "D" conditions during the peak traffic periods. Although small in number, the vehicles waiting to turn left into the project access road would likely result in significant disruption to the flow of southbound through traffic, particularly if Queen Kaahumanu Highway is not widened to four lanes. Traffic turning right into or from the project access road would experience Level of Service "B" or "C" conditions.

The projected traffic from the Increment I project would not significantly affect conditions at the intersection of Queen Kaahumanu Highway and Kealakahe Parkway.
Mitigative Measures

Candidate measures to improve conditions for traffic turning left (southbound) from the project access road onto Queen Kaahumanu Highway are as follows:

1. Install a traffic signal at the access road intersection;

2. Provide a refuge/acceleration lane in the center of Queen Kaahumanu Highway (similar to the one at Kaloko Industrial Park) to enable exiting traffic to first cross the northbound traffic, then slow or stop in the refuge lane, and then merge with the southbound traffic flow; or

3. Provide an access road or frontage road connection to Kealakehe Parkway so southbound project traffic can exit onto Queen Kaahumanu Highway using the traffic signal or grade separation which will be provided at this major roadway junction.

The access road connection to Kealakehe (#3) is proposed for the project. The State DOT would be expected to deny a traffic signal (#1) due to the short 800-foot spacing with a future signal or grade separation at Kealakehe Parkway, and to oppose a refuge lane (#2) due to safety concerns.

Therefore, a two-lane, two-way roadway connection is proposed from the project access road to an intersection with the future mauka extension of the Kealakehe Parkway. The roadway connection can be located makai of the project area to function as a "frontage road", or could extend from a point further mauka as an "entrance roadway" to the project site. The location should be coordinated with State DOT and adjacent property owners to most effectively and efficiently serve traffic access to this area.

It is proposed that the project access road intersection remain to serve right-turn movements, and the left-turn into the project site. If the left-turn movement is permitted, then a left-turn storage lane should be constructed on Queen Kaahumanu Highway.

Volume-to-capacity ratios and service levels for the Queen Kaahumanu Highway - Kealakehe Parkway intersection, assuming installation of a traffic signal, are summarized in Table 2 for conditions with and without the project.
# Table 2
1995 Intersection Volume-to-Capacity Ratios
Queen Kaahumanu Highway and Kealakahe Parkway

<table>
<thead>
<tr>
<th>Future Site Access Condition</th>
<th>Morning Peak Hour Volume-to-Capacity Service Ratio</th>
<th>Afternoon Peak Hour Volume-to-Capacity Service Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Two Through Lanes on Queen Kaahumanu Hvy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Without Project</td>
<td>.79</td>
<td>C</td>
</tr>
<tr>
<td>2. With Project and Existing Project Access Road</td>
<td>.81</td>
<td>D</td>
</tr>
<tr>
<td>3. With Project and New Project Access Road to Kealakahe Parkway</td>
<td>.80</td>
<td>D</td>
</tr>
<tr>
<td>With Four Through Lanes on Queen Kaahumanu Hvy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Without Project</td>
<td>.51</td>
<td>A</td>
</tr>
<tr>
<td>2. With Project and Existing Project Access Road</td>
<td>.52</td>
<td>A</td>
</tr>
<tr>
<td>3. With Project and New Project Access Road to Kealakahe Parkway</td>
<td>.54</td>
<td>A</td>
</tr>
</tbody>
</table>
FUTURE DEVELOPMENT OF INCREMENT II AREA

The 44-acre Increment II area of the Honokohau Industrial Park, located mauka of the Increment I area, is proposed for development with light industrial uses, with possible inclusion of a mix of retail and service uses. This area would likely be developed after completion of the Increment I area, with the development extending for a period of 10 or more years.

An initial assessment was made of the potential traffic generation from this area, and potential access needs.

Potential Traffic for Increment II Area

The amount of traffic generated by future development of Increment II would depend upon the mix of industrial versus retail/service uses to be located in the project site. Each acre of retail/service use typically generates 5 to 10 or more times as much traffic as each acre of industrial use, with the ratio varying dependent upon the particular type of activity. Conversely, the industrial uses would attract "new traffic" into the area, while much of the trips to retail/service uses (restaurants, banks, convenience stores) is by "pass-by" traffic or persons already in the area.

The range of trip generation potential for the Increment II area, assuming 44 acres for development is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Peak Hour Vehicle Trips</th>
<th>Daily Vehicle Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To/From Project</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Morning</td>
<td>Afternoon</td>
</tr>
<tr>
<td>Full Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Industrial</td>
<td>450</td>
<td>480</td>
</tr>
<tr>
<td>Uses(6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with Retail/</td>
<td>350</td>
<td>1,800</td>
</tr>
<tr>
<td>Service Uses(7)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6 Based on trip rates for industrial park.

7 Based on trip rates for shopping center, and floor area ratio of 0.3.
Development of the Increment II area with a combination of the two types of uses would result in traffic volumes within this range.

Access Needs for Increment II Area

Future expansion of the area's roadway system is expected to include extension of the Kealakehe Parkway mauka near the south side of the Increment I and II areas. Several north-south arterial roadways will likely be constructed parallel to Queen Kaahumanu Highway, with one of these roadways being located along the mauka boundary of the Increment II area, or penetrating the area.

With development as an industrial park, the Increment II traffic could be accommodated by an extension of the access road serving the Increment I development. However, given the linear shape of the Increment I/II site, it would be desirable to establish one or more additional access points from the Increment II area to Kealakehe Parkway and/or any future major north-south arterial roadway adjacent to or through the project area.

If Increment II is developed largely as a retail/services area, the area should have at least two access connections to the arterial roadway system. The type and location of these access points would depend upon the configuration of the future roadway system for the North Kona district, and the type and location of uses within the Increment II area.
APPENDIX A

METHODOLOGY AND LEVEL OF SERVICE CRITERIA
FOR UNSIGNALIZED INTERSECTIONS

This standard procedure provides a comparative measure of delay at stop sign-controlled intersections for those movements which must yield to the conflicting movements at the intersection. Those include:

- Left-turn out of the side street;
- Right-turn out of the side street; and
- Left-turn into the side street.

The general indicator of intersection delay is determined by calculating the one-hour capacity for each key movement, based on the conflicting traffic volumes, and then comparing the number of vehicles making that maneuver to the calculated capacity. The unused or "reserve" capacity for that movement is then used to identify a level of service for that movement. The level of service interior at stop sign-controlled intersections is as follows:

<table>
<thead>
<tr>
<th>Reserve Capacity (Vehicles per Hour)</th>
<th>Level of Service</th>
<th>Expected Delay to Side Street Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 400</td>
<td>A</td>
<td>Little or no delay</td>
</tr>
<tr>
<td>300 - 399</td>
<td>B</td>
<td>Short delay</td>
</tr>
<tr>
<td>200 - 299</td>
<td>C</td>
<td>Average delay</td>
</tr>
<tr>
<td>100 - 199</td>
<td>D</td>
<td>Long delay</td>
</tr>
<tr>
<td>0 - 99</td>
<td>E</td>
<td>Very long delay</td>
</tr>
<tr>
<td>Negative value</td>
<td>F</td>
<td>Exceeds capacity with extreme delays and warrants improvements</td>
</tr>
</tbody>
</table>

Stormwater Drainage Analysis

1. Assumptions
   - Estimates based on 10-year storm with a peak rainfall of 2 inches per hour.
   - Surface conditions on site will be paved, graveled, and pre-existing.
   - Peak intensity run-off for these surfaces is:
     Paved = 5.1 in./hr.
     Graveled = 4.2 in./hr.
     Pre-existing = 3.3 in./hr.
   - Run-off coefficient for surfaces is:
     Paved = .95
     Graveled = .55
     Pre-existing = .18
   - Lot coverage for proposed uses is:
     Automotive Operations. Paved = 40%  Graveled = 60%
     Boat Storage. Paved = 40%  Graveled = 60%
     Equipment/Truck Storage. Paved = 20%  Graveled = 80%
     Self Storage. Paved = 20%  Graveled = 80%
     Lumber Operations. Paved = 40%  Graveled = 60%
     Office Complex. Paved = 50%  Graveled = 50%
     West Hawaii Concrete. Paved = 10%  Graveled = 90%
     Quarry Expansion. No change
     Nursery. Paved = 10%  Graveled = 90%
   - Roadway is paved and 60-foot wide.

2. Findings
   - Stormwater drainage during a potential 10-year storm is estimated to be:
     Onsite = 88.5 cfs
     Roadway = 14.4 cfs
Water Demand Analysis

Auto sales, service and repair - 6 acres:
Basic water use of 1,000 gpd, plus an additional 10 gpd per car serviced, for an estimated 30 cars; for a daily total of 1,300 gpd. Through an eight-hour day this computes to an average rate of 2.7 gpm. The peak-hour rate will be five times this amount, or 13.5 gpm.

Boat storage, construction and repair - 5 acres:
Total daily usage is estimated to be approximately 500 gpd through an eight-hour day, or 0.67 gpm; with a peak-hour rate of 3.33 gpm.

Equipment, truck and bus storage - 3 acres:
Total daily usage is estimated to be approximately 300 gpd through an eight-hour day, or 0.40 gpm; with a peak-hour rate of 2.0 gpm.

Self-storage - 7 acres:
Total daily usage is estimated to be approximately 200 gpd through an eight-hour day, or 0.27 gpm; with a peak-hour rate of 1.35 gpm.

Retail lumber and hardware materials and the manufacture of lumber products - 8.5 ac.:
Total daily usage is estimated to be approximately 1,000 gpd through an eight-hour day, or 1.33 gpm; with a peak-hour rate of 6.65 gpm.

Office complex and contractor storage, with office square footage of approximately 20,000 - 3 acres:
Office is estimated to have 12 people using an average 15 gpd per person, for a daily total of 180 gpd through an eight-hour day, or 0.375 gpm. The storage area is estimated to have a usage of 300 gpd through an eight-hour day, or 0.625 gpm. Total daily water usage rate will be 1 gpm with a peak-hour rate of 5 gpm.

West Hawaii Concrete (existing business) - 4 acres:
In their current operation, the concrete company has been using approximately 13,000 gpd, which equates to 27.08 gpm through an eight-hour work day, or a peak-hour rate of 135.41 gpm.
In summation, it appears that total water usage will fall in the 17,000 gpd range with an average daily rate of approximately 35.4 gpm and an approximate peak-hour rate of 177 gpm.

We recognize that the foregoing does not speak to any requirement for irrigation, and there are factors here that need to be considered. Generally, there is a minor area irrigated on any of the industrial lots here in the very rocky Kona condition. In this proposed instance we believe this will also be the general situation. In any case, the subdivision covenants and restrictions can be structured so that all irrigation be during the evening hours so that daily and peak-hour rates not be affected. Irrigation can also be restricted to drip irrigation, and lawns can be forbidden. With these measures taken we estimate irrigation to be less than an additional 2,000 gpd, which will render a total water usage for the project of approximately 19,000 gpd.

Sincerely,

Leo Fleming, C. E.
Probable Hydro-Geologic Impacts of the Proposed
Honokohau Industrial Park, North Kona, Hawaii

Information and analyses in this letter provide a qualitative assessment of potential hydro-geologic impacts of the proposed 89.5-acre Honokohau Industrial Park. The park is to be developed in two increments. A subdivision layout is only available for the first increment. It will consist of eight lots of various sizes on 45.5 acres. Uses for these eight lots are identified in the tally below. Although the 44-acre second increment may have a greater number of smaller-sized lots, it will presumably have similar land use.

<table>
<thead>
<tr>
<th>Use</th>
<th>Acres</th>
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<tr>
<td>Quarry</td>
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<td>Nursery</td>
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<tr>
<td>West Hawaii Concrete</td>
<td>4</td>
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<tr>
<td>Equipment Storage</td>
<td>3</td>
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<tr>
<td>Self Storage</td>
<td>2</td>
</tr>
<tr>
<td>Boat Storage, Construction, and Repair</td>
<td>5</td>
</tr>
<tr>
<td>Lumber Storage and Product Manufacturing</td>
<td>8.5</td>
</tr>
<tr>
<td>Office Complex and Storage</td>
<td>3</td>
</tr>
<tr>
<td>Automotive Sales, Storage, and Repair</td>
<td>6</td>
</tr>
<tr>
<td>Roads</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45.5</strong></td>
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</tbody>
</table>

From the perspective of potential hydro-geologic impacts, two aspects of the project need to be evaluated: (1) disposal of sanitary wastewater will occur in one or more cesspools in each of the lots; and (ii) disposal of stormwater and various washdown waters will be in drywells. Ultimately, the liquid fraction of these wastewaters will percolate down to the underlying brackish basalt lens and then move laterally to discharge points in Honokohau Harbor and elsewhere along the shoreline. Obviously, the percolating wastewater will contain chemicals which will increase, to at least a limited extent, the concentration of these constituents in the underlying groundwater. Since the quantity of percolating water will be small compared to the quantity of groundwater, and since none of the constituents in the percolating water are considered hazardous in the concentrations that they will occur, a general assessment of possible effects is reasonable. This is the approach taken in the following analysis.
Occurrence of Groundwater Beneath and Downstream of the Project

Specific knowledge of the groundwater environment in this area is derived from results of the several drilled wells in the region (No. 3980-01 on Liliuokalani Trust land, No. 4059-01 near Palani Junction, and No. 4360-01 in Kalaeo), by the existence of anchialine ponds near the shoreline, and by the observable discharge of groundwater into Honokohau Harbor and along the shoreline. Groundwater occurs here as a thin lens of brackish water floating on underlying seawater. This configuration is primarily due to the high permeability of the lava rocks, the modest recharge rate of percolating rainfall, and the absence of a low permeability formation at the shoreline to impede groundwater discharge into nearshore waters. Groundwater beneath the project is likely to have a chloride concentration of 3000 to 6000 milligrams per liter (MGL), an indication that it is comprised of about 15 to 30 percent seawater which has been introduced by mixing from below. The Department of Health's Underground Injection Control (UIC) line is located inland of the project. Its location reflects the groundwater's relatively high salinity and conclusions regarding its negligible potential for potable development.

The quantity of groundwater moving to shoreline discharge cannot be measured directly but it can be approximated. A hydrologic budget approximation, which is based on estimates of the fraction of rainfall which becomes groundwater recharge and the total area contributing this recharge, indicates that the groundwater flowrate may be in the range of 2 to 4 million gallons per day (MGD) per coastal mile. Another method, one which applies the Darcy flow equation to estimated values for permeability and flow gradients, results in a flowrate on the order of 1.5 to 3.0 MGD. These figures, while obviously approximate, establish the order of magnitude of the flow. For the purpose of the illustrative calculations which follow, a groundwater flowrate of 2.5 MGD per mile will be used.

Contaminants Introduced at Cesspools and Disposal Wells

Using projected water consumption figures for the first development increment provided by Leo Fleming, the civil engineering consultant for the project, it is estimated that the average disposal rate in cesspools of the project's first increment will be 10,000 to 15,000 gallons per day (GPD). This amount may ultimately be doubled when the second development increment is completed. Concentrations of nitrogen and phosphorous, the principal "contaminants" in liquid percolating from the cesspools, are anticipated to be on the order of 25 to 40 and 10 to 20 milligrams per liter (MGL), respectively. These concentrations are substantially higher than the normal, "background" concentrations in groundwater in this location which are about 0.5 to 1.0 MGL for nitrogen and 0.0 to 0.1 MGL for phosphorous.

Liquid discharged into and percolated from the project's drywells will consist of washdown water, wastewater, and stormwater runoff. The washdown water, which may amount to 2000 to 4000 GPD for each of the two development increments, would occur on a regular (daily) basis. Where appropriate for the particular industrial user, grease and oil traps would be installed. Stormwater runoff, on the other hand, would obviously occur only during rainfall events. These may occur on the order of 10 to a couple of dozen times in any given year in this relatively arid environment. If averaged over a year, the estimated runoff would be equivalent to about 30,000 GPD from each of the project's two development increments. This would amount to about two to three times the volume percolating from project cesspools. Concentrations of contaminants in the washdown water and surface runoff are highly variable and difficult to quantify. For nitrogen and phosphorous, the concentrations will probably be of the same order of magnitude as water percolating from cesspools.
In the calculations which follow, it is assumed that the project's discharge to the underlying groundwater will total 50,000 GPD for both development increments. To illustrate the influence that contaminants introduced in this manner may have on groundwater, an average nitrogen concentration of 40 MGL will be assumed for percolating water.

Dilution and Dispersion of Contaminants in Groundwater Flow

Contaminants introduced by water percolating downward from the project would be diluted and dispersed in the flow of groundwater toward shoreline. A cone of 15 to 30 degrees in width moving away from the source of contamination toward the shoreline would generally encompass the maximum aerial extent that the contaminants would travel. The existence of Honolulu Harbor, which is down gradient from the project, will strongly influence the direction and ultimate point of discharge of most contaminants. Studies done by and for the Corps of Engineers following initial construction of the harbor and after its subsequent expansion demonstrate that the harbor functions as a "point sink" for groundwater discharge. In other words, groundwater flow paths bend toward the harbor, focusing discharge toward this single point.

The enclosed drawing depicts in a qualitative way the likely lateral extent of the movement introduced contaminants as they are carried in the groundwater to ultimate discharge into Honolulu Harbor and the adjacent shoreline. Actually, two cones are shown on the drawing. The inner, "most probable" discharge cone is approximately 3200 feet wide at the shoreline. The concentration of contaminants would be highest in the center of this cone and lower on each side. On an average, however, the nitrogen concentration would be approximately 3.2 MGL. This would be about three to six times greater than the normal "background" level but only eight percent of the concentration of water percolating from the project.

If dilution and dispersion of contaminants occurred over the wider, "maximum" discharge cone shown on the enclosed drawing, the resulting average nitrogen concentration would be lower, possibly as low as 2.5 MGL. It would still be expected that the highest concentration would be in the center of the cone, with concentrations decreasing with distance from the center.

Neither of the cones show that water percolating from the project is likely to reach Alisakapu Fishpond. Although such a result cannot be predicted with absolute certainty, it is definitely a reasonable expectation that the fishpond will not be affected. In the unlikely event that some contaminants do disperse that far to the north, their concentration would be far lower than the average figures given in the approximations above.

Summary

In summary, the foregoing discussion and analyses indicate that the project is likely to impact the groundwater body and receiving waters of groundwater discharge in the following ways:

1. Wastewater discharged from project cesspools and disposal wells will influence the receiving groundwater's chemistry, particularly as localized increases in the concentration of certain inorganic constituents.

2. The movement of these contaminants will be along prevailing flow paths of the groundwater body toward shoreline discharge.
3. Lateral movement of these contaminants by mixing and dispersion can be approximated by a cone which widens with distance from their point of introduction toward the shoreline.

4. For the anticipated quantities of wastewater percolating into underlying groundwater, and considering the concentration of contaminants and the effects of dispersion and dilution, the concentrations of contaminants in groundwater near the shoreline will be relatively low. These contaminants will be rapidly dissipated after mixing into nearshore waters.

5. The effect of Honokahua Harbor to concentrate discharge of groundwater into it is a significant factor. It is likely to narrow the width of the discharge cone. In fact, most introduced contaminants are likely to be discharged into the harbor itself.

6. It is unlikely that the contaminants will travel as far north to reach Almakapa Fishpond. In the unlikely event that some of these do enter the pond, it would amount to an extremely small fraction of the total contaminant load at a very low concentration.

Sincerely,

Tom Nance

TN:It

Enclosure
Movement of Wastewater Percolating From Honokohau Industrial Park into the Basal Lens
HONOKOHU INDUSTRIAL PARK

Assessment of Potential Impacts of Light Industrial Development at Honokohau Industrial Park on the Anchialine Pond Resources at Kaloko and Honokohau, Kona, Hawaii.

Proposed Action: The site of the proposed development is located about three miles north of Kailua-Kona, approximately 1,000 feet mauka of the Queen Kaahumanu Highway, northeast of the Honokohau Small Boat Harbor (Figure 1). The proposed action consists of development of the project site for light industrial use, as outlined in the Environmental Assessment (Helbert Haster & Kimura, 1989) submitted to the Hawaii Land Use Commission.

Proposed uses include production and sale of concrete and concrete products; boat storage, sales and repair; lumber and hardware sales; automotive sales, service and repair; storage of trucks, buses and construction equipment; self-storage facilities; offices and storage areas for contractors; and nurseries and other light industrial uses.

Sources of Potential Impact:

The potential for adverse environmental impact of the proposed light industrial development arises from the potential for input of toxic or other materials into the underlying groundwater, and transport of those materials into the existing anchialine ponds located along the shoreline. The magnitude of the potential impact is a function of the location and condition of the anchialine pond resources; the types of materials discharged into the groundwater; the pathways taken by the groundwater; chemical and physical changes to the discharge materials during their passage through the underlying volcanic substrate; rates of dilution and mixing; and the sensitivity of the anchialine pond organisms to the discharge materials.

Anchialine Pond Resources:

Anchialine ponds are found in four major concentrations within areas potentially affected by the proposed development (Fig. 2): an area northwest of Kaloko Fishpond ("Kaloko"); an area just north of the Honokohau Small Boat Harbor at Malu Point ("Malu"); and an area just south of the boat harbor ("Kealakehe"). Additional scattered ponds are located in the area north of Aimakapa fishpond ("Honokohau"). While they may be important cultural and wildlife areas, neither Kaloko nor Aimakapa fishponds are anchialine ponds by the strict definition of the term, but rather are former embayments which have been closed off at their mouths by natural or human activities. The closure at the mouth of Kaloko pond is sufficiently porous that the conditions within the fishpond are more nearly marine than brackish; the closure at Aimakapa is fronted by a well-developed sand beach, and water within that fishpond is more nearly fresh.
The biological conditions within the anchialine ponds and the two fishponds were surveyed as part of a larger survey of the ponds of the Kona coast (OI Consultants, 1985); results of this survey are presented in Appendix I and summarized below.

Greatly different biological communities were found within the four pond areas, and significant differences were also seen within areas. At Kaloko, for example, topminnows were found in almost all ponds, and the small red anchialine shrimp, *Halocaridina rubra*, were found only in ponds which did not contain fish. This same pattern was seen in the other pond areas. Typical anchialine pond organisms (*H. rubra, the snails Melania and Theodoxus*) were more numerous in the ponds located on either side of the Honokohau small boat harbor that in the ponds to the north. All areas contained examples of well developed anchialine pond communities.

The salinity of water found in the ponds is an indication of the degree of mixing of the fresh groundwater and underlying seawater, and may be taken as an index of the potential of ponds to be affected by changes in groundwater quality due to development. The salinity levels in the ponds of the Kaloko-Honokohau area are also presented in Appendix I. Salinities in the Kaloko and Malu area were generally higher than in the Kealakehe area, while salinities were lowest in the Honokohau area.

**Projected Discharges:**

The discharges from the project site will be of two major types: sanitary wastes which will be discharged into cesspools, from which liquid will seep into the groundwater; and surface runoff as the result of rainfall, equipment washdown, nursery watering, landscape maintenance, etc. Some of the runoff water and the solid and dissolved materials which it carries will percolate through the surface, while some other portion, primarily runoff from paved surfaces, will be discharged through dry wells.

The majority of the particulate material contained in the discharges, whether it be organic or inorganic in nature, will be rapidly removed from the discharge flow by filtration and adsorption onto soil particles. It is unlikely that any solid wastes generated by the quarry and concrete production plant, for example, would travel any significant distance after discharge.

Organic wastes produced by the sanitary discharges would generally have long residence times after discharge, and would be expected to be broken down into dissolved forms by bacterial action. Recent instances of high bacterial levels in near shore well waters suggest, however, that the possibility of downstream contamination exists. It appears that most, if not all, of such cases of contamination can be attributed to the discharge of wastes into lava tubes which provide a direct connection to lower
lying areas without the opportunity for bacterial breakdown and
degradation. Care will have to be taken that any cesspools
developed on the project site be designed such that proper
breakdown and filtration occurs.

It is likely that some amounts of herbicides and pesticides
used in conjunction with the nursery operation or local
landscaping may be introduced into the groundwater. In general,
much of this material will be adsorbed by the underlying soil
particles and slowly broken down. The distance from the project
site to the anchialine ponds is sufficiently far that the
likelihood of negative impacts from small amounts of such
materials is small. No measurable quantities of such pesticide
or herbicide materials used in conjunction with resort
development or golf course operation have been observed at
Waikoloa, an area where such activities are located in close
proximity to anchialine ponds (Brock and Norris, 1988), and no
evidence of biological impacts of these materials has been
observed.

Petroleum products (gasoline, oil, grease) may be introduced
to the groundwater during rains and through equipment washdown.
The amounts introduced are likely to be small, given the
relatively small amount of activity proposed for the project
site. Such materials, again, will be filtered and adsorbed by
soil particles, and that material not so removed will be diluted
by the existing groundwater flow. Petroleum products also appear
not to be extremely toxic to some anchialine pond organisms. For
example, the pond at Malu containing the most numbers of
Malocardiina rubra was observed to contain numerous empty oil
cans, an old motor, assorted trash, and to have a floating scum
covering a portion of the surface (OI Consultants, 1985).

In-Situ Changes in Discharge Quality:

Changes in chemical composition due to adsorption,
filtration and degradation, and the magnitude of the mixing and
dilution process for discharges into the groundwater flow are
examined in detail in the hydrographic impacts section (Balt
Collins & Associates, 1990). In general, organic materials would
be broken down to dissolved forms, and solids would be removed by
filtration. In addition, one would expect an approximate 1:1000
dilution of any material injected into the groundwater at the
project site by the time it reached the shoreline. Such high
dilution rates would reduce the concentrations of materials
introduced at the project site to levels generally undetectable
by current methodology, and lower than the toxic threshold for
aquatic organisms.

Sensitivity of Anchialine Pond Organisms:

Data from anchialine ponds located in close proximity to
resort development (Brock and Norris, 1988) indicate that little
if any change in pond community composition or abundance can be
attributed to such activities. While levels of dissolved nutrients appear to have increased in some such pond areas, there does not appear to have been a systematic biological response to such changes.

Projected Groundwater Pathways:

The envelop of projected pathways for sanitary and runoff discharges at the project site has been estimated (Balt Collins & Associates, 1990; Fig. 3). The envelop includes those areas which lie within the possible pathways of discharge waters added to the existing groundwater flow. The potential for impact due to groundwater quality alteration is highest along the center of the envelop, and lowest near the edges. Thus, ponds located in the Kaloko and Honokohau areas, including both Kaloko and Aimakapa fishpond, are outside the region of potential impact, while ponds within the Maliiu and Kealakehe areas are included in the envelop.

Impact Assessment:

Only ponds in the Maliiu and Kealakehe areas are located with the envelop of potential impact from the proposed light industrial development project. There is little likelihood, however, of significant environmental impact on the ponds within the envelop. The projected uses for the project site will generate discharges containing few toxic materials; most materials in the discharge will be removed from the groundwater stream by adsorption, filtration or bacteriological degradation long before the flow reaches the ponds. The predominant chemical addition to the groundwater flow will be dissolved nutrients (nitrogen and phosphorus). These chemicals are already found in high concentration in undisturbed groundwater, so the relatively small additions from the project site will have no effect on the aquatic ecosystems. In addition, the point discharges will be mixed and diluted by the receiving groundwater to levels at least 1000 times lower than at the discharge point. All these factors combine to make any measurable environmental impact unlikely.
References


Appendix I.

Key to species

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<th>Schl</th>
<th>Schizothrix sp.</th>
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<td>Enteromorpha sp.</td>
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<td>Theo</td>
<td>Theodoxus cariosa</td>
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<td>Poec</td>
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Key to abundance scale

1 present
2 common
3 abundant
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