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PLANNING DEPARTMENT

'99 APR 20 AB 45

April 16, 1999


Honorable Gary Gill, Interim Director
Office of Environmental Quality Control
235 South Beretania Street
State Office Tower, Room 702
Honolulu, HI 96813-2437

SUBJECT: Final Environmental Impact Statement (FEIS)
Kauai Electric Lihu'e Energy Service Center
TMK 3-8-05: por. 3 Nāwiliwili, Lihu'e, Kaua'i
TMK 3-8-03: por. 1 Hanamā'ulu, Lihu'e, Kaua'i
TMK 3-7-02: por. 1 Hanamā'ulu, Lihu'e, Kaua'i

The County of Kaua'i Planning Department has accepted the Final Environmental Impact Statement for the Kauai Electric Lihu'e Energy Service Center in conformance with Chapter 343, Hawai'i Revised Statutes. Although the proposed project does not trigger HRS Chapter 343 requirements, the applicant voluntarily submitted to these requirements. Therefore, we request publication of the acceptance of the subject FEIS in the May 8, 1999, issue of the OEQC Environmental Notice. Attached please find the following items:

- (1) Acceptance letter from the County of Kaua'i Planning Department to Kauai Electric, a Division of Citizens Utilities Company; and
- (2) the FEIS Acceptance Report.

Should you have any questions, please feel free to contact planner Barbara Pendragon of my staff at 241-6677.


DEE M. CROWELL
Planning Director

Enclosures

COUNTY OF KAUAI
PLANNING DEPARTMENT
LIHUE, KAUAI

COPY

April 16, 1999

FINAL ENVIRONMENTAL IMPACT STATEMENT ACCEPTANCE REPORT

PROJECT: Kauai Electric Līhu'e Energy Service Center

PROPOSING APPLICANT: Kauai Electric, a Division of Citizens
Utilities Company
4463 Pahe'e Street
Līhu'e, Hawai'i 96766-2032

LOCATION and TMK: TMK 3-8-05: por. 3 Nāwiliwili, Līhu'e, Kauai
TMK 3-8-03: por. 1 Hanamā'ulu, Līhu'e, Kauai
TMK 3-7-02: por. 1 Hanamā'ulu, Līhu'e, Kauai

A. BACKGROUND

Kauai Electric plans to develop the Līhu'e Energy Service Center in the vicinity of Līhu'e, Kaua'i, Hawai'i. The project would include 119 to 150 megawatts of new electrical generating capacity (to be constructed in phases over a period of at least 30 years) and ancillary facilities, and a Transmission and Distribution facilities baseyard. The project would occupy approximately 14.5 acres at one of the three sites reviewed. As determined through the review process and stated in the Final Environmental Impact Statement (FEIS), the applicant has decided to seek permits for the project to proceed at the "Field 390" site (TMK 3-8-03: por. 1, Hanamā'ulu, Līhu'e, Kauai).

B. PROCEDURE

1. Notice of Availability of the Environmental Assessment/ Environmental Impact Statement Preparation Notice (EA/EISPN) for this project was published in the July 23, 1997, Office of Environmental Quality Control's (OEQC) publication, "The Environmental Notice".
2. The 30-day consultation period for the project expired on August 22, 1997. However, the applicant voluntarily extended the deadline for comments to September 5, 1997. During this period, thirty-nine (39) letters were received which offered comments. Substantive comment letters as well as the applicant's responses to them are included in the FEIS.
3. Notice of Availability of the Draft Environmental Impact Statement (DEIS) for this project was published in the December 23, 1998, OEQC "Environmental Notice".
4. The 45-day review period for the DEIS ended on February 8, 1999. Fifty-one (51) letters of comment were received and responded to, and are included in the FEIS.

5. The Notice of Availability of the FEIS for this project was published in the April 8, 1999, OEQC "Environmental Notice".

The Planning Department has determined that this document is in compliance with the filing requirements of Chapter 200 of Title 11, Hawai'i Administrative Rules, Environmental Impact Statement Rules and with Chapter 343, Hawai'i Revised Statutes.

C. ENVIRONMENTAL IMPACT STATEMENT CONTENT

The FEIS consists of the one (1) volume (the Final Environmental Impact Statement and Appendices A through D).

As required, these documents contain:

1. Table of contents
2. A summary
3. A statement of purpose and need for proposed action
4. Project description
5. Discussion of known alternatives to the proposed action
6. Description of the environmental setting
7. A statement of the proposed action's relationship to land use plans, policies, and controls for the affected areas
8. A statement of probable impact on the environment
9. Relationship between short-term uses and enhancement of long-term productivity
10. Disclosure of all irreversible and irretrievable commitments of resources
11. Discussion of all probable unavoidable adverse environmental effects
12. Description of mitigation measures to minimize impacts
13. A summary of unresolved issues
14. A list of organizations and individuals consulted in preparation of the EA/EISPN, DEIS and FEIS
15. Reproductions of all substantive comments and responses made during the EA/EISPN and DEIS review periods

The County of Kaua'i Planning Department has determined that the content requirements of the FEIS, as specified in Sections 11-200-17 and 11-200-18, Hawai'i Administrative Rules, Environmental Impact Statements, have been met.

D. RESPONSES TO COMMENTS

The applicant has responded to all substantive comments made during the review period of the Draft Environmental Impact Statement. The substantive comment letters as well as the responses to them are included in the Final Environmental Impact Statement.

The County of Kaua'i Planning Department has determined that the FEIS has fulfilled the public review requirements of Chapter 200 of Title 11, Hawai'i Administrative Rules, Environmental Impact Statement Rules.

E. UNRESOLVED ISSUES

1. The major unresolved issue identified in the DEIS was the selection of one of the three sites under consideration for development. Through the review process, the Field 390 site was determined by the applicant to be the most appropriate site for the project. The FEIS indicated that permit processing would be suspended for the Puhi site, and permit applications would be made for the Field 390 site instead if the FEIS is accepted.
2. The following unresolved issues were identified in the FEIS:
 - a. Detailed design of the project has not begun yet, including selection of best available control technology (BACT), design and types of drainage improvements to be made, and the detailed characteristics of the generating units that will be developed in later phases of the project.
 - b. Electrical transmission improvements that are assessed in detail in the report are insufficient to accommodate the full build-out on the Field 390 site. Additional engineering and environmental studies will be needed before final decisions are made with respect to the routing and design of those facilities.
 - c. The exact timing of the construction of each generating unit depends on how closely the actual demand for electricity matches the applicant's forecasts, and the extent to which alternate, renewable energy technologies that do not benefit from centralized siting become practical.
3. The Department identified the following unresolved issues during the review of the FEIS, and in comments received and responses presented:
 - a. Alternate and/or renewable energy technology options for future additions to generating capacity beyond Phase I, whether at the site or decentralized, depending on feasibility and economics at the time;
 - b. Resolve with the County of Kaua'i Department of Water the issue of any potential adverse effects of the proposed project on Hanama'ulu Well #1, and the detailed hydrogeologic study requested.
 - c. Possible roadway and intersection improvements which might be required for the proposed location as a condition of land use permit applications in the short and long term.

F. MITIGATION MEASURES

The mitigation measures proposed in the environmental impact statement will minimize the negative economic, social and environmental impacts of the project. Therefore, the Applicant should implement all the mitigation measures disclosed in the statement or alternative and at least equally effective mitigation measures at the discretion of the permitting agencies.

G. SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

After this FEIS for the Līhu'e Energy Service Center is accepted, a Supplemental Environmental Impact Statement shall be prepared if there is a major or substantial change to the proposed project, or if new or different environmental impacts are anticipated. Any Supplemental Environmental Impact Statement shall be reviewed in accordance with Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Hawaii Administrative Rules, Environmental Impact Statement Rules.

H. DETERMINATION

The County of Kaua'i Planning Department has determined this Final Environmental Impact Statement to be acceptable under the procedures established in Chapter 343, Hawaii Revised Statutes. Therefore, we hereby accept this document.



DEE M. CROWELL
Planning Director

1999 FEIS KAUAI
LIHUE ENERGY SERVICE CENTER

APR 8 1999

FILE COPY

Final Environmental Impact Statement

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KAUAI ELECTRIC
LIHUE ENERGY SERVICE CENTER

Prepared for:

Kauai Electric

A Division of Citizens Utilities Company



Prepared by:

Planning Solutions, Inc.

MARCH 1999

**FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR**

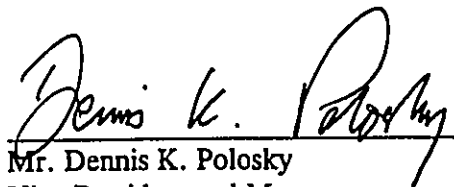
**LIHUE ENERGY SERVICE CENTER
LIHUE, KAUAI**

Submitted pursuant to Chapter 343, Hawaii Revised Statutes (HRS) by:

**Kauai Electric, A Division of Citizens Utilities, Inc.
4463 Pahe'e Street
Lihue, Hawaii 96766**

MAR 19 1999

Date



Mr. Dennis K. Polosky
Vice-President and Manager
Kauai Electric
A Division of Citizens Utilities, Inc.

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Mr. Dee Crowell, Director

March 1999

REC'D
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QUALITY

This Final Environmental Impact Statement and all ancillary documents were prepared under the direction of the signatory and the information submitted, to the best of the signatory's knowledge, fully addresses the document content requirements as set forth in Hawaii Administrative Rule Title 11, Chapter 200-18, as appropriate.

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EXECUTIVE SUMMARY

ES-1. DESCRIPTION OF THE PROPOSED ACTION

Kauai Electric (KE), a division of Citizens Utilities Company, is proposing to develop a master-planned energy service center in Lihue, Kauai, Hawaii. The complex, once fully developed, would include 120 to 150 megawatts (MW) of new electrical generating capacity and ancillary facilities, and a Transmission & Distribution facilities baseyard (T&D). Altogether, the Lihue Energy Service Center facilities would occupy approximately 14.5 acres. New electrical transmission lines would be required to connect the proposed facilities with the existing transmission system on the Island.

The "Lihue Energy Service Center" is intended to provide the needed generating capacity for the Island of Kauai over the next several decades as envisioned in KE's *1997 Integrated Resource Plan (1997 IRP)*. The *1997 IRP* represents KE's long-range plan to provide sufficient generating capacity to meet future anticipated needs. The *1997 IRP* considers both demand-side and supply-side means of meeting KE's customers' needs. It examines different forecasts representing baseline, high, and low economic growth scenarios. These forecasts, along with planning criteria approved by the State of Hawaii Public Utilities Commission (PUC), are used to determine when additional electrical generating units are needed on Kauai.

The proposed Lihue Energy Service Center would accommodate a number of fossil fuel-fired generating units. Each unit would be installed as needed to meet customers' need for electricity. KE is considering a range of generating technologies. This report illustrates two possible combinations of generating unit types and sizes.

- Generating Alternative 1 includes two 26.4-Megawatt (MW) capacity Advanced Steam-Injected Cycle Combustion Turbines, a 58-MW capacity Dual Train Combustion Turbine (DTCC) consisting of two 20-MW Combustion Turbines, two Heat Recovery Steam Generators and one 18-MW capacity Steam Turbine Generator; and four 10-MW diesels. All units would be oil-fired.
- Generating Alternative 2 contains the same two 26.4 MMW Advanced Steam-Injected Cycle Combustion Turbines and four 10 MW diesels. Instead of the DTCC system in Generating Alternative 1, however, this alternative would include a 25-MW coal-fired fluidized-bed steam generating unit.

KE considered three possible sites for its proposed development (see Figure ES-1). Conceptual layouts for Generating Alternatives 1 and 2 on the Puhi Site are shown in Figures ES-2 and ES-3. Conceptual layouts for Generating Alternative 2 on the Field 390 Site and the Airport Industrial Area Site are shown on Figures ES-4 and ES-5, respectively. Following its receipt and evaluation of comments on the *Draft Environmental Impact Statement (DEIS)*, KE informed Kauai County that it would seek land use approvals only for the Field 390 Site at this time.

KE hopes to begin construction of the proposed (T&D) facilities by mid-2000. Construction of the first generating unit by Kauai Power Partners (KPP), the Independent Power Producer whom KE has contracted for the unit, is expected to start shortly thereafter. If permitting delays and/or cost considerations lead KPP to choose an alternate location for its single 26.4 MW unit, the first generating unit would not be installed on the Lihue Energy Service Center Site for a number of years.

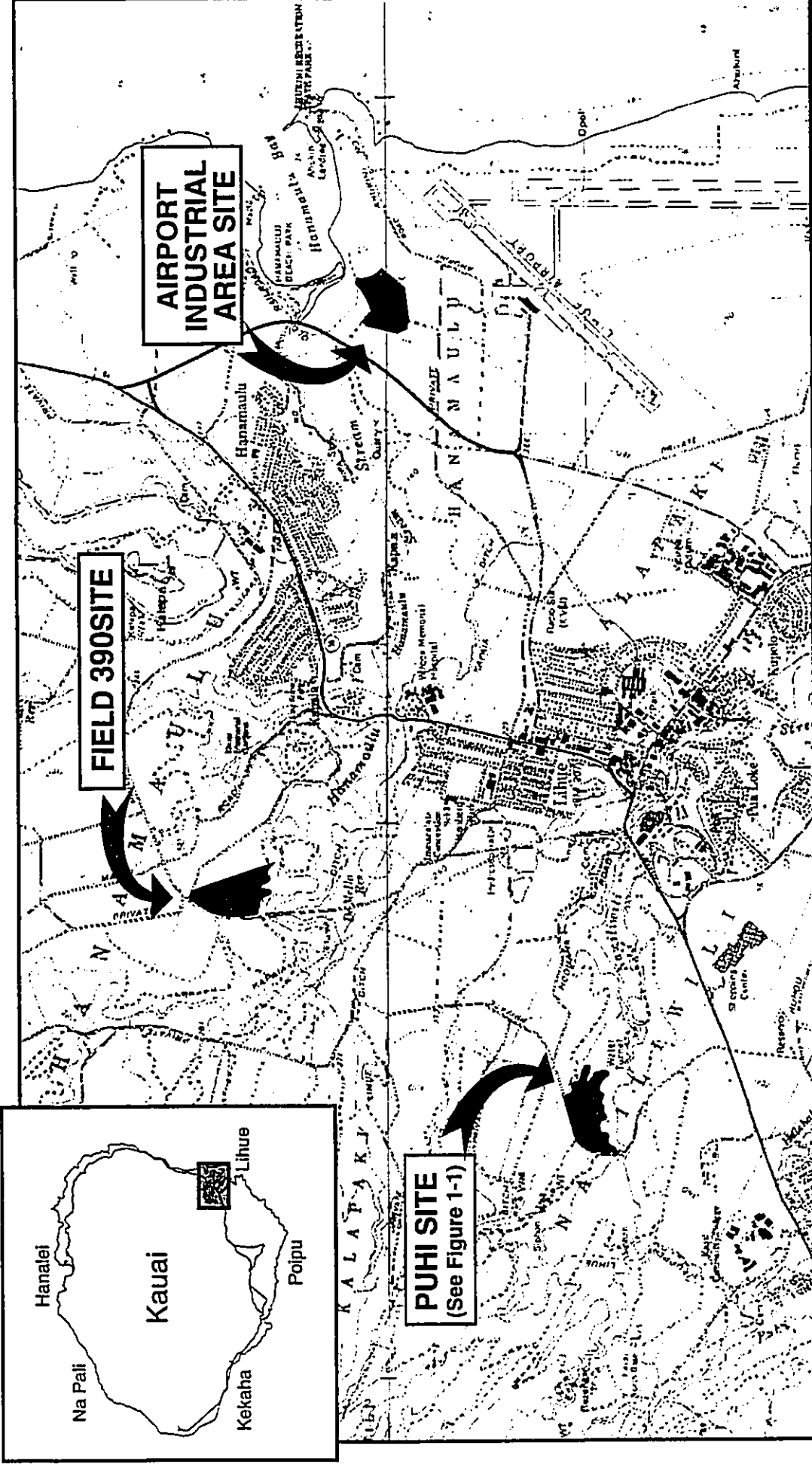


FIGURE ES-1:
Location of Sites Being Considered

PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 USGS 7.5' Lihue Quadrangle, 1983
 USGS 7.5' Kapaa Quadrangle, 1983.

0 2000 4000 Feet
 1" = 2,800'

N

Kauai Electric
Lihue Energy Service Center

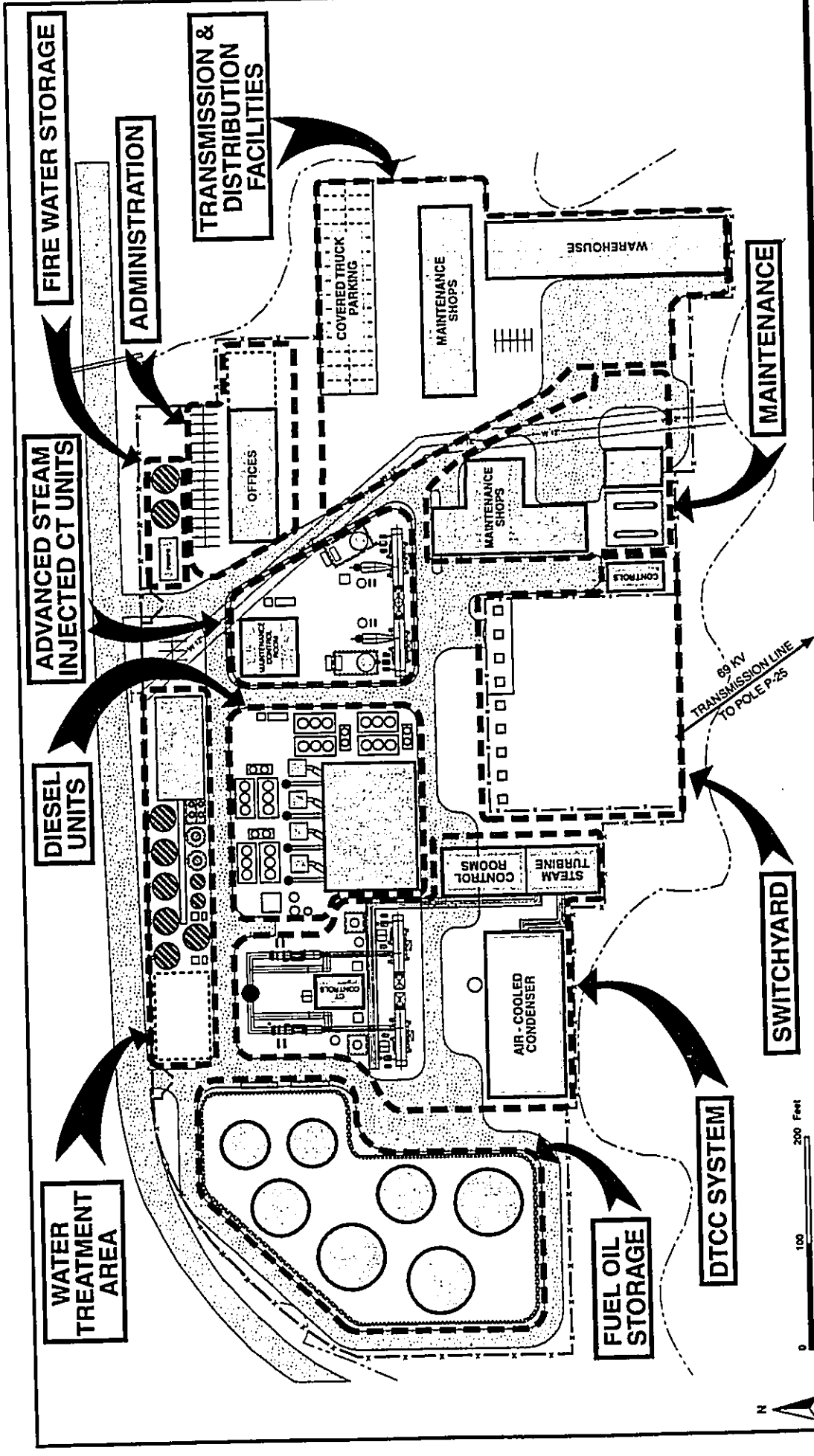


FIGURE ES-2:
**Conceptual Layout for Puhī Site:
 Generating Alternative 1**
 Kauai Electric
 Lihue Energy Service Center

LEGEND:

●	EXHAUST STACK	---	PROPERTY BOUNDARY
○	FUEL STORAGE TANK	- - -	LIMIT OF DEVELOPED AREA
⊙	WATER STORAGE TANK	—	EXISTING WATERLINE
□	TRANSFORMER	—	VEHICLE ROADWAY
⊠	CHEMICAL & DAY TANK WITH CONTAINMENT	▭	BUILDINGS
⊞	VEHICLE FUEL STORAGE TANK		VEHICLE PARKING
⊞	RADIATOR FOR DIESELS	⊞	COMBUSTION TURBINE

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 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Stone & Webster Engineering Corp.

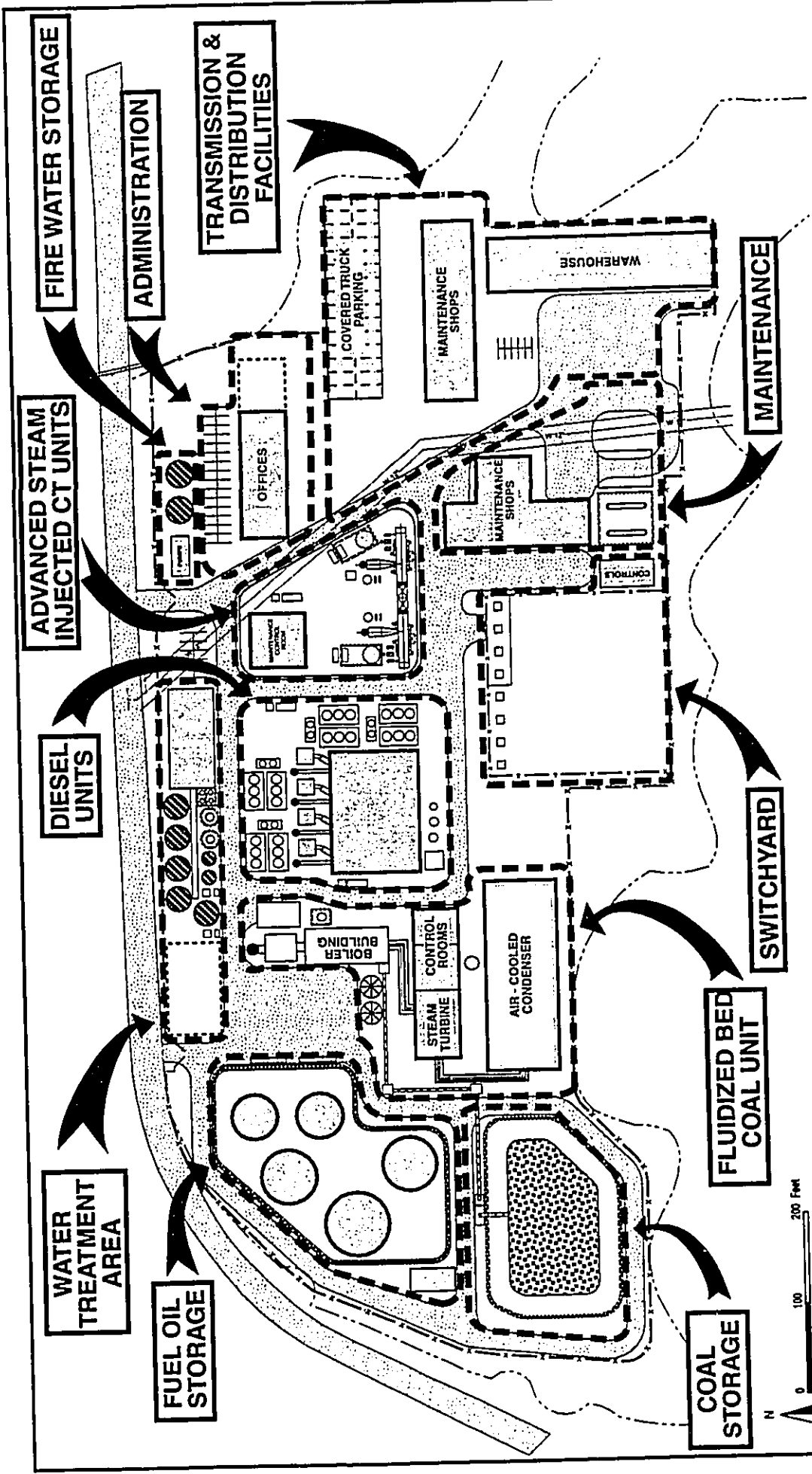


FIGURE ES-3:

**Conceptual Layout for Puhī Site:
Generating Alternative 2**

Kauai Electric
Lihue Energy Service Center

- LEGEND:**
- EXHAUST STACK
 - FUEL STORAGE TANK
 - ◐ WATER STORAGE TANK
 - ◑ LIMESTONE STORAGE SILO
 - TRANSFORMER
 - ⊞ CHEMICAL & DAY TANK WITH CONTAINMENT
 - ▭ VEHICLE FUEL STORAGE TANK
 - ⊞ RADIATOR FOR DIESELS
 - ▨ COAL STORAGE
 - PROPERTY BOUNDARY
 - - - LIMIT OF DEVELOPED AREA
 - - - EXISTING WATERLINE
 - - - CONVEYOR BELT
 - - - VEHICLE ROADWAY
 - ▭ BUILDINGS
 - ||||| VEHICLE PARKING
 - ⊞ COMBUSTION TURBINE

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A Division of the
Citizens Utilities Company

PREPARED BY:
Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:
Stora & Webster Engineering Corp.

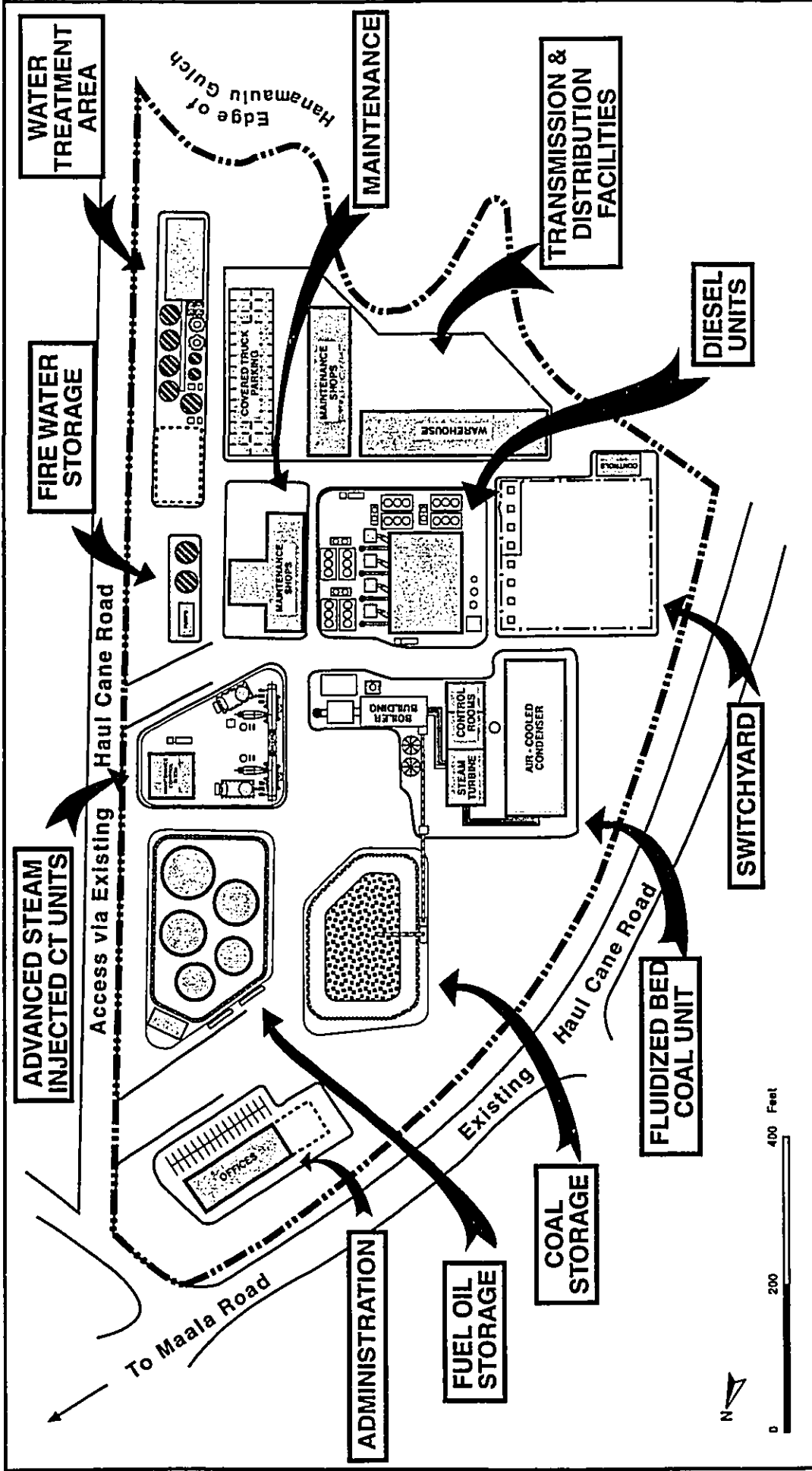


FIGURE ES-4:
Conceptual Layout for Field 390
Site: Generating Alternative 2

Kauai Electric
 Lihue Energy Service Center

- LEGEND:**
- EXHAUST STACK
 - FUEL STORAGE TANK
 - ◐ WATER STORAGE TANK
 - ⊗ LIMESTONE STORAGE SILO
 - TRANSFORMER
 - ⊠ CHEMICAL & DAY TANK WITH CONTAINMENT
 - ▭ BUILDINGS
 - ⊞ RADIATOR FOR DIESELS
 - ▨ COAL STORAGE
 - - - PROPERTY BOUNDARY
 - - - FENCE
 - CONVEYOR BELT
 - ⊞ VEHICLE PARKING
 - ⊞ COMBUSTION TURBINE

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 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Kauai Electric

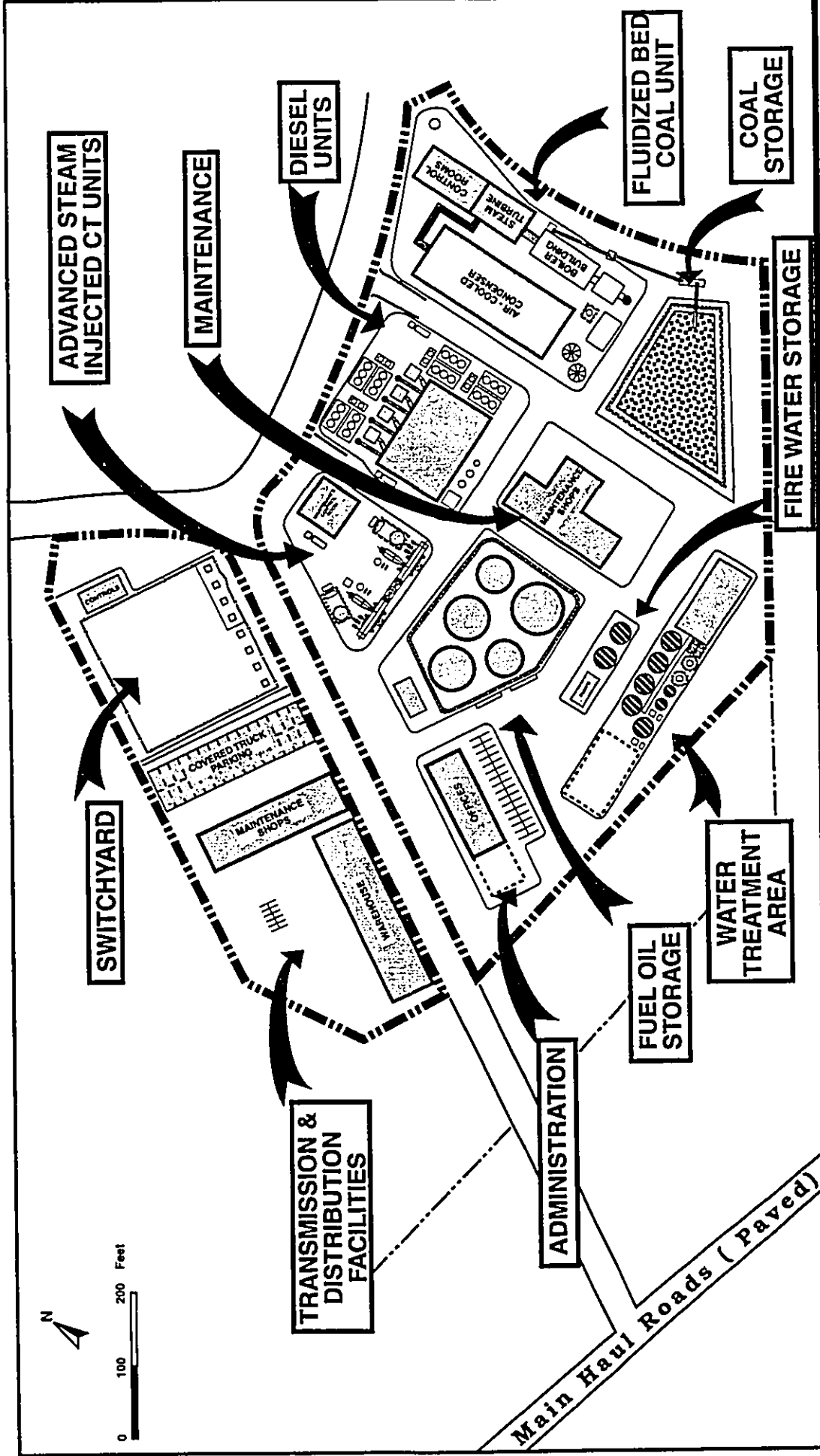


FIGURE ES-5:
**Conceptual Layout for the Airport
 Industrial Area Site: Generating
 Alternative 2**

Kauai Electric
 Lihue Energy Service Center

LEGEND:

●	EXHAUST STACK	▨	COAL STORAGE
○	FUEL STORAGE TANK	---	PROPERTY BOUNDARY
◐	WATER STORAGE TANK	- - -	FENCE
◑	LIMESTONE STORAGE SILO	□	CONVEYOR BELT
□	TRANSFORMER		VEHICLE PARKING
◻	CHEMICAL & DAY TANK WITH CONTAINMENT	⊠	COMBUSTION TURBINE
▤	BUILDINGS		
⊞	RADIATOR FOR DIESELS		

PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizen Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Kauai Electric.

Kauai Electric Energy Service Center, P.O. Box 111, Lihue, HI 96766

ES-2. SIGNIFICANT BENEFICIAL AND ADVERSE IMPACTS

Expected impacts are discussed in the following section. Significant impacts are generally a subset of expected impacts. Significant adverse impacts are those impacts that do not meet regulatory limits and/or that endanger the welfare of the general public either directly or indirectly. No such impact is anticipated as a result of the construction and operation of the Lihue Energy Service Center. The single most significant beneficial effect resulting from the development of this project is the ability to meet the forecast demand for electricity in accordance with KE's mandate from the PUC.

ES-2.1 DIRECT IMPACTS

Expected impacts attributable to the proposed project are summarized in Table ES-1 and are discussed in detail in Chapter 4. In general, environmental effects associated with the land disturbance that would accompany construction of the proposed facilities are limited. Changes associated with the long-term operation of the facilities are of more consequence. As noted in the table, all of the alternatives would meet applicable emission and ambient environmental quality standards.

ES-2.2 CUMULATIVE AND SECONDARY IMPACTS

The impact analyses summarized in Table ES-1 and described in detail in Chapter 4 fully address cumulative impacts. Thus, for example, the air quality impact analysis considers existing pollutant sources as well as emission from the proposed facilities. Similarly, the traffic impact analysis considers vehicular traffic from other existing and forecast traffic generators as well as the trips that would be generated by the proposed project.

The proposed Lihue Energy Service Center has sufficient on-site fuel storage to meet KE's reserve fuel requirements in accordance with KE's filings with the PUC. Secondary impacts related to this project are any actions that KE's fuel vendors may take to support this increased demand. Depending on the capacity of existing facilities, this could include the construction of additional fuel storage and unloading facilities.

KE's proposed facilities are intended to support future growth on Kauai as envisioned in State and County land use plans. The cost of the electrical power from the proposed facilities would not differ substantially from the present cost of electrical energy. Hence, it will not increase or decrease costs to KE's customers sufficiently to encourage or discourage particular land uses or types of development substantially.

The proposed facilities at full build-out will have the direct effect of increasing employment on Kauai by about 30 positions. It will also increase KE's expenditures for supplies and services purchased from Kauai's businesses by several million dollars per year. The economic stimulus of employee expenditures on goods and services and KE's direct purchase of goods and services will indirectly affect economic activity on the Island.

The proposed facilities by their nature may influence the type of development envisioned for properties adjacent to the proposed generating station. Use of any of the sites would reduce the amount of land under sugar cane cultivation by Lihue Plantation Company (LPCO) by less than one-tenth of one percent; this would not substantially affect the plantation's operation. In fact, LPCO's sale of the Puhī Site to KE provided LPCO with capital needed to sustain its operations.

None of the sites involves a zone change. Consequently, development will not set a precedent for industrial uses of adjacent areas.

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Table ES-1. Summary of Expected Impacts.

Area of Impact	Puhii Site		Field 390 Site		Airport Industrial Area Site	
	Generating Alt. 1	Generating Alt. 2	Generating Alt. 1	Generating Alt. 2	Generating Alt. 1	Generating Alt. 2
Physiographic	Minor grade changes, no significant drainage pattern changes.	Same as Generating Alternative 1	Same as Puhii Site	Same as Puhii Site	Same as Puhii Site	Same as Puhii Site
Soils/Geology	Soils are well-suited for agriculture. Withdrawal represents less than 1/10 th percent of LPCO lands under cultivation. Soils are suitable for construction.	Same as Generating Alternative 1	Same as Puhii Site	Same as Puhii Site	Withdrawal from agricultural production same as Puhii Site; re-rooting of existing irrigation needed.	Same as Generating Alternative 1
Air Quality	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly higher than Generating Alternative 2. Site has lowest modeled ambient pollutant concentrations.	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly lower than Generating Alternative 1. Site has lowest modeled ambient pollutant concentrations.	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly higher than Generating Alternative 2.	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly lower than Generating Alternative 1.	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly higher than Generating Alternative 2.	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly lower than Generating Alternative 1.
Hydrological	Permanent commitment of water to the proposed project. Surface water supply available. Requirement offset by reduction in irrigation. Increased stormwater runoff. Reuse of process wastewater possible. Site located near Garlinghouse Tunnel (DOW Water source).	Surface water supply available. Uses about 9% more water than Generating Alt. 1. Some offset due to reduction in irrigation. Increased stormwater runoff. Reuse of process wastewater possible. Site located near Garlinghouse Tunnel (DOW Water source).	Permanent commitment of water to the proposed project. Surface water supply available. Requirement offset by reduction in irrigation. Increased stormwater runoff. Reuse of process wastewater possible.	Permanent commitment of water to the proposed project. Surface water supply available. Uses about 9% more water than Generating Alt. 1. Some offset due to reduction in irrigation. Increased stormwater runoff. Reuse of process wastewater possible.	Groundwater source required (existing or new). Some offset due to reduction in irrigation increased stormwater runoff. Disposal of wastewater through Disposal Wells.	Same as Generating Alternative 1 except slightly more water needed.
Vegetation	Site previously disturbed/ cultivated. No endangered species. Therefore no impact anticipated.	Same as Generating Alternative 1.	Site previously disturbed/ cultivated. No endangered species. Therefore no impact anticipated.	Same as Generating Alternative 1.	Site previously disturbed/ cultivated. No endangered species. Therefore no impact anticipated.	Same as Generating Alternative 1.
Fauna	No endangered species on site. No impact anticipated.	Same as Generating Alternative 1.	No endangered species on site. No impact anticipated.	Same as Generating Alternative 1.	No endangered species on site. No impact anticipated.	Same as Generating Alternative 1.
Aquatic Biota	No discharge of process water to streams. Stormwater runoff to be handled in accordance with Best Management Practices. No effect on aquatic habitat anticipated.	Same as Generating Alternative 1.	No discharge of process water to streams. Stormwater runoff to be handled in accordance with Best Management Practices. No effect on aquatic habitat anticipated.	Same as Generating Alternative 1.	No discharge of process water to streams. Stormwater runoff to be handled in accordance with Best Management Practices. No effect on aquatic habitat anticipated.	Same as Generating Alternative 1.
Archaeological/Cultural Resources	Site previously disturbed/ cultivated. "No effect" on archaeological or cultural resources	Same as Generating Alternative 1.	Site previously disturbed/ cultivated. "No effect" on archaeological or cultural resources	Same as Generating Alternative 1.	Site previously disturbed/ cultivated. "No effect" on archaeological or cultural resources	Same as Generating Alternative 1.

Table ES- 1. Summary of Expected Impacts.

Area of Impact	Publ Site		Field 390 Site		Airport Industrial Area Site	
	Generating Alt. 1	Generating Alt. 2	Generating Alt. 1	Generating Alt. 2	Generating Alt. 1	Generating Alt.2
Transportation Facilities	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways.	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways. Coal delivery would involve different vehicles and delivery timing.	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways.	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways. Coal delivery would involve different vehicles and delivery timing.	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways.	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways. Coal delivery would involve different vehicles and delivery timing.
Noise	Noise in excess of 50 dB at the parcel boundaries. One existing home may be exposed to noise greater than 45 dBA nighttime standard. Would constrain type of future development appropriate on nearby land now used for agriculture.	Noise in excess of 50 dB at the parcel boundaries. 2-3 dB quieter than Alternative 1. Would not expose existing residences to noise greater than 45 dBA. Would constrain type of future development appropriate on nearby land now used for agriculture.	Noise in excess of 50 dB at the parcel boundaries. Would not expose existing residences to noise greater than 45 dBA. Would constrain type of future development appropriate on nearby land now used for agriculture.	Noise in excess of 50 dB at the parcel boundaries. 2-3 dB quieter than Alternative 1. Would not expose existing residences to noise greater than 45 dBA. Would constrain type of future development appropriate on nearby land now used for agriculture.	Noise in excess of 50 dB at the parcel boundaries. Would not expose existing residences to noise greater than 45 dBA. Noise from airport operations is more restrictive than power plant noise.	Noise in excess of 50 dB at the parcel boundaries. Would not expose existing residences to noise greater than 45 dBA. Noise from airport operations is more restrictive than power plant noise.
Scenic/Aesthetic	Facilities would be most visible from area mauka of Kaunamali and Kuuio Highways. Existing vegetation and proposed landscaping would screen all structures except stacks, which would protrude above the tree line. The presence of these facilities may influence future land uses on adjacent land. If the Lihue-Hanamaulu Bypass Road is constructed as planned, occupants of vehicles will be able to view the site, increasing the importance of vegetative screening.	The boiler building (up to 110 feet high) and the stack (165 feet high) for the coal-fired generator would be visible from many additional viewpoints. Otherwise, generally the same as Generating Alternative 1.	The greatest potential for visual impacts would occur on the existing residences along Kamalei and Noi Streets and the rim lot in Kapaia. Views from most of these areas are blocked by existing structures and vegetation. Proposed landscaping along the perimeter of the power plant site would screen most structures from view, but the portions of the stacks taller than approximately 50 feet would be visible from some vantage points. Landscaping needed to screen the facilities from view from cars that are mauka-bound on Masao Road.	The boiler building (up to 110 feet high) and the stack (165 feet high) for the coal-fired generator would be visible from many additional viewpoints. Otherwise, generally the same as Generating Alternative 1.	Existing vegetation along the edge of Hanamaulu Gulch and planned landscaping around the perimeter of the site would screen lower structures at this location from all directions. In time, the industrial structures that AMFAC/JMB expects to develop within its Airport Industrial Park will provide some additional screening. However, the highest structures will be visible above the tree line. If aboveground transmission lines are used to connect the site to the Hanamaulu substation north of Hanamaulu Stream, they will be visible as well. Finally, development on this site will be much more visible to passengers on aircraft arriving or departing Lihue Airport to/from the north.	The boiler building (up to 110 feet high) and the stack (165 feet high) for the coal-fired generator would be visible from many additional viewpoints. Otherwise, generally the same as Generating Alternative 1.

Table ES- 1. Summary of Expected Impacts.

Area of Impact	Puhi Site		Field 390 Site		Airport Industrial Area Site	
	Generating Alt. 1	Generating Alt. 2	Generating Alt. 1	Generating Alt. 2	Generating Alt. 1	Generating Alt.2
Economic	The anticipated construction cost for the generation portion of the project is estimated at \$170 million (approximately \$30 million on the first phase). The T&D facilities are estimated to cost up to \$3 million. Up to 30 persons could be employed at the generating component of the Lihue Energy Service Center at full build-out (6-10 for the first increment). Anticipated Operation & Maintenance expenditures at full build-out are (in 1998 \$): Salaries & Wages-\$4.6 million Materials & Services-\$3 million Fuel -\$28 million	Same as Alternative 1 except total construction cost would be approximately \$135 million.	Same as Puhi Site.	Same as Generating Alternative 2.	Same as Puhi Site.	Same as Generating Alternative 2.
Public Facilities/ Services	The project would rely almost entirely on itself for needed utility systems and services. Consequently, it would place little burden on other public utility systems or services.	Same as Generating Alternative 1.	Generally the same as Alternative 1 on the Puhi Site.	Generally the same as Alternative 2 on the Puhi Site.	Generally the same as Alternative 1 on the Puhi Site.	Generally the same as Alternative 2 on the Puhi Site.

ES-3. PROPOSED MITIGATION MEASURES

The proposed sites have been selected following a review of alternatives, thereby minimizing the effects that require special mitigation. In addition, mitigation has been treated as an integral part of the design process. Measures included at all locations include such things as:

- Implementation of Best Available Control Technology (BACT).
- Use of clean fuel (i.e. low sulfur).
- Use of an electrostatic precipitator for the fluidized bed boiler if a coal plant is built.
- Provision of state-of-the art fuel containment and monitoring systems.
- Establishment of landscape screens around the site.
- Use of appropriately muffled equipment.

In addition, specific mitigation measures are incorporated into the design and equipment layout at each site. These include such things as modification of the Kaunualii Highway/Nawiliwili Road intersection to allow vehicles accessing the Puhi Site to use an existing signalized intersection, avoidance of injection wells on the sites that are situated above potable water aquifers, and use of surface water sources for the two inland sites to avoid conflicts with the Department of Water's potable water sources.

ES-4. ALTERNATIVES CONSIDERED

KE has proposed construction of the Lihue Energy Service Center only after it determined that its Demand-Side Management programs could not allow it to meet its customers demand for electricity using its existing generating facilities alone. This document describes the numerous generating and siting alternatives it analyzed in detail. The company also evaluated numerous other possibilities. These include:

- No-Action.
- Additional Demand-Side Management Programs/Enhanced Conservation.
- Alternate locations.

In the context of the Lihue Energy Service Center project, the "no-action alternative" means that KE would take no steps to bring the demand and supply of electricity into balance. It would neither increase the source capacity nor actively seek to reduce demand through conservation or other means. The no-action alternative would not allow KE to meet the energy needs of Kauai's residents, thereby jeopardizing the health, safety, and welfare of the community. This is inconsistent with the company's PUC charter, which makes KE the designated electrical utility for the island of Kauai. Consequently, "no-action" is not a viable alternative.

As discussed in Chapter 1 of this report, energy conservation measures are part of the actions that KE proposed in its *1997 Integrated Resource Plan (1997 IRP)*. The PUC subsequently approved a number of the programs in KE's plan, and the company is now implementing these to meet customer needs. The forecasts presented in Chapter 1 assume that these conservation measures will be successfully implemented. If they are not, the peak demand for electrical power in 2004 is expected to be at least 5 megawatts greater than would otherwise be the case. Thus, while Demand-Side Management will reduce the amount of additional capacity that is needed, it is not a substitute for the proposed Lihue Energy Service Center.

As discussed in Chapter 2, KE has signed a power purchase agreement with Kauai Power Partners (KPP) for the provision of 26.4 MW of firm capacity. KPP was selected based on its response to a competitive Request for Proposals (RFP) that allowed bidders to specify the technology and fuel that they would use. KPP has formally notified KE that it will consider the three sites addressed in this report as possible locations for its generating unit. It has further stated that it would select this location if KE is able to obtain the approvals for the site that are needed to allow KPP to meet its June 30, 2002 contract deadline and development on the site is not materially more expensive than building at a separate KPP site option. If KPP elects to construct its unit on a site separate from the Lihue Energy Service Center, KE will delay the development of the first generating unit in Lihue. Ultimately, generating capacity in addition to that provided by KPP will be needed, however. Consequently, a decision by KPP to locate its unit elsewhere would simply delay the start of construction of the first generating unit at the Lihue Energy Service Center.

The need for the proposed project is linked to the forecast increase in the demand for electricity. As described in Chapter 1, KE has also evaluated scenarios involving load growth rates that are slower and faster than the Baseline Scenario on which its plan is based. To protect its customers against the uncertainty present in any forecast, KE's contract with KPP allows KE (at the utility's sole option) to delay the addition of KPP's 26.4 MW unit by as much as two years (i.e., until 2004); the contract also allows KE to ask KPP to try to place the unit in service earlier. In view of the possibility that the Lihue Plantation Company (LPCO) may curtail operations in the foreseeable future (thereby depriving the utility of 14 MW, or 12.7%, of its existing capacity) and that the Demand-Side Management (DSM) programs may prove less successful than anticipated, KE believes it is essential that it add generating capacity in accordance with its present schedule. That schedule calls for the next generating unit to be in operation by July 1, 2002. Permitting for the Lihue Energy Service Center must proceed now if that schedule is to be met.

KE considered a range of generating technologies during preparation of its 1997 IRP. Most of the fossil fuel-fired generating technologies shown in the table are included in at least one of the two generating alternatives whose impacts are evaluated in Chapter 4 of this report. KE evaluated renewable energy alternatives both individually and as part of its analysis of the "Energy Sufficiency/Environmental Scenario" that is discussed in Section 8.5 of the 1997 IRP. Even with the additional weighting given to environmental and energy self-sufficiency factors (which, in Kauai's situation means renewable energy), KE found renewable energy sources to be more costly than the combination of Demand-Side Management Programs and conventional electric generating facility development program it has proposed. KE will continue to explore renewable energy options during its on-going planning. It will also continue to be receptive to proposals from IPPs who wish to provide electrical power generated using renewable resources.

ES-5. UNRESOLVED ISSUES

The DEIS identified the Puhi Site as "KE's Preferred Site, but it gave equal treatment to all three of the locations KE was considering. It noted that the largest unresolved issue had to do with which of the three sites the Lihue Energy Service Center will be developed. The DEIS went on to state that KE intended to review the comments it received on the Environmental Impact Statement to determine whether one of the locations is clearly superior to the others. The report stated that if, in consultation with other parties, KE determined that this is the case, it would proceed with the necessary County land use approvals for that location. Conversely, it stated that if none of the sites emerged as clearly superior to the others, KE could move forward with applications for more than one site.

Following review of the comment letters and consultation with community leaders, KE asked the County to suspend processing of the land use applications it had submitted for the Puhi Site. Instead, it asked that the County process applications for the Field 390 Site. At the same time, KE notified the County and the landowner that it would no longer seek approvals needed to develop the Lihue Energy Service Center at the Airport Industrial Area Site.

Other unresolved issues pertaining to this project are primarily related to detailed design which has not yet begun. They include selection of best available control technology (BACT), the specifics regarding the design and type of drainage improvements to be made, and the detailed characteristics of the generating units that will be developed during later phases of the undertaking. As stated in the report, the electrical transmission improvements that are assessed in detail in this report are insufficient to accommodate full build-out on the Field 390 Site. Thus, additional engineering and environmental studies will be needed before final decisions are made with respect to the routing and design of those facilities. Finally, the exact timing of the construction of each generating unit depends on how closely the actual demand for electricity matches KE's forecasts and the extent to which alternate, renewable energy technologies that do not benefit from centralized siting become practical.

ES-6. COMPATIBILITY WITH LAND USE PLANS AND POLICIES

The generating component of the Lihue Energy Service Center is intended to provide a sufficient supply of energy for forecast demand in accordance with the *Hawaii State Plan* policies. The *Hawaii State Plan* contains other policies and objectives regarding Demand-Side Management and the use of renewable energy sources which KE actively supports. That support is evidenced by its PUC-approved Demand-Side Management Programs and through its solicitation to Independent Power Producers that utilize generating technologies based on renewable sources of energy.

The Puhi Site and the Field 390 Site are located in the State Agricultural District. The proposed facility is allowable within the Agricultural District if a Special Use Permit is granted by the County. The Airport Industrial Area site is in the State Urban District; the proposed facilities are a permitted use in the Urban District.

The Puhi Site and Field 390 Site are on land zoned *Agriculture*, and they are not immediately adjacent to existing urban areas. The Lihue Energy Service Center can be constructed in this zoning district if the County grants a Use Permit, a Class IV Zoning Permit, and other necessary approvals. The Airport Industrial Area Site is on land zoned *General-Industrial*. This zoning designation allows uses, such as the one proposed, to be constructed in this zoning district, subject to obtaining a Class IV Zoning Permit. None of the sites proposed are in the Special Management Area.

ES-7. REQUIRED PERMITS OR APPROVALS

A number of permits are required for the development of the proposed facility. These permits and approvals required for the construction of the facility regardless of the site that is ultimately chosen are listed in the table below. Those permits required that are specific to a particular site are listed in the following sections.

ES-7.1 PUHI SITE

If the Lihue Energy Service Center is developed on the Puhi Site, it will require those permits listed in Table ES-2 and Table ES-3. The Puhi Site is located in the State Agricultural District and is zoned

“Agriculture”. Facilities such as the one being proposed can be developed on such land provided that a Special Permit is obtained from the County of Kauai. The County of Kauai is the granting authority because less than 15 acres will be developed. Some additional permits may be needed depending upon the final design of the water supply and disposal system.

Table ES- 2. Permits Required Regardless of Site Selected.

<i>Permit/Approval</i>	<i>Approving or Granting Authority</i>	<i>Comments</i>
Covered Source Permit	State Department of Health	Meteorological Data collected Ambient air quality data collected
National Pollutant Discharge Elimination System	State Department of Health	Stormwater permit for construction and operation if discharge is made to a body of water
Individual Wastewater Systems and Private Sewage Treatment works	State Department of Health	Required if not connected to municipal system
Historic Sites Review	State Department of Land and Natural Resources, State Historic Preservation Division	SHPD concurs with “No Effect” for Puhi Site; SHPD will review enclosed information during review of DEIS and make its determination regarding other two sites.
Environmental Impact Statement (EIS)	Kauai County Planning Department	Final EIS prepared and Submitted to Planning Department
Class IV Zoning Permit	County of Kauai	Application for Puhi Site submitted; acceptance awaiting completion of EIS. Applications for other sites not submitted.
Variance Permit	County of Kauai	Variance from height restrictions of the underlying zoning district.
Use Permit	County of Kauai	Airport Industrial Area Site Requires this for inflammable chemical storage
Building Grading and Grubbing Permits	County of Kauai	Not applied for yet
Coastal Zone Management Consistency Certification	Office of Planning, State of Hawaii	Needed only if Federal Permits are required.
Prevention of Significant Deterioration	Environmental Protection Agency	Reviewed with State Covered Source Permit
Various construction-related Permits	County of Kauai	Covers such things as installation of combustible and flammable liquid tank, driveway permit/work in county road ROW, etc.,
Final Subdivision Approval	County of Kauai	Preliminary Approval has been granted for Puhi Site.
Notification of Construction or Alteration	Federal Aviation Administration	Need to file FAA Form 7460-1 prior to construction.

Table ES- 3. Additional Permits/Approvals Required for Puhi Site.

<i>Permit or Approval Required</i>	<i>Approving Authority</i>	<i>Comment</i>
Special Permit (Agricultural District)	County of Kauai	Application submitted; action on application pending completion of environmental process

ES-7.2 FIELD 390 SITE

As indicated by Table ES 7-4, the Field 390 Site is similar to the Puhi Site with respect to permits required. There are two principal differences. The first is that because this is one of its alternate sites, KE has not yet filed applications for a Use Permit, Special Permit, or for a Class IV Zoning Permit as it did to initiate consideration of the Puhi Site. For similar reasons, the landowner has not sought preliminary subdivision approval for the Field 390 Site. Depending upon the exact nature of the final design, additional permits may be needed for the water supply and wastewater disposal system.

Table ES- 4. Additional Permit/Approvals Required for Field 390 Site.

<i>Permit/Approval</i>	<i>Approving or Granting Authority</i>	<i>Comments</i>
Special Permit (Agricultural District)	County of Kauai	Application will be submitted with <i>Final EIS</i> .
Preliminary Subdivision Approval	County of Kauai	

ES-7.3 AIRPORT INDUSTRIAL AREA SITE

The Airport Industrial Area Site is different than the other two locations with respect to the approvals and permits required for development of the proposed facilities. This is because it is in the Urban District and is zoned General Industrial. The State and County attached a number of very broad conditions when they granted the current landowner the Urban and Industrial zoning. Consequently, if this site were used KE would need to work with the County to determine which of these must be implemented in order to separate (subdivide) the Lihue Energy Service Center Site from the adjacent lands.

Table ES- 5. Additional Permit/Approvals Required for Airport Industrial Area Site

<i>Land Use Regulation</i>	<i>Existing Designation/ Status</i>	<i>Required Designation/ Approval</i>
Preliminary Subdivision Approval	County of Kauai	Not Yet Applied For
Supply Well Permits - Well Construction and Pump Installation Permits	State Department of Health	Not Yet Applied for - needed only if alternate sources cannot be used.
Underground Injection Wells	State Department of Health	Not Yet Applied for - needed for wastewater disposal if alternate disposal means cannot be implemented
Conservation District Use Permit	State Department of Land & Natural Resources	Needed only for transmission line across Hanamaulu Gulch.

SUMMARY OF DIFFERENCES BETWEEN THE DRAFT EIS AND THE FINAL EIS

GENERAL CHANGES

The changes that have been made between the *Draft Environmental Impact Statement for the Lihue Energy Service Center (DEIS)* and this *Final Environmental Impact Statement for the Lihue Energy Service Center (FEIS)* are of three basic types. The three are those that:

- Result from the Kauai Electric's decision to refer to its original choice of locations as the "Puhi Site" rather than "KE's Preferred Site". The change was made to clarify that all three sites evaluated in the report were treated equally.
- Clarify statements and correct formatting and typographical errors. None of these alters the meaning of the statements contained in the *DEIS*.
- Incorporate changes as indicated in the letters responding to comments on the *DEIS*. Both the comment and response letters are reproduced in Appendix D. Changes of this type are summarized below.

CHAPTER 3

- (1) Section 3.3.3. Statements requested by FEMA indicating that the sites lie outside the 500-year flood plain were inserted in the discussion.
- (2) Section 3.8.1. The following statement was inserted in the text. *Results of the archaeological survey and review of historical documents did not indicate any existing use of the area by native Hawaiian practitioners. Moreover, no correspondence was received from any individual or group claiming such rights during the extensive consultation that accompanied planning and report preparation for the project. Consequently, no native Hawaiian gathering rights are believed to be exercised on the sites under consideration for the Lihue Energy Service Center.*

CHAPTER 4

- (1) Section 4.10.3.1. A statement clarifying that fuel for the project would be purchased from a third party and that existing harbor facilities are capable of accommodating the increased volume was inserted in the text.
- (2) Section 4.10.9.3. The wording *vis-a-vis* airspace at the Airport Industrial Area Site was clarified.
- (3) Section 4.12.3.3. The discussion was revised to indicate that the exposed mechanical equipment, fuel storage tanks, exhaust stacks (as well as the large boiler building and tall stack that are included in Generating Alternative 2) distinguish the proposed facility from the kinds of industrial uses that are more typically found on Kauai in industrial areas.
- (4) Section 4.14.9. A discussion of solid waste has been added.

CHAPTER 7

- (1) Section 7.1. The following paragraph was added to the discussion. *At full build-out, the generating units (total capacity of approximately 150 (MW) that are part of Alternative 1 would consume up to 1.5 times the amount of fuel that is presently consumed at the Port Allen Generating Station. Generating Alternative 2, which has a lower ultimate capacity (approximately 118 MW, 25 MW from coal), would consume slightly less fuel than is presently burned at the Port Allen Generating Station. All of this fuel would be transported to Kauai,*

probably by ocean-going barges. Private industry and the State have implemented a number of programs designed to insure the safety of interisland fuel transport, and the record of the carriers is good with respect to spill prevention. Nonetheless, it is impossible to completely eliminate the risk of accident during transport and loading/unloading. Consequently, by increasing the use of fossil fuel, the Lihue Energy Service Center will marginally increase the potential for oil spills and their accompanying environmental damage.

CHAPTER 8

- (1) Section 8.3. This section was added to describe circulation of the *DEIS*.

APPENDIX D

- (1) Comment and response letters resulting from circulation of the *DEIS* are reproduced in Appendix D.

CHAPTER 1 INTRODUCTION

1.1 OVERVIEW OF THE PROPOSED PROJECT

Kauai Electric (KE), a Division of Citizens Utilities Company, is the legally franchised public utility responsible for the production, purchase, transmission, distribution, and sale of electricity on the Island of Kauai, Hawaii. The company's current expansion plan concludes that the best means of serving the electrical energy needs of its customers includes developing new fossil fuel-fired power generation facilities. The company identified a site near Lihue as the most appropriate location for these facilities. KE plans to use approximately two-thirds of the site for generating-related facilities; the remainder would be used for a new Transmission and Distribution (T&D) facilities baseyard. KE refers to the new facility as its "Lihue Energy Service Center".

In 1993 KE concluded a purchase and sale agreement with AMFAC/JMB for a 17-acre parcel (TMK 3-8-005: Por. 3) on which to construct the proposed Lihue Energy Service Center (see Figure 1-1). The site is located northeast of Puhi, approximately 0.6 miles inland of Kaunualii Highway. The *Draft Environmental Impact Statement (DEIS)* called this parcel KE's "Preferred Site"; this report refers to it as the "Puhi Site". In addition to the property itself, the agreement covers electrical transmission line, utility, and roadway easements needed to support the generating facilities.

The agreement between KE and AMFAC/JMB recognized the possibility that issues could arise during permitting for the project that could necessitate use of an alternate location. Consequently, the agreement provided for the use of alternate sites on AMFAC/JMB land in the event KE was unable to develop the aforementioned parcel. It also provided for the return of the property to Lihue Plantation Company (LPCO), a subsidiary of AMFAC/JMB, if KE were unable to secure the approvals needed to develop the site for its intended use. If KE exercises this provision of the agreement, LPCO must return the payments it has received for the property.

As a result of concerns raised following the July 1997 publication of the Environmental Impact Statement Preparation Notice (EISPN) for the Lihue Energy Service Center, KE and AMFAC/JMB worked together to identify possible alternate locations. These alternate sites were selected to avoid some of the adverse effects that the public felt might occur if the company proceeded with development on the Puhi Site. Figure 1-2 shows the location of these alternate locations.

Figure 1-3 shows the existing topography and other features of the Puhi Site. Sugarcane is presently being cultivated on most of the property, but an abandoned water tank occupies a 60-foot by 80-foot parcel situated near its eastern end. The reservoir is earmarked for removal before KE begins construction of the new energy facilities.

Figures 1-4 and 1-5 provide comparable information for the two alternate sites. The "Field 390 Site" (TMK 3-8-03: por. 1) is the first of these alternates. It is located along LPCO's main cane haul road in the area, approximately 800 feet south of Ma'alo Road (also known as Wailua Falls Road). It is currently used for the cultivation of sugar cane. The second alternate site, referred to as the "Airport Industrial Area Site" (TMK 3-7-02: por. 1), is located on industrially zoned land immediately west of Lihue Airport. This site borders the existing County solid waste transfer station. Like the other two sites, LPCO is currently cultivating sugar cane in this area.

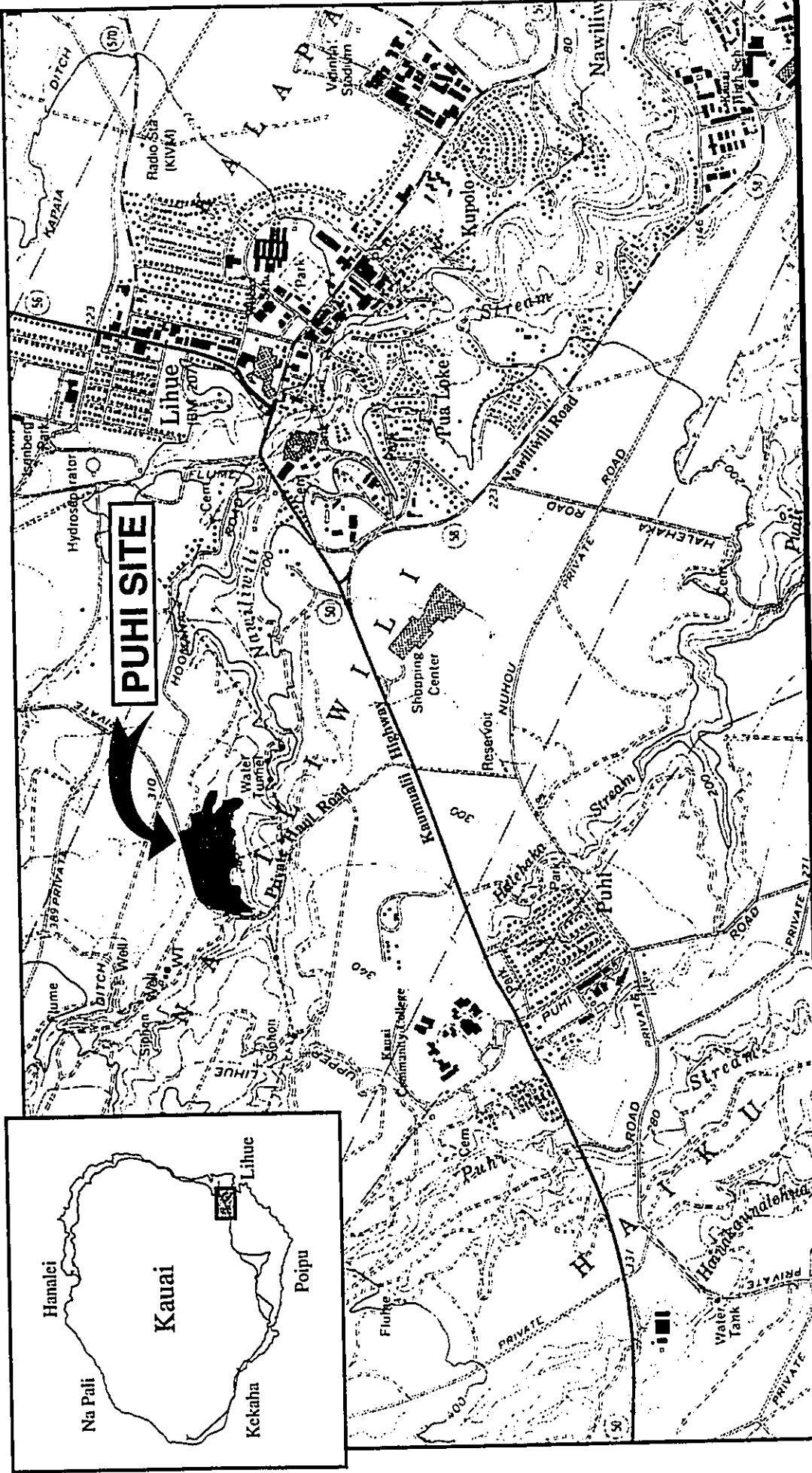
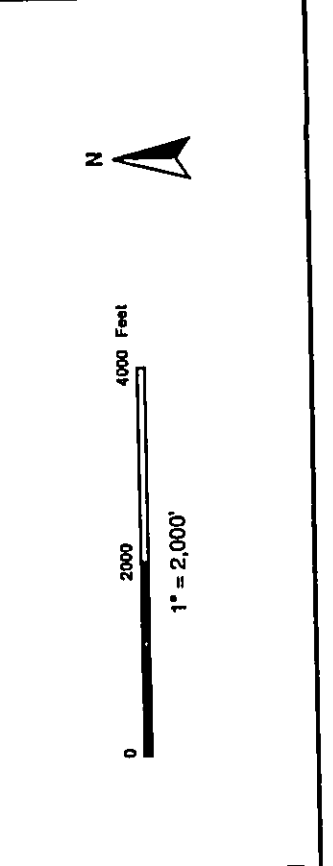


FIGURE 1-1: Puihi Site and Vicinity

PUIHI SITE

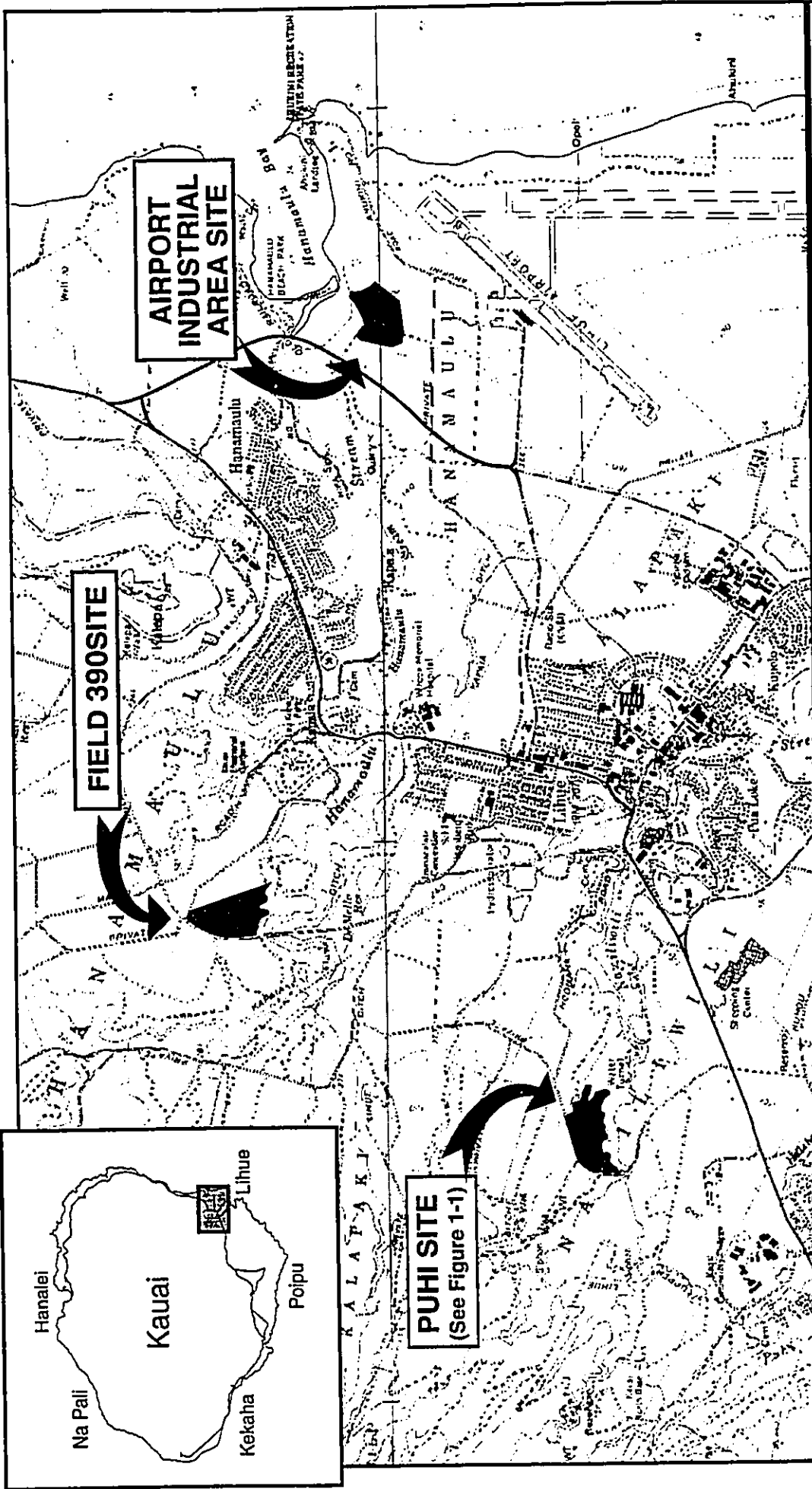
Kauai Electric
Lihue Energy Service Center



PREPARED FOR:
Kauai Electric
A Division of the
Citizens Utilities Company

PREPARED BY:
Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:
USGS 7.5' Lihue Quadrangle, 1983.



FIELD 390 SITE

AIRPORT INDUSTRIAL AREA SITE

PUHI SITE
(See Figure 1-1)

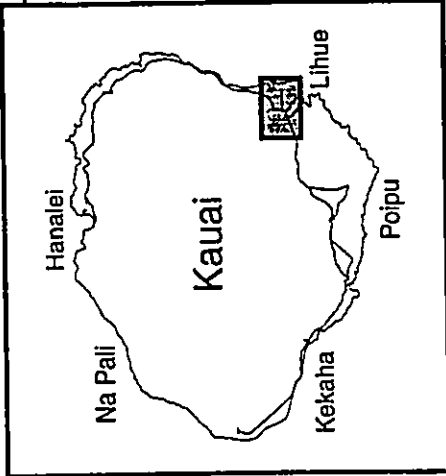


FIGURE 1-2:

Location of Sites Being Considered



PREPARED FOR:

Kauai Electric
A Division of the
Citizens Utilities Company

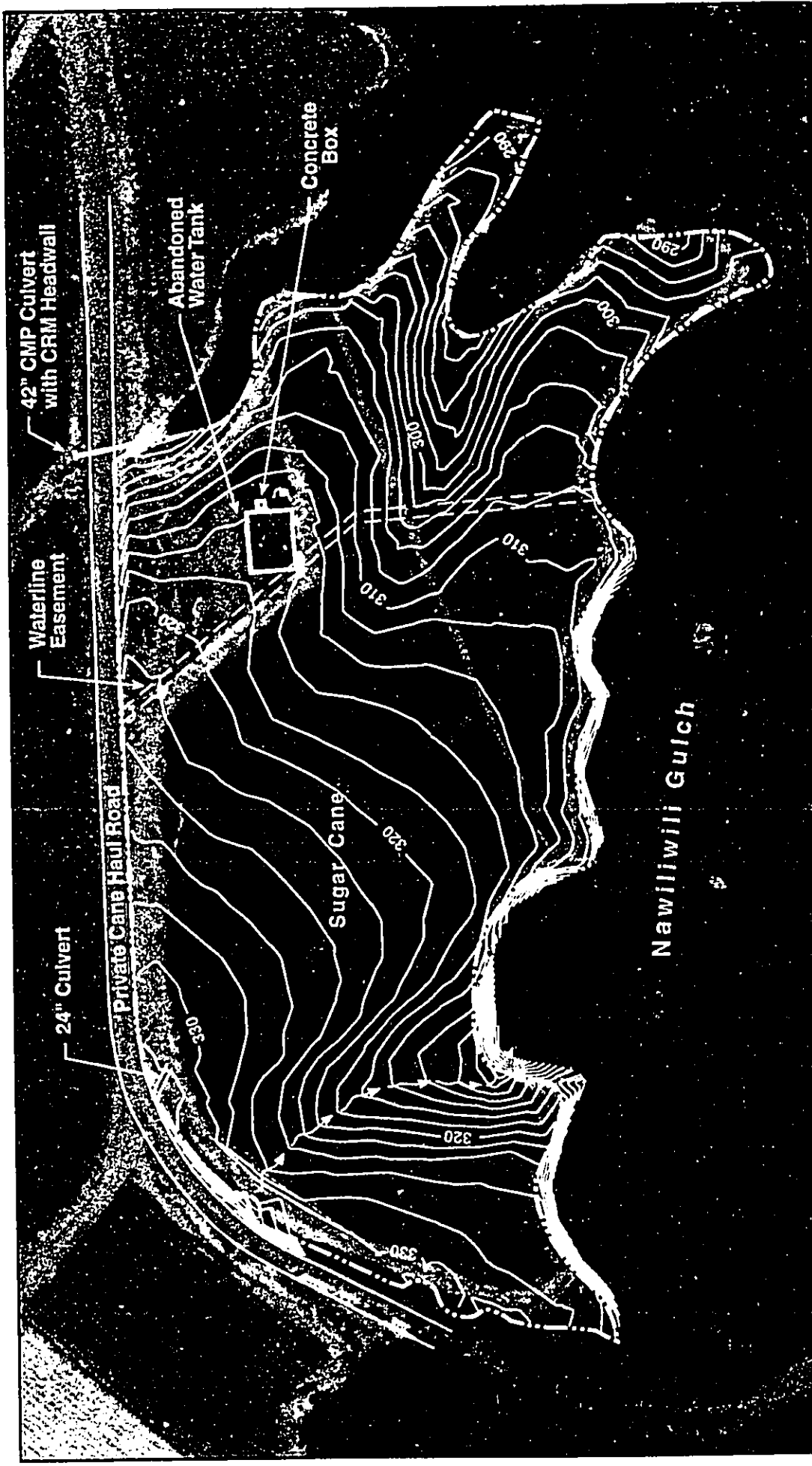
PREPARED BY:

Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:

USGS 7.5' Lihue Quadrangle, 1983.
USGS 7.5' Kapaa Quadrangle, 1983.

Kauai Electric
Lihue Energy Service Center



PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Kodani & Associates, Inc.
 Air Survey Hawaii, March 14, 1996

LEGEND:

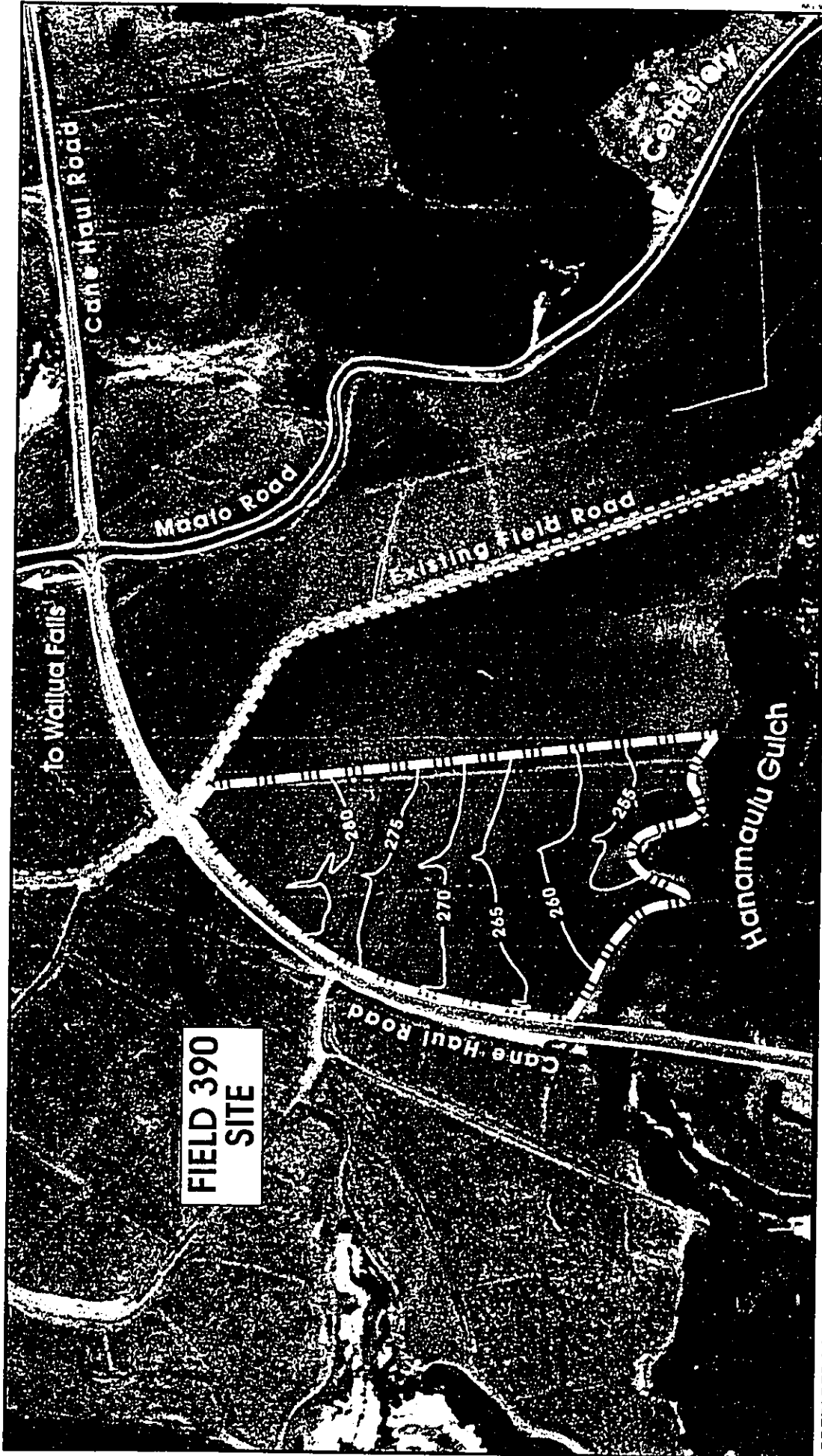
- Property Boundary
- == Easement Boundary
- Drainage
- 300— Elevation in Feet

0 200 400 Feet
 Contour Interval 2 Feet

N

FIGURE 1-3:
Existing Features of Kauai Electric's Puhi Site

Kauai Electric
 Lihue Energy Service Center



PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizen Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Air Survey Hawaii, February 1998
 Kauai County Public Works Dept., December 1975

LEGEND:

- 265 Elevation in Feet
 - Field 390 Site Boundary
 - County and Main Cane Haul Road
 - Main Field Roads
- Approximate Scale
 1" = 440'
- N

FIGURE 1-4:

Existing Features of Field 390 Site

Kauai Electric
 Lihue Energy Service Center

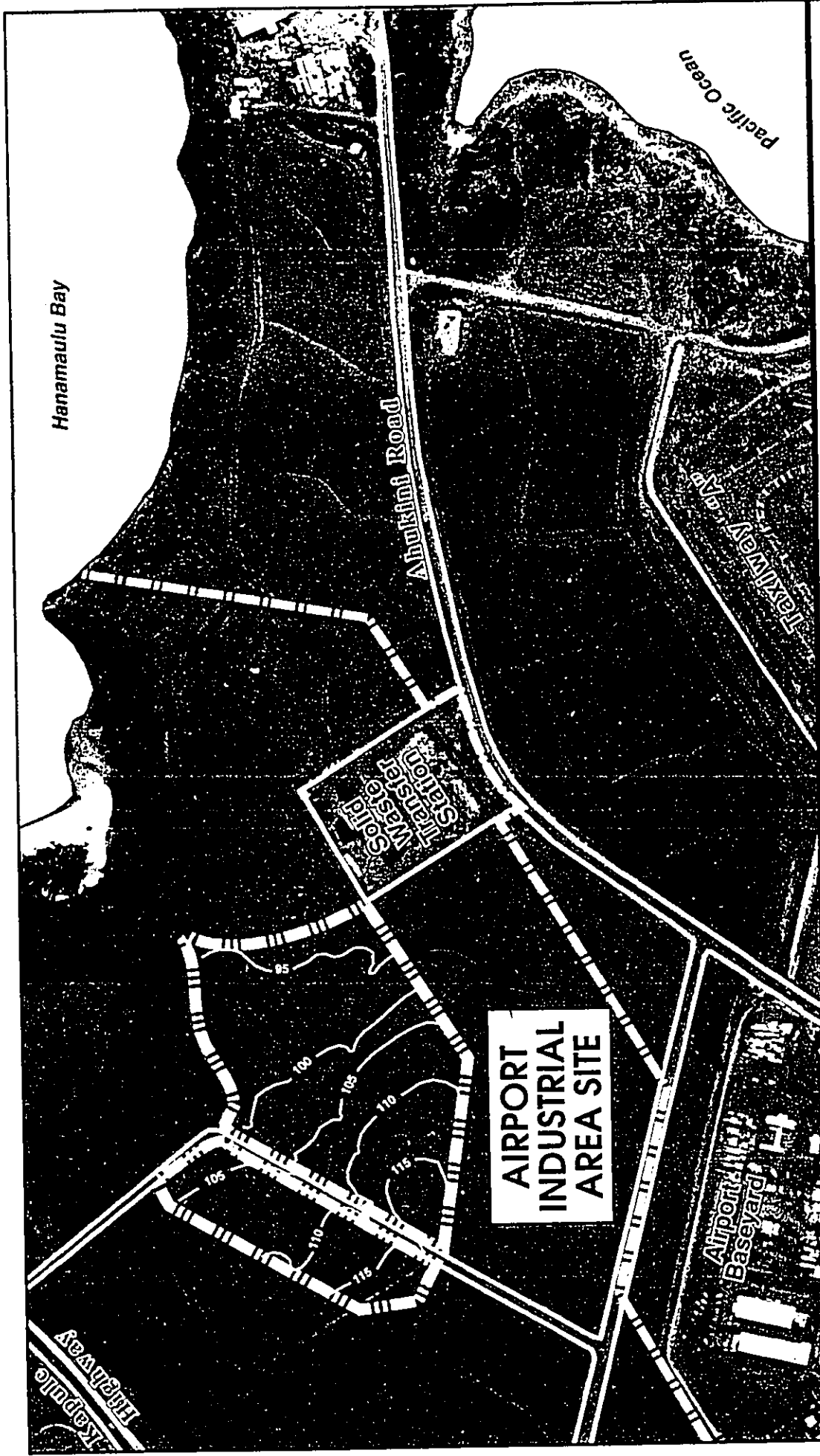


FIGURE 1-5:
Existing Features of the Airport Industrial Area Site

PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizen Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Air Survey Hawaii, February 1998
 Kauai County Public Works Dept., December 1975

LEGEND:

- 100 — Elevation in feet at mean sea level
- Lihue Airport Boundary
- Airport Industrial Area Site Boundary
- Paved Road

Approximate Scale
 1" = 325'

N
 ↑

1.2 NEED FOR ADDITIONAL ELECTRICAL GENERATING CAPACITY

This section explains the reasons KE must install additional generating capacity if it is to meet its customers' electrical power needs over the coming decades. It describes the power sources that are currently available, reviews existing and forecast power use under a range of possible future conditions, and discusses the generating capacity that KE plans to add to its system to meet that demand.

1.2.1 EXISTING GENERATING CAPACITY

As shown in Table 1-1, the total firm electrical generating capacity on Kauai is presently slightly over 110 megawatts (MW).¹ The great majority of this capacity (96 MW) is located at KE's Port Allen Generating Station. The remaining 14 MW are from the Lihue sugar mill; these are obtained under a "purchase power" agreement with LPCO.

KE also purchases non-firm power² from Island Coffee and the Kekaha, and Gay & Robinson sugar mills. The nominal amounts available from these three sources are 2.5 MW, 1.2 MW, and 0.4 MW, respectively (Kauai Electric, 1997 *Integrated Resource Plan*). However, this power is acquired under "surplus power" contracts with the companies and cannot be relied upon to meet peak demand.³

1.2.2 DAILY AND SEASONAL LOAD VARIATIONS

The amount of generating capacity a utility must have to meet its customers' needs varies over time. This variation can be shown by graphs of usage over time. Figure 1-6 shows typical load shapes KE experiences over the course of a day (Kauai Electric, 1997 *Integrated Resource Plan*, Figure 6-2). Two load curves are presented, one for the winter and the other for summer. They differ because summer's higher temperatures boost daytime electrical power usage due to air-conditioning loads.

Figure 1-7 shows the way peak usage typically varies over the course of a year. The highest use is typically in the fall. KE takes this seasonal variation into account. Thus, it typically performs normal maintenance on its largest generating units during the spring. This is the time when peak energy consumption is lowest and the amount that KE can purchase from the sugar plantations is relatively high.

1.2.3 RULES USED TO DETERMINE NEED TO INSTALL ADDITIONAL GENERATING CAPACITY

KE determines when it needs to add additional generating capacity using planning criteria established by KE and approved by the State of Hawaii Public Utilities Commission (PUC) pursuant to PUC Order No. 6055, issued in 1992. These PUC-approved planning criteria are designed to insure that the electricity needs of all of the citizens of Hawaii are met with the minimum capital investment by the utility companies. Under these regulations, KE is required to maintain installed generating capacity sufficient to:

¹ "Firm power or capacity" is power or power-producing capacity intended to be available at all times not specifically excluded. The term allows for periods when scheduled maintenance is being performed on generating units and for a certain specified amount of unscheduled outages.

² "Non-firm power or capacity" is power or power-producing capacity supplied or available under an arrangement which does not have the guaranteed continuous availability feature of firm power. Power supplied to the utility at the convenience and discretion of another party is non-firm power.

³ Until it closed in 1996, KE also purchased power from the Koloa Mill.

Table 1 - 1. Capacity and Location of Existing KE System Generating Units Providing Firm Power.

Location	Unit Name	Year Installed	Rated Peak Capacity (MW)
Port Allen Generating Station	Gas Turbine No. 1	1973	19.10
Port Allen Generating Station	Gas Turbine No. 2	1977	23.70
Port Allen Generating Station	Steam Plant	1968	10.00
Port Allen Generating Station	EMD Diesel 1	1964	2.00
Port Allen Generating Station	EMD Diesel 2	1964	2.00
Port Allen Generating Station	EMD Diesel 3	1968	2.75
Port Allen Generating Station	EMD Diesel 4	1968	2.75
Port Allen Generating Station	EMD Diesel 5	1968	2.75
Port Allen Generating Station	SWD 6	1990	7.85
Port Allen Generating Station	SWD 7	1990	7.85
Port Allen Generating Station	SWD 8	1991	7.85
Port Allen Generating Station	SWD 9	1991	7.85
Lihue	Lihue Plantation Mill	1981	14.00
Sum of Unit Capabilities			110.45

Note: Amfac Sugar Kauai (Lihue Plantation) provides 14 MW of firm dispatchable power under terms of a power purchase agreement effective November 1992. This is a firm resource that KE includes in its capacity mix. The Agreement establishes prices for energy supplied under four separate price mechanisms. It also requires a three-year notice of intent of either party to cancel the contract.

Source: Kauai Electric Division, Citizens Utilities Company (April 1, 1997), *1997 Integrated Resource Plan*.

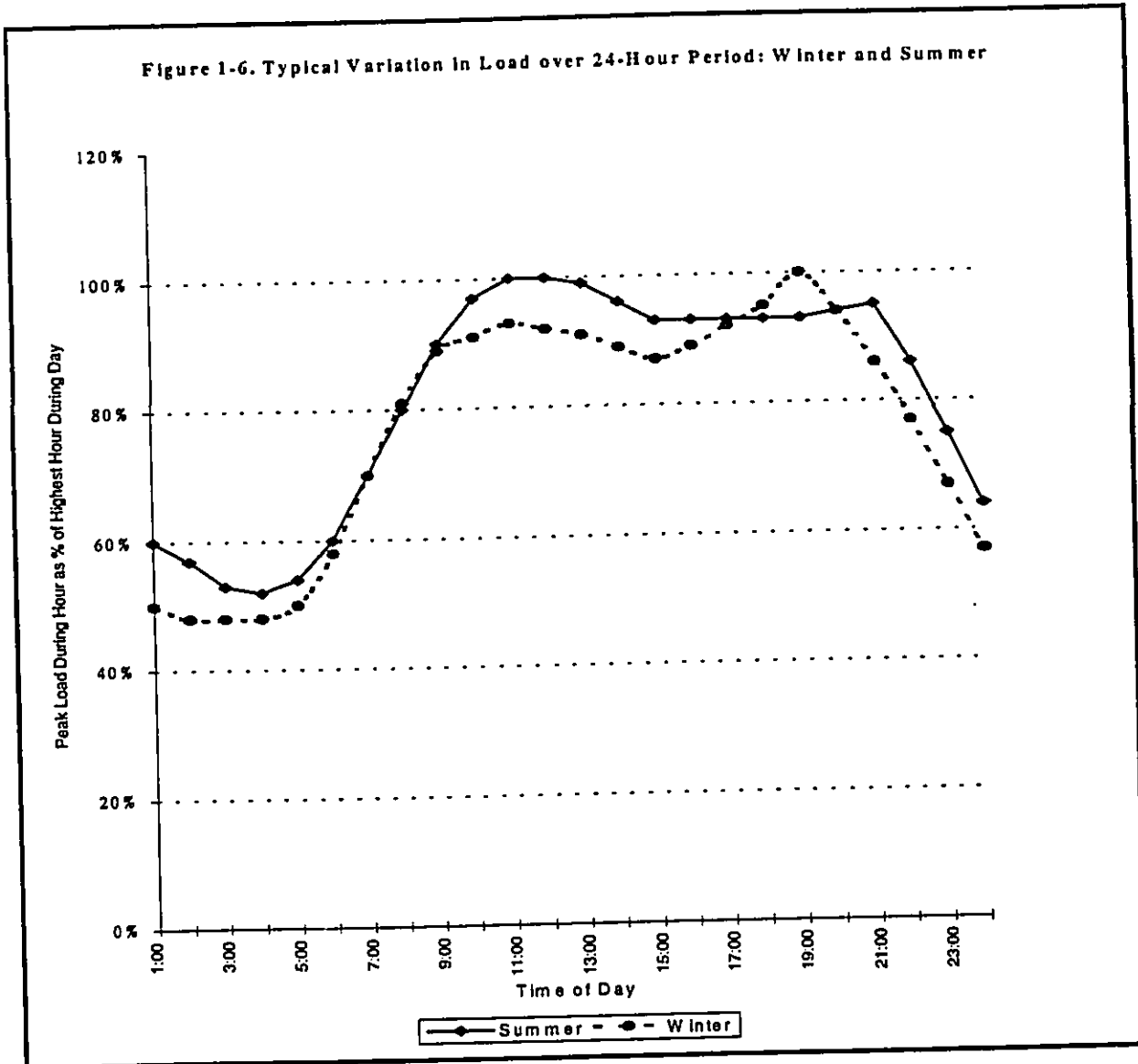
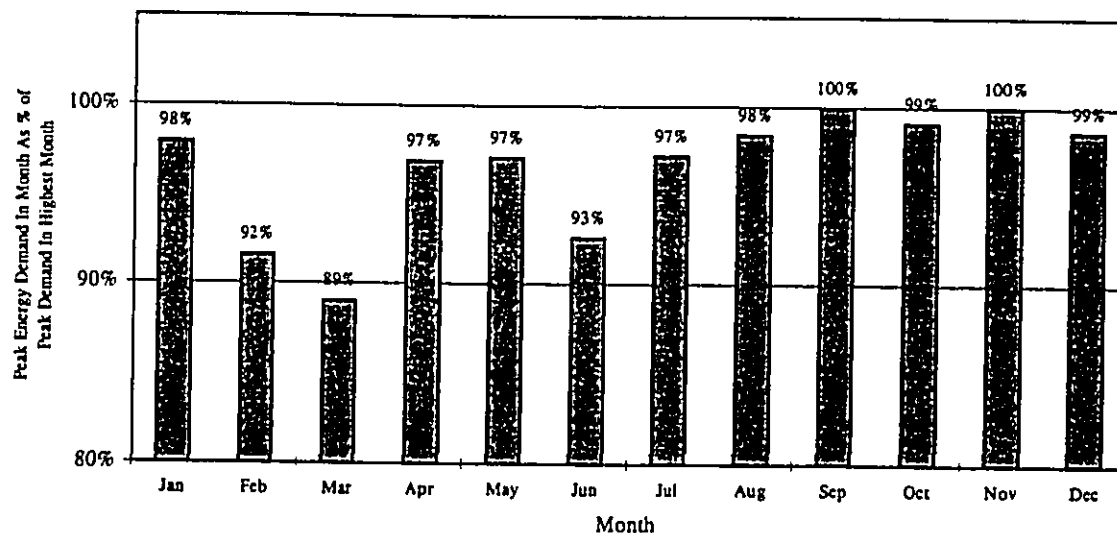


Figure 1-7. Seasonal Variation In Peak Electrical Energy Demand.



- meet Kauai's annual peak load without the largest generating unit available (this is presently the 23.7 MW Gas Turbine No. 2); and
- meet Kauai's morning peak load without the largest generating unit unavailable (presently the 23.7 MW Gas Turbine No. 2) and with the third largest generating unit (typically the 14 MW LPCO unit) on scheduled maintenance.

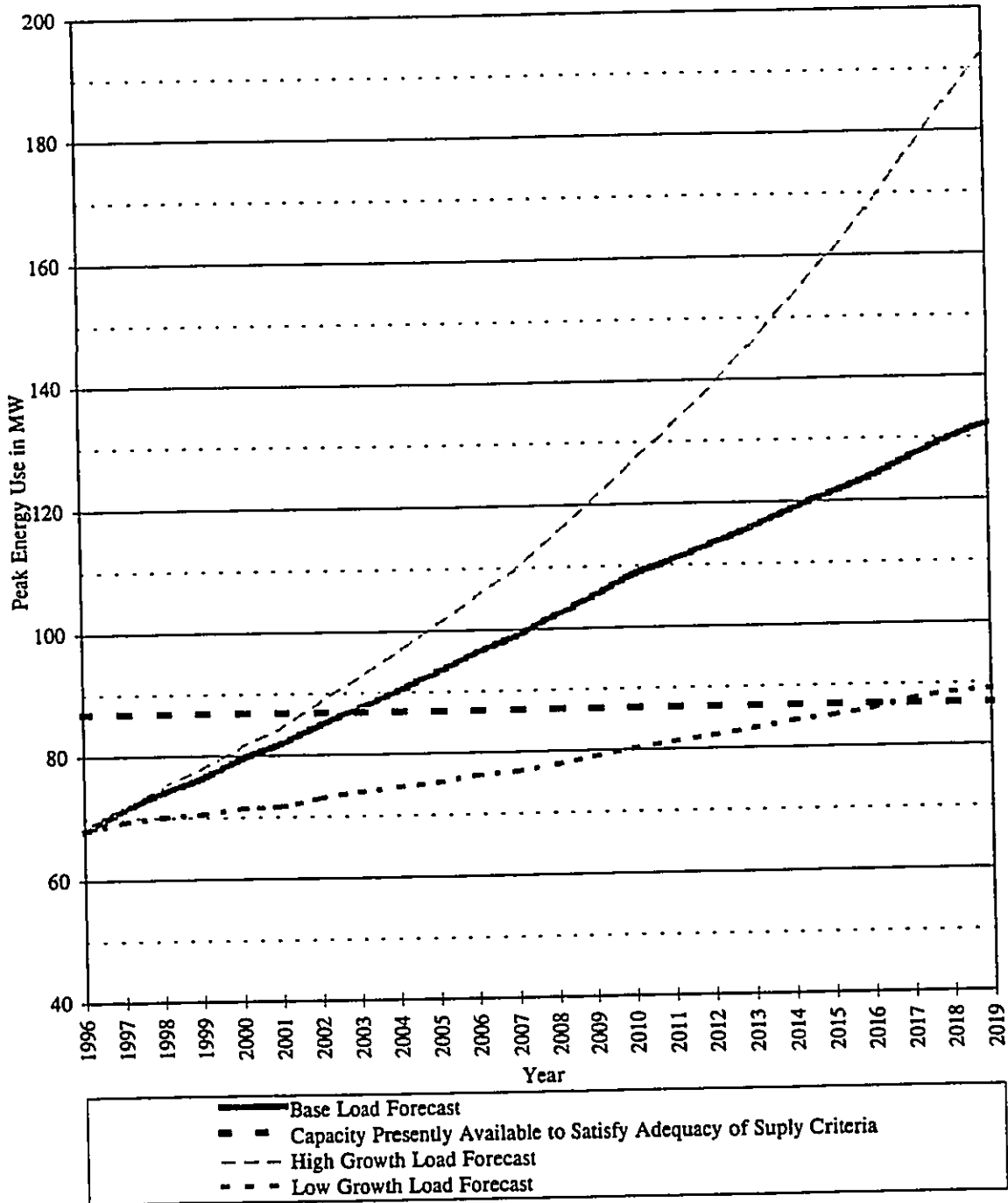
To illustrate the application of these rules, consider the situation during the first half of 1997. Subtracting the largest unit (23.7 MW) from the total of 110.45 MW shows that KE had 86.75 MW available to satisfy the first criteria. Since the peak demand during 1998 is forecast to be about 74 MW, the company has approximately 13 MW more installed capacity than it needs to satisfy its capacity criteria during the present year.

1.2.4 FORECAST ELECTRICAL ENERGY DEMAND

KE prepares annual forecasts of peak electrical power demand for use in its operational planning. It also prepares long-range forecasts as part of its Integrated Resource Planning process. KE's 1997 *Integrated Resource Plan (1997 IRP)* contains forecasts of island-wide electrical energy demand. These forecasts incorporate the expected effect that energy conservation measures encouraged through the IRP process will have on the demand for electrical energy. The IRP forecasts are for three different scenarios:

- A **Baseline Scenario** that forecasts a continuation of recent trends with a slow recovery from the effects of Hurricane Iniki yielding relatively slow growth in population and employment. This scenario anticipates that visitor activity will continue to recover but the rate of growth will remain well below the pace experienced in the 1980s. This scenario also assumes a continuation of current regulatory policies concerning the environment, energy, and the electric utility industry. As shown in Figure 1-8, peak demand under this scenario is expected to rise from about 74 MW in 1998, to 132 MW in 2019.

Figure 1-8. Comparison of Forecast Demand With Existing System Capacity.



- A **High Economic Growth Scenario** that assumes rapid recovery from the effects of Hurricane Iniki. Growth in visitor activity, population, and employment is assumed to return to levels typical of the pre-Iniki period, and the U.S. and Japanese economies are assumed to be robust. This scenario also assumes a continuation of current regulatory policies concerning the environment, energy, and the electric utility industry. As shown in Figure 1-8, peak demand under this scenario is expected to rise from about 74 MW in 1998, to 193 MW in 2019.
- A **Low Economic Growth Scenario** that assumes an extremely slow recovery from the effects of Hurricane Iniki. It anticipates lower levels of population growth, economic activity, and increases in visitor arrivals than were experienced during the late 1980s. This scenario also assumes that the U.S. and Japanese economies are stagnant. Finally, it assumes a continuation of current regulatory policies concerning the environment, energy, and the electric utility industry. Under the low economic growth scenario, there is little increase in electrical demand. Peak use in 2019 under this scenario is only 89 MW. This is only 15 MW (approximately 20 percent) greater than the anticipated peak in 1998.

1.2.5 NEED FOR ADDITIONAL GENERATING CAPACITY

All three of the demand forecasts (Baseline Scenario, High Economic Growth Scenario, and Low Economic Growth Scenario) represent "net" electrical energy use, i.e., the amount that would be needed after accounting for the effect of increased conservation and energy efficiency resulting from KE's Demand-Side Management" (DSM) programs. These DSM programs, which are the starting point for KE's system planning, are described in Section 1.2.5.1. Only after it determines that the forecast demand cannot be efficiently met by decreasing customer demand does KE consider constructing new generating units. Section 1.2.5.2 describes the additional generating capacity that KE forecasts it will need even after successful implementation of its DSM programs.

1.2.5.1 Demand-Side Management Program

In December 1994, KE filed an application with the PUC requesting approval of six DSM programs intended to encourage its customers to use electrical energy more efficiently. These investments, which were expected to reduce peak electrical demand by 5.1 MW by 2004, focused on:

- Energy-efficient lighting,
- Improved Heating, Ventilating, and Air-Conditioning (HVAC) systems,
- Better electrical motors and control systems, and
- Water-heating conservation.

While it was awaiting Commission action on its application, KE updated its description of these programs in its April 1997 *IRP* filing.⁴ The five major programs described in KE's *IRP* included:

- **Commercial Retrofit Program.** This program promotes energy-efficiency improvements in existing commercial buildings. The primary components of this program are energy surveys by a commercial energy auditor, customer education and recommendations for cost-effective energy efficiency measures, and monetary incentives (up to 30%) for measures which are installed through the program. Eligible measures include efficient lighting technologies, cooling maintenance and equipment, motor controls, and energy management systems. Cost-effective, custom measures for unique applications may also be eligible. Different marketing strategies will be

⁴ The *IRP* filing withdrew the Commercial Equipment Replacement Program included in its 1997 application as a stand-alone, full-scale program. Instead, the measures originally included in that program were incorporated into the Commercial Retrofit Program.

followed for small (<30 kilowatts [kW]) to medium (30-100 kW) customers and large customers (100+ kW). In the early years, the program also includes qualifying equipment replacement and new construction measures until such time as a commercial new construction program proves cost effective as a stand-alone program.

- **Commercial New Construction.** KE's Commercial New Construction Program is designed to provide energy efficiency technical assistance and incentives to owners/developers of new commercial structures. The program provides incentives for builders who incorporate energy efficiency features into their projects that go beyond the minimum building code requirements. This program includes measures such as VSD high-efficiency chillers, hard-wired compact fluorescent fixtures, halogen PAR flood lamps, and high-efficiency ventilation fan motors. KE's program provides technical training to design professionals and firms and cash incentives to owners who incorporate the prescribed features in their designs.
- **Residential Retrofit.** Participation in this program is targeted for homeowners and those customers who are not eligible for the Direct Install program (see next paragraph). Customers who participate in the rebate program are mailed a home energy questionnaire. After the completed survey is returned, a report containing recommendations for energy saving practices and installations is sent to the participant. Coupons redeemable at local retailers are included with the participant's report for 30% rebates on recommended energy-efficient lighting and low-cost water heating measures. The program also offers a 45% rebate to owner-occupied single-family residential customers to convert from conventional electric water heating to energy efficient heat pump or solar water heating systems when such systems are determined to be cost-effective.
- **Residential Direct Install Program.** This program targets low-income and renter households having conventional electric water heating. It provides for a residential energy auditor to go to the customer's home, conduct an energy survey, provide energy use information to the customer, and install appropriate low-cost measures (compact fluorescent lamps, tank insulation, temperature turndown, faucet aerators, efficient showerheads) at no direct cost to participants. If it is determined that a heat pump or solar water heater would be cost effective for the household, a rebate (70%) will be offered for up to a maximum amount for the installation of a system. Customers in this group who do not have electric water heaters are eligible to participate in the Residential Rebate Program.
- **Residential New Construction.** KE's proposed residential new construction program was designed to provide energy efficiency technical assistance to residential builders. The proposed program provided for incentive payments to builders who include solar water heaters, heat pump water heaters, and hard-wired fluorescent light fixtures in the homes they construct.

In August 1997, the PUC approved KE's application for all six of the DSM programs included in its 1994 filing. However, because significant changes in KE's planning assumptions had occurred regarding Kauai's market and economy since it had filed that application, KE asked the PUC to allow it to proceed with modified Commercial Retrofit, Residential Retrofit, and Residential Direct Install programs and to delay the implementation of the two new construction programs until Kauai's construction industry has recovered from the downturn that followed Hurricane Iniki. KE expects that this will occur in 2001. In the meantime, KE will serve its new construction customers under the respective retrofit programs. KE started implementation of these programs during the first quarter of 1998.

KE is devoting substantial company resources to its DSM programs, budgeting \$11.3 million for the 1998 to 2002 period. However, preliminary results suggest that the DSM programs may fall short of

its intended energy savings. To the extent that it does, the electrical loads that the company must serve could be up to 5 MW higher than indicated in the forecasts presented in the previous section of this report. This could accelerate the need for KE to bring its next generating unit on line.

1.2.5.2 Residual Need for Additional Generating Capacity

Comparing these forecasts of residual electrical demand (i.e., the demand for electricity not eliminated by the DSM programs) with the system capacity defined using the rules discussed in Section 1.2.3 shows when additional generating capacity is needed under each of the scenarios. This is represented by the point at which the line showing demand intersects the line indicating the required capacity (see Figure 1-9). For the Baseline Scenario, this occurs in 2002.⁵ Under the High Economic Growth Scenario, the need for additional capacity would be experienced a year earlier. Under the Low Economic Growth Scenario, the need for additional capacity might not occur until 2016.

There is an important caveat to these numbers. They all assume that LPCO will continue to provide 14 MW of firm power to KE's system. The difficulties faced by the State's sugar industry in general, and LPCO in particular, raise the possibility it might choose to shut down its operations at any time. KE's contract with LPCO stipulates that it must be given three years advance notification of the Plantation's intention to terminate its purchase power agreement. No such notice has been given, but Lihue Plantation has made it publicly known that its decision to continue sugar operations is being made on an annual basis. Thus, it could issue notice to KE at any time. If it does, the utility must be in a position to provide replacement capacity quickly. The loss of the Lihue Plantation unit would necessitate the immediate addition of capacity under all three scenarios (see Figure 1-9). The uncertainty introduced by this factor adds urgency to the need to identify and begin developing a site that can accommodate the new facilities (see Section 1.5 for discussion of schedule issues).

1.3 SUMMARY OF SITING PROCESS TO-DATE

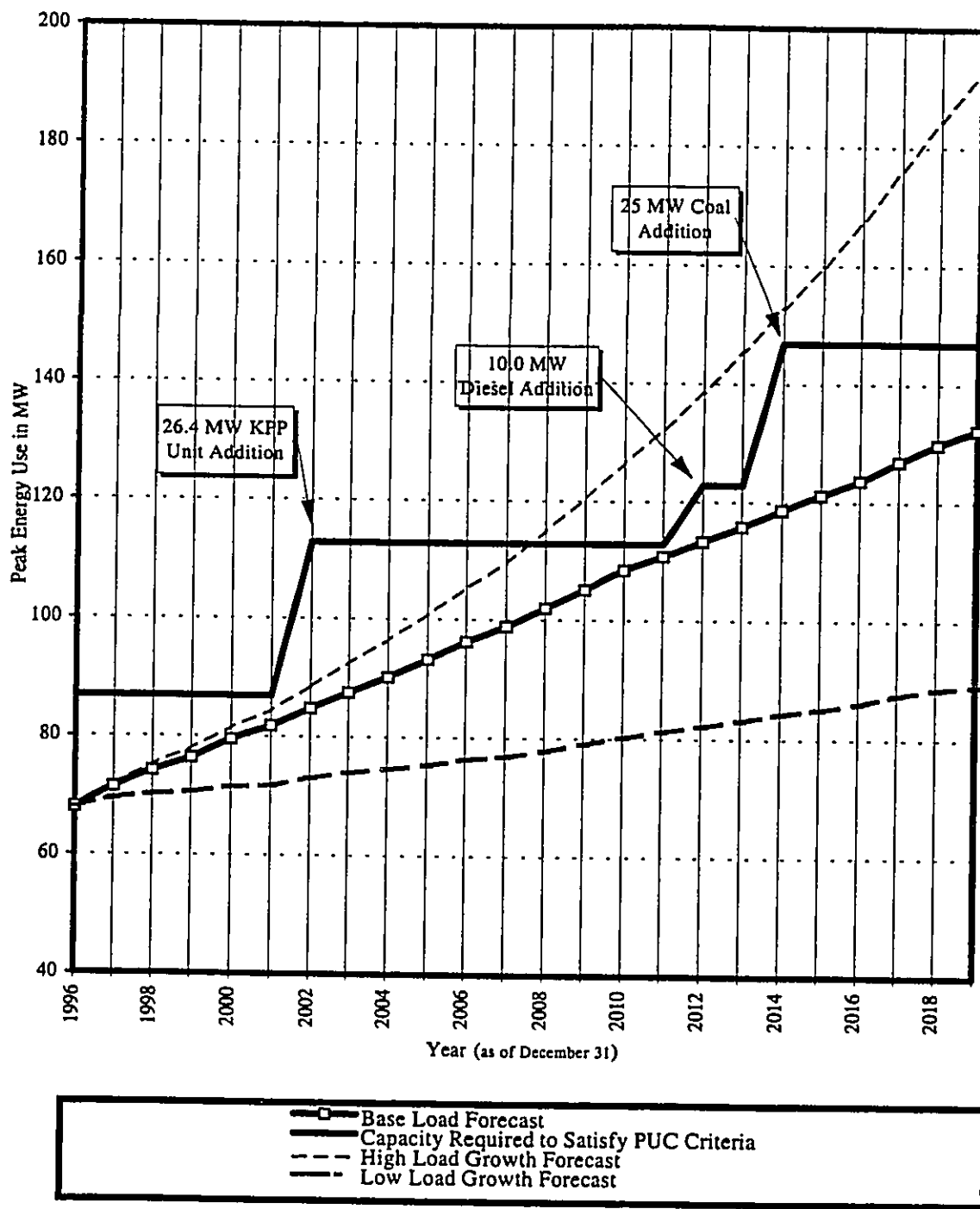
1.3.1 INTEGRATED RESOURCE PLAN

The Integrated Resource Planning process has become the focal point for all of KE's decisions about new generating capacity. The company's choices of generating technology, fuel, and the other technical characteristics of the facilities stem from that analysis.

KE's 1997 IRP describes both the supply-side and demand-side alternatives it has considered in attempting to meet its customers' needs. On the supply-side, these include the use of different fuels (diesel oil, naphtha, biomass, coal, etc.) and various technologies (e.g., gas turbines, fluidized-bed boilers, steam turbines, combined-cycle, renewables, etc.). On the demand-side, the alternatives include promoting the use of such things as solar water heaters, heat pumps, energy-efficient lighting and air-conditioning among its customer base, and pricing differentials based on time of use, etc. The 1997 IRP does not address the location of the proposed generating facilities.

⁵ Note that this is based solely on the point at which demand is forecast to exceed the capacity of the existing units. Some of those units are already 30 years old and are not optimal from an efficiency standpoint. Consequently, it is possible, even likely, that it could make economic sense to install new units before the time indicated above.

Figure 1-9. Comparison of Forecast Demand With Planned System Capacity.



1.3.2 SITE-SPECIFIC ANALYSES

For most of its history, the utility was able to rely on the Island's sugar plantations for a substantial part of its generating capacity since excess power was a byproduct of sugar cane processing. This geographic diversity provided a measure of protection against natural disasters. It also helped provide reliability and lower losses for the transmission system.

Over the past 30 years, the combination of the gradual closure of sugar plantations and the increase in the use of electrical energy that has accompanied island-wide economic and population growth has led KE to install additional generating units at its Port Allen Generating Station on a regular basis (see Table 1-1 for dates of the additions). This has concentrated most of the utility's generating capacity at Port Allen (see Figure 1-10).

All of the company-owned generating units that it has added to its system over the past over the past 30 years are at Port Allen. There are four principal reasons why KE believes that it would be unwise to add additional capacity at that location:

- First, the existing generating units are significant sources of air pollutant emissions. While the facility complies with all Federal and State emission standards and does not cause or contribute to exceedances of ambient air quality standards at that location, KE cannot continue to add emission sources at this location indefinitely and remain in compliance with the air quality regulations. Preliminary estimates are that the Port Allen "airshed" could accommodate no more than 30 MW of additional fossil-fuel-fired generating capacity without substantial (and expensive) retrofits or replacement of existing generating units.
- Second, KE's existing property at Port Allen is already fully used. Installation of additional generating units at this location would require the acquisition of adjacent land or premature replacement of existing generating units.
- Third, the existing electrical transmission lines out of Port Allen are approaching capacity. The addition of more than approximately 35 MW of additional generating capacity at this location would require KE to construct a new transmission line from Port Allen at least as far as Lihue.
- Finally, while KE's Port Allen generating facilities weathered Hurricane Iniki quite well, the transmission system was less fortunate. If KE continues to have generating units only at Port Allen, damage or problems to transmission facilities within a single corridor could lead to island-wide power outages, as it did following Hurricane Iniki.

In view of the foregoing, KE has decided to focus its efforts to develop additional generating capacity elsewhere on the island, preferably near its load center.⁶ The efforts that it has made to identify a suitable location for these facilities are summarized below.

1.3.2.1 1989 Through 1991 Siting Review

Starting in 1989 and continuing through 1991, KE undertook an informal review of sites that might accommodate its proposed facilities. This review was conducted by company engineers with the assistance of professionals from Sierra Research, KE's air quality consultant. The sites that were considered, and the findings made for each, are summarized below.

⁶ The "load center" is the geographic point that is, on average, closest to a utility's customers.

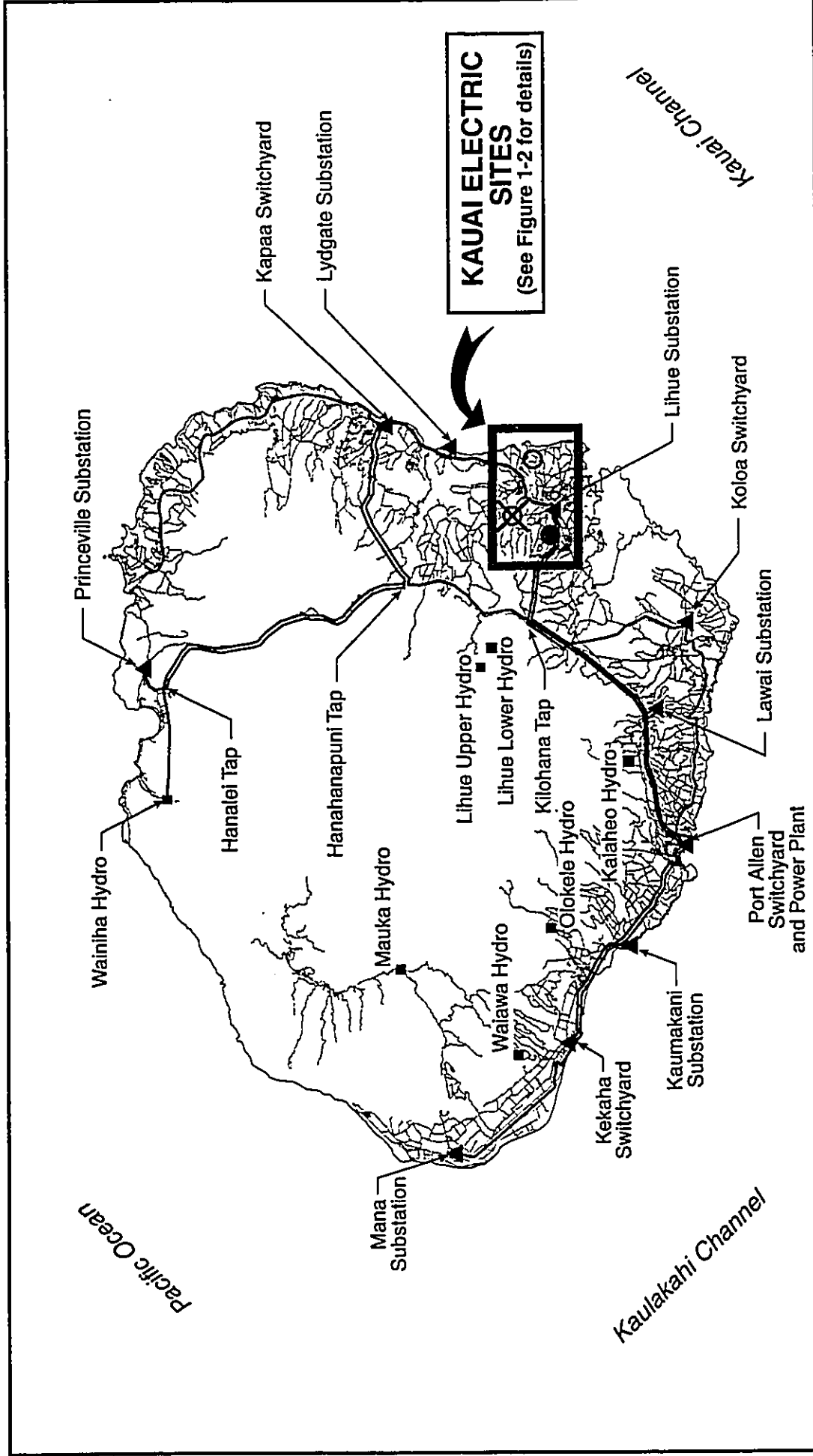


FIGURE 1-10:
Existing Kauai Electric Transmission System
 Kauai Electric
 Lihue Energy Service Center

LEGEND:

- Roads
- Electrical Transmission Lines
- ▲ Switchyard
- Hydro
- Airport Industrial Site
- ⊗ Field 390 Site
- Puhi Site

0 6 12 Miles

N

PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 USGS 1:100,000 DLG, 1983
 Kauai Electric

- **Westin Hotel Site.** This site was located close to a steep embankment. The downwash caused by wind passing over the embankment was judged to make the site unsuitable from an air quality standpoint. The resort eventually decided that this was not feasible.
- **Nawiliwili Harbor Site.** This site was located in the vicinity of Nawiliwili Harbor. The site's proximity to the utility's load center made it attractive from a transmission loss standpoint; the location is also favorable from the standpoint of fuel delivery. However, its proximity to steep terrain led the reviewers to conclude that it might be difficult to obtain required Department of Health air quality permits at this location. The available land area is also limited, and it is close to potentially incompatible land uses.
- **Ahukini Landing Site.** The review team concluded that this location (which is on the high ground on the Lihue side of Ahukini Landing) would be excellent from an air quality standpoint. However, they expressed concern that the site's proximity to the Lihue Airport might limit the possible height of the exhaust stacks. Installing transmission facilities to serve this site would have been particularly costly.
- **Kapa'a Site.** This site is located near KE's existing Kapa'a baseyard. The area is relatively flat, and the prevailing wind would carry emissions away from the town of Kapa'a. Air quality specialists expressed some concern about the high terrain *mauka* of the site, fearing that it could make it difficult to comply with air quality standards. The area that was considered was also found to be quite boggy.
- **Kealia Site.** This possible site is in a broad valley. At the time of the survey the land was in sugar cane production. The reviewers felt that the location was adequate from an air quality standpoint. It was judged less favorable from the viewpoint of fuel delivery.
- **Vicinity of Moloa'a Mill.** This site is on the coastal plain near the Moloa'a Mill. The members of the study team concluded that the site was sub-optimal. This was due principally to the fact that locating it close to the highway resulted in severe visual impacts, while locating it so as to minimize adverse visual impacts would lead to adverse air quality impacts as a result of the proximity to the high terrain *mauka* of the property.
- **Koloa Mill Site.** This site was the old Koloa Sugar Mill, which was still in operation at the time of the assessment. It is distant from high terrain, minimizing the likelihood of adverse air quality impacts. The team noted that the prevailing winds carry emissions toward Poipu, but expressed the belief that its distance from that settlement would make it possible to permit the site.
- **Old McBryde Mill (Island Coffee) Site.** This site is relatively isolated from other development, and the prevailing winds would carry power plant emissions toward the ocean. However, the team noted that some high terrain is located *mauka* of the site and that this could cause some air quality problems. Moreover, the site is too far toward the west to move KE's generating capacity closer to the center of its load, one of the company's principal objectives.
- **Lihue Plantation Sites.** During 1991, KE also began discussions with representatives of AMFAC/JMB concerning the availability of property LPCO owns in the area *mauka* of Lihue and Puhi. KE carried out limited field investigations in conjunction with these discussions. The analyses focused on four factors — terrain and site developability, potential air quality impacts, fuel delivery, and aesthetics. Kites were used to help determine the extent to which facilities constructed on the sites would be visible from nearby areas. KE undertook air quality impact screening investigations in the vicinity of Kalepa Ridge during the summer of 1991. Adding generating capacity in this area would be desirable from a transmission standpoint because it is close to the center of the utility's load. However, the analysis indicated that there is a potential for ad-

verse air quality impacts on the ridge under some meteorological conditions. The results of these investigations indicated that a site on Lihue Plantation land would be superior to the other locations evaluated.

1.3.2.2 Property Purchase Agreement

Based on further work carried out in 1992, the two parties reached preliminary agreement on the location of the proposed facility and the steps that would be taken to consummate a sale. During 1992, KE and AMFAC/JMB negotiated a purchase agreement for the Puhi Site. Items covered under the agreement include the purchase price, alternate locations⁷ that AMFAC/JMB would make available in the event that KE encountered unanticipated problems developing the primary site, and the circumstances under which the purchase could be canceled. These circumstances included KE's failure to obtain the required governmental approvals. AMFAC/JMB have agreed to extend this purchase agreement to include the Airport Industrial Area Site.

AMFAC/JMB prepared the subdivision application needed to separate the 17-acre Puhi Site from the larger parcel in which it is located during 1993. The County of Kauai issued a preliminary subdivision approval on March 11, 1994. Final subdivision approval is contingent upon compliance with numerous conditions.

In the meantime, KE established an air quality monitoring station on the property and collected the 12 months of meteorological data needed to prepare an application to the Department of Health for the air emission permits needed to comply with Hawaii Administrative Rules §11-60, Air Pollution Control.

1.3.2.3 Confirmation of Approval Process

Shortly after it reached agreement with the property owner concerning the purchase of the site, KE commissioned a consultant to undertake an in-depth review of the approvals that would be needed to develop a new power plant on the site. The consultant contacted the Kauai County Planning Department during the course of the review for assistance in determining which of the available permitting processes it wished KE to pursue. On July 18, 1995, the Planning Department provided the following response:

"In response to your request with staff planner Brian Mamaclay and the information contained in your letter dated May 29, 1995 this is to confirm that:

- 1. the review of a Use Permit, Special Permit, and Class IV Zoning Permit application would be the appropriate way to evaluate the project at the proposed location;*
- 2. due to the proposed use, location, nature and overall magnitude of the proposed operation, the provisions of Chapter 343, Hawaii Revised Statutes, relating to the preparation of environmental impact statements will be required.*

Please be advised that the Planning Commission will render its decision on the land use permits subsequent to the completion of the environmental impact statement review procedures.

Although the Special Permit allows in most instances urban land uses in non-urban areas, this procedure would be preferred over a General Plan, Land Use District Boundary, and Zoning Amendment petition because the spot urban land use amendments

⁷ The original agreement included Field 390 as an alternate site

that would be necessary to accommodate the power plant will conflict with the existing agricultural zoning and long-range land use patterns of the surrounding area. Furthermore, the County would have the ability to control the range of possible uses on the 17 acres through the use and special use permits as long as the site remains in agricultural zoning."

Based on the more detailed information it has reviewed since that time, the Planning Department has informed KE that a Variance Permit may be required from limits on height, lot coverage, or other county codes relating to the project. This determination will be made when final plans for the facilities are available.

1.3.2.4 Alternatives Developed During the Formal Environmental Review Process

In accordance with the foregoing, KE prepared an Environmental Assessment (EA) for the proposed project dated July, 1997. This was filed with the Kauai County Planning Department and used as the basis of the Department's decision to request preparation of an environmental impact statement (EIS) for the proposed project. The Department notified KE of its decision, and the Office of Environmental Quality Control published an announcement of the determination in its July 23, 1997, edition of *The Environmental Bulletin*.

In addition to sending copies of the EA together with written requests for comments to many organizations and individuals it believed might have an interest in the proposed project (see Chapter 8 for a listing), KE held an evening public informational meeting in Lihue on August 21, 1997.

Some of those who spoke at the public meeting, as well as several individuals who submitted written comments, expressed concerns about the proposed project. The most commonly expressed concerns dealt with:

- The effect that emissions of air pollutants might have on nearby residences and schools.
- Potential adverse effect on the quality of water from the nearby Garlinghouse Tunnel source.
- The potential for adverse effects on surface water quality in the event of a fuel spill.
- The appropriateness of developing such a facility on property that the County and State have zoned for Agricultural use.
- Potential incompatibility with existing and planned schools.

These comments led KE to identify the two additional alternatives described in Section 1.1.

1.4 INVOLVEMENT OF INDEPENDENT POWER PRODUCER

In the spring of 1996, in its effort to insure the lowest cost, most reliable supply of electrical power for its customers, KE decided to solicit proposals from Independent Power Producers (IPPs) for the design, construction, and operation of additional generating capacity. In addition to preparing its own cost estimate for a KE-constructed facility, it issued a Request for Proposal (RFP) soliciting bids for the supply of 15 to 25 MW of firm capacity. The RFP stipulated that the successful bidder would be expected to provide a power plant including all controls, step-up transformer(s), and other power plant equipment and work needed to provide a complete, fully automated, commercially operable plant. It required the plant to be placed in service no later than July 1, 2002. The RFP made the respective bidders responsible for all engineering, permits (including environmental and land use permits), financing, materials, construction, testing, insurance, and other items needed to create a fully

functional and commercially operable power plant. Finally, the RFP required the successful bidder to operate the power plant for up to 25 years.

KE solicited proposals from 37 different parties and received a total of five completed bids. It evaluated the bids on the basis of numerous factors. These included ability to meet applicable environmental standards, cost, technical reliability, demonstrated financial strength and management expertise, ability to obtain the needed permits and approvals, and expandability. Following review of the proposals, interviews with the respective bidders, and an evaluation of all submitted materials, KE notified Kauai Power Partners, L.L.P (KPP) of its intent to negotiate an agreement with it on the basis of the firm's proposal. A tentative contract was negotiated between October 1996 and March 1997. In July 1997, KE formally asked the State of Hawaii PUC to approve the contract the two firms had negotiated. The PUC approved the contract in June 1998.

KPP's proposal calls for it to develop a 26.4 MW General Electric LM-2500 Advanced Steam-Injected Cycle Combustion Turbine unit.⁸ KPP is evaluating several possible locations for the unit. These include one at Port Allen, one in Koloa, and the three sites that KE is considering. KE is working with KPP to insure that it will be able to accommodate KPP's unit on the Lihue Energy Service Center site that is selected.

KPP has stated that it will consider locating its unit at one of the three sites KE is considering for the Lihue Energy Service Center if the site can be approved in time to meet KPP's contract obligations, water is available, and KPP development costs at that site are not substantially higher than at one of its own site options. KPP has also informed KE that the location and site layouts for the Advanced-Steam Injection Cycle unit depicted in Chapter 2 of this report are generally satisfactory. In the meantime, KPP is continuing to secure options on the alternate sites to insure that it has a viable location for its facility if KE is unable to obtain the needed approvals for its proposed site in a timely fashion. KPP expects to initiate permit applications for its Koloa and Port Allen alternate sites in sufficient time to meet its on-line schedule requirement of July 1, 2002.

1.5 IMPLEMENTATION SCHEDULE

Electric generating facilities require many land use and environmental permit approvals. In the case of the Lihue Energy Service Center, required land use approvals at the Puhi Site and Field 390 Sites include a Use Permit, a Class IV Zoning Permit, a Height Variance, and a Special Permit. Environmental permits can include water supply and wastewater disposal permits, grading permits, storm-water discharge permits, approvals for possible off-site roadway crossings, and, most importantly, air emission permits from the State Department of Health. Because it is already zoned for general industrial use, the Airport Industrial Area Site will not require a Special Use Permit or a Use Permit; it will still require a Class IV Zoning Permit and Height Variance and the various environmental permits needed for this type of facility. These additional approvals are discussed elsewhere in this report.

The air emission permit that is needed for new generating units is particularly critical to power plant development. When the time required to obtain the meteorological data⁹, prepare the air permit application¹⁰, and obtain the State of Hawaii, Department of Health (SDOH) approval¹¹, are all con-

⁸ The technical characteristics of this unit are described in the following chapter of this report.

⁹ 3-6 months to secure permits for and erect the monitoring tower plus 12 months of data collection.

¹⁰ 3-6 months to analyze data and prepare the report.

¹¹ 12 - 18 months to secure approval from the State of Hawaii Department of Health.

sidered, a minimum of three years, and typically more, are needed from the time a site is identified to the time that construction can begin.

As noted above, KE began work on the Puhi Site in the early part of this decade. Since mid-1997, its conceptual planning has extended to the Field 390 and Airport Industrial Area sites as well. Thus far, it has:

- secured rights to the properties;
- collected the meteorological data needed to prepare the air emission permit application for the first unit;
- prepared conceptual engineering plans for the required facilities;
- conducted environmental studies;
- offered the use of a portion of the site to KPP for its proposed generating unit;
- obtained preliminary subdivision approval (Puhi Site only); and
- planted trees along the perimeter of the property to help screen the facility in the event the project is approved (Puhi Site only).

In order to meet the needs of its customers, KE must move expeditiously to develop the proposed Lihue Energy Service Center. Assuming the necessary approvals can be obtained, KE hopes to begin constructing the T&D facilities by mid-2000. If land use and environmental permit approvals are obtained in sufficient time for KPP to locate its proposed unit on the site ultimately selected for the Lihue Energy Service Center, construction of the first generating unit would be initiated shortly thereafter. If KE fails to obtain the needed approvals in a timely fashion, KPP will construct the generating unit called for in its contract with KE elsewhere. In this event, it is unlikely that the first generating unit will be installed on KE's Lihue Energy Service Center site until after 2012. It is expected that the remainder of the site would be developed over the following several decades.

1.6 OBJECTIVES OF THE PROPOSED ACTION

KE's objectives in seeking permission to develop the Lihue Energy Service Center are to:

- Install generating facilities closer to the center of its load. The more central location would decrease "line losses"¹² associated with the long transmission distance between the existing generating facilities at Port Allen and the center of KE's load. This, in turn, would reduce the amount of fuel burned to meet the Island's electrical needs.
- Secure a site that can accommodate the additional generating units that Kauai will need over a period of at least 30 years rather than one sized only for a single generating unit. By obtaining a site suitable for long-term development, KE will minimize its staffing requirements, be able to share resources (personnel and equipment) between multiple activities, and benefit from other economies of scale.
- Increase the variety of fuels it can use in its system. This would increase the reliability of supply and allow the company to generate the electricity it needs using the lowest-priced fuel.
- Develop facilities in such a manner as to minimize adverse environmental impacts.

¹² "Line losses" are the energy that is lost as electricity passes through the transmission lines. KE estimates that a location in Lihue will reduce line losses by approximately 2 to 3 percent relative to a location at Port Allen.

- Be in a position to develop a T&D facility on the same property as generating facilities. This would allow the company to share personnel and equipment between different functions and simplify administration of the facilities.
- Eliminate its dependence upon a single generating facility, thereby reducing the damage that might be done to them by a single catastrophic event.
- Establish these generation facilities in a location that: (i) allows KE to make efficient use of its existing electrical transmission facilities (thereby avoiding the need to construct a new transmission line to Lihue) and (ii) helps KE improve the quality and reliability of the service it provides to customers in the central and eastern portions of the island.

CHAPTER 2

DESCRIPTION OF THE PROPOSED ACTION

2.1 OVERVIEW OF THE PROPOSED FACILITIES

As described in Section 1.1 of this report, Kauai Electric (KE) plans to develop a master-planned Energy Service Center in Lihue, Kauai. The complex would eventually contain 120 to 150 megawatts (MW) of new generating capacity and a centralized Transmission and Distribution (T&D) facilities baseyard. The T&D facilities and the first generating unit (26.4 MW Advanced Steam-Injected combustion turbine that Kauai Power Partners [KPP] is developing for KE) would be constructed over the next four years.¹ The remainder of the generating units would be constructed much later. Consequently, full build-out on the site would not occur for at least 30 years.

KE has developed its present plans for the Lihue Energy Service Center as part of its long-range Integrated Resource Planning (IRP) process. The two generating alternatives described below represent the site development scenarios it considers most likely. One or both also include all of the generating technologies now considered likely to be situated at the site. However, readers should note that the State of Hawaii Public Utilities Commission (PUC) requires KE to make final decisions about the fuel and technology (e.g., diesel, combustion turbine, coal- or oil-fired steam turbines, etc.) and detailed design (e.g., unit size, manufacturer, operating parameters, etc.) for each unit incrementally as additional capacity is actually needed. Moreover, KE's decisions with respect to each unit addition require PUC approval. Consequently, while this document addresses the alternatives that KE presently believes are most likely, it is possible that technological, economic, or regulatory changes will lead it to develop some facilities that differ from those addressed here.² Notwithstanding this possibility, present plans are believed to be sufficiently detailed and representative of the facilities that will be constructed on the site to allow an adequate assessment of the project's probable environmental effects.

Figures 2-1 and 2-2 contain long-range illustrative site plans for the Puhi Site. They show the combinations of generating units that are considered most likely and illustrate all of the types of generating units that KE considers to be proven technologies suitable for its system. Figures 2-3 and 2-4 show conceptual site layouts for the facilities included in Generating Alternative 2 on the Field 390 and Airport Industrial Area Sites, respectively. Generating Alternative 2 involves the greatest variety of generating technologies and the tallest structures; focusing on it allows a complete investigation of potential impacts without the additional complexity of dealing with both generating alternatives at all sites. [Note: Because the electrical generating capacities of the two alternatives differ (150 MW for Alternative 1 versus 119 MW for Alternative 2), they are not directly comparable.]

¹ While it is anticipated that most of the facilities that are constructed at KE's Lihue Energy Service Center will belong to the utility, KE plans to make portions of the site available to independent power producers under contract to it if it believes that doing so will benefit its customers. It has extended such an offer to Kauai Power Partners (KPP). KPP is not obligated to accept the offer, and may choose an alternate location.

² For example, fuel cell technology could improve to the point where it is a viable alternative by the time KE expects to add a second generating unit at the site (sometime after 2012). Micro-turbines are another developing technology that could become viable in that time frame. However, none of these technologies is yet at the point where it is superior to the advanced steam-injected combustion turbine now proposed for the initial increment of development.

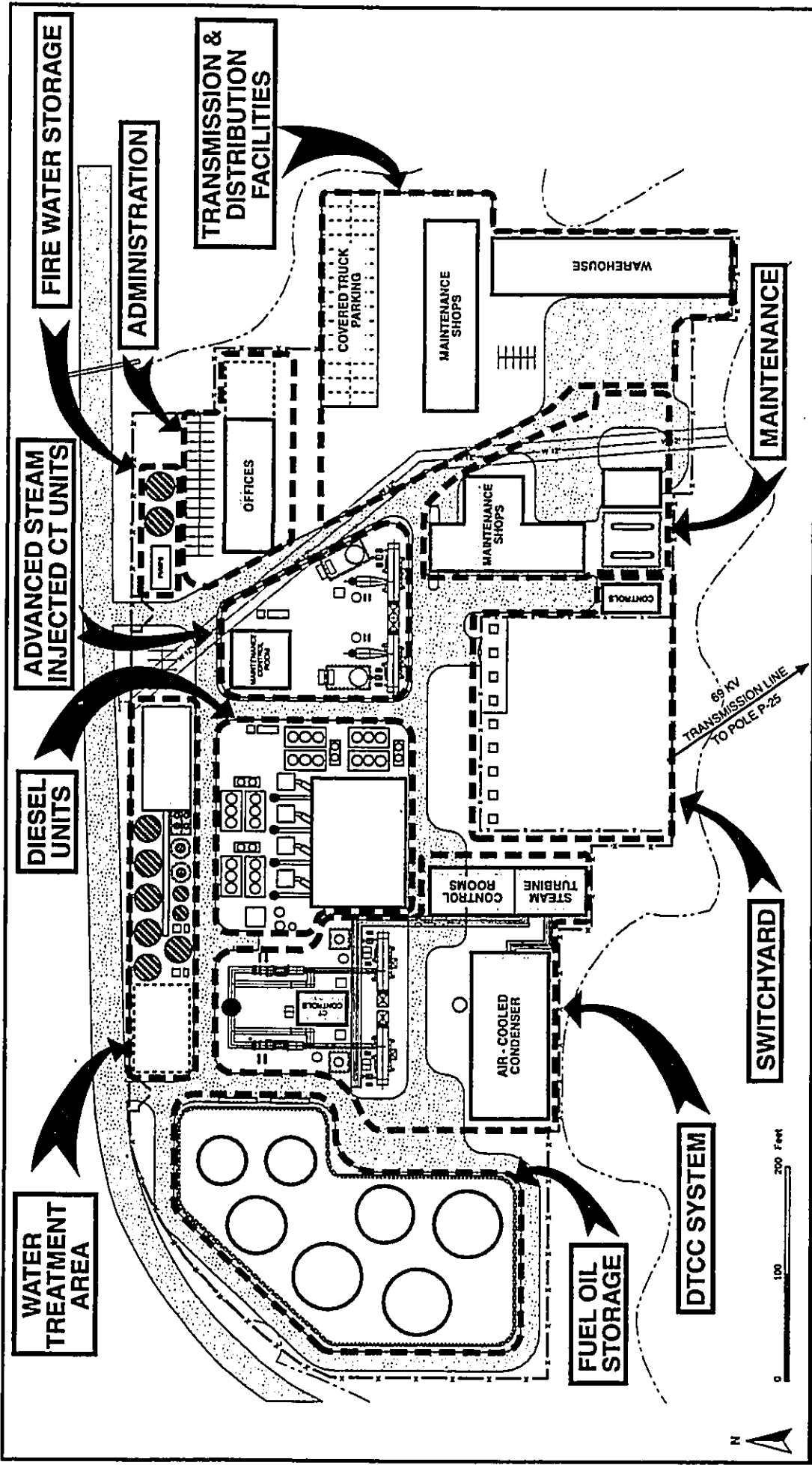


FIGURE 2-1:
**Conceptual Layout for Puhi Site:
 Generating Alternative 1**

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 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

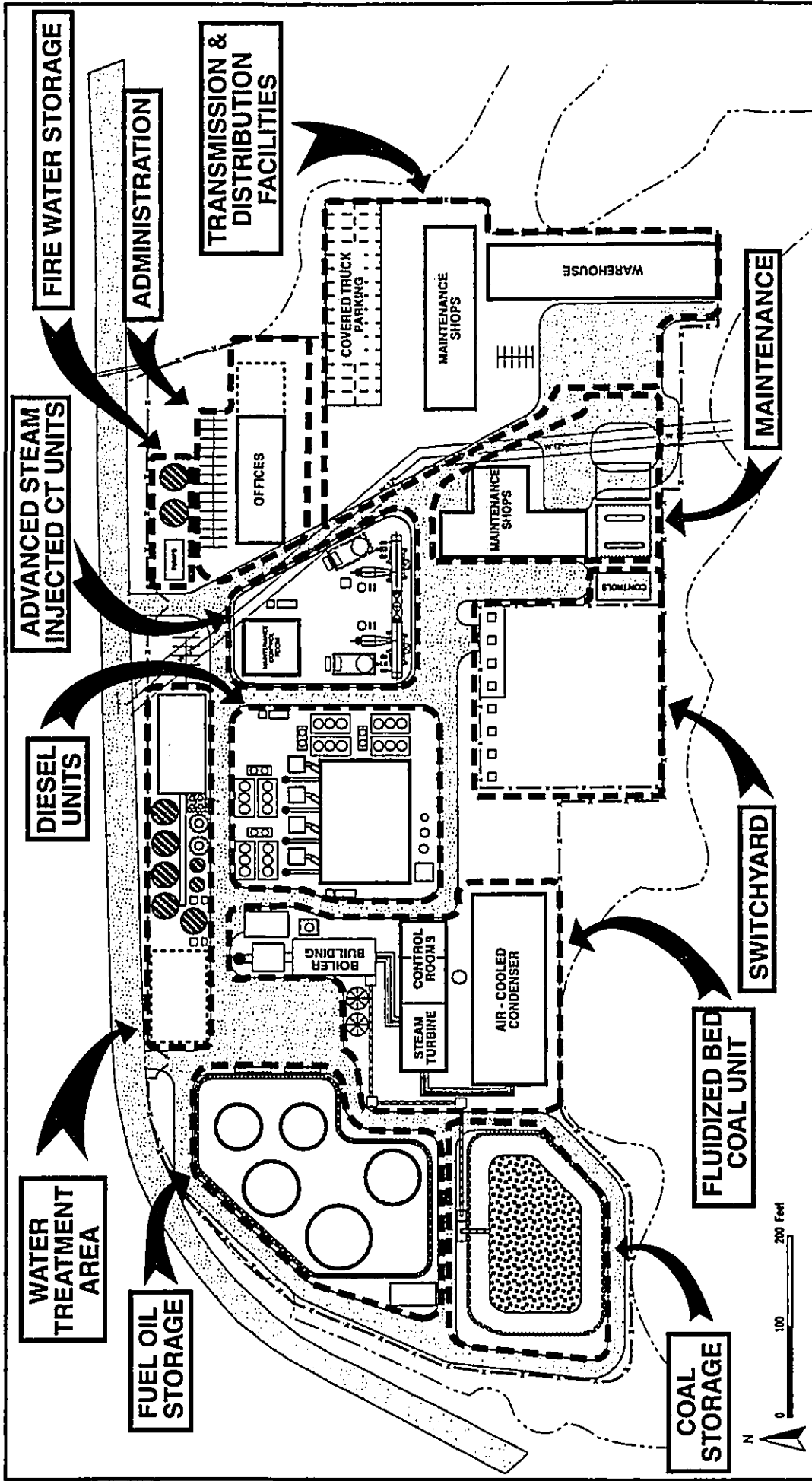
SOURCE:
 Stone & Webster Engineering Corp.

**Kauai Electric
 Lihue Energy Service Center**

LEGEND:

●	EXHAUST STACK	---	PROPERTY BOUNDARY
○	FUEL STORAGE TANK	- - -	LIMIT OF DEVELOPED AREA
◐	WATER STORAGE TANK	---	EXISTING WATERLINE
□	TRANSFORMER	---	VEHICLE ROADWAY
◻	CHEMICAL & DAY TANK WITH CONTAINMENT	---	BUILDINGS
◻	VEHICLE FUEL STORAGE TANK		VEHICLE PARKING
◻	RADIATOR FOR DIESELS	⊠	COMBUSTION TURBINE

KDC (Lihue Energy Service Center) Pg. 2-1 (Rev. 04/2011)



Kauai Electric Service Center, Fig. 2-2, Rev. 5/89, 2/89

FIGURE 2-2:
**Conceptual Layout for Puhi Site:
 Generating Alternative 2**

Kauai Electric
 Lihue Energy Service Center

LEGEND:

●	EXHAUST STACK	▨	COAL STORAGE
○	FUEL STORAGE TANK	---	PROPERTY BOUNDARY
⊙	WATER STORAGE TANK	- - -	LIMIT OF DEVELOPED AREA
⊗	LIMESTONE STORAGE SILO	---	EXISTING WATERLINE
□	TRANSFORMER	---	CONVEYOR BELT
⊠	CHEMICAL & DAY TANK WITH CONTAINMENT	---	VEHICLE ROADWAY
⊡	VEHICLE FUEL STORAGE TANK	□	BUILDINGS
⊢	RADIATOR FOR DIESELS		VEHICLE PARKING
		⊠	COMBUSTION TURBINE

PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Stone & Webster Engineering Corp.

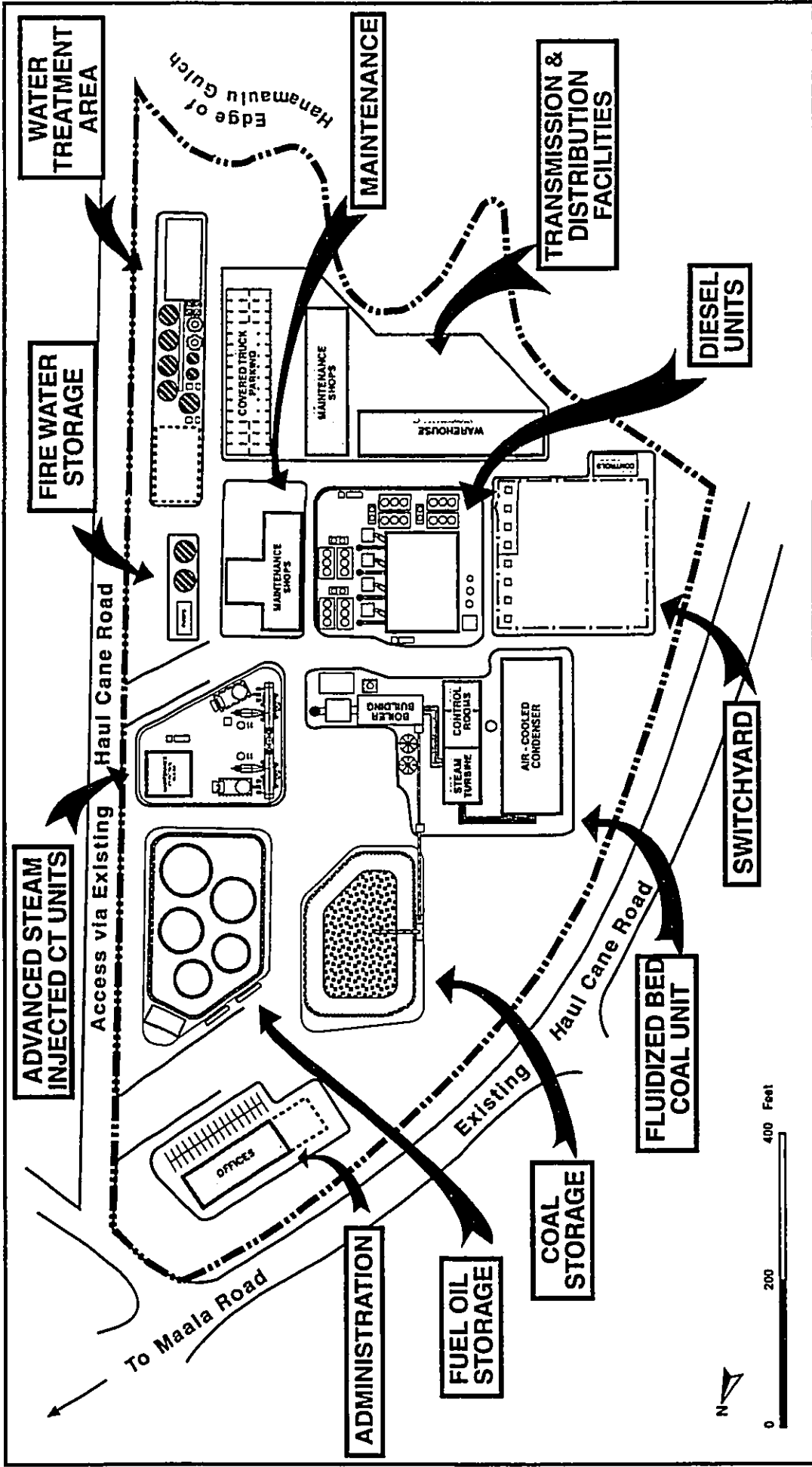


FIGURE 2-3:
Conceptual Layout for Field 390
Site: Generating Alternative 2

Kauai Electric
 Lihue Energy Service Center

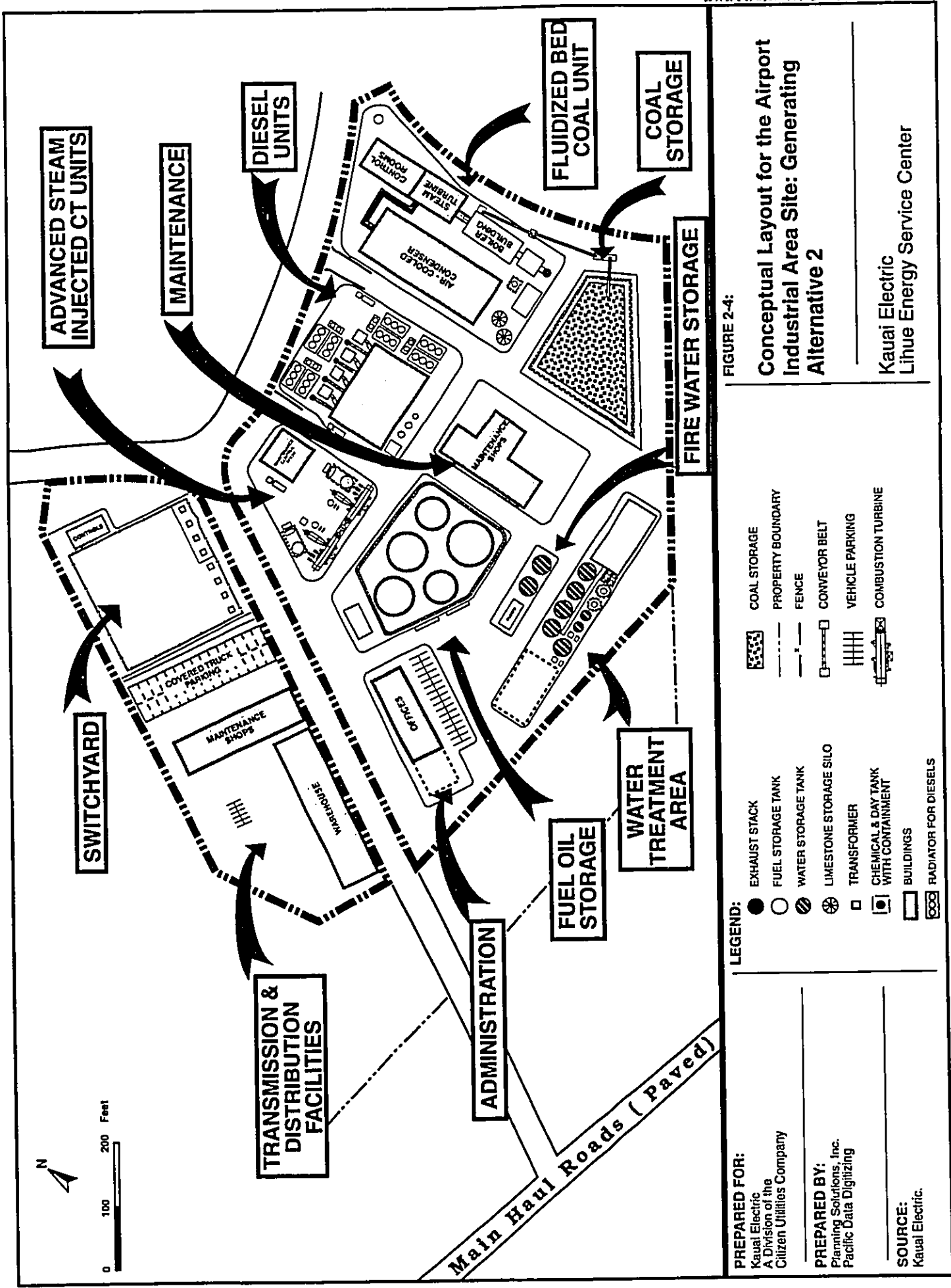
LEGEND:

●	EXHAUST STACK	▨	COAL STORAGE
○	FUEL STORAGE TANK	---	PROPERTY BOUNDARY
⊙	WATER STORAGE TANK	-x-	FENCE
⊗	LIMESTONE STORAGE SILO	□	CONVEYOR BELT
□	TRANSFORMER		VEHICLE PARKING
⊠	CHEMICAL & DAY TANK WITH CONTAINMENT	⊠	COMBUSTION TURBINE
⊡	BUILDINGS		
⊞	RADIATOR FOR DIESELS		

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 Citizen Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Kauai Electric



KCO Line Energy Service Center, Fig 2-4 Airport Site A2, 10/14/88

FIGURE 2-4:

Conceptual Layout for the Airport Industrial Area Site: Generating Alternative 2

Kauai Electric
Lihue Energy Service Center

- LEGEND:**
- EXHAUST STACK
 - FUEL STORAGE TANK
 - ◐ WATER STORAGE TANK
 - ◑ LIMESTONE STORAGE SILO
 - TRANSFORMER
 - ◻ CHEMICAL & DAY TANK WITH CONTAINMENT
 - ▭ BUILDINGS
 - ▩ RADIATOR FOR DIESELS
 - ◼ COAL STORAGE
 - PROPERTY BOUNDARY
 - - - FENCE
 - CONVEYOR BELT
 - |||| VEHICLE PARKING
 - ⊠ COMBUSTION TURBINE

PREPARED FOR:
Kauai Electric
A Division of the
Citizen Utilities Company

PREPARED BY:
Planting Solutions, Inc.
Pacific Data Digitizing

SOURCE:
Kauai Electric.

DESCRIPTION OF THE PROPOSED ACTION

- **Generating Alternative 1 (Figure 2-1).** The first generating alternative includes: (i) two 26.4 megawatt (MW) capacity Advanced Steam-Injected Cycle combustion turbines³, (ii) a 58-MW capacity Dual-Train Combustion turbine (DTCC) consisting of two 20 MW LM-2500 combustion turbines or similar units, two Heat Recovery Steam Generators (HRSG), and one 18-MW capacity steam turbine/generator; and (iii) four 10-MW diesels⁴. All of these units burn oil or naphtha.⁵
- **Generating Alternative 2 (Figure 2-2).** The second generating alternative contains the same two 26.4 MW Advanced Steam-Injected Cycle combustion turbines and four 10 MW diesels included in Generating Alternative 1. However, it substitutes a 25 MW coal-fired fluidized-bed steam generating unit for the DTCC system contained in Generating Alternative 1. This alternative generally matches the long-range scenario contained in KE's 1997 *Integrated Resource Plan*.

Both alternatives include several types of facilities in addition to the generating units themselves. These include the following:

- A **Transmission and Distribution (T&D) Base Yard** occupies approximately 5 acres and provides warehouse, shop, and office space for KE's T&D workers.
- **Water Treatment and Storage Facilities** occupy approximately 1 acre. These treat the source water that is piped to the site to produce the extremely pure water needed in the power generation process.
- **Fuel Storage, Off-Loading, and Handling Facilities** occupy approximately 2.5 acres of the site. In the case of Alternative 1, provisions are made for petroleum fuels only. Alternative 2 includes facilities for both petroleum fuels and coal.
- A 200-foot by 200-foot **Electrical Switchyard** is situated along the perimeter of the complex. All of the generating units are connected to it by underground power cables. The connection between the switchyard and KE's existing 69 kV transmission facilities is by overhead lines.
- **Maintenance, Support, and Administrative Facilities** are situated in several areas around the site. These are generally located close to the function that they serve.
- In addition to these on-site facilities, the project also entails the construction of power transmission lines between the site and KE's existing power transmission facilities. Off-site water supply facilities (e.g., wells and water pipelines) and wastewater disposal facilities (e.g., pipelines and injection wells) will be required, some of which may need to be installed or modified. Roadway improvements will also be needed.

³ This document assumes the use of LM-2500s. However, other similar combustion turbines such as an ABB GT 10, a General Electric Frame 5, and a Rolls Royce RB-211, could also be used. Their operation and potential impacts would be virtually identical to those of an LM-2500.

⁴ The diesel units would be Wartsila Vasa 12V46 or similar units.

⁵ Naphtha is a light petroleum fuel intermediate between diesel oil and gasoline.

2.2 TECHNICAL DESCRIPTION OF THE PROPOSED FACILITIES

2.2.1 GENERATING ALTERNATIVE 1

2.2.1.1 Advanced Steam-Injected Cycle Combustion Turbines⁶

Generating Alternative 1 includes two General Electric LM-2500 combustion turbines; these are in an "Advanced Steam-Injected Cycle" configuration. These engines are known as "aero-derivatives" because they are a modified version of the kinds of engines used on many commercial jet aircraft. Examples include the Boeing 747 and 767 aircraft. More than 1,500 LM-2500s are now in use in power plants and on ships. These engines have accumulated more than 4 million hours of operation with 99.6 percent documented reliability record. Figure 2-5 contains an illustration of a unit similar to the one that would be used. Figure 2-6 contains a schematic diagram showing the major components of a typical Advanced Steam-Injected Cycle engine.

Advanced Steam-Injected Cycle engines use heat recovered from the exhaust gas to produce steam. This is done in a Heat Recovery Steam Generator (HRSG). Superheated steam from the HRSG is piped to the gas turbine through a relatively short main steam line. The injected steam increases the output of the LM-2500 from its normal 20 MW to approximately 26.4 MW, a 35 percent improvement. As a result, the engines are very fuel-efficient. They burn "light" liquid fuels such as diesel oil or naphtha. Because Advanced Steam-Injected Cycle engines do not need to be adjusted to accommodate different types of fuel, they can be switched from one type to another in order to achieve the lowest possible operating costs. The combustion turbine is enclosed in a sound-attenuating package provided by the supplier.

Each of the LM-2500 Advanced Steam-Injected Cycle turbines is served by its own exhaust stack. When the first unit is installed, it is expected that its stack will be from 50 to 70 feet high. When the buildings housing the diesels and HRSGs that are part of the DTCC and fluidized bed coal units are constructed, it will probably be necessary to raise the stack for this first unit. Consequently, the ultimate height of the stack (which will be determined by the results of air quality modeling conducted as part of the State Department of Health air quality permitting process) could be greater, perhaps reaching 100 feet or more. This is needed to avoid air quality impacts that can result from wind down-wash in the lee of these relatively high structures. A continuous emission monitoring system room is located in the base of the stack shell.

2.2.1.2 Dual-Train Combined-Cycle Combustion Turbines

The second pair of combustion turbines in Alternative 1 is part of a 58-MW capacity dual-train combined-cycle (DTCC) system. Figure 2-7 contains a photograph of a typical 58-MW DTCC unit. Figure 2-8 contains a schematic diagram of the system's major elements.

⁶ As discussed in Chapter 1, KE has signed a Purchase Power Agreement with Kauai Power Partners (KPP) for its next unit. KPP is responsible for providing a site for this unit as well as the unit itself. Accordingly, it is presently pursuing several possible locations for these facilities. While no legally binding commitment has yet been made, KPP has informed KE that it will place that unit on KE's Lihue Energy Service Center site if the land use approvals for that location can be obtained in sufficient time to allow KPP to meet its contractual commitments to KE. In the event that KPP constructs its unit elsewhere, it could be a decade or more before an engine of this type is constructed at KE's proposed Lihue Energy Service Center.

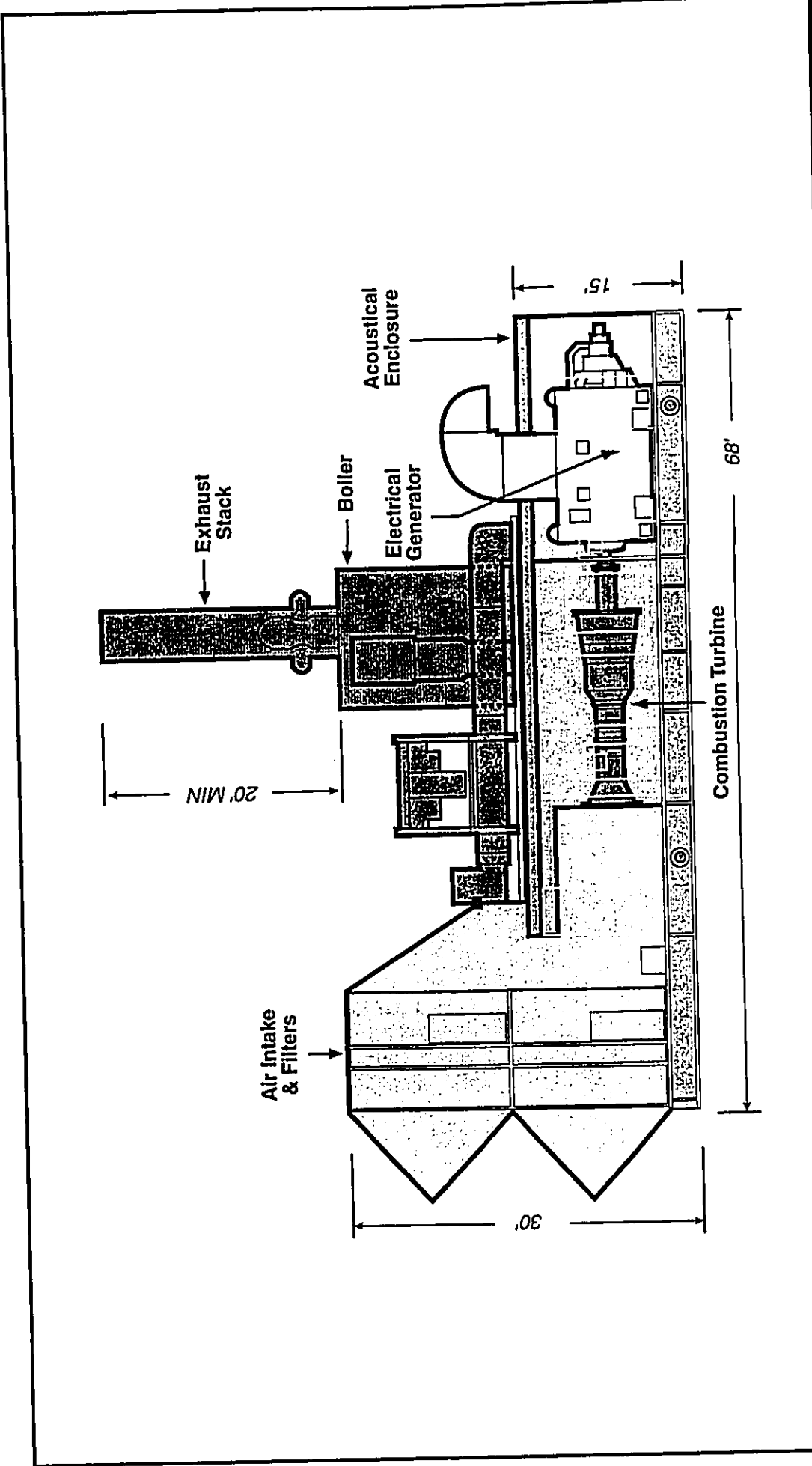


FIG 2.5 Typical Comb. Turbine, May 1997

FIGURE 2-5:

Typical 26.4 MW Advanced Steam-Injected Combustion Turbine

Kauai Electric
Lihue Energy Service Center

NOTE: NOT TO SCALE

PREPARED FOR:
Kauai Electric
A Division of the
Citizen Utilities Company

PREPARED BY:
Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:
Kauai Power Partners, May 1997

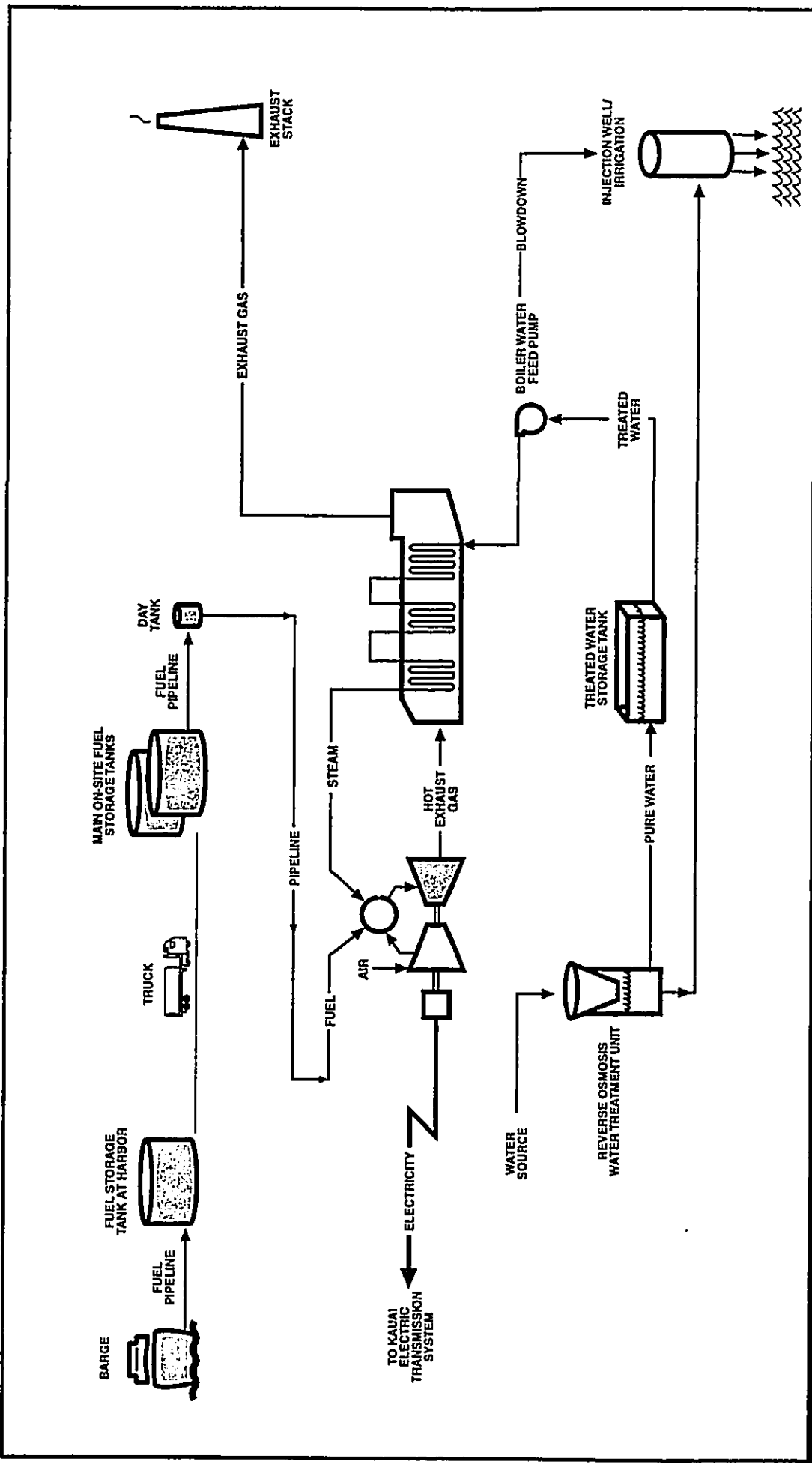


FIGURE 2-6:
Schematic Diagram of Advanced Steam-Injected Combustion Turbine

PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizens Utilities Company

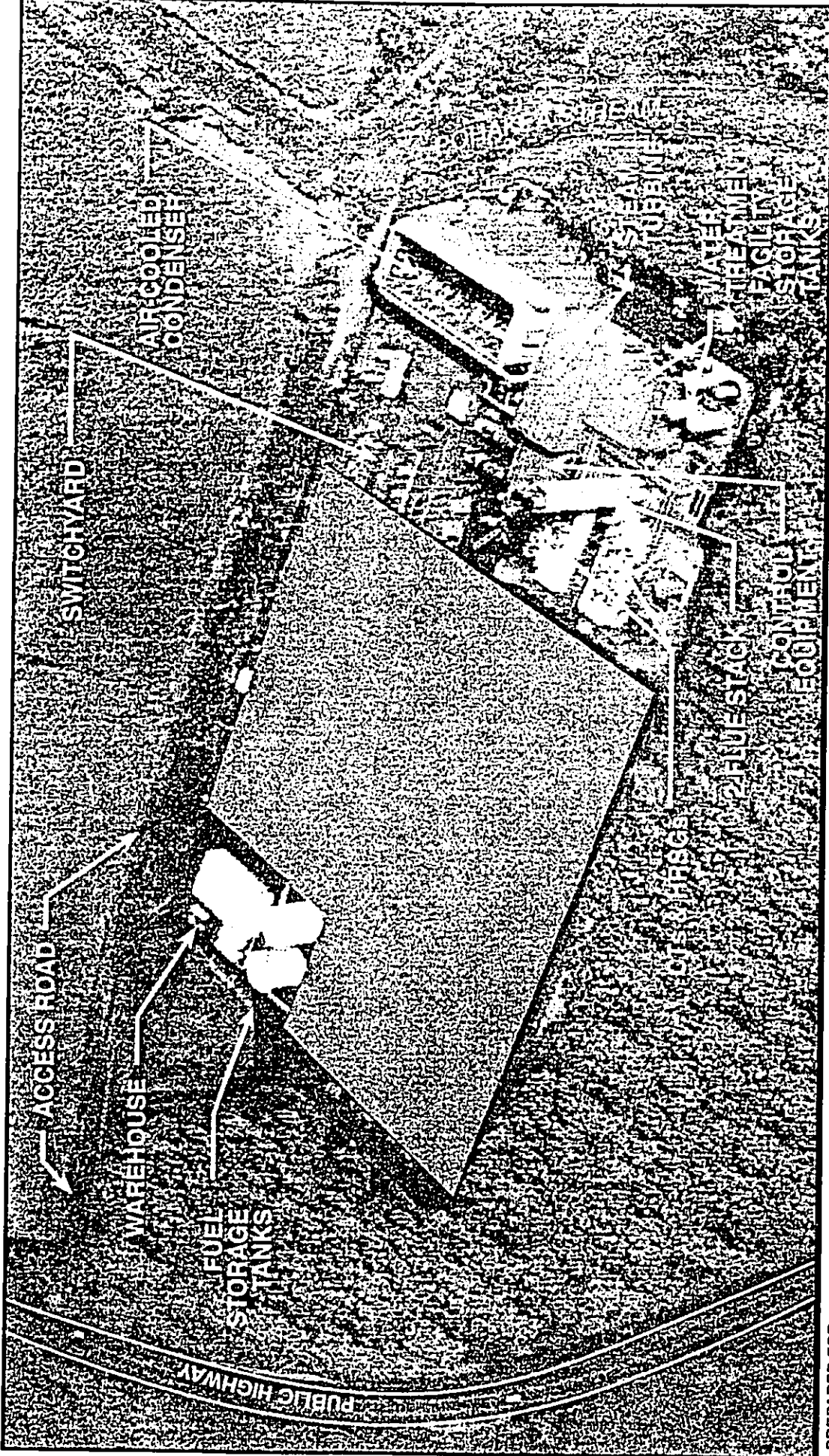
PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Planning Solutions, Inc.

LEGEND:

- ELECTRICAL GENERATOR
- COMBUSTOR
- ▴ COMPRESSOR
- ▾ COMBUSTION TURBINE

Kauai Electric
 Lihue Energy Service Center



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 Kauai Electric
 A Division of the
 Citizen Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

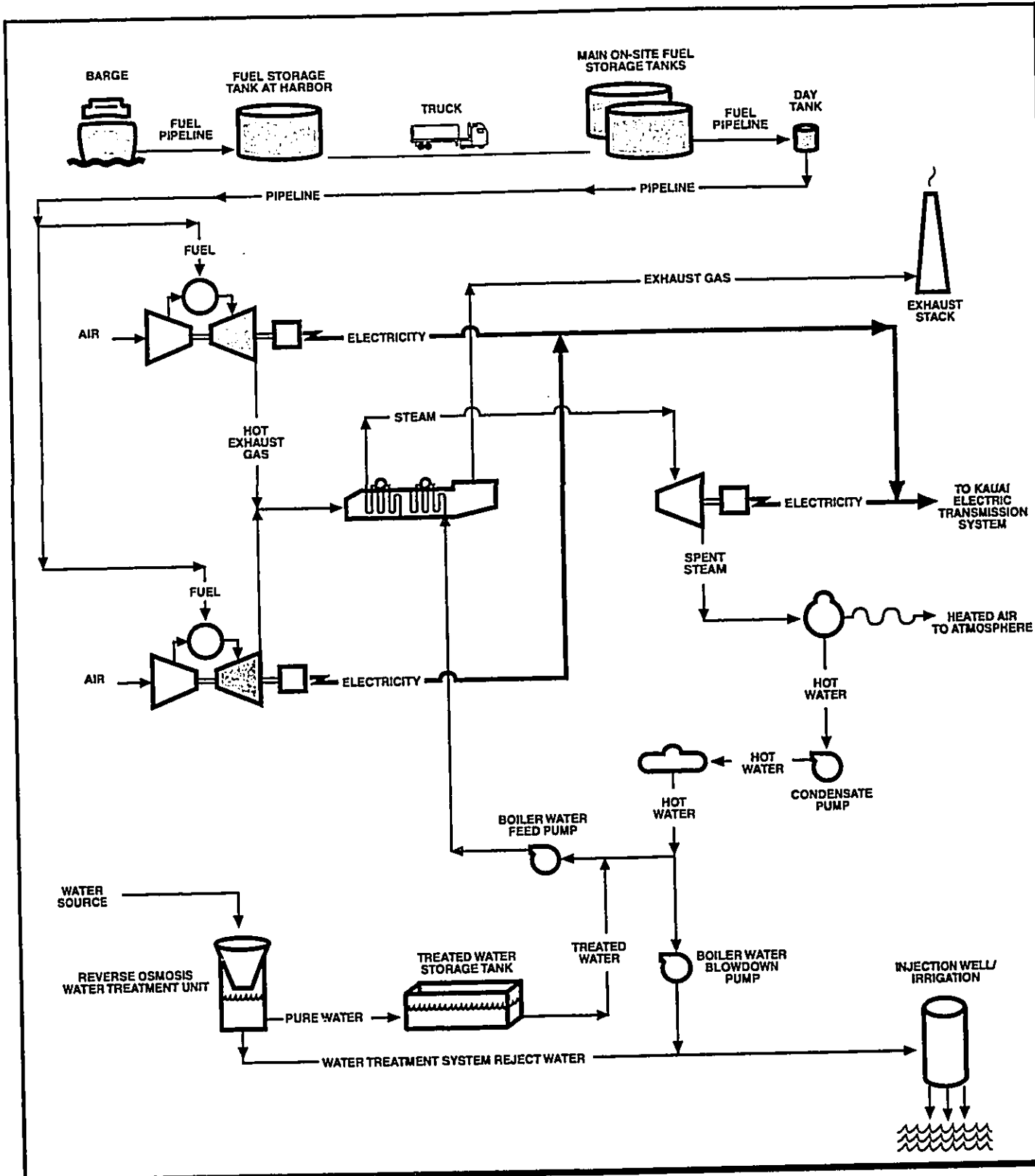
SOURCE:
 Maui Electric Company, Limited.

FIGURE 2-7:

**Photograph of Typical 58 MW
 Dual-Train Combined-Cycle Unit**

Kauai Electric
 Lihue Energy Service Center

NOTE: NOT TO SCALE



PREPARED FOR:
Kauai Electric Division
Citizens Utilities Company

PREPARED BY:
Planning Solutions, Inc.,
Pacific Data Digitizing

SOURCE:
Planning Solutions, Inc.

LEGEND:

- | | | | |
|--|---------------|--|----------------------|
| | COMPRESSOR | | ELECTRICAL GENERATOR |
| | COMBUSTOR | | HRSG |
| | TURBINE | | DEARATOR |
| | STEAM TURBINE | | CONDENSER |

FIGURE 2-8:

Schematic Diagram of Dual-Train Combined-Cycle Unit

Kauai Electric
Lihue Energy Service Center

DESCRIPTION OF THE PROPOSED ACTION

The DTCC system consists of two LM-2500 combustion turbines or similar, each having a nominal output of 20 MW. These are the same types of engines used in the LM-2500 Advanced Steam-Injected Cycle system described above. The method of heat recovery from the combustion turbine exhaust gases is different, however. In the DTCC system, each combustion turbine (CT) is paired with a separate heat recovery steam generator (HRSG). Steam from the two HRSGs powers a single 18-MW capacity steam turbine/generator. The DTCC system can run in a variety of modes (e.g., one combustion turbine without heat recovery, two combustion turbines without heat recovery, or one or both combustion turbines with heat recovery). Consequently, it is very flexible.

When the first combustion turbine in this system is installed, it will be used in simple-cycle mode only (i.e. no heat recovery). A steam turbine building and additional control room space will be erected when the DTCC plant is expanded to combined-cycle operation (i.e. with heat recovery). The prototypical design assumes that the steam turbine will be a 3,600 revolution per minute, down-exhaust type. However, space is available for other types, such as geared-turbine and/or axial-flow exhaust turbine. The generator is assumed to be air-cooled, taking air from inside the building and exhausting it to the outside. The steam turbine building has two levels, with the steam turbine located on a pedestal on the upper level. The lower level houses steam turbine auxiliary equipment, electrical equipment, air compressors, HRSG chemical feed systems, the water and steam sampling system, and a testing laboratory.

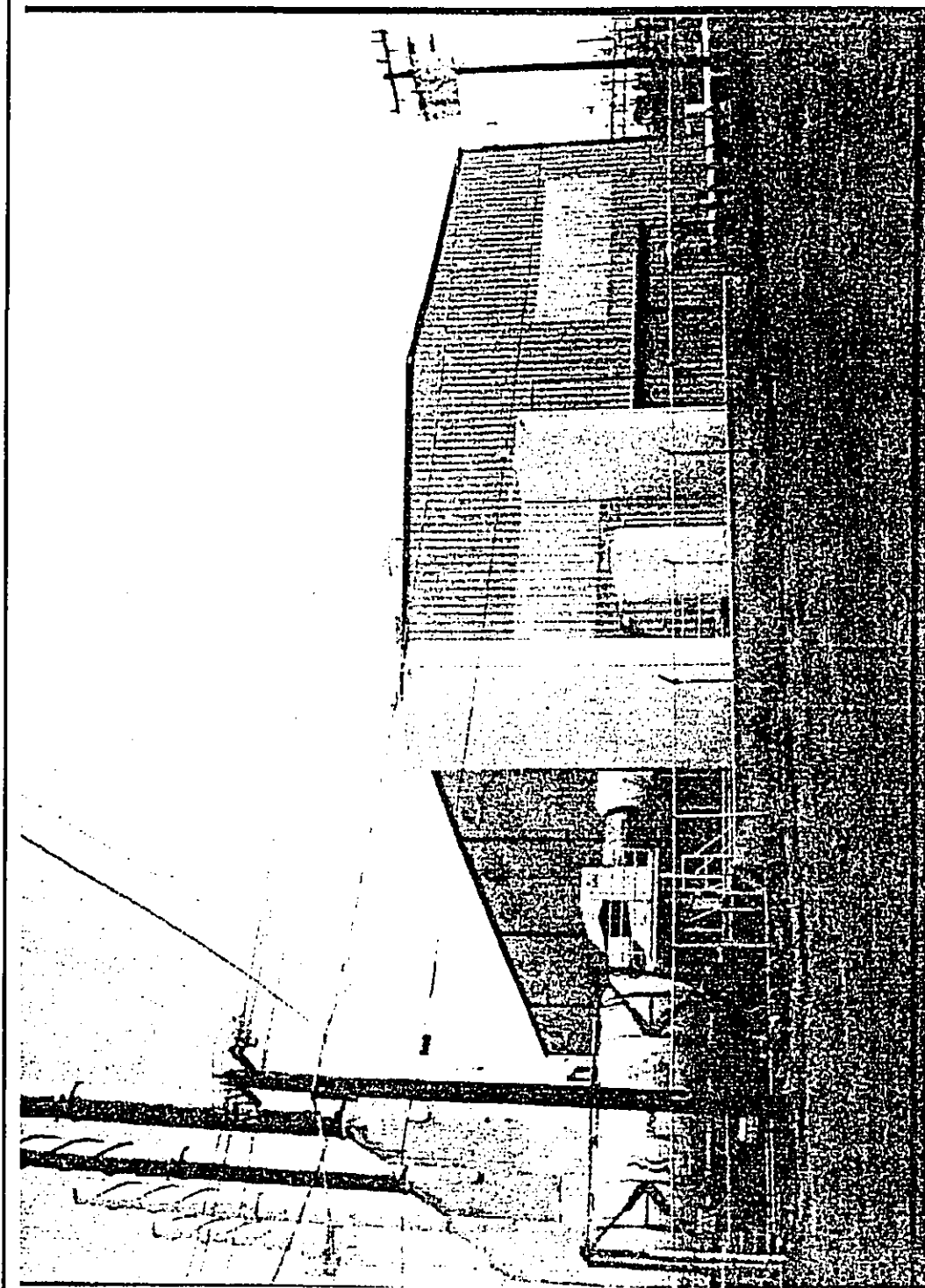
The system pipes steam from the HRSG to the steam turbine. Other pipes carry the spent steam from the steam turbine outlet to an air-cooled condenser where the water is changed from steam (vapor) back into liquid. The water from the condenser is returned to the HRSG and reused.⁷ A bypass around each HRSG in each DTCC allows the combustion turbines to be operated in both simple-cycle (i.e., without heat recovery) and combined-cycle (i.e., in combination with the heat recovery steam generators) modes. Day tanks near each combustion turbine in the DTCC system provide local storage for fuel oil; other tanks store water used in the water injection system used to limit emissions of nitrogen oxides (NOx). Containment walls are provided around the fuel oil storage tank. One acid and one caustic tank will be installed with the first combustion turbine.

A two-flue stack serves the DTCC module. Preliminary estimates are that the stack may be approximately 100 feet high. It will contain two 8-foot diameter flues in a 24-foot diameter shell. However, this must be confirmed after further air quality modeling is completed. The design provides a continuous emission monitoring system room in the base of the stack shell.

2.2.1.3 Diesel Engines

Both this alternative and Generating Alternative 2 include four 10 MW medium-speed diesel electric generating units (Wartsila Vasa 12V46 or similar). The diesel building is arranged similarly to the existing diesel powerhouse at the Port Allen Generating Station (see Figure 2-9 for a photograph of that facility). The engines are cooled with radiators.

⁷ Some water is constantly bled off from this system and disposed of in order to maintain the extremely high quality necessary to prevent the build-up of residual material, normally present in even the purest water, on the boiler tubes.



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Kauai Electric
A Division of the
Citizen Utilities Company

PREPARED BY:
Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:
Photograph Provided by Kauai Electric

FIGURE 2-9:

**Photograph of Diesel Generator
Building at Port Allen**

Kauai Electric
Lihue Energy Service Center

NOTE: NOT TO SCALE

2.2.2 GENERATING ALTERNATIVE 2

2.2.2.1 Advanced Steam-Injected Cycle Combustion Turbines

This alternative includes two 26.4 MW Advanced Steam-Injected Cycle combustion turbines. These are identical to the two Advanced Steam-Injected Cycle units in Generating Alternative 1. The support systems for this unit are the same as those described for Generating Alternative 1.

2.2.2.2 25 MW Coal-Fired Fluidized-Bed Generating Unit

This alternative includes a coal-fired, fluidized bed boiler to produce superheated steam; the steam powers a 25 MW turbine-generator. The system is very similar to that being used at the 180 MW AES coal-fired power plant on Oahu. However, it is at a much smaller scale. Figure 2-10 is a process-flow diagram for this technology. The boiler building is expected to be between 80 and 110 feet high depending upon the design of the unit.

The site plans shown in Figures 2-2, 2-3, and 2-4 includes coal storage piles, but the coal supplier might store some coal off-site as well. When needed, the coal is removed from the storage pile, pulverized, and then burned at relatively low temperatures on a bed of limestone. High-pressure air is injected into the limestone to keep it constantly circulating. The limestone captures the sulfur that is present in all coal before it is converted into sulfur dioxide (SO₂), providing low emission rates for this potential pollutant. Because of the relatively low combustion temperature, emissions of nitrogen oxides (NO_x), another pollutant often produced by power plants, are also relatively low. The boiler uses a cyclone for dust collection and a baghouse for final particulate control. Space is provided for both bottom and fly ash handling and storage. The ash, which is non-toxic, is trucked off-site for disposal.

2.2.2.3 Diesel Engines

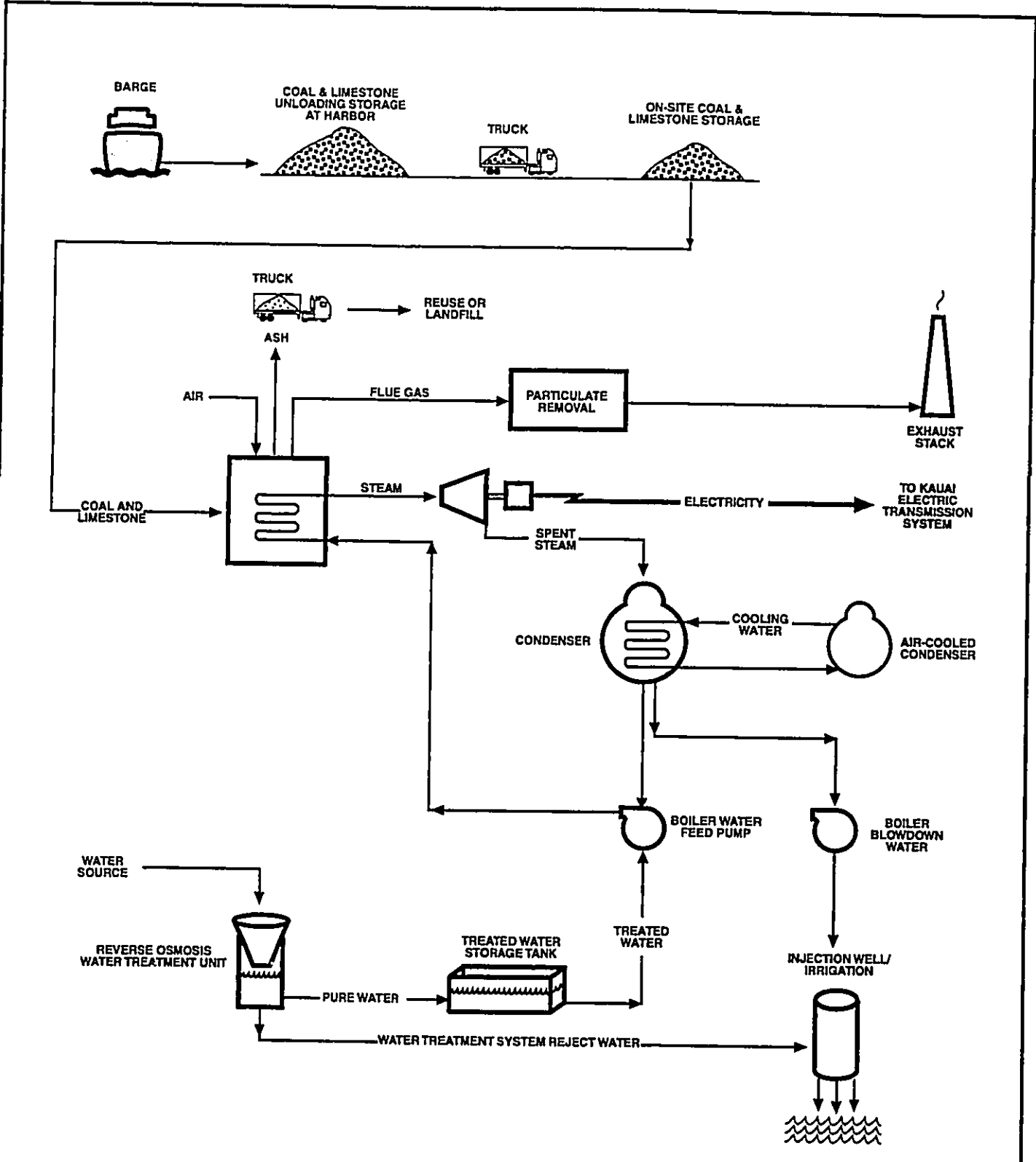
The diesel generators in this alternative are identical in design and location to those in Generating Alternative 1.

2.2.3 CONTROL HOUSES/CONTROL ROOMS AND EQUIPMENT⁸

Both the generating alternatives that are illustrated include control houses, control rooms, and other support structures and equipment. The design provides control houses for each pair of combustion turbines. These contain the switchgear, generator breakers, uninterruptible power supply (UPS), batteries, motor control centers (MCCs), combustion turbine control panels, and distributed control system (DCS) operator console and relay panels.

The control room buildings shown on the plans for the generating alternatives will be built in phases. The controls will be attended at all times, with the possible exception of off-shift periods when only the first combustion turbine is installed. The DCS operator consoles for the first combustion turbine will be located in the control room. As the diesels and subsequent CTs are added, additional control/monitoring equipment will be installed.

⁸ While the components described in this subsection differ slightly between the two generating alternatives, the major components are the same. Because of this, the discussion does not distinguish between the two plans.



PREPARED FOR:
Kauai Electric Co.

PREPARED BY:
Planning Solutions, Inc.,
Pacific Data Digitizing

SOURCE:
Planning Solutions, Inc.

LEGEND:




-  STEAM TURBINE
-  ELECTRICAL GENERATOR
-  FLUIDIZED BED STEAM GENERATOR

FIGURE 2-10:

**Process Flow Diagram for
Coal-Fired Fluidized Bed
Generating Unit**

Kauai Electric
Lihue Energy Service Center

2.2.4 WATER SUPPLY/WASTEWATER DISPOSAL

2.2.4.1 Water Supply

Estimated Supply Requirements. The proposed power plant will use water for a variety of purposes. These include steam production, equipment and plant washdown, injection for air pollution control, landscape irrigation, and domestic use by operating personnel. Table 2-1 summarizes the estimated water supply requirements for the two alternative combinations of generating units being considered. Tables 2-2 to 2-5 provide a more detailed breakdown of the process water requirements for each of the types of generating units.

As shown in Table 2-1, water supply requirements will be in the range of 0.75 to 0.79 million gallons per day (MGD) at full generating capacity. These estimates assume the use of air-cooled condensers to limit the amount of water use. The alternatives to air cooling, which are once-through cooling or use of an evaporative cooling tower, would require substantially more water. Because of the limited amount of water available in the Lihue area, these alternatives were not considered.

Sources of Supply. To avoid potential conflict with existing Department of Water (DOW) wells in Lihue and with DOW's current well development program in Hanamaulu, the source of supply for the Preferred and Field 390 Sites would be surface water from the Lihue Plantation Company's (LPCO) irrigation system. The Puhi Site could be supplied either by gravity from the Upper Lihue Ditch or by water pumped from the Lower Lihue Ditch (refer to Figure 2-11). The Field 390 Site could be supplied either by gravity from Kapaia Reservoir via Aii Reservoir or by pumping from the Lower Lihue Ditch (also shown on Figure 2-11). Service from DOW's system would be available for the minor amounts of domestic and sanitary requirements at the Puhi Site, but this would not be possible at the more remote location of the Field 390 Site.

KE's preferred source of water for the Airport Industrial Area Site consists of new wells within or in close proximity to the power plant site. However, test borings and pump testing will have to be undertaken to determine the viability of new wells in this location. If the supply from these wells is not sufficient, it would be supplemented with well water purchased from the Kauai Lagoons Resort. If this purchase is necessary, a 1.5-mile long connecting pipeline would have to be installed. Kauai Lagoons has developed three wells to irrigate its two 18-hole golf courses. However, most of its irrigation needs are met by effluent from the County's adjacent Lihue Wastewater Treatment Plant. Consequently, the irrigation wells have excess capacity, and the management of the Kauai Lagoons has indicated that it is amenable to making water from its wells available to KE. As with the Puhi Site, water service from the DOW system would be available for the small domestic and sanitary requirements at the Airport Industrial Area Site.

Water Treatment and Storage. Whether the source of supply is surface or groundwater, it will require treatment before it can be used in boilers, turbines, and other generating equipment. The water treatment process would be comprised of the following components: (1) mechanical filtration [only required for surface sources to reduce suspended solids during rainy periods]; (2) multi-media filtration; (3) five-micron pre-filtration for the reverse osmosis system; (4) reverse osmosis treatment; (5) gas transfer membrane filtration [to control dissolved carbon dioxide and oxygen levels]; (6) water softening; and (7) electrodeionization [ion exchange].

Table 2 - 1. Summary of Required Supply and Wastewater Disposal for the Generating Alternatives Being Considered.

<i>Generating Alternative</i>	<i>Required Supply (MGD)</i>	<i>Amount Discharged by Destination (MGD)</i>		
		<i>Discharged to Atmosphere</i>	<i>Process Wastewater Disposal to Reservoir or Injection Well</i>	<i>Septic Tank System</i>
GENERATING ALTERNATIVE 1				
1-58 MW DTCC	0.2094	0.0993	0.1101	--
2-26.4 MW Steam-Injected CTs	0.5038	0.4002	0.1036	--
4-10 MW Diesels	0.0228	0.0028	0.0200	--
Domestic/Sanitary Water Use	0.0015	--	--	0.0015
Landscape Irrigation	0.0170	0.0170	--	--
TOTAL	0.7545	0.5193	0.2337	0.0015
GENERATING ALTERNATIVE 2				
2-26.4 MW Steam-Injected CTs	0.5038	0.4002	0.1036	--
4-10 MW Diesels	0.0228	0.0028	0.0200	--
1-25 MW Fluidized Bed Coal Unit	0.2411	0.0014	0.2397	--
Domestic/Sanitary Water Use	0.0015	--	--	0.0015
Landscape Irrigation	0.0170	0.0170	--	--
TOTAL	0.7862	0.4214	0.3633	0.0015

Note: The water shown as being discharged to a reservoir is suitable for irrigation use. Consequently, this component need not be a consumptive use of the water.

Source: Tom Nance Water Resource Engineering, Inc.

DESCRIPTION OF THE PROPOSED ACTION

Table 2 - 2. Required Water Supply and Wastewater Disposal for the 58-MW DTCC Unit.

Specific Water Use Component	Required Supply (MGD)	Amount Discharged (MGD)		
		Discharged to Atmosphere	Process Wastewater Disposal to Reservoir or Well	Septic Tank System
<i>Continuous or Frequent Batch Processes</i>				
Dual Media Filter Reject	0.0086		0.0086	
Reverse Osmosis Reject	0.0835		0.0835	
Combustion Turbine NOx Control	0.0979	0.0979		
HRSB Blowdown and Losses	0.0130		0.0130	
Equipment Leakage and Wastewater	0.0014		0.0014	
Inside Service Water System	0.0036		0.0036	
Outside Service Washwater	0.0014	0.0014		
<i>Infrequent Batch Processes</i>				
HRSB & Condenser Tube Cleaning				(0.001)
HRSB External Washwater				(0.004)
TOTAL	0.2094	0.0993	0.1101	(0.005)

Note: Quantities given for the infrequent batch processes are per event. The batches are infrequent (typically once every few months or years). Consequently, they are not significant components of the required water supply.

Table 2 - 3. Required Water Supply and Wastewater Disposal for the 26.4 MW Steam-Injected Combustion Turbine Units.

Specific Water Use Component	Required Supply (MGD)	Amount Discharged (MGD)		
		Discharged to Atmosphere	Process Wastewater Disposal to Reservoir or Well	Septic Tank System
<i>Continuous or Frequent Batch Processes</i>				
Dual Media Filter Reject	--	--	--	--
Reverse Osmosis Reject	0.04900		0.0490	
Combustion Turbine Injection	0.1987	0.1987		
HRSB Blowdown and Losses				
Equipment Leakage and Wastewater	0.0014		0.0014	
Inside Service Water System	0.0014		0.0014	
Outside Service Washwater	0.0014	0.0014		
<i>Infrequent Batch Processes</i>				
HRSB & Condenser Tube Cleaning				(0.001)
HRSB External Washwater				(0.003)
TOTAL	0.2519	0.0993	0.0518	(0.004)

Note: Quantities given for the infrequent batch processes are per event. The batches are infrequent (typically once every few months or years). They are not significant components of the required water supply.

Source: Tom Nance Water Resource Engineering, Inc.

Table 2 - 4. Required Water Supply and Wastewater Disposal for a 10-MW Diesel.

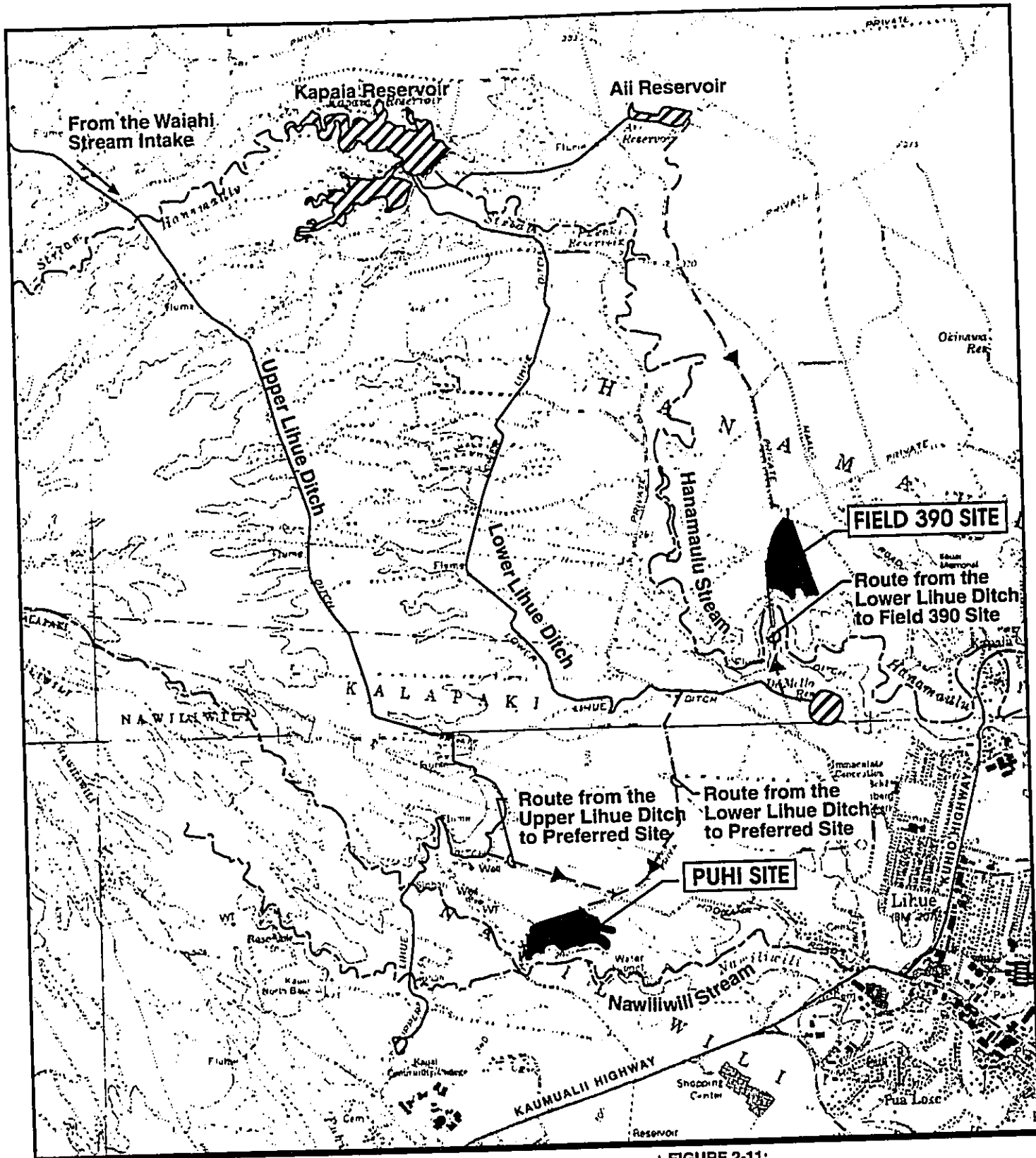
Specific Water Use Component	Required Supply (MGD)	Amount Discharged by Destination (MGD)		
		Discharged to Atmosphere	Process Wastewater Disposal to Reservoir or Well	Septic Tank System
<i>Continuous or Frequent Batch Processes</i>				
Dual Media Filter Reject	--	--	--	--
Reverse Osmosis Reject	--	--	--	--
Combustion Turbine NOx Control	--	--	--	--
HRSG Blowdown and Losses	--	--	--	--
Equipment Leakage and Wastewater	0.0014		0.0014	
Inside Service Water System	0.0036		0.0036	
Outside Service Washwater	0.0007	0.0007		
<i>Infrequent Batch Processes</i>				
HRSG & Condenser Tube Cleaning	--	--	--	--
HRSG External Washwater	--	--	--	(0.005)
TOTAL	0.0057	0.0007	0.0050	(0.005)

Note: Quantities given for the infrequent batch processes are per event. The batches are infrequent (typically once every few months or years). They are not significant components of the required water supply.

Table 2 - 5. Required Water Supply and Wastewater Disposal for 25-MW Coal Unit.

Specific Water Use Component	Required Supply (MGD)	Amount Discharged by Destination (MGD)		
		Discharged to Atmosphere	Process Wastewater Disposal to Reservoir or Well	Septic Tank System
<i>Continuous or Frequent Batch Processes</i>				
Dual Media Filter Reject	0.0086	--	0.0086	--
Reverse Osmosis Reject	0.0965	--	0.0965	--
Combustion Turbine NOx Control	--	--	--	--
HRSG Blowdown and Losses	0.1296	--	0.1296	--
Equipment Leakage and Wastewater	0.0014		0.0014	
Inside Service Water System	0.0036		0.0036	
Outside Service Washwater	0.0014	0.0014		
<i>Infrequent Batch Processes</i>				
HRSG & Condenser Tube Cleaning	--	--	--	(0.001)
HRSG External Washwater	--	--	--	(0.004)
TOTAL	0.2411	0.0014	0.2397	(0.005)

Note: Quantities given for the infrequent batch processes are per event. The batches are infrequent (typically once every few months or years). They are not significant components of the required water supply.



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SOURCE:
 Tom Nance Water Resource
 Engineering.

LEGEND:

- Existing Ditch
- - - Proposed Ditch
- - - Stream
- ▨ Reservoir

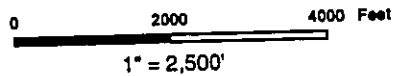


FIGURE 2-11:

**Alternative Water Supply Routes:
 Puhi and Field 390 Sites**

Kauai Electric
 Lihue Energy Service Center

Kauai Electric Lihue Energy Service Center, Fig. 2-11, Alternative Water Supply Routes, 3-1998

Raw (i.e., untreated or partially treated) water and treated water storage tanks would be provided on-site. The quantity of raw water storage would be on the order of one day's water use. This storage would function as a buffer between the different rates of incoming supply and the rate of use within the site. Treated water storage tanks of varying capacities would be installed to match the requirements of the generating units, typically to provide sufficient volume for the operating requirements of up to three days. This would allow the generating units to continue to function during periods when the water treatment system is inoperative.

2.2.4.2 Wastewater Disposal

Types of Wastewater Streams. Of the total supply of 0.75 to 0.79 MGD, 0.42 to 0.52 MGD (53 to 69 percent) would be discharged to the atmosphere. The remaining 0.24 to 0.36 MGD of wastewater would require acceptable means of disposal. The wastewaters would be of three types:

- Process waters, generally comprised of water treatment plant reject, blowdown, and wash waters;
- Domestic and sanitary wastes; and
- Infrequent wash waters which would require a special means of disposal.

The quantities in each stream are shown in Tables 2-1 through 2-5.

Disposal of Process Wastewater. The largest component of the process wastewater stream consists of "reject" from the water treatment process. This water would have several-fold higher concentrations of the constituents naturally found in the raw water supply; in addition, it would contain very low concentrations of standard anti-fouling compounds that are added to prevent biological growth in the water systems. Wash waters, which pick up oil and other hydrocarbons, would pass through oil separators before being combined with the bulk of the process wastewater stream. For the Preferred and Field 390 Sites, this combined wastewater stream would be returned to LPCO's irrigation system for reuse. The point of delivery would be the Lower Lihue Ditch for the Puhi Site and the Lower Lihue Ditch for the Field 390 Site. A short distance downstream of these points, the ditch empties into the 15 million gallon (MG) DeMello Reservoir. Water is subsequently drawn from the reservoir for use at the LPCO mill or for irrigation.

Reuse of the process wastewater for irrigation is not a practical option for the Airport Industrial Area Site due to its location *makai* of LPCO's fields and the long distance to the nearest LPCO reservoir. However, since the site is *makai* of the State of Hawaii, Department of Health's Underground Injection Control (UIC) line, injection wells are an allowable means of disposal. The number of wells necessary would be determined by field-testing, but it is expected that two or three wells, with one of these providing standby capacity, would suffice. Because supply wells would also be located on or in near proximity of the site, maximum spacing between these two types of wells would be necessary to minimize recirculation. The disposal wells would be located downgradient and would deliver wastewater to strata below that tapped by the KE supply wells.

Disposal of Domestic and Sanitary Wastewater. At the Preferred and Field 390 Sites, a septic tank and leach field would be used for disposal of domestic and sanitary wastewater. The State Department of Health requires any such individual wastewater disposal system to be at least 1,000 feet from a drinking water well. The proximity of DOW's Garlinghouse Tunnel drinking water source to the Puhi Site limits leach field locations to the small portion of the site. Hanamaulu Well No. 1 (State No. 0022-01), DOW's unused test well, is about 1000 feet to the north of the upper end of the Field 390 Site. If it is ultimately developed as a drinking water well, its location would not impose any practical restriction on a leach field location, since it would be located at the lower (south) end of the site.

2.2.5 FUEL DELIVERY AND STORAGE

2.2.5.1 Fuel Oil

Fuel delivery and storage facilities and activities are essentially the same for all of the sites. Consequently, to avoid repetition they are included in a single discussion. Differences between the alternatives that have the potential to affect impacts are called out below.

Fuel Delivery - General. Fuel oil would be delivered to the sites by tanker trucks. These could arrive from existing or expanded fuel oil handling facilities in Port Allen or from existing or expanded facilities that a fuel supplier might construct at Nawiliwili Harbor. Because of its proximity to Lihue, Nawiliwili Harbor is by far the more likely location. This analysis assumes that fuel will come from Nawiliwili Harbor. In either case, it is anticipated that the off-site fuel unloading and storage facilities would be owned, constructed, and operated by someone other than KE.

Both Generating Alternative 1 and Generating Alternative 2 include space for two fuel-truck-unloading stations. The design provides sufficient space for fuel trucks to turn around without backing-up and without circumnavigating the entire bermed area. The fuel truck unloading pads have a small curb around the perimeter (roll-over type curb on the ends) to contain any minor spills. The pads are sloped toward drains that carry spilled fuel back into the bermed area. The drains discharge into barrels or small tanks; these are large enough to hold the small amounts of fuel that might at some time be spilled from daily operations. Should a larger spill occur, the tanks or barrels overflow pipes carry the liquid back into the containment area. The design includes unloading pumps, a flow meter, and an air separator/filter on this pad.

Fuel Delivery - the Puhi Site. Fuel trucks would travel between this site and Nawiliwili Harbor using Nawiliwili Road. KE would construct a new road beginning on the *mauka* side of the Kaunualii Highway/Nawiliwili Road intersection. The road would turn northwest, paralleling the highway, until connecting to the existing cane haul road that passes by this site. The new roadways that the State plans to construct over the next 25 years would eventually be used (See Section 4.10).

Fuel Delivery - Field 390 Site. Initially, the principal road access to this site would be via the existing cane haul road. Fuel trucks travelling from fuel unloading and storage facilities at Nawiliwili Harbor to the site would take Rice Street from the harbor to Kapule Highway. From there, they would follow Kapule Highway to Ahukini Road. The fuel trucks would turn *mauka* on Ahukini Road and follow it to the point where they can access the existing cane haul road system (about halfway between Kapule Highway and Kuhio Highway). They would then follow the cane haul road system parallel to Ahukini Road, cross Kuhio Highway and proceed up Ehiku Street and onto the cane haul road that eventually passes the Field 390 Site. KE will acquire an easement from AMFAC/JMB and would provide for the long-term maintenance of the portion of the cane haul road that would be used.

Airport Industrial Area Site.⁹ Fuel trucks travelling from Nawiliwili Harbor to this site would take Rice Street from the harbor to Kapule Highway. From there, they would follow Kapule Highway to Ahukini Road, where they would turn right. Once on Ahukini Road, they would follow it around to the northeast, turning left onto the existing paved roads that lead through the cane fields. Empty trucks returning to Nawiliwili Harbor would follow the same route.

⁹ Because of its location *makai* of the Underground Injection Control (UIC) Line, relative closeness to Nawiliwili Harbor, and possible synergy with the fuel storage operations and facilities at Lihue Airport, it may eventually be appropriate to develop a pipeline to deliver fuel this facility.

Fuel Oil Storage. Conceptual plans call for the main fuel storage to be concentrated in a single location rather than spread around the site. This improves security and makes it more economical to provide redundant safety measures. The fuel storage will be installed in increments as generating units are added. The on-site fuel oil tanks are within an area that is lined and bermed to contain the full volume of the largest tank. The unit-by-unit breakdown of on-island fuel storage requirements is tabulated below. It is based on:

- KE's requirement that there never be less than a 21-day supply of fuel on the island;
- Once-a-week fuel barge deliveries;
- Once-monthly coal deliveries;
- The Advanced Steam-Injected Cycle combustion turbine's potential use of naphtha (which has a lower heating value and, therefore, larger storage requirements); and
- All units operating at 90 percent of their capacity.

Both site plans have sufficient space for all of the fuel oil storage to be on the generating plant site. However, it is possible that some of the required on-island storage will be provided in tanks located off the power plant site. This is particularly true for the Advanced Steam-Injected Cycle unit that KPP is developing for KE.

Various size tanks will be used to provide the storage. The largest are 60 feet in diameter and 42 feet high; these have a useable capacity of 19,650 barrels. The smaller tanks that are shown will provide flexibility with respect to fuel types (e.g., naphtha and diesel oil) as well as storage tank redundancy during the early stages of site development. The fuel-handling facilities, fuel storage tanks, and fuel oil piping will have many safety provisions designed to keep fuel from escaping to the surrounding environment. These include such things as: (i) berms and containment walls around all fuel-handling and fuel storage areas; (ii) double-bottom tanks and/or the use of impermeable membranes for secondary containment within the main fuel storage area; (iii) leak-detection sensors between the primary and secondary containment that will notify plant operators immediately if there is a breach in either containment barrier; and (iv) double-wall fuel pipes.

Type of Unit	No. of Units	On-Island Storage Requirement (in Barrels or Tons)
Generating Alternative 1		
26.4-MW Advanced Steam-Injected Cycle CT	2	55,376 Bbl
10 MW Medium Speed Diesels	4	42,984 Bbl
58-MW DTCC	1	57,542 Bbl
Total =		155,902 barrels of oil
Generating Alternative 2		
26.4-MW Advanced Steam-Injected Cycle CT	2	55,376 Bbl
10 MW Medium Speed Diesels	4	42,984 Bbl
25 MW Fluidized Bed Coal	1	16,524 tons
Total =		98,360 barrels of oil 16,524 tons of coal

DESCRIPTION OF THE PROPOSED ACTION

The use of naphtha as a potential fuel imposes certain requirements on fuel storage facilities that are not present if only diesel oil is used. For example, the tanks must have floating roofs; electrical gear near the naphtha storage tanks must be explosion-proof; and, the combustion turbines must be designed for dual-fuel (naphtha and fuel oil). The latter would be needed because fuel oil would be used for ignition and as an alternative fuel to allow KE to choose the least expensive fuel. Since fuel oil would be used principally during start-up, no additional combustion-turbine fuel oil storage tanks are provided. However, since the present plan calls for the first combustion turbine to be installed before the first diesel units, the design provides for that eventuality by equipping the first combustion turbine's fuel oil day tank with a tanker truck unloading pump. That pump allows the day tank to be filled directly from a tanker truck. The day tank at the combustion turbines provides enough fuel oil storage volume to start them several times. After the diesel units are installed, fuel oil needed for starting all additional naphtha-fired combustion turbines can be piped directly to each combustion turbine's day tank from the main fuel oil tanks in the fuel storage area.

2.2.5.2 Coal¹⁰

Coal Delivery. The coal needed for the fluidized bed unit in Generating Alternative 2 will be delivered to the site by trucks. These will unload the coal into a hopper from which it will be conveyed either to the active coal silos near the boiler or to the on-site coal storage pile. The site plans provide space for a crusher house; this would be needed if the coal that is purchased requires some preliminary crushing prior to the final preparation in the boiler house.

Coal Storage. The site plans provide space to store 10,000 tons of coal. The coal storage pile is approximately 18 feet high with side-slopes of 35 degrees. The design provides a lined storage area equipped with run-off collection gutters. A small building located near the coal pile houses coal-pushing equipment. Depending upon the utilization rate of the unit, the actual heating value of the coal that is used, and the frequency with which coal is delivered, some off-site storage may be needed. This would probably be located near the harbor unloading facilities.

2.2.5.3 Limestone

Limestone Delivery. Limestone needed for the operation of the fluidized bed unit in Generating Alternative 2 will be delivered to the site by trucks.

Limestone Storage. Limestone storage is provided in two 25-foot-diameter by 55-foot-tall silos located near the boiler house. These are sized to hold a 30-day supply of limestone.¹¹ The equipment that prepares the limestone for use in the fluidized bed boiler requires limestone that is one-eighth inch or less in diameter. Since this size is not always readily available, the plans provide sufficient space to install the additional crushing equipment needed to process oversize pieces.

2.2.6 ELECTRICAL SWITCHYARD AND TRANSMISSION FACILITIES**2.2.6.1 Switchyard**

The switchyard is the same in all alternatives. It is sized for a breaker-and-a-half scheme with 69 kV transmission outgoing. The design uses a 25-foot breaker-bay spacing. The transmission lines run out

¹⁰The anticipated firing rate is approximately 15 tons per hour. This was calculated assuming the use of coal having a lower heating value of 10,000 British Thermal Units (Btu) per pound.

¹¹This assumes a limestone usage rate equal to 20 percent that of coal. The actual usage rate will depend on the sulfur dioxide reduction rate required and the amount of sulfur in the coal. In general, reducing sulfur emissions by 90% requires 10% to 20% as much limestone as coal.

of the switchyard to the south. All the generator step-up transformers are located in the switchyard; 13.8 kV leads run underground from the generator breakers to them. The design provides one transformer per pair of diesels and one transformer for each of the other generators. The site plans provide space for a switchyard control house adjacent to the southeastern corner of the switchyard. This 30-foot by 60-foot structure contains a protective relay panel, switchyard control panels, batteries, and other equipment related to the switchyard.

2.2.6.2 Transmission Line Interconnection

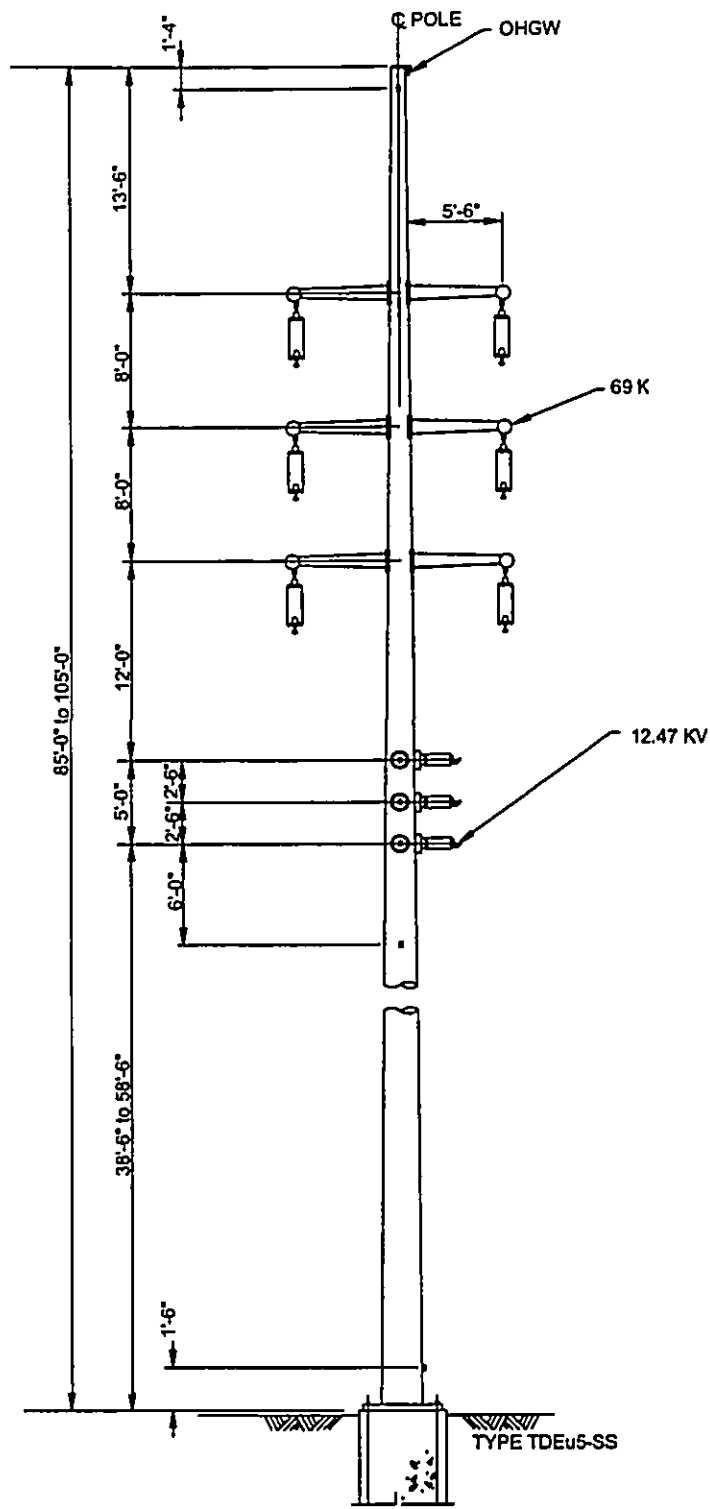
The Puhi Site. This site has the simplest transmission line interconnection. It would require only two new steel poles. Figure 2-12 shows a typical pole design. This type of pole would be used at all sites. The first would be located within the switchyard. The second would be on the opposite side of Nawiliwili Stream Gulch. Wires would carry power from the switchyard to the first pole, then across the gulch to the second tower (see Figure 2-13). The connection would be completed with a short tie into the existing transmission line at Pole 25.

This tie would accommodate most of the additional capacity that could be developed on the Puhi Site. However, reliability considerations dictate the need for a third circuit as the site approaches full build-out. When the additional transmission capacity is needed, KE would add an additional conductor and pole line within its existing right-of-way up Kilohana Crater (see Figure 2-14).

Field 390 Site. KE has developed electrical transmission line interconnection concepts for this site for the both the first-unit-only and full site build-out scenarios. Its analysis concluded that that the first unit on this site could be served quite simply and relatively inexpensively using a double-circuit transmission line. The line would extend from the site to a point on the existing Lydgate transmission line behind Isenberg Subdivision near KE's existing 4/12 kV step-down substation.

KE is considering three transmission schemes for accommodating full build-out on the Field 390 Site.

- The first full build-out transmission alternative (shown as "F390-1" on Figure 2-14) is to construct a steel-pole transmission line south from the Field 390 Site until it intercepts KE's existing Kilohana-Lihue line. From that point, it would extend west to Kilohana following the existing double-circuit corridor. From Kilohana, the circuit would be placed as a second circuit on the existing steel poles that runs from Kilohana to Hanahanapuhi.
- The second full build-out transmission alternative (F390-2 on Figure 2-14) consists of a single-circuit transmission line north from Field 390 along the base of Kalepa Ridge. This line would eventually meet Kuhio Highway and cross along the Wailua River alongside the existing Lydgate line. From that point, it would be a double circuit (the new line plus the existing line) along Kuhio Highway to the Kapaa Switchyard.
- The third full build-out transmission alternative for the Field 390 Site (F390-3 on Figure 2-14) is to install another transmission circuit along the cane haul road from the power plant back to KE's existing Lydgate line near the Isenberg Subdivision. A double-circuit line would be substituted for the existing single-circuit line from this point all the way to the Kapaa Switchyard.



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PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Kauai Electric, October 30, 1998.

LEGEND:

FIGURE 2-12:

Typical Transmission Pole Detail

Kauai Electric
 Lihue Energy Service Center

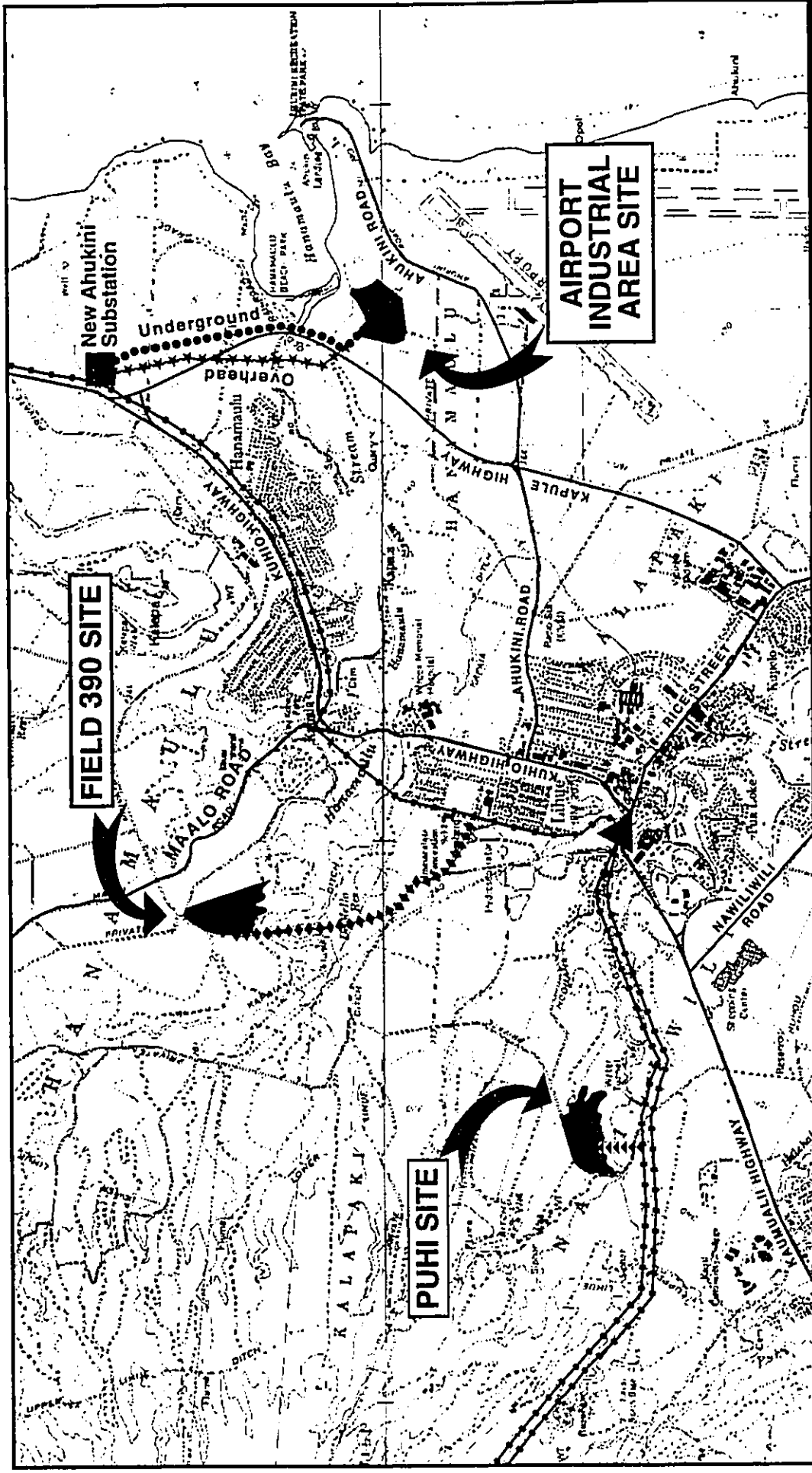


FIGURE 2-13:
Transmission Line Routes:
Initial Increment

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PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 USGS 7.5' Lihue Quadrangle, 1983.
 USGS 7.5' Kapaa Quadrangle, 1983.
 Kauai Electric.

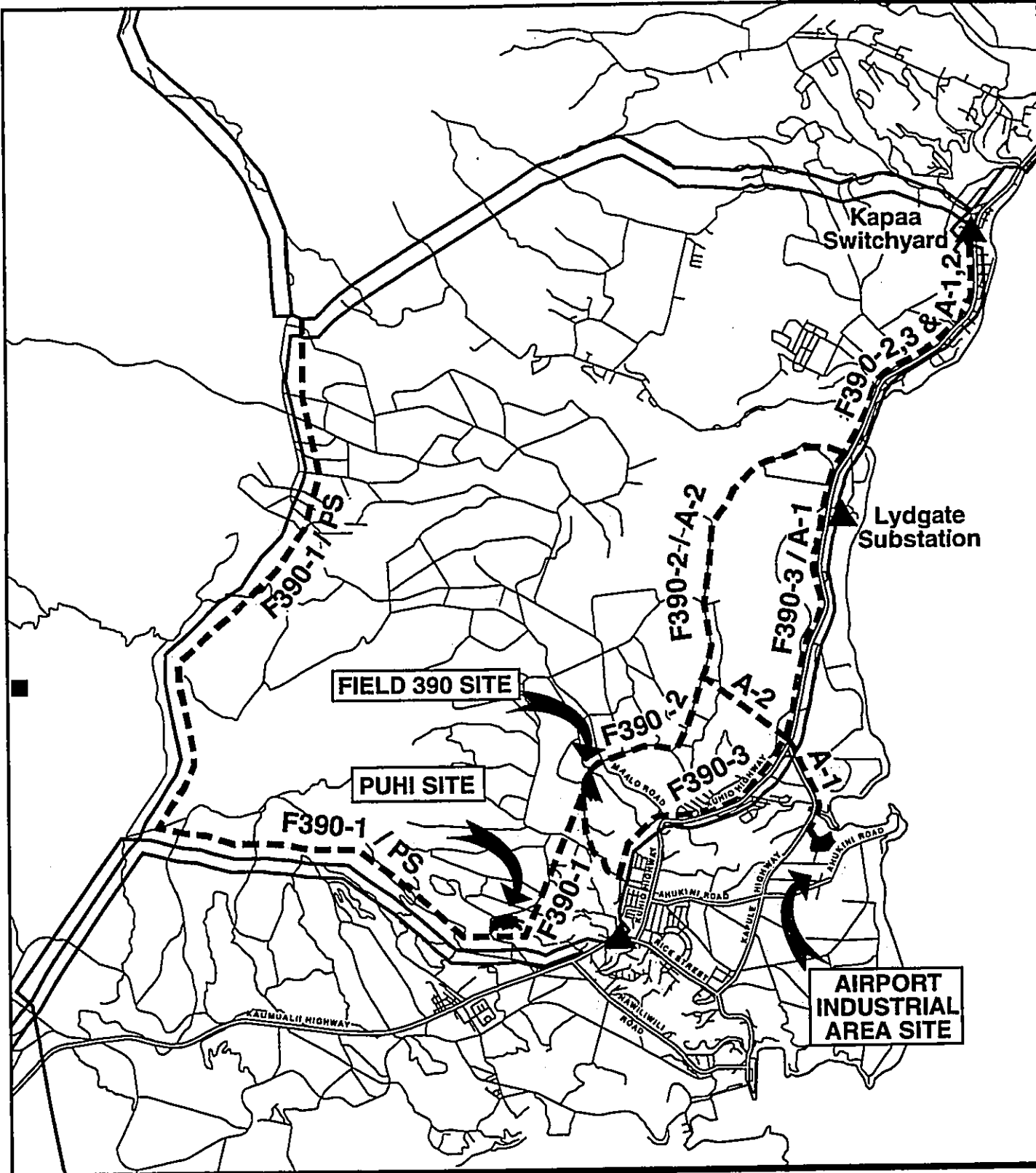
LEGEND:

- Existing Transmission Route
- ◄◄◄◄◄◄ Preferred Site Proposed Routing
- ◆◆◆◆◆◆◆◆ Field 390 Site Proposed Routing
- ***** Airport Site Proposed Routing (overhead)
- Airport Site Proposed Routing (underground)

0 2000 4000 Feet
 1" = 2,800'

N

Kauai Electric
 Lihue Energy Service Center



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SOURCE:
 USGS 1:100,000 DLG, 1983.
 Kauai Electric.

LEGEND:

- | | | | |
|-------|---|--------|------------------|
| ▲ | Switchyard/
Substation | PS | Preferred Site |
| — | Existing
Electrical
Transmission
Lines | F390-1 | Field 390 Alt. 1 |
| — | | F390-2 | Field 390 Alt. 2 |
| — | | F390-3 | Field 390 Alt. 3 |
| - - - | Long-Range
Electrical
Transmission
Lines | A-1 | Airport Alt. 1 |
| - - - | | A-2 | Airport Alt. 2 |

FIGURE 2-14:

**Transmission Line Route
 Alternatives: Full Build-Out**

Kauai Electric
 Lihue Energy Service Center

Kauai Electric Lihue Energy Service Center, Fig. 2-14 Transmission Line Long Range, 3-8-88

Airport Industrial Area Site. The first unit on this site would be served using a single, steel pole-mounted line. The line would extend north from the power plant site to Kapule Highway. Two slightly different routes are being considered from that point onward to the existing Lydgate substation. The first (identified as A-1 on Figure 2-13) consists of an overhead line extending northeast from the Airport Industrial Area Site along the existing road and tree line to Kapule Highway. It crosses to the far (western) side of Kapule Highway south of the Hanamaulu Stream Bridge, then spans the valley to a pole on its northern side. It would extend due north from that point, crossing the highway again before connecting to the Lydgate Substation at the intersection of Kapule and Kuhio Highways. The portion along the highway would involve a double-circuit transmission line with a double-circuit distribution line hung lower on the same steel poles. KE would put a break into the existing Lydgate Transmission line and bring two separate circuits back to the Airport Industrial Area Site. Approximately 14 poles would be needed. A substation would allow KE to tie-in directly to the transmission bus. This substation would have step-down power transformers to feed the distribution voltage circuits in the Lihue-Hanamaulu areas, thereby eliminating the need for the proposed new Ahukini Substation. A route for an alternate, underground transmission route (identified as A-2 on Figure 2-13) follows the same route as A-1 along the tree line. However, it turns north on the *makai* side of Kapule Highway, is suspended beneath the highway bridge for the crossing of Hanamaulu Stream, and then continues underground directly to the Lydgate (Hardwoods) substation.

Full build-out of the Airport Industrial Area Site would require an additional transmission tie from the power plant to Kapaa. This would be in addition to the existing Lydgate transmission line. Since full build-out requires this additional transmission tie rather than the first unit, environmental and technical studies needed to select a specific route and line configuration will be undertaken at a later date. However, KE has identified two conceptual alternatives.

- The first full build-out transmission alternative for the Airport Industrial Area Site (shown as "A-1" on Figure 2-14) is to build an additional circuit from the Airport Industrial Area Site to the intersection of Kapule and Kuhio Highways. This would be within the same corridor used by the initial circuit described previously. KE would then replace the existing wood pole single-circuit along Kuhio Highway with a double-circuit steel pole line from that point to the Kapaa switchyard.
- The second full build-out transmission alternative for the Airport Industrial Area Site (shown as "A-2" on Figure 2-14) is the same as described in the preceding transmission alternative up to the Kapule Highway/Kuhio Highway intersection. However, instead of replacing wood poles with steel poles along the highway, a single-circuit, steel-pole circuit would be extended along Kalepa Ridge to the Wailua River. At that point the line would return to Kuhio Highway and the existing single-circuit line would be converted to a double circuit design from there to the Kapaa switchyard. A variant of this alternative is to build the line along Kalepa Ridge to handle a future second circuit. This would make it possible to relocate the existing Kuhio Highway transmission circuit and put it on the Kalepa line.

This report only addresses the potential impacts of the transmission facilities needed for the first circuit. Further studies and approvals will be needed before constructing the subsequent facilities.

DESCRIPTION OF THE PROPOSED ACTION

2.2.7 MISCELLANEOUS OTHER FACILITIES

All of the generating alternatives include a number of ancillary facilities described below.

2.2.7.1 Production Equipment and Vehicle Maintenance Building

Both generating alternatives include a 160-foot long, 50-foot wide production equipment and vehicle maintenance building. The building contains 8,000 square feet of space. It is divided into a production maintenance area (4,750 square feet) and vehicle maintenance area (3,250 square feet). The overall height of the building is between 20 and 25 feet.

2.2.7.2 Administration Building

Both generating alternatives include an administration building. That structure is situated so that it can serve both the T&D and power generation activities on the site. It consists of a 50-foot-wide modular structure that can be expanded as necessary to a total length of 210 feet. At completion, it will have 10,500 square feet of gross floor area. The overall height of the building is approximately 15 feet.

2.2.7.3 Shop Building/Covered T&D Vehicle Parking

Both site plans include a shop building. It is 200 feet long and 55 feet wide, for a total floor area of approximately 11,000 square feet. The building, which is about 35 feet high, will have an open floor with an overhead crane. Specialty shops for meters and system maintenance activities are included in the shop building. Locker rooms for men and women are also located in this building. The shop building is located adjacent to the covered area where mobile equipment is parked. This parking area has 30 bays, each 30-feet-long by 15-feet-wide.

2.2.7.4 Warehouse

Plans include a general-purpose warehouse for KE's T&D Department. It is 250 feet long and 60 feet wide, for a total of 15,000 square feet of gross floor area. Preliminary plans call for the building to be of typical metal construction, with a roof height of approximately 35 feet. It will be constructed incrementally as the site is developed.

2.2.7.5 Vehicle Refueling Area

A vehicle refueling station is located near the T&D baseyard area. One 5,000-gallon gasoline tank and one 5,000-gallon diesel fuel tank are provided in this area. The area containing the tanks will be lined and surrounded by a concrete spill-containment wall. The actual refueling area will have a low rollover curb that can contain any minor spills that occur during the refueling of vehicles. This area will drain back to the tank containment area to insure that larger spills do not escape.

2.2.7.6 Vehicle/Parts Wash Area

The vehicle parts/wash facility shown on the site plans is readily accessible to the production and vehicle maintenance buildings that house its primary users. The wash area is paved, and run-off from it is directed into a holding tank. This washwater is eventually disposed of in the normal wastewater treatment system.

2.2.7.7 Fire-Fighting Facilities

Both site plans provide a fire pump house and two fire/service water tanks between the access road and the administration building. This location is close to the main entrance to the site and provides good access for the fire department. The pump house is sized to accommodate a 3,000 gallon per

minute (GPM) electric motor-driven fire pump, a 3,000 GPM diesel engine-driven fire pump, and a jockey pump and controllers. On-site firewater storage is provided. All facilities will comply with the National Fire Protection Association's (NFPA) recommendations, Kauai County code, and other applicable fire protection regulations.

2.3 PHASING

T&D Facilities. KE plans to begin development of the T&D portion of the site early in 2000. It anticipates that it can have the first phase of those facilities constructed by early in 2001.

If KPP opts to construct its generating unit on KE's site, KE will initiate development of the generating units planned for the site a short time after work on the T&D facilities begins. KE's power purchase agreement with KPP calls for its 26.4 MW Advanced Steam-Injected Cycle unit to be installed and operating no later than July 1, 2002.¹² Supporting fuel storage, water treatment, maintenance, and transmission facilities would be installed in conjunction with the generating unit. In order to meet this schedule, KPP must authorize the manufacturers to begin work on long lead-time items by the end of the year 2000. If KE is able to obtain the approvals needed to develop the Lihue Energy Service Center in time, KPP expects to install its generating unit there. If the approvals are not granted, or if KPP finds the costs too high, it will install its unit at a location other than the three discussed in this report. In this event, the first generating unit will probably not be constructed at the Lihue Energy Service Center until after 2012.

Subsequent units will be installed as needed to meet the demand for electrical energy. At the present time, KE's Integrated Resource Plan envisions that one of the four diesel units will follow the first combustion turbine. The coal unit would follow this if that technology were selected. If a DTCC system is used, the HRSG/steam turbine-generator will probably be installed at the same time as the second combustion turbine. These units will be followed by additional diesel units, and, finally, by the second DTCC system.

¹² If Lihue Plantation notifies KE that it plans to terminate its power purchase agreement with the utility, KE may ask KPP to accelerate this schedule.

CHAPTER 3

OVERVIEW OF THE EXISTING ENVIRONMENT

This chapter briefly describes the existing environment on the sites that are being considered (i.e., the Puhi Site, Field 390 Site, and Airport Industrial Area Site as depicted on Figures 1-2, 1-3, 1-4, and 1-5). The discussion is organized by topic (e.g., topography, hydrology, noise, etc.). Within each topic, the descriptions are broken down into general, i.e., information that is applicable to all of three sites under consideration, and site-specific, i.e., information that is specific to each of the three sites. The information is intended primarily as a means of orienting readers to the general characteristics of the areas. Chapter 4 presents additional information as needed to describe and discuss potential impacts.

3.1 TOPOGRAPHY

3.1.1 GENERAL

All of the sites under consideration are on gently-sloping land that was previously used for sugar cane cultivation. All the sites are several hundred feet from the nearest stream, but surface runoff from the sites drains toward them.

3.1.2 PUHI SITE

As shown by Figures 1-1 and 1-2, the Puhi Site consists of gently sloping plateau land. It is bounded on the north and west by a cane haul road owned by Lihue Plantation (LPCO). A gulch formed by Nawiliwili Stream forms its southern boundary. On the east, it ends in a depression that drains into a small tributary to Nawiliwili Stream.

The overall slope is from northwest to southeast. The highest point, 326 feet above sea level, is situated at the top of the cut in which the haul road passes around the western side of the property. The lowest point, just under 300 feet above sea level, is adjacent to Nawiliwili Stream Gulch. The gradient averages 2-3 percent in most areas. However, a broad area in the northeast central part of the property is flatter, and small areas within drainageways are steeper, reaching a maximum of 18 percent over a few tens of feet.

3.1.3 FIELD 390 SITE

As shown in Figure 1-1, the topography on the Field 390 Site is similar to that of the Puhi Site. As described in Chapter 1, it is located along LPCO's main cane haul road through the area, approximately 800 feet south of Ma'alo Road (also known as Wailua Falls Road). The ground on this site slopes gently from north-northwest to south-southeast, from a high of approximately 285 feet above sea at its upper end near the LPCO cane haul road to approximately 250 feet above sea level at its southern end adjacent to the Hanamaulu Stream valley. Slopes are generally consistent across the entire site at approximately 2.5 to 3.0 percent, but a few very localized areas of greater slope (5 to 10 percent) are present, most noticeably at the extreme southern end of the property.

3.1.4 AIRPORT INDUSTRIAL AREA SITE

This third site, is located immediately west of Lihue Airport. It borders the existing Kauai County Transfer Station. Like the other two sites, LPCO is currently cultivating sugar cane on the property. It is bisected by an existing field road; that road also provides access to the quarry.

OVERVIEW OF THE EXISTING ENVIRONMENT

operation on the western side of Kapule Highway. The ground slopes gently downward at an average of approximately 2 percent. The portion of the site that is west of the field road slopes downward in a northeasterly direction; the portion that is east of the field slopes from west to east.

3.2 GEOLOGY AND SOILS

3.2.1 GENERAL

Koloa Series lavas underlie all of the sites to a substantial, but unknown depth. These lavas were erupted during the later stages of the island's growth, but the youngest are still hundreds of thousands of years old. Renewed volcanism is not a threat, and there are no other known geologic hazards at any of the three locations.

3.2.2 PUHI SITE

The U.S. Soil Conservation Service (SCS) (Foote, *et al.*, August 1972:115 and Sheet 31) classifies the soils on the site as Puhi silty clay loam. Soils in this series are well-drained upland soils that developed in place from the underlying lavas. In a representative profile, these soils have a surface layer of silty clay loam that is typically about one foot thick. This is underlain by at least four feet of silty clay loam that has a subangular, blocky structure. The surface layer is very strongly acidic; the subsoils range from slightly to moderately acidic. Permeability is moderate to rapid, runoff is slow, and there is no erosion hazard. In places, roots penetrate to a depth of 5 feet or more. The soil, which has an SCS rating of IIs (the "s" means it is stony), is suitable for a wide range of crops. It has a high shear strength and low shrink-swell potential.

The University of Hawaii Land Study Bureau classifies the soils as Type B78i. These soils are deep, non-stony, and have a moderately fine texture. They have an overall productivity rating of "B".

3.2.3 FIELD 390 SITE

Foote, *et al.* classifies the soils on the Field 390 Site as Puhi silty clay loam (PnB). This is the same classification as the soil on the Puhi Site.

3.2.4 AIRPORT INDUSTRIAL AREA SITE

Foote, *et al.* (August 1972:115 and Sheet 30) classifies the soils on the Airport Industrial Area Site as Lihue silty clay. Soils in this series are well-drained upland soils that developed in place from the underlying lavas. In a representative profile, these soils have a surface layer of dusky-red silty clay that is typically about one foot thick. This is underlain by at least four feet of silty clay that has a subangular, blocky structure. The surface layer is very strongly acidic; the subsoils range from slightly acidic to neutral. Permeability is moderate to rapid, runoff is slow, and there is no more than a slight erosion hazard. In places, roots penetrate to a depth of 5 feet or more. The soil, which has an SCS rating of Iie (the "e" means it is erodible), is suitable for a wide range of crops. It has a high shear strength and high compacted density.

3.3 HYDROLOGY

3.3.1 GENERAL OVERVIEW

All three of the sites being considered are located in the southern half of the Lihue Basin. The extent of this basin is delineated by the mountains around its perimeter: Mt. Waialeale and Mt. Kawakini to the west; the Makaleha Mountains to the north; Haupu Ridge to the south; and Kalepa and Nonou

Ridges along the eastern shoreline. The Wailua River runs from west to east across the middle of the basin, dividing it into its northern and southern halves. The river ultimately passes through the break between the Kalepa and Nonou Ridges before reaching the shoreline. All of the mountains which circumscribe the basin are formed of Waimea series lavas, the original island-building formation.

Within the southern half of the Lihue Basin, Kilohana Crater is the dominant topographic and hydrologic feature. It is the point of eruption of the more recent lava series known as the Koloa volcanics. These lavas blanket the entire floor of the Lihue basin, extending to depths beyond those which have been drilled during the development of production wells and test borings.

The southern half of the Lihue Basin is drained by numerous perennial streams. The largest of these originate at the foot of Mt. Kawakini on the western edge of the basin, but there are also numerous smaller streams which originate on the slopes of Kilohana Crater. LPCO maintains an extensive system of intakes, ditches, flumes, and reservoirs which capture and store water from these streams for sugar cane irrigation and use at the mill.

The extent of groundwater development in the southern half of the Lihue basin is illustrated by the production and test wells located on Figure 3-1 and listed in Tables 3-1 and 3-2. All of these wells tap into the Koloa formation. None develop water from the older Waimea series lavas at depth or on the perimeter of the basin. The Kauai County Department of Water's (DOW) active production wells are above Lihue and in Puhi. It has drilled a number of test wells in the Hanamaulu area, but none of these have produced sufficient yield to warrant development for production.

3.3.2 HYDROLOGY OF THE PUHI SITE

As shown on Figure 3-1, there are existing DOW production wells to the north and to the northwest (upgradient) of this site. DOW's Garlinghouse Tunnel (State No. 5823-01), which is a shallow horizontal skimming well, is across Nawiliwili Stream to the southeast of the site. Based primarily on data from Garlinghouse, the groundwater level in the Koloa lavas beneath the Puhi Site may stand about 190 feet above sea level. This would be more than 100 feet below ground around the *makai* perimeter of the site and it would be deeper than that across the remainder of the site.

All of the Puhi Site drains directly into Nawiliwili Stream or into its tributary gulch at the east end of the site. This stream originates on the southeast side of Kilohana Crater. At the point where it crosses under the cane haul road next to the site, its watershed is 1.25 square miles in size. Its flow is perennial, sustained even during dry periods by groundwater seepage along its length from the Koloa volcanics. LPCO does not divert water from this stream. However, just below the site, water is diverted for various minor agricultural uses. The stream ultimately discharges into Nawiliwili Bay next to Kalapaki Beach. The size of its watershed discharging at the shoreline is 4.35 square miles. It encompasses most of Lihue Town and its adjacent residential areas as well as the southeast flank of Kilohana Crater. According to FEMA Community Panel Map No. 150002-0201 C, the site lies outside the 500-year flood plain.

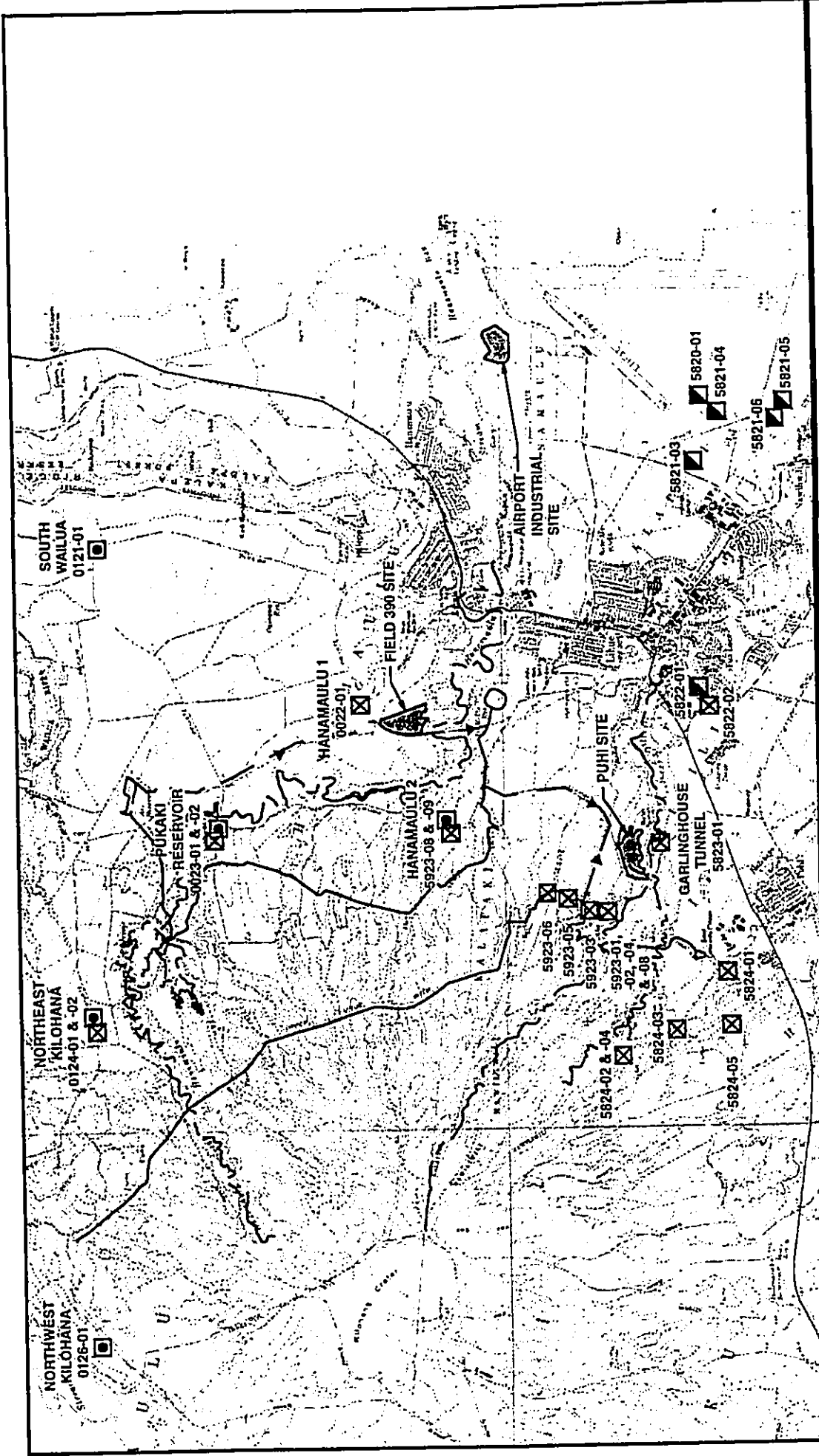


FIGURE 3-1:

**Locations of Supply and Test Wells
in the Lihue-Hanamaulu Area**

LEGEND:

- ☒ DEPARTMENT OF WATER MUNICIPAL SUPPLY WELLS (INCLUDES UNUSED EXPLORATORY WELLS IN HANAMAULU)
- ☐ TEST/MONITOR WELLS DRILLED BY THE U.S. GEOLOGICAL SURVEY
- ☐ PRIVATE SUPPLY WELLS



PREPARED FOR:
Kauai Electric
A Division of the
Citizen Utilities Company

PREPARED BY:
Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:
Tom Nance Water Resources Engineering,
September 1996.

Kauai Electric
Lihue Energy Service Center

Kauai Electric Service Center 9/21/96

Table 3 - 1. Summary Statistics of Existing Production Wells in the Vicinity of the Sites Being Considered for the Lihue Energy Center.

State Well No.	Owner/ Present Use	Year Drilled	Ground Elevation (feet)	Well Depth (feet)	Elevation at Bottom (Ft. MSL)	Open Strata (Ft. MSL)	Static Water Level (Ft. MSL)	Date of Static Water Level Measurement
5820-01	Kauai Lagoons/Irrigation	1987	138	316	-178	+30 to -178	16	1987
5821-03	Kauai Lagoons/Irrigation	1987	160	277	-117	+5 to -117	13	1987
5821-04	Kauai Lagoons/Irrigation	1987	137	375	-238	+12 to -238	11	1987
5821-05	Kauai Lagoons/Circulation	1987	100	338	-238	+20 to -238	14	1987
5821-06	Kauai Lagoons/Circulation	1987	100	380	-280	+5 to -280	12	1987
5822-01	Lihue Plantation/Industrial	1965	150	700	-550	+10 to -550	120	1965
5822-02	Kauai DOW/Unused	1961	224	593	-369	-36 to -369	30.6	1961
5823-01	Kauai DOW/Municipal	1935	187	Tunnel	-187	--	187	1935
5823-02	Kauai DOW/Observation	1992	213	20	192	+200 to +193	200.3	1992
5824-01	Kauai DOW/Municipal	1975	328	772	-444	+148 to -444	69	1975
5824-02	Kauai DOW/Unused	1979	488	250	238	+303 to -444	69	1975
5824-03	Kauai DOW/Municipal	1980	408	200	208	+338 to +208	347	1980
5824-04	Kauai DOW/Abandoned	1981	484	475	9	+484 to +9	n.d.	n.d.
5824-05	Kauai DOW/Municipal	1990	411	346	65	+291 to +65	345	1990
5923-01	Kauai DOW/Municipal	1974	371	920	-549	+30 to -549	47	1974
5923-02	Kauai DOW/Municipal	1977	371	187	184	+274 to +184	226	1977
5923-03	Kauai DOW/Municipal	1978	364	194	170	+231 to +170	250	1978
5923-04	Kauai DOW/Municipal	1980	369	201	168	+209 to +168	225	1980
5923-05	Kauai DOW/Municipal	1981	384	295	89	+253 to +89	238	1981
5923-06	Kauai DOW/Unused	1981	393	240	153	+383 to +153	311	1981
5923-07	Kauai DOW/Municipal	1982	363	200	163	+223 to +163	225	1982

Note: MSL refers to "mean sea level", the datum used in the measurements.

Source: Commission on Water Resource Management. August 1993. *Hawaii Groundwater Index and Summary*. Compiled by Tom Nance Water Resource Engineering.

OVERVIEW OF THE EXISTING ENVIRONMENT

Table 3 - 2. Exploratory and Monitoring Wells Drilled in the Hanamaulu-Kilohana Area.

State Well No.	Owner/Present Use	Year Drilled	Ground Elevation (Feet MSL)	Well Depth (feet)	Elevation at Bottom (Feet MSL)	Static Water Level	
						Elevation (Feet MSL)	Date of Measurement
5923-08	USGS/Monitoring	1995	273	1,002	-730	217	October 5, 1995
5923-09	Kauai DOW/Unused						
0022-01	Kauai DOW/Unused	1994	277	700	-423	253	January 1995
0023-01	USGS/Monitoring	1996	319	1,147	-828	147	April 2, 1996
0023-02	Kauai DOW/Unused	1998		730			
0121-01	USGS/Monitoring	1995	289	1,143	-854	14	October 17, 1995
0124-01	USGS/Monitoring	1995	466	1,047	-581		
0124-02	Kauai DOW/Unused	1998	462 (est.)	560	-98	426	May 15, 1998
0126-01	USGS/Monitoring	1996	678	1,004	-326	590	January 23, 1996

Source: Compiled by Tom Nance Water Resource Engineering, Inc. from State of Hawaii Commission on Water Resources Management records.

3.3.3 HYDROLOGY OF THE FIELD 390 SITE

The best indication of groundwater occurrence beneath the Field 390 Site is provided by data from DOW's nearby Hanamaulu No. 1 test well (State No. 0022-01). The piezometric head of the underlying groundwater stands within 20 feet of the ground surface, although it is first encountered during drilling several tens of feet below this. Since the yield from the Hanamaulu No. 1 well during pump tests was minimal with very large drawdown (almost 200 feet at less than 100 gallons per minute [GPM]), it has not been converted into a production well. However, DOW is considering deepening this well to improve its yield. This well, like all of the other Hanamaulu test wells, shows progressive geothermal heating with increasing depth (see Figure 3-2). There is a good correlation between increasing salinity and increasing temperature. Consequently, deepening is likely to encounter even warmer water than shown on Figure 3-3 with a quality which may not be appropriate for potable use.

The entire Field 390 Site slopes down to the south, draining into the adjacent reach of Hanamaulu Stream. The watershed of Hanamaulu Stream originates on the northeast flank of the Kilohana Crater. As it passes the Field 390 Site, its watershed encompasses 6.0 square miles. In terms of consistent surface water flow, the 2.1-square mile upper portion of the basin which drains into LPCO's Kapaia Reservoir is the most productive. This part of the watershed includes drainage from the interior of the Kilohana Crater itself. According to FEMA Community Panel Map No. 150002-0140 C, the site lies outside the 500-year flood plain.

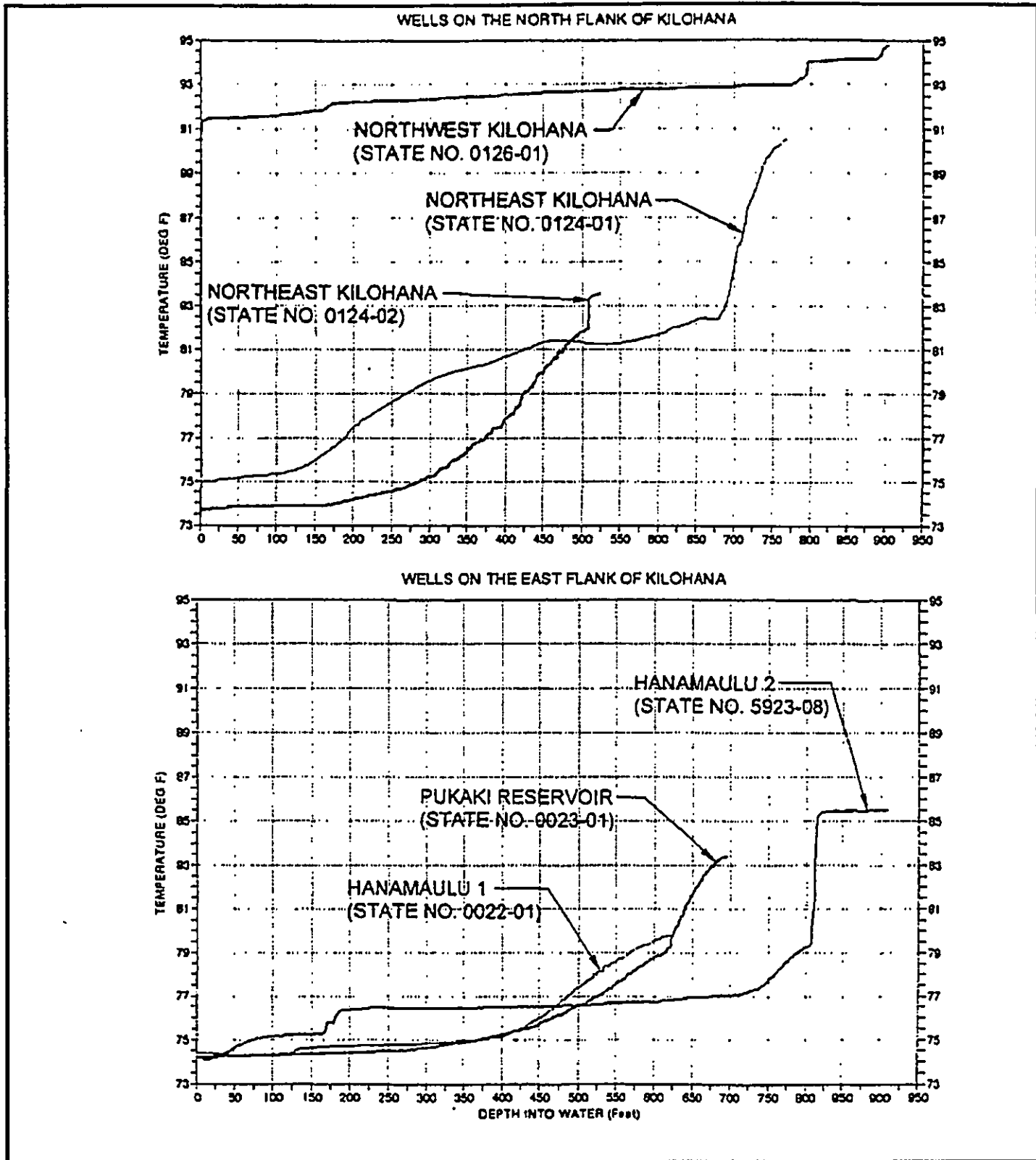
Kapaia Reservoir was created by the construction of an earthfill dam across Hanamaulu Stream. The Lower Lihue Ditch begins at the release point from the reservoir. Water impounded in the reservoir comes from three different sources. In order of importance, they are: water diverted from Waiahi Stream by the Upper Lihue Ditch and dropped into the reservoir via the Lower Lihue cutoff ditch; water from the 2.1 square miles which are directly tributary to the reservoir; and water diverted from Waiahi Stream by the Hanamaulu Ditch (below the Upper Lihue intake) and periodically released into the reservoir.

For some distance downstream of the Kapaia Reservoir's earthfill dam, the bed of Hanamaulu Stream is dry. However, it gradually gains flow through groundwater seepage and the addition of numerous small tributaries. As a result, there is typically at least some flow in the stream as it passes the Field 390 Site. The stream ultimately discharges into Hanamaulu Bay. At that point, its watershed is 10.8 square miles in size. Although ungaged, its observed dry period base flow in this lower reach is in excess of several million gallons a day.

3.3.4 HYDROLOGY OF THE AIRPORT INDUSTRIAL AREA SITE

No wells or test borings have been drilled on or near the Airport Industrial Area Site. Consequently, site-specific data on groundwater conditions there are not available. The nearest wells are the five wells at the Kauai Lagoons Resort. These are about 1.2 miles to the south (refer to Figure 3-1) and, like the Airport Industrial Area Site, are relatively close to the shoreline. Summarized below are characteristics of groundwater occurrence at Kauai Lagoons which may be representative of conditions beneath the Airport Industrial Area Site.

- In all five wells at Kauai Lagoons, an upper and lower aquifer were encountered.
- The upper aquifer is semi-confined by overlying clay, ash, and boulder layers. Its piezometric head is between 69 and 123 feet above sea level at the Kauai Lagoons wells, defining a steep gradient toward the south. Potential yields from this upper aquifer are very modest, generally on the order of 50 GPM or less on a sustained basis.



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PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Tom Nance Water Resource
 Engineering.

LEGEND:

FIGURE 3-2:

**Temperature Profiles of Wells
 on the Flank of Kilohana Crater**

Kauai Electric
 Lihue Energy Service Center

- The bottom of the upper aquifer, which is also the confining layer for the lower aquifer, is below sea level and slopes down to the south. Based on data from the Kauai Lagoons wells, this separating layer is just 10 feet thick in places and up to 60 feet thick in others.
- Heads in the lower aquifer were originally measured between 11 and 16 feet above sea level at the Kauai Lagoons wells, also with a southerly gradient.
- The lower aquifer is the source of most of the water developed by the Kauai Lagoons wells. Yields of these wells vary between 200 and 700 GPM.
- Well No. 5, which is the deepest and closest to the shoreline of the Kauai Lagoons wells, produces slightly brackish water (chlorides of 400 milligrams per liter [MG/L]). The other four wells produce fresh water (chlorides of less than 250 MG/L). Chlorides in Well No. 1, for example, are less than 100 MG/L.

Aside from remnants of LPCO's furrow irrigation system, there are no surface water features within the Airport Industrial Area Site. However, the site is next to the 90- to 100-foot high south valley wall of Hanamaulu Stream. Although the stream discharges at the shoreline almost directly below the site, only a small portion of the site naturally drains in that direction, and that drainage is intercepted by a ditch that runs along the northern boundary of the property. Most of the site slopes toward Ahukini Road and the island's eastern shoreline. According to FEMA Community Panel Map No. 150002-0140 C, the site lies outside the 500-year flood plain.

3.4 CLIMATE AND EXISTING AIR QUALITY

3.4.1 CLIMATOLOGY

The Hawaiian Island chain is situated south of the large Eastern Pacific semi-permanent high-pressure cell, the dominant feature affecting air circulation in the region. Over the Hawaiian Islands, this high-pressure cell produces very persistent winds called the northeast trade winds. During the winter months, cold fronts sweep across the north central Pacific Ocean, bringing rain to the Hawaiian Islands and intermittently modifying the trade wind regime. Thunderstorms, which are much more frequent in the mountains, also contribute to annual precipitation.

3.4.1.1 Temperature

Due to the tempering influence of the Pacific Ocean and their low-latitude location, the Hawaiian Islands experience extremely small diurnal and seasonal variations in ambient temperature. Average temperatures in the coolest and warmest months at Lihue Airport are 71.2° and 80.3°, respectively. These temperature variations are quite modest compared to those experienced at inland continental locations. Temperature data from Lihue Airport and from the Puhi Site are summarized in Tables 3.4 - 1 and 3.4 - 2.

Table 3.4 - 1. Average Monthly Temperatures In Lihue And Puhi.

Month	Ambient Temperature, Degrees Fahrenheit	
	Lihue	Puhi (1993-94)
January	71.2	67.4
February	69.0	69.4
March	71.0	70.0
April	72.2	70.5
May	71.7	72.7
June	76.4	74.7
July	78.4	76.7
August	80.3	77.6
September	79.0	77.4
October	78.3	75.2
November	76.1	73.9
December	74.1	71.0

Notes: The Lihue data are long-term historical averages, while the temperatures shown for Puhi represent a single year.

Source: Lihue Airport Data are from *The State of Hawaii Data Book 1996, A Statistical Abstract*, State of Hawaii Department of Business, Economic Development and Tourism. They are based on Lihue temperature data collected by the National Weather Service.

Table 3.4 - 2. Tabulation of Temperatures at the Puhi Site During the Months That Wind Speed Was Recorded.

<i>Month</i>	<i>Maximum Average Hourly Temperature</i>		<i>Minimum Average Hourly Temperature</i>		<i>Average Temperature</i>	
	° Centigrade	° Fahrenheit	° Centigrade	° Fahrenheit	° Centigrade	° Fahrenheit
September-93	29.0	84.2	19	66.2	24.7	76.5
October-93	29.8	85.6	15.3	59.5	24.0	75.2
November-93	27	80.6	16	60.8	22.7	72.9
December-93	24.9	76.8	14.8	58.6	21.6	70.9
January-94	25.3	77.5	12.7	54.9	19.7	67.5
February-94	25.3	77.5	14.5	58.1	20.8	69.4
March-94	25.6	78.1	15.9	60.6	20.4	68.7
April-94	24.6	76.3	16.6	61.9	21.4	70.5
May-94	25.1	77.2	17	62.6	22.6	72.7
June-94	25.8	78.4	19	66.2	23.7	74.7
July-94	27	80.6	21.5	70.7	24.8	76.6
August-94	27.6	81.7	21.8	71.2	25.4	77.7
September-94	28.3	82.9	22	71.6	25.3	77.5

Source: Compiled by Sierra Research

3.4.1.2 Rainfall and Humidity

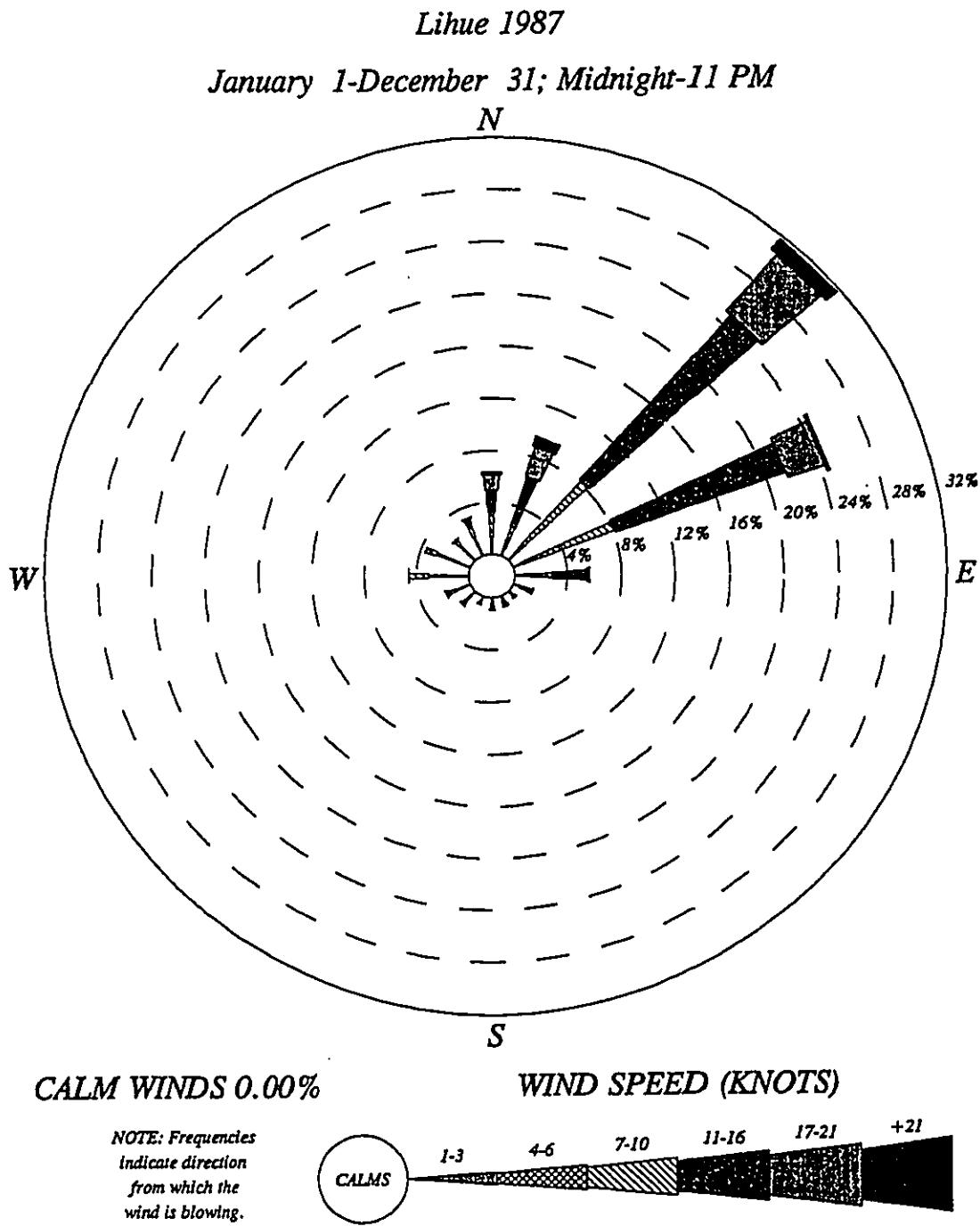
The terrain on Kauai is influential in determining the amount of rainfall. On the windward side of the island, the rainfall increases with elevation, reaching an average of over 460 inches per year on Mount Waialeale. On the leeward side of the islands, the annual average rainfall is much lower. Annual average rainfall at Lihue Airport, for example, is 43 inches. Rainfall at all of the sites being considered for the Lihue Energy Service Center is greatest during the winter and least during the summer months.

Although Lihue and Puhi are on the leeward side of the island, the humidity is still moderately high. On an annual basis, it averages 78% at 8 a.m., declining to 67% at 2 p.m.

3.4.1.3 Wind Patterns

As shown in the wind roses in Figures 3.4-1 and 3.4-2, the northeast trade winds are by far the dominant wind regime in Lihue. These winds are most persistent in the summer. In winter, the island is also influenced by occasional Kona storms, which are intense low pressure centers that pass near the island bringing moderate to strong southerly winds and rain. When the wind flows are not dominated by the trades or storms, the winds are typified as land/sea breezes and Kona winds. Both regimes are influenced by the ocean and terrain.

Figure 3.4 -1. Wind Rose for Lihue Airport 1987.



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Meteorological data were collected at the Puhi Site from September 1993 through September 1994. Conditions there are generally representative of those at the other two locations as well. The data show that the wind is predominantly from the north-northeast through east-northeast sector (see Figure 3.4 - 2). Except for the three-month period from December 1993 through February 1994, it was calm less than one percent of the time. ("Calm" is defined as a wind speed of less than 0.5 meter per second or 1.15 miles per hour.) During these three months, winds were calm 3.3%, 3.6%, and 5.4% of the time, respectively. These months were also exceptional in that they were the only months having winds from other directions a substantial percentage of the time. The maximum one-hour average wind speed during the monitoring period ranged from a low of 15 miles per hour (6.5 meters per second) in September to a high of 23 miles per hour (10.0 meters per second) in March. Typically, wind speeds were highest between 8:00 a.m. and 4:00 p.m.

3.4.2 APPLICABLE AIR QUALITY STANDARDS

The U.S. Environmental Protection Agency has set national ambient air quality standards (NAAQS) for ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, 10-micron particulate matter (PM₁₀), and airborne lead. It recently adopted a NAAQS for particulate matter less than 2.5 microns in diameter (PM_{2.5}). These ambient air quality standards establish the maximum concentrations of pollution considered to be acceptable, with an adequate margin of safety, to protect the public health and welfare.

The State of Hawaii has also adopted ambient air quality standards for some pollutants. In some cases these are more stringent than the federal standards. At present, the State has set standards for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM₁₀, lead, and hydrogen sulfide.

Both state and national air quality standards consist of two parts: an allowable concentration of a pollutant, and an averaging time over which the concentration is to be measured. The allowable concentrations are based on the results of studies of the effects of the pollutants on human health, crops and vegetation, and, in some cases, damage to paint and other materials. The averaging times are based on whether the damage caused by the pollutant is more likely to occur during exposure to a high concentration for a short time (one hour, for instance), or to a lower average concentration over a longer period (8 hours, 24 hours, or one month). For some pollutants there is more than one air quality standard, reflecting both its short-term and long-term effects. Table 3.4-3 presents the state and national ambient air quality standards for selected pollutants.

3.4.3 EXISTING AIR QUALITY: CRITERIA POLLUTANTS

Ozone. Ozone (O₃) is an end-product of complex reactions between reactive organic gases (ROG) or non-methane hydrocarbons (NMHC) and oxides of nitrogen (NO_x) in the presence of intense ultraviolet radiation. ROG and NO_x emissions from vehicles and stationary sources, in combination with daytime wind flow patterns, mountain barriers, a persistent temperature inversion, and intense sunlight, contribute to high ozone concentrations.

Kauai Electric has monitored ozone concentrations at Burns Field for its Port Allen Generating Station since 1989. The available monitoring results are summarized in Table 3.4-4. The Burns Field monitoring station is located approximately 20 miles from Lihue.

Table 3.4 - 3. State and National Ambient Air Quality Standards.

<i>Pollutant/Averaging Period</i>	<i>Standard, $\mu\text{g}/\text{m}^3$</i>	
	<i>State Standard</i>	<i>Federal Standard</i>
Nitrogen Dioxide		
Annual	70	100
Sulfur Dioxide		
3-hour	1300	1300
24-hour	365	365
Annual	80	80
Carbon Monoxide		
1-hour	10,000	40,000
8-hour	5,000	10,000
Particulate Matter (PM ₁₀)		
24-hour	150	150
Annual	50	50
Particulate Matter (PM _{2.5})		
24-hour	n/a	65
Annual	n/a	15
Ozone		
1-hour	100	235
8-hour	n/a	156
Hydrogen Sulfide		
1-hour	35	n/a
Lead		
3 months	1.5	1.5

Source: Compiled by Sierra Research

Table 3.4 - 4. Ozone Levels at Burns Field, 1989-1997.

<i>Recorded Maximum 1-Hour Concentrations (in $\mu\text{g}/\text{m}^3$)</i>				<i>Standard (in $\mu\text{g}/\text{m}^3$)</i>	
<i>1989*</i>	<i>1992**</i>	<i>1996</i>	<i>1997</i>	<i>State</i>	<i>Federal</i>
103.8	99.9	105.9	84.2	100	235

Notes: * December 1988 through November 1989.
**Twelve-month period beginning February 1 and ending January 31 of following year.

Source: Compiled by Sierra Research

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Nitrogen Dioxide. Nitrogen dioxide (NO₂) is formed primarily in the atmosphere from a reaction between nitric oxide (NO) and oxygen or ozone. Nitric oxide is formed during high-temperature combustion processes when the nitrogen and oxygen in the combustion air combine. Although NO is much less harmful than NO₂, it can be converted to NO₂ in the atmosphere within a matter of hours, or even minutes under certain conditions.

Nitrogen dioxide has been monitored at Burns Field since 1989. Table 3.4-5 shows the annual average concentration for each monitoring year.

Table 3.4 - 5. Annual Concentrations of Nitrogen Dioxide (in $\mu\text{g}/\text{m}^3$) at Burns Field, 1989-1997.

1989*	1992**	1996	1997	Standard	
				State	Federal
2.4	2.4	2.2	3.3	70	100

Notes: * December 1988 through November 1989.
 ** Twelve-month period beginning February 1 and ending January 31 of following year.

Source: Compiled by Sierra Research

Carbon Monoxide. Carbon monoxide (CO) is a product of inefficient combustion, principally from automobiles and other mobile sources of pollution. Industrial sources of pollution typically contribute less than 10 percent of ambient CO levels. Peak CO levels occur typically during winter months, due to a combination of higher emission rates and stagnant weather conditions.

Carbon monoxide has not been monitored anywhere on the island of Kauai. However, CO was monitored by Maui Electric Company, Ltd., near their Maalaea power plant between August 1993 and July 1994. Concentrations monitored near Maalaea include the influences of vehicle traffic and commercial and industrial activity, and thus are believed to be representative of CO concentrations expected to be found at the Lihue sites. The results of this monitoring are also presented for comparison. Table 3.4-6 shows available CO monitoring data for the Maalaea site.

Table 3.4 - 6. Carbon Monoxide Concentrations (in $\mu\text{g}/\text{m}^3$) at Maalaea, 1993-1994.

Averaging Period	Concentration (in $\mu\text{g}/\text{m}^3$)	Standard (in $\mu\text{g}/\text{m}^3$)	
		State	Federal
1-hour	798	10,000	40,000
8-hour	456	5,000	10,000

Source: Compiled by Sierra Research from State of Hawaii Department of Health records.

Sulfur Dioxide. Sulfur dioxide (SO₂) is produced when any sulfur-containing fuel is burned. Because of the complexity of the chemical reactions that convert SO₂ to other compounds (such as sulfates), peak concentrations of SO₂ occur at different times of the year in different areas, depending on local fuel characteristics, weather, and topography. Table 3.4-7 shows monitored concentrations of SO₂ at the Burns Field monitoring station between 1989 and 1997.

Table 3.4 - 7. Sulfur Dioxide Levels at Burns Field, 1989-1997.

Averaging Period	Concentrations (in $\mu\text{g}/\text{m}^3$)				Standard (in $\mu\text{g}/\text{m}^3$)	
	1989*	1992**	1996	1997	State	Federal
3-hour	20.0	50.5	15.6	33.5	1300	1300
24-hour	12.8	11.8	6.7	4.4	365	365
Annual	0.3	1.5	0.7	0.3	80	80

Notes: * December 1988 through November 1989.
** Twelve-month period beginning February 1 and ending January 31 of following year.

Source: Sierra Research

Fine Particulate (PM_{10}). Particulate matter in the air is caused by a combination of wind-blown fugitive dust; particles emitted from combustion sources (usually carbon particles); and organic, sulfate, and nitrate aerosols formed in the air from emitted hydrocarbons, sulfur oxides, and oxides of nitrogen. In 1987, EPA adopted standards for fine particulate (PM_{10} - particulate matter less than 10 microns in size) and phased out the prior total suspended particulate (TSP) standards. PM_{10} standards were substituted for TSP standards because PM_{10} corresponds to the size range of inhalable particulate related to human health. The Department of Health has monitored PM_{10} at Lihue since 1986. Table 3.4-8 summarizes the PM_{10} monitoring data collected there since 1992.

The EPA and SDOH adopted a $\text{PM}_{2.5}$ -based standard in 1997. However, no monitoring data for particulates in that size range are yet available.

Table 3.4 - 8. Fine Particulate (PM_{10}) Concentrations Monitored at Lihue, 1992-1998.

Averaging Period	Concentrations (in $\mu\text{g}/\text{m}^3$)							Standards	
	1992	1993	1994	1995	1996	1997	1998*	State	Federal
24-hour	32	41	32	37	37	31	30	150	150
Annual	17.6	16.0	21.1	16.6	19.4	16.1	n/a	50	50

Note: * Partial year.
n/a - not available

Source: Compiled by Sierra Research from State of Hawaii Department of Health records.

3.4.4 OTHER AIR QUALITY ISSUES

3.4.4.1 Hazardous Air Pollutants

A substance is considered toxic if it has the potential to cause or contribute to an increase in mortality or an increase in serious illness, or if it may pose a present or potential hazard to human health. In future years, sources of air toxic emissions will be regulated under Section 112, Hazardous Air Pollutants, of the 1990 Clean Air Act Amendments. Additionally, the federal gasoline standards

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that became effective in 1996 are expected to result in significant reductions in benzene and 1,4-butadiene emissions from motor vehicles. Motor vehicles, as a category, are the sources of toxic air contaminants that contribute most significantly to health risks in urban areas.

3.4.4.2 Global Warming

Global warming is the name given to the projected increase in worldwide average temperatures as a result of the "greenhouse effect." The greenhouse effect is due to the increased concentration of carbon dioxide (CO₂) and several trace gases in the atmosphere. Like the glass in a greenhouse, these gases are transparent to visible light, but absorb energy in the infrared spectrum. Visible light from the sun is thus transmitted through to the earth's surface, but infrared radiation from the earth's surface is absorbed near the atmosphere, rather than radiating back to space. As a result, higher CO₂ concentrations cause more heat buildup within the atmosphere than would otherwise be the case.

Although scientific opinion is not unanimous, several studies suggest that the increasing concentration of infrared absorbing gases in the atmosphere is likely to lead to a measurable increase in average global surface temperature by the middle of the next century. The most obvious effect that this hypothesized increase in average global temperature could have on Hawaii is a rise in ocean level. However, it could also alter climatic patterns, and this, in turn, could have a number of secondary effects (e.g., changes in rainfall, increased air pollution, etc.).

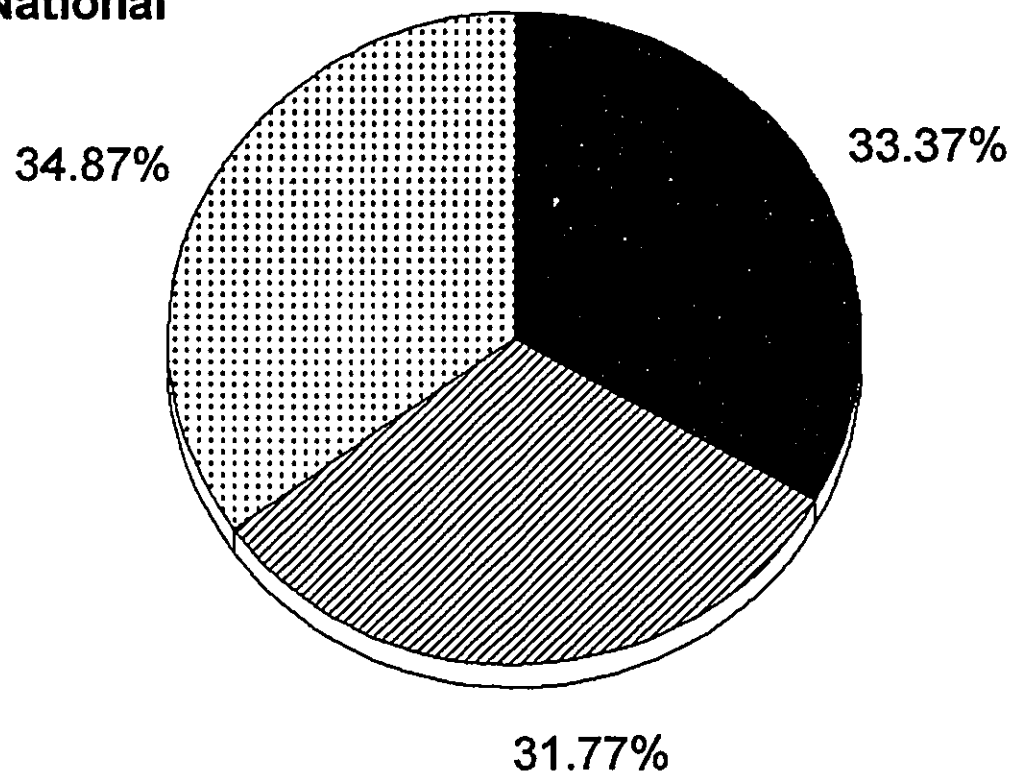
Significant greenhouse gases, in addition to CO₂, include methane, ozone, nitrous oxide, and various chlorofluorocarbon (CFC) species. Carbon monoxide (CO) and non-methane hydrocarbons (NMHC) are also important through their effects on atmospheric chemistry. These species react in the atmosphere to form ozone, and compete for OH radicals, which are responsible for degrading methane. Nitrous oxide and the CFC species are present in the atmosphere in much smaller concentrations than CO₂, ozone, and methane; however, their infrared absorption per molecule is thousands of times greater. Consequently, they have a major impact overall. One much-cited study by Ramanathan *et al.* projects a global temperature increase of 1.54°C, by 2030. The estimated contributions of various gases to this phenomenon are shown in Figure 3.4-3. The total warming due directly to the various CFC species was projected to be 0.36°C, with another increase of 0.08°C due to depletion of stratospheric ozone (also due to CFCs). The total CFC contribution is thus 0.44°C – the second largest effect after CO₂, accounting for 29% of the projected warming.

Major emissions of CFCs result from their use as cleaning solvents in the computer and aerospace industries, and as blowing agents in the production of foam insulation and packaging material. CFCs are also used extensively as working fluids in refrigeration and air-conditioning systems, but this does not result in their emission, except in the case of leakage, or when the systems are scrapped or recharged without salvaging the refrigerant.

Figure 3.4 - 3. Contribution of Greenhouse Gases to Global Temperature Change.

Carbon Emissions by Sector (as percent of total emissions from fossil fuels)

National



Industrial/Commer./Residential Electric Utilities Transportation

3.5 FLORA AND FAUNA

3.5.1 FLORA

Field studies were conducted at three sites: the Puhi Site, Field 390 Site, and the Airport Industrial Area Site (Char and Associates, May 2, 1998). The purpose of the studies was to assess the botanical resources present. Prior to undertaking these studies, topographic maps and recent color aerial photographs were reviewed to determine the vegetation cover patterns, terrain characteristics, access, boundaries and reference points. Special attention was given to areas likely to contain native plant communities, rare plants, and wetlands and wetland vegetation.

3.5.1.1 Puhi Site

This site is located within an existing sugar cane field under active cultivation. It had been recently planted at the time of the survey. The following common weedy species normally associated with such agricultural lands were present along the boundary of the field and the cane haul roads: swollen fingergrass (*Chloris barbata*), nutgrass (*Cyperus rotundus*), Bermuda grass (*Cynodon dactylon*), little bell (*Ipomoea triloba*), wild bittermelon (*Mormordica charantia*) and hair spurge (*Chamaesyce hirta*).

The abandoned concrete tank on the eastern corner of the property is overgrown. Vegetation in this area consists of weedy scrub composed of dense mats of California grass (*Brachiaria mutica*) and clumps of Guinea grass (*Panicum maximum*), with scattered shrubs of koa haole (*Leucaena leucocephala*) and young trees of Java plum (*Syzygium cumini*), ironwood (*Casuarina* sp.), and *Macaranga tanarius*. There is one royal palm (*Roystonea* sp.) near the tank. The tank is surrounded with clumps of silver fern (*Pityrogramma calomelanos*), Malayan ground orchid (*Spathoglottis plicata*), hairy swordfern (*Nephorolepis multiflora*) and maunaloa vine (*Canavalia cathartica*).

There is a forest of *Macaranga* trees in the depression/gully on the east side of the Puhi Site along with a scattering of Java plum and satin leaf (*Chrysophyllum oliviforme*) trees. In the large gulch on the south side of the site, there are stands of very tall ironwood and swamp mahogany (*Eucalyptus robusta*) trees. Other trees and shrubs present in this area include satin leaf, mango (*Mangifera indica*), Chinaberry (*Melia azedarach*), African tulip (*Spathodea campanulata*) *Macaranga*, cinnamon (*Cinnamomum verum*), strawberry guava (*Psidium cattelianum*) and rose myrtle (*Rhodomyrtus tomentosa*). The ground cover within the forest is sparse, consisting mostly of fallen leaves and branches or barren soil.

KE planted trees around the perimeter of the site to create a visual barrier between it and surrounding areas. There is a line of ironwood trees over 15 feet tall along the lower (Nawiliwili Stream) side of the property. Ironwood, koa (*Acacia koa*) and *Eucalyptus* sp. are planted along the cane haul road side of the site.

No endangered botanical species were observed on this site.

3.5.1.2 Field 390 Site

This site is presently used for sugar cane cultivation and supports the usual assemblage of weedy species. Swollen fingergrass is abundant on the dirt roads which border this site. A large gulch (Hanamaulu Gulch) bounds the southern side of the site. There is a narrow band of California grass, guinea grass, and weedy annual species where the parcel adjoins the gulch. On the steep slopes of the gulch there are Java plum forests with scattered *Macaranga* satin leaf, octopus (*Schefflera actinophylla*), and Banyan (*Ficus* sp.) trees. The nearest area containing wetland species is located northwest (*mauka*) of the cane haul road in an area that is not affected by runoff from the Field 390

Site. This manmade low-lying area contains several small ponded areas which are home to wetland indicator species such as cattails (*Typha latifolia*, *Cyperus difformis*, *Cyperus halpan*), primrose willow (*Ludwigia octovalvis*), and honohono (*Commelina diffusa*).

No endangered botanical species were observed on this site.

3.5.1.3 Airport Industrial Area Site

This site, as is true for the others, is presently under sugar cane cultivation. It includes the expected assemblage of weedy species along the field edges, ditches, and dirt roads in amounts greater than observed at the other sites. Weedy species on this site include Mexican poppy (*Argemone mexicana*), *Macroptilium atropurpureum*, *Brachiaria subquadripara*, white thunbergia (*Thunbergia fragrans*), sensitive plant (*Mimosa pudica*) along with swollen fingergrass, guinea grass and little bell. Two indigenous species (native to the Hawaiian Islands and elsewhere throughout the Pacific) were also present on the site. They are beach pea or mohihi (*Vigna marina*) and 'uhaloa (*Waltheria indica*).

A band of dense guinea grass with scattered castor bean (*Ricinu communis*) and koa haole shrubs is present on the eastern boundary of the site, along Ahukini Road. Ironwood trees are the predominant cover along the gulch which bounds the site on the north side. There are scattered smaller stands of Java Plum and a *Eucalyptus* sp.

No endangered botanical species were observed on this site.

3.5.2 FAUNA

Ornithological and mammalian field surveys were conducted at three sites: the Puhi Site, Field 390 Site, and the Airport Industrial Area Site (David, May 1998). The primary purpose of the surveys was to determine if there were any federally listed, endangered, threatened, proposed, or candidate avian or mammalian species on or in the immediate vicinity of the sites that would preclude the use of the sites. Prior to conducting the surveys, a review of previous relevant survey reports was conducted. An effort was also made to detect any presence of Hawaiian hoary bats since they are endangered and a previous report documents their presence in the lowlands and gullies of Kauai.

No comprehensive trapping program was undertaken to quantify the usage of the sites by mammalian species since mammals (excepting the Hawaiian hoary bat) on Kauai represent alien species only. Signs or remains of four alien mammalian species: rat (*Rattus* sp.), domestic dog (*canis* F. *familiaris*), cat (*Felis catus*) and pig (*Sus s. scrofa*) were found on the boundaries of at least two the three sites. Evidence of the house mouse (*Mus musculus*) was also detected.

Stationary remote bat census stations were deployed on two successive nights. These bat detectors were coupled to voice activated cassette recorders. Visual scans for bats were made during twilight hours on two evenings and two mornings. Count stations were sampled twice at the Puhi Site and once at each of the other sites. The tapes were reviewed and number of bat passes that were recorded were counted.

Table 3.5-1 lists the 22 avian species that were detected on or within the immediate vicinity of the three sites. Seventeen of these were alien species (i.e., introduced to Hawaii by man). One species, Pacific Golden Plover is a common indigenous (i.e., native to Hawaii but also found elsewhere) migrant shorebird. Two seabird species, Dark-Rumped Petrel and Wedge-tailed Shearwater are endemic (i.e., native and unique to Hawaii) at the sub-species level. The two waterbird species that were observed in the general area (Hawaiian coot and the Common moorhen) are also endemic. Three of the endemic birds detected (Dark-Rumped Petrel, Hawaiian Coot, and Common Moorhen) are listed as endangered by the United States Fish and Wildlife Services (USFWS) and the State of Hawaii.

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Table 3.5 - 1. Avian Species Detected During the Faunal Survey.

Common Name	Scientific Name	1	2	3
PETRELS & SHEARWATERS - Procellariidae				
Dark-rumped Petrel (Hawaiian)	<i>Pterodroma phaeopygia sandwichensis</i>			•
Wedge-tailed Shearwater	<i>Puffinus pacificus cholororhynchus</i>			•
HERONS - Ardeidae				
Cattle Egret	<i>Bubulcus ibis</i>	•	•	
PHAESANTS & ALLIES - Phasianidae				
Jungle Fowl (Red)	<i>Gallus gallus</i>	•	•	•
Ring-necked Pheasant (common)	<i>Phasianus colchicus</i>	•	•	
Common Peafowl (Indian)	<i>Pavo cristatus</i>	•		
RAILS & ALLIES - Rallidae				
Moorhen (Common)	<i>Gallinula chloropus sandvicensis</i>		•	
Hawaiian Coot	<i>Fulica alai</i>		•	
PLOVERS & LAPWINGS - Charadriidae				
Pacific Golden Plover	<i>Pluvialis fulva</i>	•	•	•
PIGEONS & DOVES - Columbidae				
Spotted Dove	<i>Streptopelia chinensis</i>	•	•	•
Zebra Dove	<i>Geopelia striata</i>	•	•	•
BARN OWLS - Tytonidae				
Barn Owl	<i>Tyto alba</i>	•	•	•
MIMIC THRUSHES & ALLIES - Mimidae				
Northern Mockingbird	<i>Mimus polyglottos</i>			•
STARLINGS - Sturnidae				
Common Myna	<i>Acridotheres tristis</i>	•	•	•
OLD WORLD FLYCATCHERS & ALLIES - Muscicapinae				
White-rumped Shama	<i>Copsychus malabaricus</i>	•	•	
SILVEREYES - Zosteropidae				
Japanese White-Eye	<i>Zosterops japonica</i>	•	•	•
BABLERS - Timaliidae				
Melodius Laughing Thrush	<i>Garulax canorous</i>	•	•	
WAXBILLS & ALLIES - Estrilidae				
Scaly-breasted Munia	<i>Lonchura punctulata topela</i>	•	•	•
Black-headed Munie	<i>Lonchura malacca</i>	•	•	•
FRINGILLIDS - Fringillidae				
House Finch	<i>Carpodacus mexicanus mexicanus</i>	•	•	•
EMBERIZIDS - Emberizidae				
Red-crested Cardinal	<i>Paroaria coronata</i>	•		•
Northern Cardinal	<i>Cardinalis cardinalis</i>	•	•	•

Note: "1" is Puhi Site; "2" is Field 390 Site; "3" is Airport Industrial Area Site.

Source: Rana Productions, Inc. 1998.

The endangered Hawaiian hoary bat, Hawaii's sole endemic terrestrial mammalian species, was detected foraging over the Puhi Site and the Airport Industrial Area Site. While bats were not observed during the field survey of the Field 390 Site, the vegetated gulch adjacent to that site provides habitat suitable for them; it is possible that a longer survey period might have identified bats at this location as well. Several Dark-rumped Petrels were observed flying inland above the Hanamaulu Gulch.

3.6 EXISTING NOISE LEVELS

3.6.1 PROSPECTIVE POWER PLANT SITES

3.6.1.1 Puhi Site and Field 390 Site

Existing noise levels in the vicinity of the two *mauka* sites (the Puhi Site and the Field 390 Site) are typical of those found in agricultural areas removed from busy roadways. The most significant noise source in the vicinity of these sites are trucks using the cane haul roads that run past them. When haul trucks are present, peak noise levels along the boundary of the sites can reach 80 dB or more. The level drops with increasing distance from the haul road.

When haul trucks are absent and no mechanical equipment is operating in the fields, wind blowing through the vegetation is the loudest noise source. Spot measurements made during a period of gentle winds when no heavy equipment was working nearby and there was no cane haul truck traffic indicate that it is typically on the order of 35-40 dBA.

3.6.1.2 Airport Industrial Area Site

The Airport Industrial Area Site is not on a major cane haul road. Consequently, that noise source is absent. However, it is near Ahukini Road, the County's solid waste transfer station, a new papaya disinfestation facility, and the access road to a large asphalt plant; all of these contribute noise during their hours of operation. More importantly, because of its proximity to the runways at Lihue Airport, aircraft noise is present. Wilson Okamoto & Associates, Inc., *et al.* (December 1989) estimated that the average Day-Night noise levels (DNL) in calendar year 1991 would be approximately 65 dBA. There have been no changes in airport operations that would substantially change this. Spot measurements made during mid-1998 when no aircraft were present, wind speed was low, and the cane fields were fallow showed a background noise level of approximately 35 dBA.

3.6.2 EXISTING NOISE LEVELS IN NOISE-SENSITIVE RECEPTOR LOCATIONS

As discussed elsewhere in this report, all of the sites under consideration are well away from existing residential areas and other noise-sensitive uses. Because of this, no detailed noise measurements were made specifically for this project. Spot recordings were made and are reproduced in Table 3.6-1. These data indicate that traffic noise and the sound of wind passing through vegetation are the principal sources of environmental noise in the residential areas that are closest to the Preferred and Field 390 Sites. These are also important noise sources in the residential areas that are closest to the Airport Industrial Area Site, but aircraft noise plays an equal or greater role at some of these locations.

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Table 3.6 - 1. Existing Noise Levels at Representative Locations in Lihue

<i>Location/Condition</i>	<i>Noise Level (in dBA)</i>
EAST LIHUE:	
Elua Street, between Ahukini Road and Hardy Street:	
<i>No traffic or wind</i>	30
<i>With wind rustling in palm trees</i>	35-38
<i>During passing of quiet new car</i>	62
<i>During passage of pickup truck</i>	72
Ahukini Road, 1 block makai of Kuhio Highway (50-feet from centerline):	
<i>Lowest measured</i>	42
<i>Typical</i>	51-55
<i>Cars passing on roadway</i>	63-67
WEST LIHUE:	
Kanakalu Street Near Isenberg Park:	
<i>No traffic or sounds from park, gentle breeze, hum from transformer</i>	35-38
<i>No traffic sounds, gentle breeze, sounds from park</i>	42-45
<i>Barking dog</i>	48
Immaculate Conception School Yard:	
<i>No wind or other identifiable noise sources</i>	30-32
<i>Wind passing through vegetation</i>	35-40
West end of Ekolu Street:	
<i>Gentle breeze through vegetation</i>	34-36
<i>Moderate breeze through vegetation</i>	40
HANAMAULU:	
Eastern end of Hoohuki Street:	
<i>Gentle breeze with no specifically identifiable sound</i>	36-38
<i>Gentle breeze with background traffic noise and children's voices</i>	44-46
KAPAIA:	
Eastern end of Manulele Street:	
<i>No wind noise or other identifiable sound</i>	34-36
<i>Background traffic noise, lawn mowers, and voices</i>	44-46
Maalo Road at Kauai Memorial Gardens:	
<i>Quietest</i>	32
<i>Typical with no passing vehicles</i>	38-40
<i>When helicopters passing well to the north on approach to Lihue Airport</i>	45-52

Note: Measurements made with B&K Type 2219 Sound Level Meter on October 19, 1998.

3.7 AQUATIC RESOURCES

3.7.1 AQUATIC RESOURCES OF CONCERN

There are no streams or ponds on any of the sites that are under consideration. However, as described below, storm runoff from them would drain into nearby streams (Nawiliwili Stream and Hanamaulu Stream). As discussed in Chapter 2 of this report, the proposed facilities are designed to limit this to the extent practical. Nonetheless, some discharge is unavoidable. In view of this, published information on aquatic resources was reviewed to determine the extent to which particularly sensitive and/or important biota might be present.

Hawaiian streams support a small, but unique aquatic fauna, including freshwater fish, mollusks, crustaceans, and insects. The diversity is typically low, but the resources can be important because some of the species are found only in the Hawaiian Islands. The most thorough inventory of these resources conducted to date is the *Hawaii Stream Assessment: A Preliminary Appraisal of Hawaii's Stream Resources* (National Park Service, December 1990). The report notes that prior to human habitation of the islands most continuous streams may have been occupied by one or more native stream species. Many of these are amphidromous. This means that after the adults breed in streams or estuaries the larvae are swept out to sea where they become part of the marine zooplankton. After a prolonged period of maturation, the postlarval form of the organisms that survive predation return to the stream mouths and migrate upstream. The *Hawaii Stream Assessment Report* notes that many of the native Hawaiian stream species are "rheophyllic" or "current-loving". This makes them well-suited to their native habitat, which has clear, well-oxygenated water that flows over boulders, cobbles, and gravel. Gobiid gobies that are found in Hawaiian waters are adapted to life in turbulent coastal waters and streams. The adaptations include fused ventral fins that allow them to "climb" waterfalls and to colonize stream sections that are inaccessible to other fishes.

Due to the amphidromous nature of many of the species that the scientists who prepared the *Hawaii Stream Assessment Report* considered important, they considered each stream as a unit rather than in segments. They included a variety of survey information in the inventory, including the presence, abundance, and spawning of native species, the occurrence of introduced species, habitat factors, and information sources. The scientists classified eleven native species into two groups on the basis of their relative scarcity. These aquatic species groups are shown in Table 3.7-1. Quoting from the report:

Native Species Group 1 (NG1): Four native freshwater species were classified as "indicator species" and comprised the Native Species Group One (NG1). The committee considered these as representative of potentially high quality stream ecosystems. They included three gobies and a mollusk. Of the four NG species, only 'O'opu alamo'o (Lentipes concolor) is listed by the U.S. Fish and Wildlife Service as a candidate endangered species. However, the Aquatic Resources Committee believes that two other 'O'opu (Awaous stamineus and Sicyopterus stimpsoni), as well as hihiwai (Neritina granosa) may be declining in Hawaiian streams.

Native Species Group 2 (NG2). The other seven native species considered more common comprised Native Species Group Two (NG2). These included two stream and two marine fishes, one shrimp, one prawn, and one snail. Presence of these species was considered to be typical of a healthy stream ecosystem.

OVERVIEW OF THE EXISTING ENVIRONMENT

Table 3.7 - 1. Aquatic Species Groups.

Group	Scientific Name	Hawaiian/Common Name	Type
Native Species Group One (NG1)	<i>Awaous stamineus</i>	'O'opu nakea	goby
	<i>Lentipes concolor</i>	'O'opu hi'ukole	goby
		'O'opu alamo'o	goby
	<i>Neritina granosa</i>	Hihiwai	snail
	<i>Sicyopterus stimpsoni</i>	'O'opu nopili	goby
Native Species Group Two (NG2)	<i>Atyoida bisulcata</i>	'O'pae kala'ole	shrimp
	<i>Eleotris sandwicensis</i>	'O'opu okuhe	eleotrid
		'O'opu okuhe	
		'O'opu akupa	
		'O'opu oau	
	<i>Kuhlia sandwicensis</i>	Aholehole	Kuhliid
	<i>Machrobrachium grandimanus</i>	'O'pae 'oeha'a	prawn
	<i>Mugil cephalus</i>	'Ama'ama	mullet
	<i>Stenogobius genivittatus</i>	'O'opu naniha	goby
<i>Theodoxus vespertinus</i>	Hapawai	snail	
Introduced Species Group One (IG1)	<i>Cichlasoma nigrofasciatum</i>	convict cichlid	
	<i>Clarius fuscus</i>	Chinese catfish	
	<i>Corbicula fluminea</i>	clam	
	<i>Gambusia affinis</i>	Mosquito fish	
	<i>Machrobrachium rosenbergii</i>	Malaysian prawn	
	<i>Micropterus dolomieu</i>	smallmouth bass	
	<i>Poecilia</i> (spp.)	Guppy	
	<i>Sarotherodon, Oreochromis</i> spp.	Tilapia	
	<i>Xiphophorous</i> spp.	Swordtail	
Introduced Species Group Two (IG2)	All those introduced species not listed in IG1; considered innocuous or accidental.		

Source: Hawaii Steam Assessment Report, Table 17, page 136.

Introduced Species Group One (IG1). This group included noxious, non-native animals that may prey upon and/or out-compete with native species. *Machrobrachium lar* (Tahitian prawn), was not included in the group even though it may pose a threat to Hawaiian stream animals because it is believed to be present in almost all Hawaiian streams.

Introduced Species Group Two (IG2). This consists of the non-native species considered to be innocuous to Hawaiian streams.

To assess and compare the biological quality of individual streams, the Aquatic Resources Committee developed a ranking system that was based primarily on the presence and abundance of the four native species believed to be indicators of potentially outstanding habitat. The criteria the Committee used to rank the streams are shown in Table 3.7-2.

3.7.2 PUHI SITE: NAWILIWILI STREAM

Nawiliwili Stream passes along the southern side of the Puhi Site, and surface runoff from it would eventually find its way into that watercourse.

The *Hawaii Stream Assessment Study* classifies the reach of Nawiliwili Stream (Code No. 2-2-13) near and below the Puhi Site as continuous, meaning it flows to the ocean year-round under normal conditions. It empties into Nawiliwili Harbor at Kalapaki Beach. Its mouth is approximately one-half-mile north of the outlet of Huleia Stream, the second, and larger, stream discharging into the harbor. There are no recorded stream diversions on Nawiliwili Stream. Table 16 in the report notes the presence of an estuarine environment at the mouth of the stream. The report does not list the stream among those possessing significant aquatic resources. Neither is it among the streams identified as having excellent riparian resources.

3.7.3 FIELD 390 SITE: HANAMAULU STREAM

Hanamaulu Stream (Code No. 2-2-12 in the *Hawaii Stream Assessment* report) is located in the deep gully immediately south of the Field 390 Site. It discharges into an estuary at Hanamaulu Bay approximately 2 miles west of the prospective power plant site. The *Hawaii Stream Assessment* report identifies Hanamaulu Stream as perennial. Table 16 in the report notes the presence of an estuary and embayment at the mouth of the stream and wetlands along portions of its banks. These are well away from the Field 390 Site.

The *Hawaii Stream Assessment Report* (Table 18) notes that the four aquatic species that are of greatest concern, 'O'opu alamo'o (*Lentipes concolor*), 'O'opu nakea (*Awaous stamineus*), 'O'opu nopili (*Sicyopterus stimpsoni*), and Hihiwai (*Neritina granosa*), have not been reported in Hanamaulu Stream. However, the inventory reported one NG1 species and three IG1 species as being present. On the basis of the criteria contained in Table 3.7-2, the presence of one NG1 species qualifies Hanamaulu Stream for a "Limited" ranking. Because of the relatively low ranking, the report does not recommend any special treatment for Hanamaulu Stream.

3.7.4 AIRPORT INDUSTRIAL AREA SITE: HANAMAULU STREAM/PACIFIC OCEAN

The Airport Industrial Area Site is adjacent to the seaward reach of Hanamaulu Stream. The characteristics of Hanamaulu Stream are discussed in Section 3.7.3, above. As discussed in Chapter 2 of this report, storm runoff from the property is presently collected in a drainage ditch that runs along the northern (Hanamaulu Stream) side of the property. This ditch carries the runoff (as well as agricultural return water from Lihue Plantation fields in the area) to an impoundment basin near

OVERVIEW OF THE EXISTING ENVIRONMENT

Ahukini Landing, where it is retained. If overflow from the basin were to occur, it would flow into the Pacific Ocean rather than Hanamaulu Stream.

Table 3.7 - 2. Aquatic Resources Ranking Criteria.

CATEGORY	CRITERIA	
Outstanding	Either A or B below:	
	A.	<u>Any</u> of these criteria:
		* <i>Lentipes concolor</i> is common in any reach of the stream
		* Evidence of spawning by any of the NG1 gobies.
		* An abundance (abundant or very abundant) of any of the four rare NG1 species anywhere in the stream.
		* Presence of all of the four NG1 species in the stream.
	B.	<u>All</u> of these criteria:
		* Two or more representatives of NG1 and NG2, each representing high native species diversity.
		* One or fewer IG1 introduced species.
		* No dams, diversions, or channelization.
Substantial	Both A and B below:	
	A.	At least three total representatives from NG1 and NG2.
	B.	One or fewer introduced species IG1.
Moderate	Presence of at least one native species from NG1.	
Limited	Presence of at least one NG1.	
Without	No native species present.	
Unknown	Insufficient biological information available for the stream.	

Source: *Hawaii Stream Assessment*, page 138.

3.8 ARCHAEOLOGICAL FEATURES

3.8.1 GENERAL

All of the sites are in areas that have been intensively cultivated for decades. None of them exhibit any surface evidence of prior use. Nonetheless, KE commissioned a reconnaissance-level investigation of all three power plant locations being considered and of the known electrical transmission corridors (McMahon, May 1998). The results of the survey, which included both a review of previous studies and a field survey, are summarized below.

Results of the archaeological survey and review of historical documents did not indicate any existing use of the area by native Hawaiian practitioners. Moreover, no correspondence was received from any individual or group claiming such rights during the extensive consultation that accompanied planning and report preparation for the project. Consequently, no native Hawaiian gathering rights are believed to be exercised on the sites under consideration for the Lihue Energy Service Center.

3.8.1.1 Previous Archaeological Work

Thrum (1907) reported numerous *heiau* on Kauai. Only two (Ahukini and Kalauokamanu) were in the same *ahupua'a* as the sites KE is considering (Hanamaulu and Kalapaki). He described Ahukini Heiau as "...[a] medium sized heiau; all destroyed" and Kalauokamanu Heiau as "[a] large walled heiau that stood above the present mill; destroyed about 1855, of pookanaka class" (1907:40).

Bennett (1931) also described Ahuhini (Ahukini) and Kalauokamanu Heiau. In addition to repeating Thrum's site descriptions and confirming that the *heiau* had been destroyed, Bennett (1931:125) indicated that Ahukini Heiau was once located "...near Ahukini Point on the bluff overlooking the sea." Bennett noted that: "[i]n the sand dunes that are along the shore halfway between Hanamaulu and Wailua River are many burials."

Handy and Handy (1972) speculate that because Hanamaulu Stream gulch offers a suitable environment for prehistoric agricultural activities, it might contain numerous terraced flats. Handy and Handy also surmise that the stream gulch was covered with *lo'i* for wetland taro cultivation for a distance of up to two and a half miles inland (425-426). This stretch of the stream valley includes the portions of Hanamaulu Stream that pass the Airport Industrial Area and Field 390 Sites.

Cox (1977) provided additional evidence of human burials in the coastal deposits near the Wailua Golf Course. The burials of this type identified within the Wailua Golf Course area are probably those referred to by Bennett (1931). With the exception of historic railroad items, he identified no other cultural remains (artifacts or deposits) during the fieldwork. According to the local informants cited in his report, burial remains previously identified north of the Wailua Golf Course clubhouse typically contained sparsely distributed single individuals. In contrast, burial remains previously identified south of the clubhouse (i.e., toward Hanamaulu) were often in-groups or multiple individuals (Cox 1977:27).

Paul H. Rosendahl, Inc. (PHRI) conducted two archaeological surveys in the Hanamaulu area in 1990. The first was an archaeological inventory survey of the approximately 66-acre area proposed for the Hanamaulu Affordable Housing project area between Hanamaulu Stream gulch, Kuhio Highway, and Kapule Highway (Walker and Rosendahl 1990). The second was an archaeological field inspection and limited subsurface testing of the Kalepa Radio Station and Kalepa Road Improvement project area located on Kalepa Ridge (Rosendahl 1990). No structural features or cultural deposits were encountered during these surveys. However, previously unidentified human burial remains were uncovered in a boulder mound during construction at the Radio Station site. The investigators who followed up on this discovery concluded that there were probably other burials in

OVERVIEW OF THE EXISTING ENVIRONMENT

undisturbed areas near the proposed Radio Station as well. Further investigation after the inadvertent discovery revealed one site on Kalepa Ridge that had originally functioned as a quarry or flake reduction area (Rosendahl 1990).

In 1991, PHRI conducted an archaeological survey of 1,550 acres in AMFAC/JMB's Lihue/Puhi/Hanamaulu Master Plan project area. (This area includes the Airport Industrial Area Site). The survey report identified ten significant historic sites within the area studied. The sites contained cultural deposits, walls, platform-like terraces, retaining walls, roads, a concrete wharf, an historic cemetery, bridges and a possible agricultural area. The Ahukini Landing wharf (which is from the historic period) is located several hundred yards east-northeast of the Airport Industrial Area Site. It is the feature closest to any of the sites under consideration for the proposed Lihue Energy Service Center.

3.8.1.2 Field Methods and Procedures for Survey of the Sites under Consideration

The survey fieldwork for the Lihue Energy Service Center project was conducted on May 28, 1998 (McMahon, May 1998). Because areas altered by sugar cane cultivation are unlikely to contain archaeological features, and because sugar cane cultivation within the present project area does not occur in low swale or alluvial flats that may contain buried cultural deposits, areas in sugar cane cultivation were not generally 100% surveyed. Areas that were surveyed included unaltered stream gulches and drainage within sugar cane fields, and the edges of all unaltered areas bordering sugar cane fields.

3.8.2 PUHI SITE

The proposed facilities are planned for an area that has been intensively cultivated in sugar cane for many decades. No evidence of significant archaeological or historical sites is present within the area that would be disturbed by the proposed development or on the adjacent slopes of Nawiliwili Stream. The Historic Preservation Division of the State Department of Land and Natural Resources (September 9, 1997) concluded:

The project area has been developed extensively for agricultural purposes. It is highly unlikely that historic sites are present in the disturbed area because of this previous development and existing location features (water tank and culvert). Thus, we believe that this project will have a "no effect" on significant historic sites.

3.8.3 FIELD 390 SITE

The Field 390 Site and the surrounding areas on three sides have been modified and are presently in sugar cane cultivation. Only Hanamaulu Stream Gulch on its southern side still contains undisturbed areas (McMahon, May 1998). The preferred routing of the electrical power transmission line that would serve the first increment of power plant development at this location follows an existing cane haul road. No historical or archaeological features are present along this alignment.

Additional electrical power transmission lines would be needed to serve the later generating units that would be developed on this site (see Chapter 2). Their exact routing has not been identified. Additional archaeological surveys will be needed if the routes that are finally proposed cross naturally vegetated land that has not been extensively disturbed by previous activities.

3.8.4 AIRPORT INDUSTRIAL AREA SITE

This entire parcel has been modified and is presently in sugar cane cultivation. No archaeological remains were identified on the site or on immediately adjacent land during the field surveys.

KE would construct a new electrical power transmission line to serve this site. The preferred routing of the transmission lines extends aboveground north from the Airport Industrial Area Site across Kapule Highway. From there, the pole line would cross Hanamaulu Gulch before returning to the *makai* side of the highway for the final leg to the Lydgate Substation. There are no known surficial remains along this alignment. KE is also considering an alternative underground transmission line. It would follow the existing field road from the power plant substation to the *makai* side of the Kapule Highway bridge across Hanamaulu Stream. The line would be hung from the bridge across the stream, and then would continue underground to the existing Lydgate Substation. The possibility that human remains could be present in the portion of the underground routing past the Wailua Golf Course is high.

3.9 SCENIC AND AESTHETIC RESOURCES

3.9.1 PUHI SITE

The Puhi Site is removed from existing residential areas, public roadways, and other important viewpoints. Because sugar cane has been cultivated on it for many years, no large trees or other distinguishing vegetation were present on the property when KE acquired it. However, KE has planted a line of trees around most of the perimeter of its 17-acre Puhi Site to provide a visual screen for its planned development.¹ In addition, some trees growing on the side of Nawiliwili Stream valley rise above the low side of the property, partially shielding it from that direction. The visual attributes of all three sites are discussed in the evaluation of potential visual impacts presented in Chapter 4 of this report.

3.9.2 FIELD 390 SITE

The Field 390 Site is similar to the Puhi Site with respect to its existing visual character. It has been cultivated in sugar cane for many years. Hanamaulu Gulch, which it adjoins, is heavily vegetated, and some of the trees growing there provide a visual screen from the south. The topography and existing vegetation make it impossible to see the ground at this site from most off-site locations.

3.9.3 AIRPORT INDUSTRIAL AREA SITE

The Airport Industrial Area Site is also cultivated in sugar cane and bordered by natural vegetation (along the edge of Hanamaulu Gulch). Consequently, it has the same general appearance as the two sites discussed previously. It differs from the Puhi Site in its greater proximity to (and visibility from) a public highway (Kapule Highway). Because of its proximity to Lihue Airport, this site is also more visible to occupants of aircraft using Lihue Airport. Finally, access to the site is along the "Gateway" corridor that is planned for the approach to Lihue Airport along Ahukini Road. Landscaping improvements and other amenities are being installed in this area to enhance the arrival experience on Kauai.

3.10 EXISTING LAND USE

The aerial photograph of the Lihue area reproduced in Appendix B illustrates the existing land use pattern. As noted previously, all of the locations being considered for the Lihue Energy Service Center are presently being cultivated in sugar cane. Most of the land that adjoins them is also in that

¹ The number and approximate height of plantings along the cane haul road to date include 34 medium-size ironwood trees (approximately 20 feet), 58 small ironwood (approximately 8 feet), 72 Eucalyptus (5-8 feet high), and 20 koa (approximately 5-8 feet high).

use. With the sole exception of the Airport Industrial Area Site, all of the adjacent land that is not used for agriculture is naturally vegetated open space. The Airport Industrial Area Site adjoins the existing Kauai County Transfer Station. Lihue Airport is located just beyond that.

3.11 LAND OWNERSHIP

As previously discussed, KE purchased the Puhī Site from AMFAC/JMB (Lihue Plantation) several years ago.² KE acquired the access, transmission line, utility, and other easements needed to construct and operate the proposed facilities when it purchased the property.

The Field 390 Site is an alternative location named in the original agreement between KE and AMFAC/JMB. Consequently, it could readily be substituted for the land that comprises the Puhī Site should that be necessary.

The Airport Industrial Area Site is also owned by AMFAC/JMB, but it was not named in the original agreement with KE. AMFAC/JMB has assured KE that it would substitute this property for the Puhī Site if that is necessary. However, no formal contract has been signed.

3.12 TRANSPORTATION FACILITIES

3.12.1 INTRODUCTION

The proposed Lihue Energy Service Center would generate vehicular traffic on area roadways. Because all of the fuel that would be burned in the proposed facilities must be imported from off-island, it would also affect the Kauai's ocean transportation facilities. This section provides a brief overview of the existing transportation facilities that would be affected. More detailed information concerning these facilities is integrated with the discussion of potential impacts on transportation facilities presented in Chapter 4.

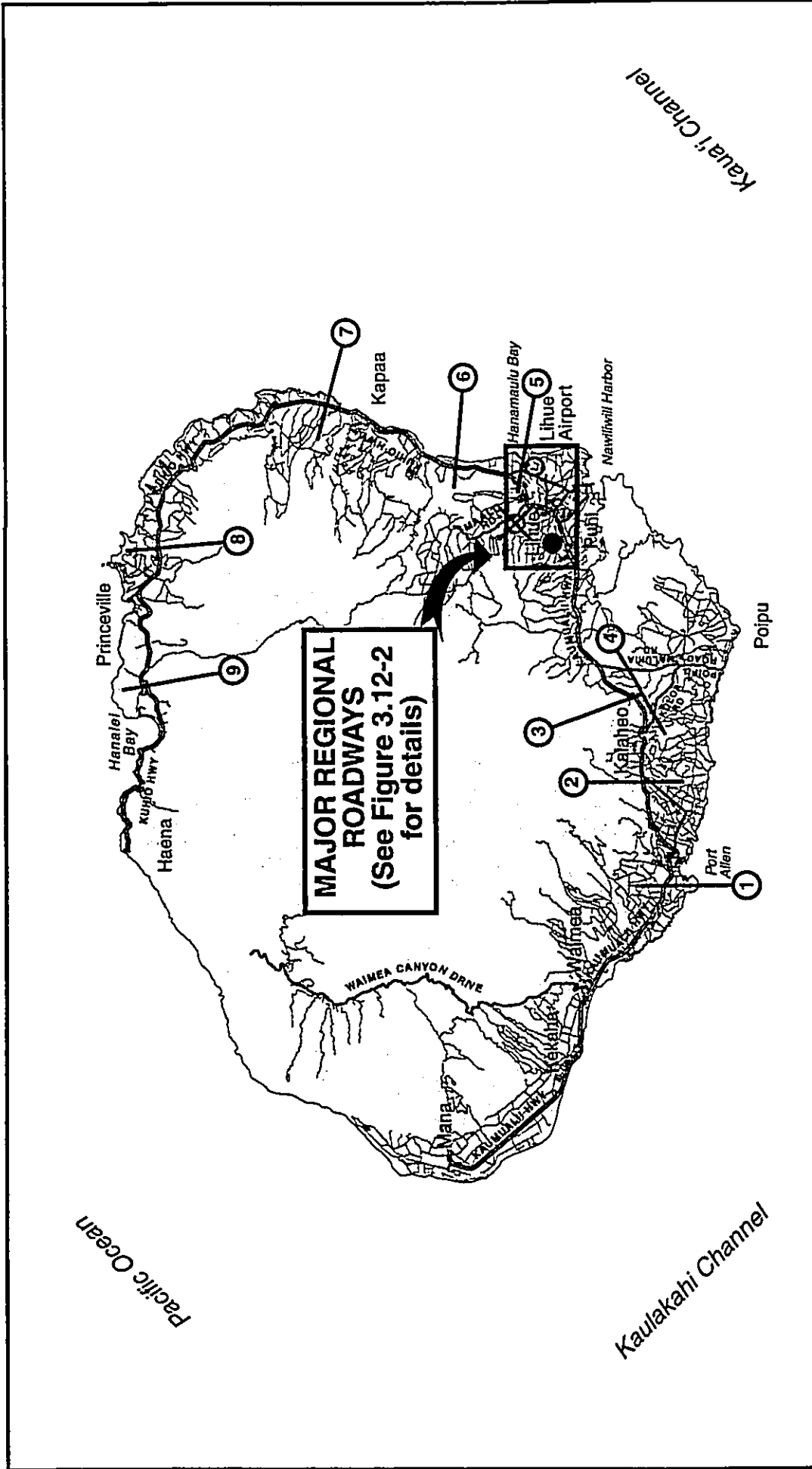
3.12.2 EXISTING ROADWAYS

Two major highways serve the Island of Kauai. Kaunualii Highway (Route 50) serves the southern and western parts of the island (see Figure 3.12-1). It begins in Lihue at the intersection of Rice Street and Kuhio Highway and ends at Mana on Kauai's western shore. Kuhio Highway (Route 56) connects with Kaunualii Highway at the Rice Street intersection and extends from there to Haena on Kauai's north shore. Because of the extremely rough topography, there is no road connection around Kauai's northwestern side between Mana and Haena.

The Lihue area includes the area between Puhī and Hanamaulu. The characteristics of the primary roadways in this area are as follows (see Figure 3.12-2 for locations of roadways discussed):

- Kuhio Highway (Route 56) is a four-lane State highway from its beginning at its intersection with Kaunualii Highway and Rice Street to a point just south of Wilcox Hospital (Eha Street). It then becomes a three-lane roadway through Kapaia, with auxiliary climbing lanes at Hanamaulu Gulch. Kuhio Highway continues northward as a two-lane highway from Hanamaulu Town to its intersection with Kapule Highway.

² The purchase agreement included clauses that allowed the parties to move to secondary locations within Amfac land if KE encountered difficulty obtaining approvals for the primary site. It also provided for cancellation of the agreement if KE failed in its efforts to obtain necessary permits.



PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 USGS 1:100,000 DLG, 1983.
 Kauai Electric.

LEGEND:

- Road
- Highway
- Airport Industrial Site
- ⊗ Field 390 Site
- Puhi Site
- ① Screenline Locations

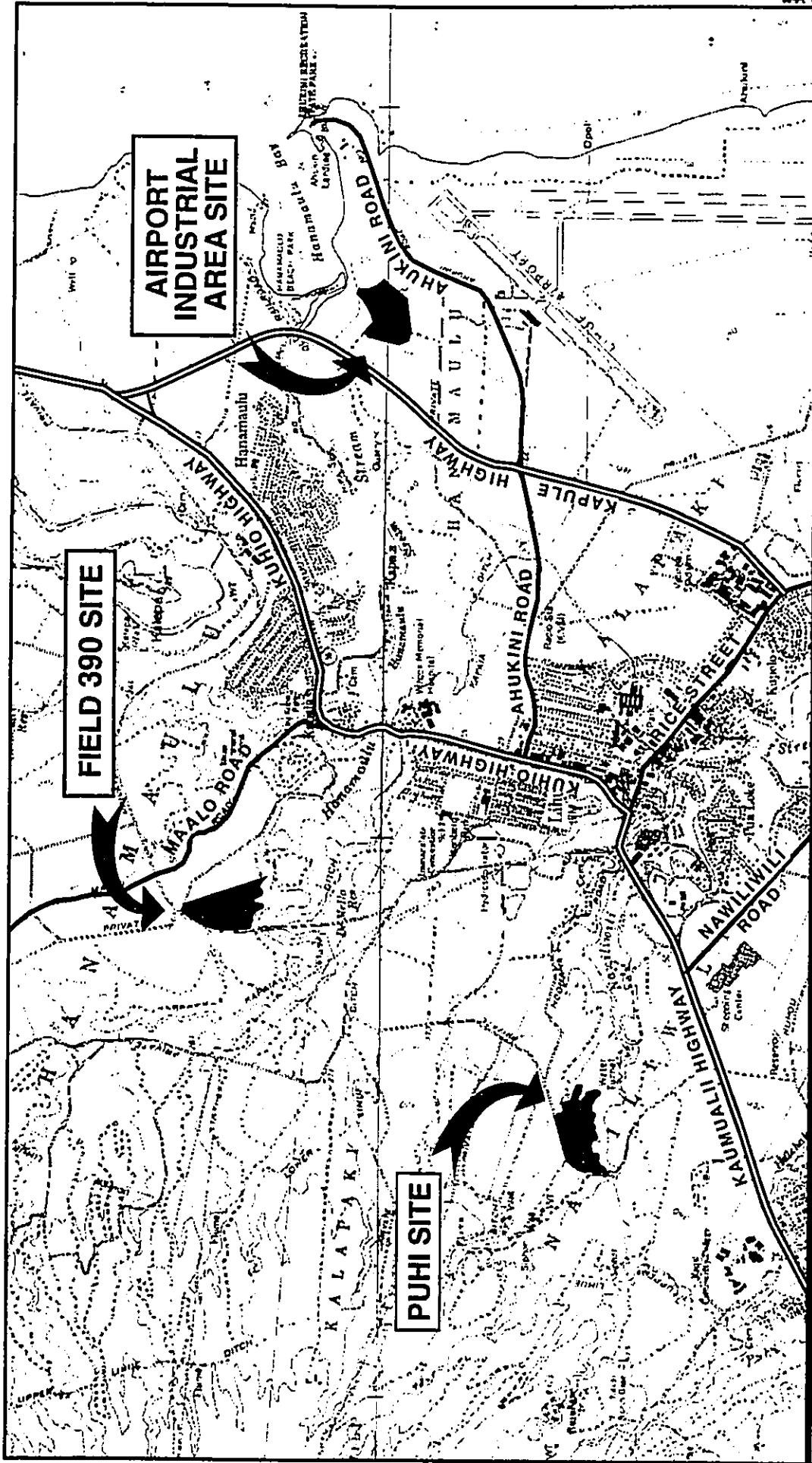
0 6 12 Miles

N

FIGURE 3.12-1:

Island Wide Highway Network

Kauai Electric
 Lihue Energy Service Center



PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 USGS 7.5' Lihue Quadrangle, 1983.
 USGS 7.5' Kapaa Quadrangle, 1983.

LEGEND:

Highway
 Road

Major Regional Roadways

Kauai Electric
 Lihue Energy Service Center

FIGURE 3.12-2:

0 2000 4000 Feet
 1" = 2,900'

N

- Kapule Highway (Route 51) is a relatively new two-lane State highway that extends northward from Rice Street to its intersection with Kuhio Highway north of Hanamaulu Bay, a distance of approximately 3 miles.
- Kaumualii Highway (Route 50) is a modern, two-lane State Highway that connects Lihue with Puhii and points further to the west.
- Nawiliwili Road (Route 58) is an improved State highway that connects Kaumualii Highway with Nawiliwili Harbor. It is a four-lane divided highway between Kaumualii Highway and Halehaka Road; it narrows to two lanes southeastward from that point to its connection with Rice Street near Waapa Road in Nawiliwili.
- Rice Street is a County collector road between the Kaumualii Highway/Kuhio Highway intersection and Kapule Highway. It is striped for three-lane operation, with parking permitted in some areas. Rice Street becomes a two-lane State roadway from its intersection with Kapule Highway to its intersection with Nawiliwili Road.
- Ahukini Road (Route 570) is a State-owned east-west collector road between Kapule Highway and Kuhio Highway. It is channelized where it passes through Lihue Airport property, returning to a two-lane configuration between the point it leaves Airport property and its terminus at Ahukini Landing.

3.12.3 EXISTING TRAFFIC VOLUMES AND LEVEL OF SERVICE

Table 3.12-1 shows existing (1995) traffic volumes and levels of service at selected locations. The data and Level-of-Service (LOS) estimates show that traffic generally flows well on the open highways during non-peak periods. During the peak commuting hours, however, the roadways can be congested. The locations that have LOS of D, E, and F³ are generally considered undesirable or unacceptable.

Several of the locations shown in Table 3.12-1 that have poor Levels-of-Service are in the Lihue area. The *Kauai Long-Range Transportation Plan* (Austin, Tsutsumi & Associates, May 1997) lists the following Lihue-area locations as having high or medium priorities for improvements:

- Rice Street, Kaumualii Highway/Kuhio Highway to Kapule Highway (High).
- Kuhio Highway at McDonald's Restaurant in Lihue (High).
- Kaumualii Highway, Omao to Lihue Corridor (High).
- Intersection of Ahukini Highway and Kapule Highway (High).
- Intersection of Kapule Highway and Kuhio Highway (High).
- Intersection of Kuhio Highway and Hanamaulu Road (Medium).

3.12.4 EXISTING SITE VEHICULAR ACCESS

Because all of the sites under consideration for the Lihue Energy Service Center are presently in agricultural use, none of them are directly accessible from existing public roadways. Instead, existing access is via main cane haul roads that are owned and maintained by Lihue Plantation Company. Access to these roadways is restricted and must be improved to accommodate the proposed facilities.

³ LOS D (unsignalized) - long traffic delays(>20 sec); LOS E (unsignalized) - Very Long Traffic Delays (>30 sec); LOS F (unsignalized) - Demand volume Exceeds Capacity (delay >45 sec).

OVERVIEW OF THE EXISTING ENVIRONMENT

Table 3.12 - 1. Existing Highway Traffic Conditions at Selected Locations.

LOCATION	DIR	DAILY				AM PEAK HOUR				PM PEAK HOUR			
		VOL	CAP	V/C	LOS	VOL	CAP	V/C	LOS	VOL	CAP	V/C	LOS
Hanapepe Screenline	EB	4250	12000	0.35	A	410	1200	0.34	A	395	1200	0.33	A
(1) Kaumualii Hwy	WB	5270	12000	0.44	B	445	1200	0.37	B	425	1200	0.35	A
Kalaheo Screenline	EB	9350	9000	1.04	F	936	900	1.04	F	691	900	0.77	C
(2) Kaumualii Hwy	WB	9320	9000	1.04	F	443	900	0.49	B	810	900	0.90	D
Lawai Screenline	EB	6544	9000	0.73	C	818	900	0.91	E	424	900	0.47	B
(3) Kaumualii Hwy	WB	6824	9000	0.76	C	301	900	0.33	A	740	900	0.82	D
Koloa-Poipu Screenline	SB	3030	9000	0.34	A	360	900	0.40	B	265	900	0.29	A
(4) Koloa Road	NB	2310	9000	0.26	A	135	900	0.15	A	185	900	0.21	A
Maluhia Rd.	SB	4250	12000	0.35	A	205	1200	0.17	A	415	1200	0.27	A
	NB	4050	12000	0.34	A	385	1200	0.32	A	415	1200	0.35	A
Hanamaulu Screenline	SB	8040	12000	0.67	C	1080	1200	0.90	D	435	1200	0.36	B
(5) Kapule Hwy	NB	9000	12000	0.75	C	375	1200	0.31	A	1030	1200	0.86	D
Kuhio Hwy.	SB	7550	9000	0.84	D	820	900	0.91	E	560	900	0.62	C
	NB	6230	9000	0.69	B	425	900	0.47	B	550	900	0.61	C
Wailua Screenline	SB	14010	12000	1.17	F	1485	1920	0.77	C	850	1200	0.71	C
(6) Kuhio Hwy (Note 1)	NB	13540	19200	0.71	C	500	1200	0.42	B	1435	1920	0.75	C
Kealia Screenline	SB	6020	12000	0.50	B	515	1200	0.43	B	470	1200	0.39	B
(7) Kuhio Hwy.	NB	5710	12000	0.48	B	330	1200	0.28	A	465	1200	0.39	B
Kilauea Screenline	EB	3960	12000	0.33	A	295	1200	0.25	A	290	1200	0.24	A
(8) Kuhio Hwy.	WB	3820	12000	0.32	A	250	1200	0.21	A	335	1200	0.28	A
Princeville Screenline	EB	3190	8000	0.40	B	180	800	0.23	A	315	800	0.39	B
(9) Kuhio Hwy.	WB	3020	8000	0.38	B	210	800	0.26	A	245	800	0.31	A

Note 1: Am Peak-Hour capacities reflect contra-flow conditions.

Note 2: Numbers in "Location" column refer to screenline locations shown in Figure 3.12-1

Source: Traffic data are from 1995 traffic counts by the State Department of Transportation. Compiled by Austin Tsutsumi & Associates, Inc. (May 1997).

3.12.5 HARBOR FACILITIES

Nawiliwili Harbor, which is located approximately three miles southeast of the Puhi Site is the busiest of the two harbors on Kauai that are capable of handling interisland and ocean-going cargo and passenger vessels. With a dredged basin depth of approximately 35 feet (U.S. Department of the Army, Corps of Engineers, November 1997), it is capable of accommodating most ocean-going vessels. Kauai's other commercial harbor is at Port Allen. Both ports are owned and operated by the Harbors Division of the State Department of Transportation.

All fuel deliveries for Kauai Electric are presently made through Port Allen. It is piped directly from the harbor to Chevron U.S.A.'s fuel storage tanks immediately *makai* of the company's Port Allen Generating Station. Nawiliwili Harbor has its own fuel unloading and storage facilities. The on-pier facilities are owned by the State of Hawaii, but fuel storage is handled by private firms. As indicated

in Table 3.12-2, in recent years Nawiliwili Harbor has handled about twice the number of vessels as Port Allen.

Table 3.12 - 2. Vessel Arrivals on Kauai by Draft of Vessel: 1995 and 1996.

Harbor	1995			1996		
	Total	18 feet and Less	19 feet and More	Total	18 feet and Less	19 feet and More
Nawiliwili Harbor	620	593	27	664	630	34
Port Allen	299	299 ¹	--	379	379 ²	--

¹29 feet and less for this year.
²23 feet or less for this year.

Source: *State of Hawaii Data Book, 1997, Table 18.55.*

3.12.6 AIRPORTS

Lihue Airport is located along the shoreline north of Nawiliwili Bay. It is owned and operated by the Airports Division of the State Department of Transportation. It consists of two runways: Runway 3-21 (6,500 feet long) and Runway 17-35 (also 6,500 feet long). The Airports Division plans to extend Runway 17-35 in the near future, first to a length of 8,500 feet and ultimately to 10,000 feet. The Airport Industrial Area Site is approximately 1,500 feet west of the centerlines of the two runways.

In 1997, the Airports Division reported 173,342 aircraft arrivals and departures at the airport, making it the second busiest airport in the State system. A large portion of those operations consisted of helicopters that use the airport as a base of operations for scenic tours around the Island. Passenger, cargo, and mail volumes for 1997 are summarized in Table 3.12-3.

Table 3.12 - 3. Passengers, Cargo, & Mail, Overseas & Interisland, By Kauai Airport: 1997.

Airport	Passengers ^(Note 1)		Cargo (tons)		Mail (tons)	
	Enplaned	Deplaned	Enplaned	Deplaned	Enplaned	Deplaned
OVERSEAS						
Lihue Airport	5,910	5,773	--	--	2	1
INTERISLAND						
Lihue	1,284,323	1,284,337	3,843	9,341	934	1,855
Princeville	90	118	-	-	-	-

Note 1: Princeville Airport was privately owned and operated during this period.

Source: Hawaii State Department of Transportation, Airports Division Records as reported in the *State of Hawaii Data Book: 1997, Table 18.40.*

CHAPTER 4

PROBABLE IMPACTS OF THE PROPOSED ACTION

4.1 INTRODUCTION

This Chapter describes the probable adverse and beneficial effects of constructing and operating the Lihue Energy Service Center at each of the three locations under consideration. The other alternatives that KE considered, including the "No Action" alternative, are discussed in Chapters 1 and 5 of this report. The discussion is organized by type of potential impact (e.g., air quality, water quality, visual, etc.). Differences between the alternatives are described within each topic.

The discussion within each topical area begins with a description of the components of the project that have the potential to impact the particular aspect of the environment being discussed. In the case of air quality impacts, for example, this involves characterizing the emissions that the facilities are expected to generate. Because they typically involve substantially different types of activities, the analysis distinguishes between activities that are needed to construct the facilities and those associated with its operation.

Good design integrates features intended to avoid or mitigate potential environmental effects into the overall design of the project. Because of this, the discussion of "mitigation measures" is integrated into the overall discussion rather than limited to a separate section of the report. Major design features that contribute to environmental quality are summarized in the Executive Summary.

4.2 PHYSIOGRAPHIC IMPACTS

4.2.1 PROJECT COMPONENTS ABLE TO IMPACT PHYSIOGRAPHY

All of the sites under consideration have moderate slopes. Moreover, the proposed facilities are modular in nature. Consequently, while it will be necessary to create level platforms for major structures and equipment, no major changes to existing landforms will be required. (The most noticeable will be the containment berm around the fuel storage facilities, but it will not be prominent.) Electrical power transmission towers that would be installed in conjunction with generating facilities will be placed at grade and will not require significant grading or other physiographic change.

As discussed in previous chapters, the facilities will be developed on a phased basis over several decades. Because of this, it is likely that finished grading will be carried out incrementally. Preliminary estimates indicate that it will be possible to balance cut and fill within each site. Consequently, it will probably not be necessary to borrow fill material from other areas or to dispose of excess material off-site.¹

4.2.2 PHYSIOGRAPHIC IMPACTS — PUHI SITE

Adequate sites for most of the facilities can be provided with excavation and/or fill of 2-4 feet, or less. The area of greatest topographic relief is the shallow ravine that drains the far western portion the site (see Figure 1-3, Existing Features of the Puhi Site). The foundations for the fuel storage facilities planned for that part of the property will be excavated to a depth of 2 to 12 feet below grade.

¹ Select materials, such as gravel and sand, needed for construction are exceptions to this general rule. These would be used in relatively small quantities, however, and the exact source is normally not determined until shortly before it is used.

PROBABLE IMPACTS OF THE PROPOSED ACTION

The material from the excavation will be used to construct a protective berm around the fuel storage tanks. The grade changes will maintain the existing drainage pattern. They will not alter the overall appearance of the site.

4.2.3 PHYSIOGRAPHIC IMPACTS — FIELD 390 SITE

No detailed topographic maps have been prepared for this site. However, topographic information from the County's 1"=500' map of the area and field inspection shows that slopes on this site are similar to those on the Puhi Site. Consequently, the proposed facilities can be constructed without significant fill or borrow at ground elevations very close to the existing grade. As with the Puhi Site, fuel storage will be in a partially excavated area and surrounded with an earthen berm. The grade changes will maintain the existing drainage pattern.

4.2.4 PHYSIOGRAPHIC IMPACTS — AIRPORT INDUSTRIAL AREA SITE

No detailed topographic maps have been prepared for this site. However, information from the County's 1"=500' map of the area and field inspection shows that this site is slightly more level than the other two under consideration. The difference is too small to have a substantial effect on the amount of earthmoving required, however. The grade changes will maintain the existing drainage pattern. They will not alter the overall appearance of the site.

4.3 GEOLOGY AND SOILS IMPACTS**4.3.1 PROJECT COMPONENTS RELATED TO GEOLOGY AND SOILS**

The facilities that comprise the proposed project will impose both static and dynamic loads on their foundations. The soils and underlying geologic strata on which they are constructed must accommodate these loads and be free of conditions (e.g., high shrink-swell potential) that cannot be readily accommodated through standard design practices. The soils must be sufficiently resistant to erosion that development will not create undue erosion or sedimentation hazard. Finally, to insure adequate safety, foundations and structural elements must be designed to tolerate anticipated seismic loads as well.

4.3.2 GEOLOGIC IMPACTS — ALL SITES

The Koloa Series lavas that underlie the sites are stable and have moderate bearing strength. The youngest are hundreds of thousands of years old, and renewed volcanism is not a threat at any of the generating sites under consideration or along any of the electrical power transmission line routes that would serve the generating facilities. Kaua'i is the least seismically active island in the State. All structures will be designed to meet Seismic Zone 1 standards or better.

4.3.3 SOILS IMPACTS — PUHI SITE**4.3.3.1 Suitability for Intended Urban Use**

The soils on this site belong to the Puhi Silty Clay Loam series. They are well-drained and have developed in place from the underlying lavas. Soils in this series have a high shear strength and low shrink-swell potential. They are well-suited for the kind of industrial structures that are planned. Permeability is moderate to rapid, runoff is slow, and there is no erosion hazard.

4.3.3.2 Effect on Agricultural Production

The soil has good agricultural potential. The Soil Conservation Service has given it an overall capability rating of IIs.² The University of Hawaii Land Study has given the soils an overall productivity rating of "B". While the site will be developed incrementally, the dispersed nature of the facilities needed to support the first generating unit and Transmission and Distribution (T&D) baseyard make it likely that Lihue Plantation (LPCO) will cease cultivation on the entire site when KE begins construction on the infrastructure needed for the first generating unit.

LPCO's field map of this area indicates that approximately 13 acres are currently under cultivation.³ This is a very small part (less than 1/10th percent) of the total sugar cane acreage the company cultivates. Moreover, the field is isolated from adjacent fields by one of LPCO's main cane haul roads and by naturally vegetated gullies. No multi-field irrigation facilities pass through the site. Consequently, its withdrawal from cultivation will not make it more difficult or expensive to cultivate or harvest adjacent areas.

LPCO records indicate that, over the last three harvests the average yield from Field 020 (of which the Puhi Site is a part) has been 8.4 tons of sugar and 78 tons of cane per acre (Rogers, May 12, 1998). The sugar yield is about 9 percent higher than the 7.7 tons per acre average for all of LPCO's fields over a similar period. Removal of the acreage will not significantly decrease the average productivity of the company's fields. Neither will it reduce the amount of cane available to the mill to the point where mill operations would become uneconomic.

4.3.4 SOILS IMPACTS — FIELD 390 SITE**4.3.4.1 Suitability for Intended Urban Use**

As indicated in Chapter 3, the soils on this site belong to the Puhi series. They are well-drained and have developed in place from the underlying lavas. Soils in this series have a high shear strength and low shrink-swell potential. They are well-suited for the kind of industrial structures that are planned. Permeability is moderately rapid, runoff is slow, and the erosion hazard is slight. There are only slight limitations on the use of septic tank filter fields.

4.3.4.2 Effect on Agricultural Production

The soil has good agricultural potential. The Soil Conservation Service has given it an overall capability rating of IIs.⁴ For reasons outlined above in the discussion of the Puhi Site, it is likely that LPCO will cease cultivation of the entire area when the first generating unit and T&D baseyard are developed.

LPCO's field map of this area indicates that approximately 19 acres are currently under cultivation.⁵ This is slightly more than the Puhi Site, but still a very small percentage of the total acreage LPCO has under cultivation. Moreover, the field is separated from adjacent fields by one of LPCO's main cane haul roads, a major *mauka-makai* service road, and by naturally vegetated gullies. No multi-

² Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices. The "s" indicates that the limitation is due to slight stoniness.

³ This is the sum of 3.78 ac., 3.37 ac., 3.28 ac., 0.86 ac., 0.85 ac., and 0.76 ac. As shown on LPCO's map of Field 020 L2A as measured in 1945.

⁴ The "s" indicates that limitations on agricultural potential are due to slight stoniness.

⁵ This is the sum of 10.70 acres and 8.52 acres as shown on LPCO's map of Field 390 (also designated L6) as measured on March 13, 1995.

field irrigation facilities pass through the site. Consequently, its withdrawal from cultivation will not make it more difficult or expensive to cultivate or harvest adjacent areas.

No separate records are kept for the sub-area that comprises this site. However, LPCO records for the entire field (approximately 85 acres) indicate that, over the last three harvests the average yield from Field 390 has been 8.5 tons of sugar and 80 tons of cane per acre (Rogers, May 12, 1998). The sugar yield is slightly higher (about 10 percent) than the 7.7 tons per acre average for all of LPCO's fields over a similar period. Removal of the Field 390 Site from sugar cultivation will not significantly decrease the average productivity of the company's fields. Neither will it reduce the amount of cane available to the mill to the point where mill operations would become uneconomic.

4.3.5 SOILS IMPACTS — AIRPORT INDUSTRIAL AREA SITE

4.3.5.1 Suitability for Intended Urban Use

As indicated in Chapter 3, the soils on this site belong to the Lihue series. They are well-drained and have developed in place from the underlying lavas. Soils in this series have a high shear strength, high compacted density, and low shrink-swell potential. They are well-suited for the kind of industrial structures that are planned. Permeability is moderate to rapid, runoff is slow, and the erosion hazard is slight.

4.3.5.2 Effect on Agricultural Production

The soil has good agricultural potential. The Soil Conservation Service has given it an overall capability rating of Iie⁶. For reasons outlined above in the discussion of the Puhi Site, it is likely that LPCO will cease cultivation of the entire area when the first generating unit and T&D baseyard are developed. LPCO's field map of this area indicates that approximately 18 acres are currently under cultivation.⁷ This is the same small percentage (less than 1/10th percent) of the total acreage LPCO is cultivating as does the Puhi Site.

Unlike the other two sites, which are drip-irrigated, this area is presently furrow-irrigated using wastewater from the LPCO cane processing operations. Small irrigation ditches and portable concrete channels are present on the property. Those needed to irrigate other fields will be re-routed around the site if the proposed project is constructed at this location. The application which led to the recent rezoning of the entire area between Kapule Highway and the Lihue Airport confirmed that LPCO has alternate uses for the water that is currently used to irrigate this area. Consequently, the area's use by KE will not adversely affect continuing cultivation of other areas.

No separate records are kept for the sub-area that comprises this site. However, LPCO records for the entire field (approximately 120 acres) indicate that, over the last three harvests the average yield from the field has been 11 tons of sugar and 100 tons of cane per acre (Rogers, May 12, 1998). The

⁶ The "e" indicates a moderate erosion potential if the soil cultivated and not protected.

⁷ This is the sum of the total area for three entire sub-areas of Field 210 (4.39, 1.80, 2.32 acres) and portions of several sub-areas (the entire areas of which are 3.10, 2.87, and 1.45 ac.) as shown on LPCO's map of Field 210 as measured on September 23, 1996.

sugar yield is well above the 7.7 tons per acre average for all of LPCO's fields over a similar period. Removal of the acreage comprising the Airport Industrial Area Site from cultivation will not significantly decrease the average productivity of the company's fields. Neither will it reduce the amount of cane available to the mill to the point where mill operations would become uneconomic.

4.4 AIR QUALITY AND CLIMATE IMPACTS

4.4.1 INTRODUCTION

The proposed Lihue Energy Service Center has the potential to affect ambient air quality in several ways. The most important is through air emissions resulting from the combustion of fossil fuels in the various generating units that are planned. Vehicles travelling to and from the proposed facilities also have the potential to generate emissions, as do the storage tanks and some of the support facilities and activities planned for the Lihue Energy Service Center. This section is divided into the following major subsections:

- 4.4.2 Summary of Findings;
- 4.4.3 Applicable Regulations;
- 4.4.4 Project-Related Emissions of Concern;
- 4.4.5 Significance Criteria;
- 4.4.6 Air Quality Impacts — General;
- 4.4.7 Air Quality Impacts — Puhi Site;
- 4.4.8 Air Quality Impacts — Field 390 Site;
- 4.4.9 Air Quality Impacts — Airport Industrial Area Site;
- 4.4.10 Air Quality Impacts — No Action Alternative; and
- 4.4.11 Climate Impacts.

4.4.2 SUMMARY OF FINDINGS

The State of Hawaii is in compliance with all state and federal ambient air quality standards. Therefore, new stationary sources constructed in the state are subject to a very stringent level of review for air quality impacts.

The Lihue Energy Service Center will be built over many years. Because it is likely that more than 18 months will elapse between the construction of successive units, each new generating unit will require a separate air permit from the State of Hawaii Department of Health (SDOH). Consequently, each generating unit that is proposed for the Lihue Energy Service Center will be required to undergo review for compliance with state and federal air quality regulations and to be constructed using the most effective feasible emission control technology available at the time the permit is issued. Historically, emission control technology has improved significantly over time. Because this air quality impact assessment assumes that only the currently available control technology will be employed, the facility is likely to have less effect on air quality than indicated here.

Even with the conservative assumptions that have been used, the analysis concludes that the proposed Lihue Energy Service Center will not cause violations of any ambient air quality standards or Prevention of Significant Deterioration (PSD) increments. Because of the relatively large scale of the proposed project, however, the air quality impacts of the project are expected to be "significant".

4.4.3 APPLICABLE REGULATIONS

The U.S. Environmental Protection Agency (EPA) has responsibility for enforcing, on a national basis, the requirements of many of the country's environmental and hazardous waste laws. Hawaii is under the jurisdiction of EPA Region IX, which has its offices in San Francisco. Region IX is responsible for the local administration of EPA programs for California, Arizona, Nevada, Hawaii, and certain Pacific Trust Territories. While EPA has delegated the implementation of some federal air pollution programs to the State of Hawaii, it retains general oversight and enforcement authority.

4.4.3.1 Federal Prevention of Significant Deterioration Program

EPA has promulgated Prevention of Significant Deterioration (PSD) regulations for areas that have achieved the National Ambient Air Quality Standards (NAAQS).⁸ Kauai is such a region and is therefore subject to the PSD regulations. These regulations allow new sources to be constructed or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., national parks and wilderness areas).

The PSD requirements apply on a pollutant-specific basis to any project that is a new major stationary source or a major modification to an existing stationary source. (These terms are defined in federal regulations at 40 CFR 52.21.) This determination is based on evaluating the emissions changes associated with the proposed project in addition to all other emissions changes at the same location over the last five years.

The five principal requirements of the PSD program are as follows:

- Emissions must be controlled using Best Available Control Technology (BACT);
- Air quality impacts in combination with other increment-consuming sources must not exceed maximum allowable incremental increases for NO₂, SO₂ and PM₁₀;
- Air quality resulting from all emission sources in the area plus natural ambient pollutant background levels cannot exceed the NAAQS;
- Pre- and/or post-construction air quality monitoring may be required; and
- The air quality impacts on soils, vegetation, and nearby PSD Class I areas (national parks and wilderness areas) must be evaluated.

The SDOH has been delegated the authority to implement its own PSD regulations; however, EPA retains oversight and approval authority over BACT determinations and ambient air quality modeling analyses.⁹

4.4.3.2 Federal New Source Performance Standards

The Standards of Performance for New Stationary Sources are source-specific federal regulations, limiting the allowable emissions of criteria pollutants (i.e., those that have a NAAQS) and their precursors (40 CFR 60). These regulations apply to certain sources depending on the equipment size, process rate, and/or the date of construction, modification, or reconstruction of the affected facility. Record-keeping, reporting, and monitoring requirements are usually necessary for the regulated pollutant from each subject source; the reports must be regularly submitted to the reviewing agency. This program has been delegated by EPA to the State of Hawaii (40 CFR 60.4).

⁸ Areas where the standards are met are called "attainment areas." ⁹ 40 CFR Part 52, effective January 5, 1989.

The emission standards imposed by the New Source Performance Standards (NSPS) that are applicable to one or more of the facilities that would be developed at the Lihue Energy Service Center project are as follows.

Subpart GG — Stationary Gas Turbines:

- Nitrogen oxides: 75 parts per million, dry, in the exhaust at 15% O₂
- Sulfur dioxide: 0.015% by volume SO₂ in the exhaust or 0.8 % by weight sulfur in fuel

Subpart Da — Electric Utility Steam Generating Units:

- Nitrogen oxides: 75 parts per million, dry, in the exhaust at 15% O₂
- Particulate matter: 0.03 pounds per million Btu of heat input
- Sulfur dioxide: 0.80 pounds per million Btu of heat input
- Nitrogen oxides: 0.30 pounds per million Btu of heat input when burning liquid fuel and 0.60 pounds per million Btu of heat input when burning bituminous coal

Subpart Kb — Organic Liquid Storage Vessels¹⁰:

- Evaporative emissions of volatile organic compounds must be controlled using one of the following: (1) a fixed-roof with an internal floating roof; (2) an external floating-roof with a secondary seal; or (3) a closed-vent system and control device to capture organic vapors.

4.4.3.3 National Emissions Standards for Hazardous Air Pollutants

The National Emissions Standards for Hazardous Air Pollutants (NESHAPS) are either source-specific or pollutant-specific regulations, limiting the allowable emissions of hazardous air pollutants from the affected sources (40 CFR 61). Unlike criteria air pollutants, hazardous air pollutants are those that do not have a NAAQS but that have been identified by EPA as causing or contributing to the adverse health effects. The EPA has delegated administration of the hazardous air pollutants program to the SDOH. There are no NESHAPS that apply to the Lihue Energy Service Center project.

4.4.3.4 Federal Clean Air Act Amendments of 1990

In November 1990, substantial revisions and updates to the Federal Clean Air Act were signed into law. This complex enactment includes a number of items that could be relevant to the proposed project Lihue Energy Service Center. These include such things as more extensive permitting requirements, new EPA mandates and deadlines for developing rules to control air toxic emissions, and acid deposition control requirements. The new provisions applicable to the proposed Lihue Energy Service Center project are summarized below.

- **Title V - Permits.** This title establishes a comprehensive operating permit program for major stationary sources (42 USC §7661 et seq.). Under the Title V program, a single permit that includes a listing of all the stationary sources, applicable regulations, and requirements is required. The State of Hawaii has received conditional approval for its Title V permitting program, which is integrated with its new source permitting program.
- **Title III - Hazardous Air Pollutants.** This title establishes a program for regulating hazardous air pollutants from area source and industrial categories rather than concentrating on individual pollutants. EPA established a list of major source categories, such as chemical plants, oil refineries, and steel plants for the purpose of setting standards. Some 250 source categories will

¹⁰ Storage tanks at the Lihue Energy Service Center will be subject to this NSPS if they store organic liquids with vapor pressure in excess of 0.5 pounds per square inch (pounds per square inch); e.g., naphtha.

be regulated. The regulations will apply technology-based standards rather than risk-based standards.

4.4.3.5 State of Hawaii Permitting Requirements

As required by the Federal Clean Air Act, the State of Hawaii has developed regulations limiting emissions from specific sources. These regulations are collectively known as "prohibitory rules," because they prohibit the construction or operation of a source of pollution that would violate specific emissions limits. The general prohibitory rules that may be applicable to Lihue Energy Services Center are summarized below. The proposed project will be subject to State of Hawaii Administrative Rules (HAR), Title 11, Chapter 60, Section 1 (§11-60.1), Air Pollution Control, Subchapters 1, 2, 5, 6, 7, 8, and 9. Each of these rules requires, in various forms, descriptions and analyses of the proposed project, its emissions, and its impact on air quality. The analyses presented below indicate that the proposed Lihue Energy Service Center project will comply with all applicable state and federal air quality requirements.

Under the state permitting regulations, the proposed project will be a major source; as such, it is considered a "covered source" for the purposes of HAR §11-60.1.¹¹ In addition, each phase of development of the Lihue Energy Service Center will be permitted as a major source, so the regulatory review requirements will apply to each phase of the proposed project. Following is a summary of the HAR §11-60 air quality permitting standards or requirements that will be applicable to one or more facilities or activities planned for the Lihue Energy Service Center project.

- §32 Visible emissions. Emissions of visible air pollutants (not including uncombined water vapor) from sources modified or constructed after March 20, 1972, may not exceed 20% opacity, except when "building a new fire" or during "breakdown of equipment" when emissions may be 60% opacity for not more than 6 minutes in any 60-minute period.
- §33 Fugitive dust. "Reasonable precautions" must be taken to prevent particulate matter emissions during construction or material handling, and "best practical operation or treatment" must be implemented to prevent visible emissions of fugitive dust beyond the property line. Several examples of "reasonable precautions" are cited in this section, including use of water or chemical dust suppressants, paving of roads, and installing hoods and fabric filters.
- §34 Motor vehicles. Visible emissions and engine idling time for mobile sources used in the construction, maintenance, and operation of the facility must comply with the requirements of this section.
- §37 Process industries. This section limits particulate emissions based on a process-weight-throughput rate. Liquid fuels and combustion air are not included in the "process weight." Steam production is considered a "process", since the feed water undergoes a physical change when it is vaporized into steam. Hence, these limits will apply to emissions from all but the diesel generating units.
- §38 Sulfur oxides from fuel combustion. This section limits fuel sulfur content to 2% by weight, and limits fossil-fuel-fired power and steam generating plants greater than 25 megawatts or 250

¹¹ This section defines "covered source" to include any "major source," or any source subject to NSPS, NESHAPS, or PSD. A "major source" includes all sources with a "potential to emit" in excess of 100 tons per year of any air pollutant. The proposed project is considered to be a "covered source" because it is a "major source," and is subject to NSPS and PSD.

MMBtu/hr to 0.5% sulfur by weight in the fuel. This requirement is applicable to the facilities proposed for the Lihue Energy Service Center project.¹²

- **§39 Storage of volatile organic compounds.** This section requires all "volatile organic compounds" stored in vessels larger than 250 gallons capacity to have a permanent submerged fill pipe, or be stored in a pressure vessel or vented to a control device. Distillate oil is a "volatile organic compound" as defined in HAR §11-60.1-1, and therefore the fuel storage tanks for this project must have at least a submerged fill pipe. Further controls are required for storage of volatile organic compounds with true vapor pressures exceeding 1.5 psia (pounds/square inch absolute) and capacities exceeding 40,000 gallons. Distillate oil has a true vapor pressure much lower than 1.5 psia and therefore is not subject to these additional controls. Naphtha has a true vapor above 1.5 psia, and the naphtha storage tanks will be designed to comply with this requirement.
- **§40 Volatile organic compound water separation.** This section requires that any volatile organic compound water separator handling more than 200 gallons per day of any volatile organic compound (defined as a compound having a Reid vapor pressure of 0.5 psia or greater) must be equipped with a vapor loss control device. The oily water separator that will be used to handle stormwater and other oil-containing water will not contain more than 200 gallons per day of volatile organic compounds, so the requirements of this section do not apply to the Lihue Energy Service Center project. [Note: An oily water separator will be used to separate petroleum products from storm or wash water before disposal. The petroleum products entering the oily water separator will be small quantities of fuel and lubricating oil, both organic materials with extremely low vapor pressures. Because of the small quantity and the low volatility of organic materials in the wastewater, VOC emissions from this source will be insignificant.]
- **§41 Pump and compressor requirements.** This section limits emissions from pumps and compressors handling volatile organic compounds with true vapor pressures exceeding 1.5 psia. Distillate oil has a true vapor pressure much less than 1.5 psia and therefore the pumps in distillate oil service are not subject to this section. Pumps that handle naphtha will be equipped with mechanical shaft seals that comply with this section.
- HAR §11-60.1, Title I Part C, and EPA regulations require that the proposed facilities incorporate the "Best Available Control Technologies" (BACT) to limit emissions of pollutants subject to any NAAQS or state ambient air quality standard. This demonstration must be made on a unit-by-unit basis at the time the air permit for the unit is being sought (typically 2-3 years before the desired in-service date for the unit).

4.4.3.6 Other Health- and Safety-Related Requirements

If selective catalytic reduction technology is selected as BACT for some or all of the generating units, KE will install ammonia storage capacity and associated safety equipment at the Lihue Energy Service Center site. Depending upon the volume of ammonia required, KE either will install a pressurized storage tank that will be filled periodically from tank truck deliveries or will receive the ammonia in portable tanks that will be emptied and returned to the vendor.

Although ammonia is widely used for agricultural and refrigeration purposes, it is considered a hazardous material and must be transported, stored, handled, and used in accordance with the following state and federal regulations:

¹² Plans for the project call for the liquid fuel sulfur content never to exceed 0.4% by weight; typical values are expected to be 0.25% or less. Fuel specifications call for the sulfur content of the coal not to exceed 0.5% by weight.

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- Federal Occupational Safety and Health Administration: *Occupational Safety and Health Act of 1970* (OSHA), 29 USC § 651 et seq.; 29 CFR Parts 1910, 1926, and 1952;
- Environmental Protection Agency, Region IX: *Emergency Planning and Community Right-to-Know Act of 1986* (SARA Title III), 42 USC § 11001 et seq.; 40 CFR Parts 350, 355, and 370;
- National Response Center, Environmental Protection Agency, Region IX: *Comprehensive Environmental Response, Compensation and Liability Act* (CERCLA), 42 USC § 9601 et seq.; 40 CFR Part 302;
- Department of Transportation: 49 CFR Chap. III, Subchapters B and C, *national safety standards for the transport of goods, materials, and substances over public highways, including hazardous materials transportation regulations*; and
- National Fire Protection Association Standards.

Ammonia may be used in either anhydrous (pure) or aqueous (25-28% solution of ammonia in water) form. Anhydrous ammonia would be stored in pressurized tanks, and transfers would take place using dry-break systems to prevent leaks or spills. The storage tank or tanks would be equipped with temperature and pressure sensors to ensure that no leaks or temperature buildups occur that could result in ammonia releases. A sprinkler system that would cool the ammonia tank automatically if the temperature exceeded a pre-set level might also be used. Aqueous ammonia is less hazardous to transport and store because it is dilute; however, larger quantities are required to yield the same quantity of pure ammonia. A final decision regarding whether, and in what form, ammonia will be used will be made in consultation with the permitting agencies (SDOH and EPA) at the time each phase of the project is permitted.

4.4.4 PROJECT-RELATED EMISSIONS OF CONCERN

The two generating alternatives described in Section 2.1 include all of the generating technologies considered likely to be situated at the Lihue Energy Service Center. For this analysis, criteria air pollutant impacts from these generating technologies were evaluated using the best available information concerning their probable design and "worst-case" assumptions concerning meteorological and other factors. As discussed in Section 4.4.2, emission control technology has historically improved significantly over time and the regulations require that each generating unit incorporate the most effective feasible emission control technology available at the time the permit is issued. Consequently, the project's actual effect on air quality is likely to be lower than those discussed here.

4.4.4.1 Criteria Pollutant Emissions: Generating Units in Generating Alternative 1

The first generating alternative includes two 26.4 MW Advanced Steam-Injected Cycle Combustion Turbines, a 58 MW Dual-Train Combustion Turbine (DTCC), and four 10 MW diesel engine generators. The minimum degree of nitrogen oxides (NOx) emission control for the combustion turbines would be the use of water or steam injection to achieve a controlled NOx emission level of 42 parts per million dry volume (ppmvd) at 15% oxygen (O₂).

A lower-emitting alternative would be the use of water or steam injection to achieve a controlled NOx emission level of 75 ppmvd at 15% O₂, followed by selective catalytic reduction technology to further reduce NOx emissions to 15 ppmvd at 15% O₂. Selective catalytic reduction (SCR) technology uses ammonia in the presence of a catalyst to reduce NOx in the exhaust stream to elemental nitrogen and oxygen. To maximize the conversion of NOx, an excess amount of ammonia is injected into the exhaust stream with the result that some small quantity of ammonia is available to react with the sulfur dioxide (SO₂) in the exhaust to form ammonium bisulfate, a particulate. Thus, particulate emissions from an SCR-equipped combustion turbine can be expected to be slightly higher than those

from a combustion turbine without SCR. There will also be small quantities of ammonia in the stack gas but these quantities will result in ambient concentrations that are far below detectable levels.

While the use of SCR technology to achieve a 15 ppm (parts per million) NO_x emission level will result in slightly higher particulate emissions and a small amount of ammonia slip, the quantity of water or steam needed to reduce turbine NO_x to 42 ppm without SCR can be expected to result in much higher emissions of carbon monoxide (CO) and unburned hydrocarbons, especially at low turbine loads. Therefore, while the use of SCR to achieve lower controlled NO_x levels can be expected to result in slightly higher particulate emissions from the turbines, it is also expected to result in lower CO and unburned hydrocarbon emissions. The decision regarding the technical feasibility and cost-effectiveness of SCR technology will be made at the time the air permits are sought. Table 4.4-1 shows emissions for the turbines with and without SCR.

The combustion turbines are expected to be fueled with diesel fuel that has a sulfur content well below the current maximum permitted level of 0.4% by weight. The diesel fuel currently used by KE at the Port Allen facility has a sulfur content of between 0.15% and 0.25%. As discussed in Section 2.2.1.1, the turbines can also be fueled with naphtha, which has a sulfur content of less than 0.1%, or about one-fourth that of the maximum permitted level for diesel fuel. To the extent that naphtha is available and cost-competitive with diesel fuel, the use of naphtha in the turbines will produce much lower SO₂ emissions. Because the future availability and price of naphtha are not known at this time, the SO₂ emissions shown in Table 4.4-1 are based on the expected sulfur content of the fuel, 0.25%.

The first generating alternative also includes four 10 MW diesel engine generators. The minimum degree of NO_x control for these units will be variable fuel injection timing retard (FITR). The diesel engines can also be equipped with selective catalytic reduction technology, which can be expected to reduce NO_x emissions by an additional 60%. Again, technical feasibility and cost effectiveness of SCR for the diesel engines will be evaluated at the time the air permit application is filed. However, at the time the units are constructed it is expected that available control technology will provide at least this degree of NO_x control, and the emissions shown in Table 4.4-1 reflect this level of control.

Because of naphtha's relatively low flash point, it cannot be used in a compression ignition engine (e.g., diesel). Therefore, the only fuel that will be used in the diesel engine generators is diesel fuel; no lower sulfur option is available.

4.4.4.2 Criteria Pollutant Emissions: Generating Units in Generating Alternative 2

The second generating alternative includes two 26.4 MW Advanced Steam-Injected Cycle Combustion Turbines, four 10 MW diesel engine generators and a 25 MW coal-fired fluidized bed boiler. Emission characteristics for the combustion turbines and the diesel engine generators are discussed above under Generating Alternative 1.

Fluidized-bed boiler technology allows a high degree of emissions control to be achieved as part of the combustion process. As discussed in Section 2.2.2.2, the coal is burned in a circulating bed of limestone, and the limestone captures most of the sulfur in the fuel before it can be converted to SO₂, providing very low SO₂ emission rates. Because the combustion temperature is lower in fluidized bed boilers than in conventional fired boilers, NO_x emissions are also relatively low. Injecting urea into the boiler can further reduce NO_x emissions. The urea reacts with the NO_x to form elemental nitrogen and water. Finally, a very high degree of particulate control can be achieved with a bag-house dust collection system. Table 4.4-2 shows air pollutant emissions from the 25 MW coal-fired fluidized bed boiler.

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Table 4.4- 1. Potential Emissions for Generating Alternative 1

Generating Unit	Units	Pollutant				
		NO _x	SO ₂	VOC	CO	PM ₁₀
Emissions Assuming Minimum Degree of Air Pollution Control						
<i>Emissions from Each Unit</i>						
Advanced Steam-Injected CTs	lb/hr	35.8	57.6	10.6	252.5	7.5
	tons/yr	156.7	252.2	46.6	1,106.1	32.9
Dual-Train Comb.-Cycle CTs	lb/hr	42.4	68.8	297.7	475.6	19.7
	tons/yr	185.5	301.3	1,304.0	2,083.0	86.5
Diesel Engines	lb/hr	85.4	32.4	28.5	29.9	9.8
	tons/yr	373.8	141.9	124.8	130.9	43.0
<i>Total Emissions, all units</i>						
Advanced Steam-Injected CTs	tons/yr, two units	313	505	93	2,212	66
Dual-Train Comb.-Cycle CTs	tons/yr, two units	371	602	2,608	4,166	173
Diesel Engines	tons/yr, four units	1,495	567	499	523	172
Plant Total	tons/yr	2,180	1,674	3,200	6,902	411
Emissions Assuming Maximum Degree of Air Pollution Control						
<i>Emissions from each unit</i>						
Advanced Steam-Injected CTs	lb/hr	12.8	57.6	5.3	126.3	10.0
	tons/yr	55.9	252.2	23.3	553.1	43.8
Dual-Train Comb.-Cycle CTs	lb/hr	13.8	68.8	6.1	144.8	10.0
	tons/yr	60.4	301.3	26.7	634.2	43.8
Diesel Engines	lb/hr	85.4	32.4	28.5	56.3	9.8
	tons/yr	373.8	141.9	124.8	246.4	43.0
<i>Total Emissions, all units</i>						
Advanced Steam-Injected CTs	tons/yr, two units	112	505	47	1,106	88
Dual-Train Comb.-Cycle CTs	tons/yr, two units	121	602	53	1,268	88
Diesel Engines	tons/yr, four units	1,495	567	499	986	172
Plant Total	tons/yr	1,728	1,674	599	3,360	348
Note: Numbers may not add due to rounding.						

Source: Sierra Research

Table 4.4- 2. Potential Emissions for Generating Alternative 2

Generating Unit	Units	Pollutant				
		NO _x	SO ₂	VOC	CO	PM ₁₀
Emissions Assuming Minimum Degree of Air Pollution Control						
<i>Emissions from Each Unit</i>						
Advanced Steam-Injected CTs	lb/hr	35.8	57.6	10.6	252.5	7.5
	tons/yr	156.7	252.2	46.6	1,106.1	32.9
Fluidized Bed Boiler	lb/hr	78.9	34.7	6.3	63.2	5.7
	tons/yr	345.8	152.1	27.7	276.6	24.9
Diesel Engines	lb/hr	85.4	32.4	28.5	29.9	9.8
	tons/yr	373.8	141.9	124.8	130.9	43.0
<i>Total Emissions, all units</i>						
Advanced Steam-Injected CTs	tons/yr, two units	313	505	93	2,212	66
Fluidized Bed Boiler	tons/yr, one unit	346	152	28	277	25
Diesel Engines	tons/yr, four units	1,495	567	499	523	172
Plant Total	tons/yr	2,154	1,224	620	3,012	263
Emissions Assuming Maximum Degree of Air Pollution Control						
<i>Emissions from each unit</i>						
Advanced Steam-Injected CTs	lb/hr	12.8	57.6	5.3	126.3	10.0
	tons/yr	55.9	252.2	23.3	553.1	43.8
Fluidized Bed Boiler	lb/hr	34.7	34.7	6.32	63.2	5.7
	tons/yr	152.1	152.1	27.7	276.6	24.9
Diesel Engines	lb/hr	85.4	32.4	28.5	56.3	9.8
	tons/yr	373.8	141.9	124.8	246.4	43.0
<i>Total Emissions, all units</i>						
Advanced Steam-Injected CTs	tons/yr, two units	112	505	47	1,106	88
Fluidized Bed Boiler	tons/yr, one unit	152	152	28	277	25
Diesel Engines	tons/yr, four units	1,495	567	499	986	172
Plant Total	tons/yr	1,759	1,224	574	2,368	284
Note: Numbers may not add due to rounding.						

Source: Sierra Research

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In addition to the relatively low air emissions that can be achieved using fluidized bed boiler technology, the technology is also capable of accommodating a variety of fuels. Although KE anticipates that it would fire such a boiler primarily on coal, it expects that the boiler would also be capable of burning biomass (including wood waste and green waste), residual (#6) fuel oil, and tire-derived fuel. These fuels would be used in relatively small amounts as available, and only when the fuel cost is advantageous to the utility and its customers. Emissions from the fluidized bed boiler would be the same regardless of the fuel burned.

4.4.4.3 Criteria Pollutant Emissions: Fuel Storage

Fuel storage facilities will emit small quantities of criteria pollutants. These are described below.

Fuel Oil. Diesel fuel has a very low vapor pressure, meaning that it does not tend to evaporate at typical ambient temperatures. Therefore, it can be stored in fixed roof storage tanks and emissions of the volatile organic compounds that are released when the fuel evaporates will be minimal. Emissions from storage of diesel fuel from the proposed facilities are considered insignificant.

Naphtha. Naphtha is more volatile than diesel fuel, meaning that it has a higher tendency to vaporize at ambient temperatures. Storage tanks handling naphtha must be equipped with vapor loss control devices. These controls include floating roofs (which minimize vapor space in the storage tanks to prevent the formation of vapors) or vapor recovery systems (which capture vapors that would otherwise be emitted into the atmosphere). Because any storage tanks that would handle naphtha are required by state and federal regulations to be controlled to prevent emissions, emissions from the storage of naphtha are also considered insignificant.

Coal. The washed coal that will be used in the fluidized bed boiler would have a very low silt content; this would minimize dust emissions during coal handling. Coal that is delivered to the site will be unloaded and conveyed either to the active coal silos or to the coal storage pile. The conveyors and transfer points will be enclosed to prevent emissions of fugitive dust during the transfer process.

A hammermill crusher will be installed to produce pulverized coal to feed the fluidized bed boiler. The pulverizer will operate on a batch basis, receiving coal via covered conveyor from the coal pile and discharging pulverized material via another covered conveyor to the coal silos. The pulverizer will produce coal particulates as a by-product of its operation. However, because these will be vented only into the coal silos, air emissions from the pulverizing operation will be negligible.

Ash Handling and Disposal. Boiler ash will be conveyed pneumatically or by wet conveyor to an ash storage area, then loaded into trucks for transport offsite. Because the ash storage, handling, and transfer will take place in a sealed system and the ash is expected to be wet, particulate emissions from this activity will also be negligible.

4.4.4.4 Other Air Emissions

In addition to the criteria pollutant emissions that will be generated during the operation of the proposed project, small quantities of non-criteria pollutant emissions and some greenhouse gases will also be produced.

Non-Criteria Pollutant Emissions. Non-criteria pollutant emissions result either from traces of impurities in the fuels or from pollutant formation during the combustion process. The proposed Lihue Energy Service Center facilities will minimize these by using high quality fuel and efficient combustion processes. The emissions of non-criteria pollutants that are expected to be emitted from this project are summarized in Table 4.4-3. These emissions estimates are based on analyses of the metals contents of the diesel fuel and coal. For the combustion turbines and the diesel engines, it is

assumed that all of the metals in the fuels will be emitted into the air. Because the fluidized bed boiler will be equipped with an electrostatic precipitator (ESP) for particulate control, it is assumed that 99% of the metals will be captured with other particulate matter in the ESP and only 1% will be emitted into the air.

Table 4.4- 3. Non-Criteria Pollutant Emissions for Generating Alternatives.

Generating Unit	Units	Pollutant				
		H ₂ SO ₄	Beryllium	Fluoride	Lead	Mercury
Generating Alternative 1						
<i>Emissions from each unit</i>						
Advanced Steam-Injected CTs	lb/hr	1.8	<0.0001	0.002	0.013	0.0001
	tons/yr	7.7	0.0002	0.008	0.056	0.0005
Dual-Train Comb.-Cycle CTs	lb/hr	1.8	<0.0001	0.002	0.014	0.0001
	tons/yr	8.1	0.0002	0.008	0.060	0.0005
Diesel Engines	lb/hr	1.4	<0.0001	0.001	0.005	<0.0001
	tons/yr	6.2	0.0001	0.003	0.022	0.0002
<i>Total Emissions, all units</i>						
Advanced Steam-Injected CTs	tons/yr, two units	15.3	<0.001	0.02	0.11	0.001
Dual-Train Comb.-Cycle CTs	tons/yr, two units	16.2	<0.001	0.02	0.12	0.001
Diesel Engines	tons/yr, four units	24.9	<0.001	0.01	0.09	0.001
Plant Total	tons/yr	56.4	0.001	0.04	0.32	0.003
Generating Alternative 2						
<i>Emissions from each unit</i>						
Advanced Steam-Injected CTs	lb/hr	1.8	<0.0001	0.002	0.013	0.0001
	tons/yr	7.7	0.0002	0.008	0.056	0.0005
Diesel Engines	lb/hr	1.4	<0.0001	0.001	0.005	<0.0001
	tons/yr	6.2	0.0001	0.003	0.022	0.0002
Fluidized Bed Boiler	lb/hr	0	0.0005	0.003	<0.0001	0.0001
	tons/yr	0	0.002	0.012	<0.0001	0.0005
<i>Total Emissions, all units</i>						
Advanced Steam-Injected CTs	tons/yr, two units	15.3	<0.001	0.02	0.11	0.001
Diesel Engines	tons/yr, four units	24.9	<0.001	0.01	0.09	0.001
Fluidized Bed Boiler	tons/yr, one unit	0	0.002	0.012	<0.0001	0.0005
Plant Total	tons/yr	40.2	0.003	0.04	0.2	0.002

Source: Compiled by Sierra Research

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Contributions to Global Warming. The combustion of fossil fuels results in the formation of carbon dioxide (CO₂), a greenhouse gas. Although releases of CO₂ cannot be controlled, they can be mitigated by minimizing fuel consumption. For this project, KE has selected generating technologies that optimize fuel efficiency while providing reliable, low-cost electricity.

4.4.4.5 Construction-Related Emissions

Construction activities at the power plant site will generate two types of air emissions: (i) exhaust emissions from construction vehicles and (ii) fugitive dust from earthmoving operations. These emissions will be short-term in nature and will not be significantly different than the emissions that currently occur due to agricultural activities on the properties.

All of the locations being considered for the Lihue Energy Service Center are currently in sugar cane cultivation. This activity also involves exhaust emissions from tractors and harvest vehicles, and fugitive dust during planting and harvesting activities. Sugar cane grows on a two-year cycle, so approximately every 18 months the cane is burned and then the area is stripped bare. A harvested field will lie barren for several months before being replanted, during which time the unprotected soil has a high potential for generating fugitive dust.

In contrast, construction emissions will occur for a relatively short period of time and will be minimized by the use of good operating practices. Unpaved areas on which construction vehicles travel will be watered frequently to minimize dust generation. Storage piles will also be treated with water or dust palliatives as necessary, to reduce windblown dust. As a result of the temporary nature of the construction activities and the mitigation KE will employ to minimize emissions, air emissions from construction activities are not expected to be significant.

4.4.5 SIGNIFICANCE CRITERIA

4.4.5.1 Introduction

In attempting to evaluate the significance of air quality impacts of proposed projects, it is difficult to identify a single measure of significance. Some people believe that percentage changes are most critical, while others believe that changes in ambient concentrations are appropriate measures. Most air quality regulations are based on emissions, rather than ambient concentrations, due to uncertainties in the accuracy of modeling techniques that are available.

State and federal air quality agencies use various tools to determine whether a project's air quality impacts are significant. Other significance measures have also been suggested.

Measures of significance for air quality impacts can generally be separated into three major categories:

- Those used for the evaluation of industrial sources of pollution, prior to issuing permits to construct or operate, or in evaluating the applicability of other permit program requirements;
- The limits of detection or reportability of ambient concentrations; or
- Measures used in areas with severe air quality problems.

Each of these categories is discussed in more detail below.

4.4.5.2 Measures Used for the Evaluation of Industrial Sources

Industrial facilities in Hawaii are required to undergo an extensive air quality analysis, known as "new source review," prior to being granted approval for construction. The new source review

program in Hawaii is carried out by the SDOH. Since air quality in Hawaii meets the federal ambient air quality standards, the new source review program implemented in Hawaii focuses on maintaining good air quality, and is known as the "prevention of significant deterioration" or PSD program.

In response to requirements in the Federal Clean Air Act Amendments of 1990, state and local air pollution control agencies throughout the country have developed and implemented operating permit programs that apply to major new and existing industrial facilities. This new program took effect in Hawaii in mid-November 1993. Each of these programs contains a number of thresholds that trigger various requirements for project applicants. One could construe these triggers as assessments of the significance of a project's impacts, since a project with impacts below these levels is exempted from all (or a portion) of the review. These trigger levels are expressed either as emissions limitations (pounds per hour or tons per year), or as ambient concentrations (parts per million or micrograms per cubic meter [μm^3]).

4.4.5.3 Limits of Detection, Accuracy, and Reportability

A second category of measures of significance has to do with scientists' ability to detect changes in concentrations of pollutants in the ambient air. This ability is a function of the limits of detection and the accuracy of the analytical system. The limit of detection for most pollutants is extremely small. Advances in analytical technology allow lower and lower concentrations of pollutants to be measured. In general, the more serious constraint has to do with the accuracy of the measurements.

As an example, the California Air Resources Board (ARB) conducts periodic audits of the ambient air quality monitoring network throughout the state of California. ARB has established guidelines for the accuracy of these analyzers. If an analyzer is found to be operating outside of ARB's 10 percent limit for accuracy, an "advisory warning" is issued and a more thorough check is made of the analyzer's calibration data. If an analyzer is found to be operating outside of ARB's 15 percent limit for accuracy, the data collected by that analyzer are rejected unless the discrepancy can be explained and corrected.

In ARB's most recent published results¹³ of its field audits, average accuracy estimates were provided for ambient monitors in California. While these accuracy tests were conducted at a variety of different concentrations, their use is most critical when pollutant concentrations are at or near the level of the ambient air quality standards. Consequently, one potential measure of "significance" for air quality impacts would be whether the difference in pollutant concentrations attributable to a project is larger than the accuracy of the average analyzer when determined at the level of the air quality standard for that pollutant.

A second (and related) measure has to do with the degree of precision to which ARB maintains and reports ambient air quality concentrations. ARB selects its reporting precision based on a subjective evaluation of the precision of the analyzers, the accuracy of the analyzers, and the level of precision to which the ambient air quality standard is expressed. Thus, another measure of significance of air quality impacts would be whether the difference in pollutant concentrations attributable to a project would change a number reported by ARB.

¹³ 1994 ARB Data Accuracy Estimates, Air Resources Board, Memorandum from Warren Crecy to Alice Westerinen, dated August 15, 1995.

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4.4.5.4 Measures Used in Areas with Severe Air Quality Problems

One final measure that has been suggested for use in areas with particularly difficult air quality problems is known as "the one molecule theory." Under this approach, it is assumed that the existing air quality problem in a region is so severe that any increase in emissions or pollutant concentrations, even just one molecule more, would constitute a significant increase. Because air quality on Kauai is relatively good, the one molecule theory is not an appropriate measure of significance for the proposed Lihue Energy Service Center.

Tables 4.4-4 to 4.4-8 summarize the available measures of significance for each pollutant.

Table 4.4- 4. Various Measures of Significance for Carbon Monoxide.

<i>Agency</i>	<i>Level</i>	<i>Abbreviation</i>	<i>Comment</i>
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA	100 tons/year	SDOH major source	definition of major polluting facility
SDOH/EPA	100 tons/year	SDOH major modification	definition of major modification
SDOH/EPA	100 tons/year	SDOH BACT	level above which BACT is required
<i>Concentration-Based Measures - Industrial Sources</i>			
SDOH/EPA	575 $\mu\text{g}/\text{m}^3$ (8-hr)	EPA <i>de minimis</i> (8-hr)	level below which ambient monitoring is not required
SDOH/EPA	500 $\mu\text{g}/\text{m}^3$ (8-hr)	EPA significant (8-hr)	definition of a significant air quality impact
SDOH/EPA	2000 $\mu\text{g}/\text{m}^3$ (1-hr)	EPA significant (1-hr)	definition of a significant air quality impact
<i>Measurement Accuracy and Reporting Precision</i>			
ARB	0.27 ppm (1-hr)	ARB accuracy (1-hr)	ARB measured accuracy of 1.37 percent times 20 ppm standard
ARB	1 ppm (1-hr)	ARB report (1-hr)	precision to which ARB reports concentrations
ARB	0.1 ppm (8-hr)	ARB report (8-hr)	precision to which ARB reports concentrations

Source: Compiled by Sierra Research

Table 4.4- 5. Measures of Significance for Hydrocarbons/Oxides of Nitrogen/Ozone.

<i>Agency</i>	<i>Level</i>	<i>Abbreviation</i>	<i>Comment</i>
<i>Hydrocarbon and NOx Emissions-Based Measures - Industrial Sources</i>			
SDOH/EPA	100 tons/year	SDOH major source	definition of major polluting facility
SDOH/EPA	40 tons/year	SDOH major modification	definition of a major modification
SDOH/EPA	40 tons/year	SDOH BACT	level above which BACT is required
<i>Ozone Concentration-Based Measures - Industrial Sources</i>			
None			
<i>Ozone Measurement Accuracy and Reporting Precision</i>			
ARB	0.10 pphm	ARB accuracy	ARB measured accuracy of 1.08 percent times 9 pphm standard
ARB	1 pphm	ARB reporting	precision to which ARB reports concen.

Source: Compiled by Sierra Research

Table 4.4- 6. Measures of Significance for Oxides of Nitrogen.

<i>Agency</i>	<i>Level</i>	<i>Abbreviation</i>	<i>Comment</i>
<i>Emissions-Based Measures - Industrial Sources</i>			
SDOH/EPA	100 tons/year	SDOH major source	definition of major polluting facility
SDOH/EPA	40 tons/year	SDOH major modification	definition of a major modification
SDOH/EPA	40 tons/year	SDOH BACT	level above which BACT is required
<i>Concentration-Based Measures - Industrial Sources</i>			
SDOH/EPA	2.5 µg/m ³ Annual	Class I annual	allowable increment: Class I areas
SDOH/EPA	25 µg/m ³ Annual	Class II annual	allowable increment: Class II areas
SDOH/EPA	14 µg/m ³ Annual	EPA de minimis annual	level below which ambient monitoring is not required
SDOH/EPA	1 µg/m ³ Annual	EPA sig annual	significant air quality impact
<i>Measurement Accuracy and Reporting Precision</i>			
ARB	0.19 parts per hundred million (pphm) (1-hr)	ARB accuracy (1 -hr)	ARB measured accuracy of 0.76 percent times 25 pphm standard
ARB	1 pphm (1-hr)	ARB reporting (1-hr)	precision to which ARB reports concentrations
ARB	0.1 pphm Annual	ARB report Annual	precision to which ARB reports concentrations

Source: Compiled by Sierra Research

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Table 4.4- 7. Measures of Significance for Sulfur Dioxide.

<i>Agency</i>	<i>Level</i>	<i>Abbreviation</i>	<i>Comment</i>
<i>Emissions-Based Measures - Industrial Sources</i>			
SDOH/EPA	100 tons/year	major source	definition of major polluting facility
SDOH/EPA	40 tons/year	major modification	definition of a major modification
SDOH/EPA	40 tons/year	SDOH BACT	level above which BACT is required
<i>Concentration-Based Measures - Industrial Sources</i>			
SDOH/EPA	2 $\mu\text{g}/\text{m}^3$ Annual 5 $\mu\text{g}/\text{m}^3$ (24-hr) 25 $\mu\text{g}/\text{m}^3$ (3-hr)	Class I annual	allowable increments for Class I areas
SDOH/ EPA	2 $\mu\text{g}/\text{m}^3$ Annual 91 $\mu\text{g}/\text{m}^3$ (24-hr) 512 $\mu\text{g}/\text{m}^3$ (3-hr)	Class II annual	allowable increments for Class II areas
SDOH/ EPA	13 $\mu\text{g}/\text{m}^3$ (24-hr)	EPA <i>de minimis</i> (24-hr)	level below which ambient monitoring is not required
SDOH/ EPA	1 $\mu\text{g}/\text{m}^3$ Annual	EPA sig annual	definition of a significant air quality impact
SDOH/ EPA	5 $\mu\text{g}/\text{m}^3$ (24-hr)	EPA sig (24-hr)	definition of a significant air quality impact
SDOH/ EPA	25 $\mu\text{g}/\text{m}^3$ (3-hr)	EPA sig (3-hr)	definition of a significant air quality impact

Source: Compiled by Sierra Research

Table 4.4- 8. Measures of Significance for Fine Particulates (PM₁₀)

<i>Agency</i>	<i>Level</i>	<i>Abbreviation</i>	<i>Comment</i>
<i>Emissions-Based Measures - Industrial Sources</i>			
SDOH/EPA	100 tons/year	SDOH major source	definition of major polluting facility
SDOH/EPA	15 tons/year	SDOH major modification	definition of a major modification
SDOH/ EPA	15 tons/year	SDOH BACT	level above which BACT is required
<i>Concentration-Based Measures - Industrial Sources</i>			
SDOH/ EPA	4 µg/m ³ Annual 8 µg/m ³ (24-hr)	EPA Class I	allowable increments for Class I areas (parks)
SDOH/ EPA	17 µg/m ³ (24-hr) 30 µg/m ³ (24-hr)	EPA Class II	allowable increments for Class II areas
SDOH/ EPA	10 µg/m ³ (24-hr)	EPA de minimis (24-hr)	level below which ambient monitoring is not required
SDOH/ EPA	1 µg/m ³ Annual	EPA sig annual	definition of a significant air quality impact
SDOH/ EPA	5 µg/m ³ (24-hr)	EPA sig (24-hr)	definition of a significant air quality impact
<i>Measurement Accuracy and Reporting Precision</i>			
ARB	0.21 µg/m ³ (24-hr)	ARB accuracy (24-hr)	ARB measured accuracy of 0.41 percent times 50 :g/m ³ standard
ARB	1 µg/m ³ (24-hr)	ARB reporting (24-hr)	precision to which ARB reports concentrations
ARB	0.1 µg/m ³ Annual	ARB reporting Annual	precision to which ARB reports concentrations

Source: Compiled by Sierra Research

4.4.6 AIR QUALITY IMPACTS - GENERAL

The EPA-approved Gaussian model ISCST3 (Industrial Source Complex, Short-Term, Version 3) was used to evaluate the ambient air quality impacts of the proposed project at all three potential locations. The ISCST3 model allows the evaluation of impacts on simple, intermediate, and complex terrain from multiple sources. It also allows the evaluation of the effects of building downwash, which occurs when all or part of a stack plume is drawn downward to the ground by the lower pressure region that exists in the turbulent wake on the lee side of a nearby building.

Data required for the evaluation of ambient impacts using the ISCST3 model include emission rates, equipment exhaust characteristics, dimensions of nearby structures, a description of the surrounding terrain, and representative meteorological data. The emission rates used for modeling were those shown in Tables 4.4-1 and 4.4-2. The "minimum degree of pollution control" emission rates were modeled to evaluate the worst-case impacts of the proposed project.

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Equipment exhaust characteristics, including exhaust temperatures and mass flow rates, and stack diameters and heights were taken from data for identical or similar equipment that was used in evaluating air quality impacts for other, similar projects in Hawaii. The exhaust parameters used in the modeling are summarized in Table 4.4-9.

Table 4.4- 9. Exhaust Characteristics Used in the Ambient Air Quality Impact Analysis.

<i>Unit</i>	<i>Exhaust Gas Temperature (degrees K)</i>	<i>Exhaust Gas Velocity (meters/sec.)</i>	<i>Stack Diameter (meters)</i>	<i>Stack Height, (feet)</i>
<i>Generating Alternative 1</i>				
Advanced Steam-Injected CTs	427	18.4	2.85	100
Dual-Train Comb.-Cycle CTs	427	20.0	2.44	100
Diesel Engines	622	37.6	1.20	95
<i>Generating Alternative 2</i>				
Advanced Steam-Injected CTs	427	18.4	2.85	100
Diesel Engines	622	37.6	1.20	95
Fluidized Bed Boiler	422	13.4	2.09	165

Source: Sierra Research

The dimensions of structures on the power plant property were taken from the facility plans that are included as Figures 2.1 through 2.4.¹⁴ Structure heights used in the modeling analysis are shown in the following Table 4.4-10. Structure locations and heights are important in evaluating potential building downwash effects. The initial stack height for the Advanced Steam-Injected Combustion Turbines is expected to be between 50 and 90 feet. The stack heights may need to be increased in future years as the Lihue Energy Service Center continues to be developed.

The model simulates the dispersion of the exhaust from each exhaust stack and calculates the air quality impact at various locations. Terrain elevation relative to the pollutant release heights must be known to accurately evaluate impacts on elevated terrain such as hillsides. The topography of the terrain surrounding each site was taken from digital terrain data obtained from the U.S. Geological Survey.

Finally, the model uses representative meteorological data, including wind speed, direction and ambient temperatures, to determine how each exhaust plume disperses. KE collected 12 months of meteorological data at the Puhi Site between October 1993 and September 1994 to characterize meteorological conditions there. These meteorological data were used in modeling the Puhi Site and the Field 390 Site. Meteorological data collected by the National Weather Service at the Lihue Airport in 1987 were used in modeling impacts at the Airport Industrial Area Site.

¹⁴ The air quality modeling for Generating Alternative 1 at the Field 390 and the Airport Industrial Area Sites assumed that the Dual Train Combined Cycle CTs would be located in the areas where the Generating Alternative 2 layouts show the Fluidized Bed Boiler and its associated equipment. The final facility layouts will be determined prior to construction of each phase of the facility, and will be designed to provide adequate plume dispersion and compliance with all air quality requirements.

Table 4.4- 10. Structure Heights Used in Modeling.

<i>Structure</i>	<i>Height (ft)</i>
<i>Advanced Steam-Injected Combustion Turbines</i>	
Combustion Turbines	30
HRSGs	50
Maintenance Control Room	25
Day Tanks	25
<i>Dual-Train Combined Cycle Turbines</i>	
Combustion Turbines	30
HRSGs	50
Steam Turbines	30
CT Controls	25
Air-Cooled Condenser	35
Control Room	25
<i>Diesel Generators</i>	
Diesel Plant	40
Radiators for Diesels	25
<i>Fluidized Bed Boiler</i>	
Boiler Building	105
Baghouse	50
Steam Turbine Building	50
Control Rooms	25
Air-Cooled Condenser	35
Coal Pile	50
Limestone Silo	80
<i>Other Structures</i>	
Administration Building	25
Fuel Oil Storage Tanks	48
Water Treatment Building	25
Fire Water Tanks	36
Maintenance Shops	35
Warehouse	30
Switchyard Controls	15
Covered Truck Parking	20

Source: Compiled by Sierra Research

4.4.7 AIR QUALITY IMPACTS - PUHI SITE

4.4.7.1 Ambient Concentrations

The maximum modeled ambient concentrations expected to result from both generating alternatives at the Puhi Site are summarized in Table 4.4-11. For reference, the ambient air quality standards and increments are also shown, and the modeled impacts of the generating alternatives are shown as a percent of the applicable standard.

4.4.7.2 Compliance with Air Quality Standards

To evaluate compliance with applicable air quality standards, the total ambient concentration expected with the power plant in operation must be less than the applicable standards. The total ambient concentration is determined by adding the maximum modeled impacts of the project to the existing background concentrations.¹⁵ Table 4.4-12 below shows the higher of the maximum modeled concentration for each pollutant and averaging period for both generating alternatives, the existing background concentration of each pollutant, and the total concentration, and compares each total to the applicable standard to demonstrate that the project will be in compliance with all applicable air quality standards. The total concentration is also shown as a percentage of the applicable standard.

4.4.7.3 Significance of Predicted Changes in Air Quality

The significance of predicted increases in emissions and changes in air quality that are expected to result from the operation of the Lihue Energy Service Center at the Puhi Site were evaluated using the criteria for significance discussed in Section 4.4.4.

Ozone (O₃). Table 4.4-13 compares the modeled concentrations for this Site/Generating Alternative with various significance criteria for ozone. In this table, volatile organic compound (VOC) and NO_x emissions are used to evaluate the significance of ozone impacts.¹⁶ As shown in Table 4.4-13, all of the emission-based significance thresholds for these emissions are exceeded by the proposed project. Thus, the proposed project would be expected to have a significant impact on ozone, due to increases in hydrocarbon and NO_x emissions. However, no violations of state or federal AAQS for ozone are expected.

Nitrogen Dioxide (NO₂). Table 4.4-14 compares project-related nitrogen dioxide estimates with various significance criteria for that parameter. As shown in the table, compared to a baseline of zero emissions/concentrations, the proposed project is shown to exceed many of the emission/concentration-based significance thresholds. Therefore, the proposed project would be expected to have a significant impact on nitrogen dioxide.

Carbon Monoxide (CO). The impact of the proposed project on carbon monoxide is shown in Table 4.4-15. The data show that, compared with a baseline of zero emissions/concentrations, the proposed project would exceed the emission-based significance thresholds; however, modeled concentrations are below the significance and *de minimis* levels, so the project would not be expected to have a significant impact on carbon monoxide levels.

¹⁵ In accordance with EPA guidance (40 CFR Part 51, Subpart W), the highest second-high modeled values were used for averaging periods shorter than one year.

¹⁶ There are no approved techniques available that can be used to estimate the change in ambient ozone concentrations due to any of the alternatives.

Table 4.4- 11. Maximum Modeled Impacts at Puhi Site.

<i>Pollutant/ Averaging Period</i>	<i>Maximum Modeled Impact ($\mu\text{g}/\text{m}^3$)</i>	<i>State Standard ($\mu\text{g}/\text{m}^3$)</i>	<i>Federal Standard ($\mu\text{g}/\text{m}^3$)</i>	<i>Project Impact as Percent of Strictest Standard</i>	<i>Class II Increment ($\mu\text{g}/\text{m}^3$)</i>
<i>Generating Alternative 1</i>					
NO ₂ – annual	12.3	70	100	18	25
SO ₂ – annual	11.3	80	80	14	20
SO ₂ – 24-hour	57.5	365	365	16	91
SO ₂ – 3-hour	211.3	1300	1300	16	512
CO – 8-hour	471.0	5,000	10,000	9	n/a
CO – 1-hour	1,280.2	10,000	40,000	13	n/a
PM ₁₀ – annual	2.9	50	50	6	17
PM ₁₀ – 24-hour	14.8	150	150	10	30
<i>Generating Alternative 2</i>					
NO ₂ – annual	12.9	70	100	18	25
SO ₂ – annual	8.3	80	80	10	20
SO ₂ – 24-hour	42.8	365	365	12	91
SO ₂ – 3-hour	152.2	1300	1300	12	512
CO – 8-hour	190.1	5,000	10,000	4	n/a
CO – 1-hour	523.6	10,000	40,000	5	n/a
PM ₁₀ – annual	2.0	50	50	4	17
PM ₁₀ – 24-hour	9.8	150	150	7	30
Note: Modeled NO _x converted to NO ₂ using the EPA-approved ARM method.					

Source: Sierra Research

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Table 4.4- 12. Maximum Ambient Concentrations at Puhi Site

<i>Pollutant/ Avg. Period</i>	<i>Maximum Modeled Impact ($\mu\text{g}/\text{m}^3$)</i>	<i>Background Concentration ($\mu\text{g}/\text{m}^3$)</i>	<i>Total Ambient Concentration ($\mu\text{g}/\text{m}^3$)</i>	<i>State Standard ($\mu\text{g}/\text{m}^3$)</i>	<i>Federal Standard ($\mu\text{g}/\text{m}^3$)</i>	<i>Total Ambient Concentration as % of Strictest Standard</i>
NO ₂ – annual	12.9	3.3	16.2	70	100	23
SO ₂ – annual	11.3	0.7	12.0	80	80	15
SO ₂ – 24-hour	57.5	6.7	64.2	365	365	18
SO ₂ – 3-hour	211.3	33.5	244.8	1300	1300	19
CO – 8-hour	471	456	927	5,000	10,000	19
CO – 1-hour	1,280	798	2,078	10,000	40,000	21
PM ₁₀ – annual	2.9	19.4	22.3	50	50	45
PM ₁₀ – 24-hour	14.8	37	51.8	150	150	35

Source: Sierra Research

Table 4.4- 13. Assessment of Significance of Hydrocarbons/Oxides of Nitrogen/Ozone: Puhi Site.

<i>Measure of Significance</i>	<i>Significance Level</i>	<i>Project-Related HC</i>	<i>Project-Related NOx</i>
<i>Hydrocarbons/Oxides of Nitrogen Emissions-Based Measures – Industrial Sources</i>			
<i>Generating Alternative 1 Emissions</i>			
SDOH/EPA Major Source	100 tons/year	3,200 tons/year	2,180 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Generating Alternative 2 Emissions</i>			
SDOH/EPA Major Source	100 tons/year	620 tons/year	2,154 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Ozone Concentration-Based Measures – Industrial Sources</i>			
None	n/a	n/a	n/a
<i>Ozone Measurement Accuracy and Reporting Precision</i>			
ARB Accuracy	0.54 pphm	n/a	n/a
ARB Precision	1 pphm	n/a	n/a

Source: Sierra Research

Table 4.4- 14. Assessment of Significance for Oxides of Nitrogen: Puhi Site

Measure of Significance	Significance Level	Project-Related NO _x Levels	
		Generating Alternative 1	Generating Alternative 2
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	2,180 tons/year	4,029.5 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA Class I Annual	2.5 µg/m ³	12.3 µg/m ³	12.9 µg/m ³
SDOH/EPA Class II Annual	25 µg/m ³	12 µg/m ³	13 µg/m ³
SDOH/EPA <i>de minimis</i> Annual	14 µg/m ³	12 µg/m ³	13 µg/m ³
SDOH/EPA Significant Annual	1 µg/m ³	12 µg/m ³	13 µg/m ³
<i>Nitrogen Dioxide Measurement Accuracy and Reporting Precision</i>			
ARB Report Annual	0.1 pphm	0.6 pphm	0.7 pphm

Source: Sierra Research

Table 4.4- 15. Assessment of Significance for Carbon Monoxide : Puhi Site.

Measure of Significance	Significance Level	Project-Related CO Levels	
		Generating Alternative 1	Generating Alternative 2
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	3,200 tons/year	3,012 tons/year
SDOH/EPA Major Modification	100 tons/year		
SDOH/EPA BACT	100 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA <i>de minimis</i> (8-hr)	575 µg/m ³	471 µg/m ³	190 µg/m ³
SDOH/EPA significant (8-hr)	500 µg/m ³	471 µg/m ³	190 µg/m ³
SDOH/EPA significant (1-hr)	2000 µg/m ³	1280 µg/m ³	524 µg/m ³
<i>Carbon Monoxide Measurement Accuracy and Reporting Precision</i>			
ARB accuracy (1-hr)	0.27 ppm	1.1 ppm	0.5 ppm
ARB report (1-hr)	1 ppm	1.1 ppm	0.5 ppm
ARB report (8-hr)	0.1 ppm	0.4 ppm	0.2 ppm

Source: Sierra Research

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Sulfur Dioxide (SO₂). Table 4.4-16 shows the impacts of the proposed project on sulfur dioxide. The data show that, compared with a baseline of zero emissions/concentrations, the proposed project would exceed many of the emissions/concentration-based significance thresholds and would be expected to have a significant impact on sulfur dioxide levels.

Table 4.4- 16. Assessment of Significance for Sulfur Dioxide: Puhi Site

<i>Measure of Significance</i>	<i>Level</i>	<i>Project-Related SO₂ Levels</i>	
		<i>Generating Alternative 1</i>	<i>Generating Alternative 2</i>
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	1,674 tons/year	1,224 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA Class I	2 µg/m ³ (annual)	11 µg/m ³	8 µg/m ³
	5 µg/m ³ (24-hr)	58 µg/m ³	43 µg/m ³
	25 µg/m ³ (3-hr)	211 µg/m ³	152 µg/m ³
SDOH/EPA Class II	20 µg/m ³ (annual)	11 µg/m ³	8 µg/m ³
	91 µg/m ³ (24-hr)	58 µg/m ³	43 µg/m ³
	512 µg/m ³ (3-hr)	211 µg/m ³	152 µg/m ³
SDOH/EPA <i>de minimis</i> (24-hr)	13 µg/m ³	58 µg/m ³	43 µg/m ³
SDOH/EPA significant (annual)	1 µg/m ³	11 µg/m ³	8 µg/m ³
SDOH/EPA significant (24-hr)	5 µg/m ³	58 µg/m ³	43 µg/m ³
SDOH/EPA significant (3-hr)	25 µg/m ³	211 µg/m ³	152 µg/m ³

Source: Sierra Research

Fine Particulates. The impacts of the proposed project on fine particulates are shown in Table 4.4-17. Once again, the data show that the proposed project results in significant impacts for this pollutant when compared to a zero baseline due to exceedances of many of the emission/ concentration-based significance thresholds.

Table 4.4- 17. Assessment of Significance for Fine Particulates: Puhi Site.

Measure of Significance	Level	Project-Related PM_{10} Levels	
		Generating Alternative 1	Generating Alternative 2
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	411 tons/year	263 tons/year
SDOH/EPA Major Modification	15 tons/year		
SDOH/EPA BACT	15 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA Class I	4 $\mu\text{g}/\text{m}^3$ (annual)	3 $\mu\text{g}/\text{m}^3$	2 $\mu\text{g}/\text{m}^3$
	8 $\mu\text{g}/\text{m}^3$ (24-hr)	15 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$
SDOH/EPA Class II	17 $\mu\text{g}/\text{m}^3$ (annual)	3 $\mu\text{g}/\text{m}^3$	2 $\mu\text{g}/\text{m}^3$
	30 $\mu\text{g}/\text{m}^3$ (24-hr)	15 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$
SDOH/EPA <i>de minimis</i> (24-hr)	10 $\mu\text{g}/\text{m}^3$	15 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$
SDOH/EPA significant (annual)	1 $\mu\text{g}/\text{m}^3$	3 $\mu\text{g}/\text{m}^3$	2 $\mu\text{g}/\text{m}^3$
SDOH/EPA significant (24-hr)	5 $\mu\text{g}/\text{m}^3$	15 $\mu\text{g}/\text{m}^3$	10 $\mu\text{g}/\text{m}^3$
<i>Measurement Accuracy and Reporting Precision</i>			
ARB accuracy (24-hr)	0.21 $\mu\text{g}/\text{m}^3$	14.8 $\mu\text{g}/\text{m}^3$	9.8 $\mu\text{g}/\text{m}^3$
ARB report (24-hr)	1 $\mu\text{g}/\text{m}^3$	14.8 $\mu\text{g}/\text{m}^3$	9.8 $\mu\text{g}/\text{m}^3$
ARB report (annual)	0.1 $\mu\text{g}/\text{m}^3$	2.9 $\mu\text{g}/\text{m}^3$	2.0 $\mu\text{g}/\text{m}^3$

Source: Sierra Research

4.4.7.4 Additional Mitigation Measures

The impacts presented here were estimated assuming the expected minimum degree of emissions control for the generating units. As discussed in Section 4.4.3, more stringent emissions controls may be required for some or all of the generating units. If more stringent emissions controls are implemented, both emissions and ambient impacts from the proposed project under both generating alternatives would be lower than those shown above. The use of more stringent emissions controls would reduce the significance of the impacts from the project. However, in some cases it could cause additional effects that would not otherwise be present. For example, the use of selective catalytic reduction technology for the control of NO_x emissions from the gas turbines and diesel engines would likely require the use of ammonia. The potential hazards of ammonia storage, transport, and use are discussed in Section 4.4.2.6. In addition, a small amount of the ammonia injected into the exhaust stream would remain unreacted and would be emitted from the exhaust stacks along with the other generating unit exhaust.

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4.4.8 AIR QUALITY IMPACTS - FIELD 390 SITE

4.4.8.1 Ambient Concentrations

The maximum modeled ambient concentrations expected to result from Generating Alternatives 1 and 2 at the Field 390 Site are summarized in Table 4.4-18. For reference, the ambient air quality standards and increments are also shown, and the modeled impacts are shown as a percent of the applicable standard.

Table 4.4- 18. Maximum Modeled Impacts at Field 390 Site.

<i>Pollutant/ Averaging Period</i>	<i>Maximum Modeled Impact ($\mu\text{g}/\text{m}^3$)</i>	<i>State Standard ($\mu\text{g}/\text{m}^3$)</i>	<i>Federal Standard ($\mu\text{g}/\text{m}^3$)</i>	<i>Project Impact as % of Strictest Standard</i>	<i>Class II Increment ($\mu\text{g}/\text{m}^3$)</i>
<i>Generating Alternative 1</i>					
NO ₂ /annual	19.8	70	100	28	25
SO ₂ /annual	17.4	80	80	22	20
SO ₂ /24-hour	73.9	365	365	20	91
SO ₂ /3-hour	262.7	1300	1,300	20	512
CO/8-hour	739.6	5,000	10,000	15	n/a
CO/1-hour	2181	10,000	40,000	22	n/a
PM ₁₀ /annual	4.6	50	50	9	17
PM ₁₀ /24-hour	18.6	150	150	12	30
<i>Generating Alternative 2</i>					
NO ₂ /annual	21.3	70	100	30	25
SO ₂ /annual	14.4	80	80	18	20
SO ₂ /24-hour	60.1	365	365	16	91
SO ₂ /3-hour	236.2	1,300	1,300	18	512
CO/8-hour	316.5	5,000	10,000	6	n/a
CO/1-hour	918	10,000	40,000	9	n/a
PM ₁₀ /annual	3.3	50	50	7	17
PM ₁₀ /24-hour	13.5	150	150	9	30

Source: Sierra Research

4.4.8.2 Compliance with Air Quality Standards

Compliance with applicable air-quality-related standards for generating alternatives at the Field 390 Site was evaluated using the same methodology described previously for the Puhi Site. Table 4.4-19 shows the maximum modeled concentration for each pollutant and averaging period for both generating alternatives, the existing background concentration of each pollutant, and the total concentration. The table also shows the total concentration as a percentage of the applicable standard to demonstrate that the project will comply with all applicable air quality standards.

Table 4.4- 19. Maximum Ambient Concentrations at Field 390 Site.

<i>Pollutant/ Averaging Period</i>	<i>Maximum Modeled Impact ($\mu\text{g}/\text{m}^3$)</i>	<i>Background Concentration ($\mu\text{g}/\text{m}^3$)</i>	<i>Total Ambient Concentration ($\mu\text{g}/\text{m}^3$)</i>	<i>State Standard ($\mu\text{g}/\text{m}^3$)</i>	<i>Federal Standard ($\mu\text{g}/\text{m}^3$)</i>	<i>Total Ambient Concentration as % of Strictest Standard</i>
NO ₂ /annual	21.3	3.3	24.6	70	100	35
SO ₂ /annual	17.4	0.7	18.1	80	80	23
SO ₂ /4-hour	73.9	6.7	80.6	365	365	22
SO ₂ /3-hour	262.7	33.5	296.2	1,300	1,300	23
CO/8-hour	739.6	456	1195.6	5,000	10,000	24
CO/1-hour	2,181	798	2,979	10,000	40,000	30
PM ₁₀ /annual	4.6	19.4	24.0	50	50	48
PM ₁₀ /24-hour	18.6	37	55.6	150	150	37

Source: Sierra Research

4.4.8.3 Significance of Predicted Changes in Air Quality

The significance of predicted increases in emissions and changes in air quality that are expected to result from the operation of the Lihue Energy Service Center at the Field 390 Site were evaluated using the significance criteria discussed in Section 4.4.4. The results of the evaluation are summarized below.

Ozone (O₃). Table 4.4-20 compares the impacts of the proposed project with various significance criteria for ozone. In this table, VOC and NO_x emissions are used to evaluate the significance of ozone impacts; there are no approved techniques available that can be used to estimate the change in ambient ozone concentrations due to any of the alternatives. The Table shows that all of the emission-based significance thresholds are exceeded by the proposed project. Thus, it would be expected to have a significant impact on ozone, due to increases in hydrocarbon and NO_x emissions.

Nitrogen Dioxide (NO₂). Table 4.4-21 compares the impacts of the proposed project with various significance criteria for nitrogen dioxide. As shown in Table 4.4-21, compared to a baseline of zero emissions/concentrations, the proposed project exceeds many of the emission/concentration based significance thresholds. Therefore, the proposed project would be expected to have a significant impact on nitrogen dioxide.

Carbon Monoxide (CO). The impact of the proposed project on carbon monoxide is shown in Table 4.4-22. The data show that, compared with a baseline of zero emissions/concentrations, the proposed project would exceed many of the emissions/concentration-based significance thresholds and would be expected to have a significant impact on carbon monoxide concentrations.

Sulfur Dioxide (SO₂). Table 4.4-23 shows the impacts of the proposed project on sulfur dioxide. The data show that, compared with a baseline of zero emissions/concentrations, the proposed project would exceed many of the emissions/concentration-based significance thresholds and would be expected to have a significant impact on sulfur dioxide.

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Table 4.4- 20. Significance of Hydrocarbons/Oxides of Nitrogen/Ozone: Field 390 Site.

<i>Measure of Significance</i>	<i>Significance Level</i>	<i>Project-Related HC</i>	<i>Project-Related NOx</i>
<i>Hydrocarbons/Oxides of Nitrogen Emissions-Based Measures – Industrial Sources</i>			
<i>Generating Alternative 1</i>			
SDOH/EPA Major Source	100 tons/year	3,200 tons/year	2,180 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Generating Alternative 2</i>			
SDOH/EPA Major Source	100 tons/year	620 tons/year	2,154 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Ozone Concentration-Based Measures – Industrial Sources</i>			
None	n/a	n/a	n/a
<i>Ozone Measurement Accuracy and Reporting Precision</i>			
ARB Accuracy	0.54 pphm	n/a	n/a
ARB Precision	1 pphm	n/a	n/a

Source: Sierra Research

Table 4.4- 21. Assessment of Significance for Oxides of Nitrogen: Field 390 Site

<i>Measure of Significance</i>	<i>Significance Level</i>	<i>Project-Related Levels of NOx</i>	
		<i>Generating Alternative 1</i>	<i>Generating Alternative 2</i>
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	2180 tons/year	2154 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA Class I Annual	2.5 µg/m ³	20 µg/m ³	21 µg/m ³
SDOH/EPA Class II Annual	25 µg/m ³	20 µg/m ³	21 µg/m ³
SDOH/EPA <i>de minimis</i> Annual	14 µg/m ³	20 µg/m ³	21 µg/m ³
SDOH/EPA Significant Annual	1 µg/m ³	20 µg/m ³	21 µg/m ³
<i>Nitrogen Dioxide Measurement Accuracy and Reporting Precision</i>			
ARB Report Annual	0.1 pphm	1.0 pphm	1.1 pphm

Source: Sierra Research

Table 4.4- 22. Assessment of Significance for Carbon Monoxide: Field 390 Site.

Measure of Significance	Level	Project-Related CO Levels	
		Generating Alternative 1	Generating Alternative 2
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	3,200 tons/year	3,012 tons/year
SDOH/EPA Major Modification	100 tons/year		
SDOH/EPA BACT	100 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA <i>de minimis</i> (8-hr)	575 µg/m ³	740 µg/m ³	317 µg/m ³
SDOH/EPA significant (8-hr)	500 µg/m ³	740 µg/m ³	317 µg/m ³
SDOH/EPA significant (1-hr)	2,000 µg/m ³	2,181 µg/m ³	918 µg/m ³
<i>Carbon Monoxide Measurement Accuracy and Reporting Precision</i>			
ARB accuracy (1-hr)	0.27 ppm	5.5 ppm	2.3 ppm
ARB report (1-hr)	1 ppm	5.5 ppm	2.3 ppm
ARB report (8-hr)	0.1 ppm	1.9 ppm	0.8 ppm

Source: Sierra Research

Table 4.4- 23. Assessment of Significance for Sulfur Dioxide: Field 390 Site

Measure of Significance	Level	Project-Related SO ₂ Levels	
		Generating Alternative 1	Generating Alternative 2
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	1,674 tons/year	1,224 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA Class I	2 µg/m ³ (annual)	17 µg/m ³	14 µg/m ³
	5 µg/m ³ (24-hr)	74 µg/m ³	60 µg/m ³
	25 µg/m ³ (3-hr)	263 µg/m ³	236 µg/m ³
SDOH/EPA Class II	20 µg/m ³ (annual)	17 µg/m ³	14 µg/m ³
	91 µg/m ³ (24-hr)	74 µg/m ³	60 µg/m ³
	512 µg/m ³ (3-hr)	263 µg/m ³	236 µg/m ³
SDOH/EPA <i>de minimis</i> (24-hr)	13 µg/m ³	74 µg/m ³	60 µg/m ³
SDOH/EPA significant (annual)	1 µg/m ³	17 µg/m ³	14 µg/m ³
SDOH/EPA significant (24-hr)	5 µg/m ³	74 µg/m ³	60 µg/m ³
SDOH/EPA significant (3-hr)	25 µg/m ³	263 µg/m ³	236 µg/m ³

Source: Sierra Research

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Fine Particulates. The impacts of the proposed project on fine particulates are shown in Table 4.4-24. Once again, the data show that the proposed project results in significant impacts for this pollutant when compared to a zero baseline due to exceedances of many of the emissions/concentration-based significance thresholds.

Table 4.4- 24. Assessment of Significance for Fine Particulates: Field 390 Site.

Measure of Significance	Significance Level	Project-Related PM ₁₀ Levels	
		Generating Alternative 1	Generating Alternative 2
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	411 tons/year	263 tons/year
SDOH/EPA Major Modification	15 tons/year		
SDOH/EPA BACT	15 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA Class I	4 µg/m ³ (annual) 8 µg/m ³ (24-hr)	5 µg/m ³ 19 µg/m ³	3 µg/m ³ 14 µg/m ³
SDOH/EPA Class II	17 µg/m ³ (annual) 30 µg/m ³ (24-hr)	5 µg/m ³ 19 µg/m ³	3 µg/m ³ 14 µg/m ³
SDOH/EPA <i>de minimis</i> (24-hr)	10 µg/m ³	19 µg/m ³	14 µg/m ³
SDOH/EPA significant (annual)	1 µg/m ³	5 µg/m ³	3 µg/m ³
SDOH/EPA significant (24-hr)	5 µg/m ³	19 µg/m ³	14 µg/m ³
<i>Measurement Accuracy and Reporting Precision</i>			
ARB accuracy (24-hr)	0.21 µg/m ³	18.6 µg/m ³	13.5 µg/m ³
ARB report (24-hr)	1 µg/m ³	18.6 µg/m ³	13.5 µg/m ³
ARB report (annual)	0.1 µg/m ³	4.6 µg/m ³	3.3 µg/m ³

Source: Sierra Research

4.4.8.4 Additional Mitigation Measures

As discussed in Section 4.4.6.4 above, additional mitigation measures are available in the form of more stringent emissions controls for the generating equipment. However, these more stringent controls may cause additional impacts that may also be significant.

4.4.9 AIR QUALITY IMPACTS - AIRPORT INDUSTRIAL AREA SITE

4.4.9.1 Ambient Concentrations

The maximum modeled ambient concentrations expected to result from Generating Alternatives 1 and 2 at the Airport Industrial Area Site are summarized in Table 4.4-25. For reference, the ambient air quality standards and increments are also shown, and the modeled impacts are shown as a percent of the applicable standard.

4.4.9.2 Compliance with Air Quality Standards

The ability of the proposed facilities to meet applicable air quality standards if they are developed on the Airport Industrial Area Site was evaluated using the same techniques used for the other two locations. Table 4.4-25 shows the maximum modeled concentration for each pollutant and averaging period for both alternatives, the existing background concentration of each pollutant, and the total modeled concentration. It also compares each total to the applicable standard and shows this as a percentage of the applicable standard.

4.4.9.3 Significance of Predicted Changes in Air Quality

The predicted increases in emissions and changes in air quality that are expected to result from the operation of the Lihue Energy Service Center at the Airport Industrial Area Site were compared with the criteria for significance discussed in Section 4.4.4. The results of the comparison are summarized below.

Ozone (O₃). Table 4.4-26 compares the impacts of the proposed project with various significance criteria for ozone. In this table, VOC and NO_x emissions are used to evaluate the significance of ozone impacts; there are no approved techniques available that can be used to estimate the change in ambient ozone concentrations due to any of the alternatives.

As shown in Table 4.4-27, all of the emission-based significance thresholds are exceeded by the proposed project. Thus the proposed project would be expected to have a significant impact on ozone, due to increases in hydrocarbon and NO_x emissions.

Nitrogen Dioxide (NO₂). Table 4.4-28 compares the impacts of the proposed project with various significance criteria for nitrogen dioxide. It shows that compared to a baseline of zero emissions/concentrations, the proposed project exceeds many of the emissions/concentration-based significance thresholds. Therefore, the proposed project would be expected to have a significant impact on nitrogen dioxide.

Carbon Monoxide (CO). The impact of the proposed project on carbon monoxide is shown in Table 4.4-29. The data show that, compared with a baseline of zero emissions/concentrations, the proposed project would exceed many of the emissions-based significance thresholds. However, all of the modeled CO impacts are below the significance and *de minimis* levels, so the project would not be expected to have a significant impact on carbon monoxide.

Sulfur Dioxide (SO₂). Table 4.4-30 shows the impacts of the proposed project on sulfur dioxide. The data show that, compared with a baseline of zero emissions/ concentrations, the proposed project would exceed many of the emissions/concentration-based significance thresholds and would be expected to have a significant impact on sulfur dioxide.

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Table 4.4- 25. Maximum Modeled Impacts at Airport Industrial Area Site.

<i>Pollutant/ Averaging Period</i>	<i>Maximum Modeled Impact ($\mu\text{g}/\text{m}^3$)</i>	<i>State Standard ($\mu\text{g}/\text{m}^3$)</i>	<i>Federal Standard ($\mu\text{g}/\text{m}^3$)</i>	<i>Project Impact as Percent of Strictest Standard</i>	<i>Class II Increment ($\mu\text{g}/\text{m}^3$)</i>
<i>Generating Alternative 1</i>					
NO ₂ – annual	22.4	70	100	32	25
SO ₂ – annual	19.8	80	80	25	20
SO ₂ – 24-hour	69.1	365	365	19	91
SO ₂ – 3-hour	137.2	1300	1300	11	512
CO – 8-hour	390.8	5,000	10,000	8	n/a
CO – 1-hour	928	10,000	40,000	9	n/a
PM ₁₀ – annual	5.2	50	50	10	17
PM ₁₀ – 24-hour	17.7	150	150	12	30
<i>Generating Alternative 2</i>					
NO ₂ – annual	20.2	70	100	29	25
SO ₂ – annual	13.9	80	80	17	20
SO ₂ – 24-hour	49.1	365	365	13	91
SO ₂ – 3-hour	99.4	1300	1300	8	512
CO – 8-hour	159.7	5,000	10,000	3	n/a
CO – 1-hour	458	10,000	40,000	5	n/a
PM ₁₀ – annual	3.2	50	50	6	17
PM ₁₀ – 24-hour	11.3	150	150	8	30

Source: Sierra Research

Table 4.4- 26. Total Ambient Concentrations at Airport Industrial Area Site.

Pollutant/ Averaging Period	Maximum Modeled Impact ($\mu\text{g}/\text{m}^3$)	Background Concentration ($\mu\text{g}/\text{m}^3$)	Total Ambient Concentration ($\mu\text{g}/\text{m}^3$)	State Standard ($\mu\text{g}/\text{m}^3$)	Federal Standard ($\mu\text{g}/\text{m}^3$)	Total Ambient Concentration as % of Strictest Standard
NO ₂ – annual	22.4	3.3	25.7	70	100	37
SO ₂ – annual	19.8	0.7	20.5	80	80	26
SO ₂ – 24-hour	69.1	6.7	75.8	365	365	21
SO ₂ – 3-hour	137.2	33.5	170.7	1300	1300	13
CO – 8-hour	390.8	456	846.8	5,000	10,000	17
CO – 1-hour	928.2	798	1,726.2	10,000	40,000	17
PM ₁₀ – annual	5.2	19.4	24.6	50	50	49
PM ₁₀ – 24-hour	17.7	37	54.7	150	150	36

Source: Sierra Research

Table 4.4- 27. Assessment of Significance of Hydrocarbons/Oxides of Nitrogen/Ozone: Airport Industrial Area Site

Measure of Significance	Level	Project-Related HC	Project-Related NOx
<i>Hydrocarbons/Oxides of Nitrogen Emissions-Based Measures – Industrial Sources</i>			
Generating Alternative 1			
SDOH/EPA Major Source	100 tons/year	3,200 tons/year	2180 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
Generating Alternative 2			
SDOH/EPA Major Source	100 tons/year	620 tons/year	2154 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Ozone Concentration-Based Measures – Industrial Sources</i>			
None	n/a	n/a	n/a
<i>Ozone Measurement Accuracy and Reporting Precision</i>			
ARB Accuracy	0.54 pphm	n/a	n/a
ARB Precision	1 pphm	n/a	n/a

Source: Sierra Research

PROBABLE IMPACTS OF THE PROPOSED ACTION

Table 4.4- 28. Assessment of Significance for Oxides of Nitrogen: Airport Industrial Area Site

Measure of Significance	Significance Level	Project-Related NO _x Levels	
		Generating Alternative 1	Generating Alternative 2
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	2,180 tons/year	2,154 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA Class I Annual	2.5 µg/m ³	22 µg/m ³	20 µg/m ³
SDOH/EPA Class II Annual	25 µg/m ³	22 µg/m ³	20 µg/m ³
SDOH/EPA <i>de minimis</i> Annual	14 µg/m ³	22 µg/m ³	20 µg/m ³
SDOH/EPA Significant Annual	1 µg/m ³	22 µg/m ³	20 µg/m ³
<i>Nitrogen Dioxide Measurement Accuracy and Reporting Precision</i>			
ARB Report Annual	0.1 pphm	1.2 pphm	1.1 pphm

Source: Sierra Research

Table 4.4- 29. Assessment of Significance for CO: Airport Industrial Area Site.

Measure of Significance	Level	Project-Related CO Levels	
		Generating Alternative 1	Generating Alternative 2
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	3,200 tons/year	3,012 tons/year
SDOH/EPA Major Modification	100 tons/year		
SDOH/EPA BACT	100 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA <i>de minimis</i> (8-hr)	575 µg/m ³	391 µg/m ³	160 µg/m ³
SDOH/EPA significant (8-hr)	500 µg/m ³	391 µg/m ³	160 µg/m ³
SDOH/EPA significant (1-hr)	2000 µg/m ³	928 µg/m ³	458 µg/m ³
<i>Carbon Monoxide Measurement Accuracy and Reporting Precision</i>			
ARB accuracy (1-hr)	0.27 ppm	0.8 ppm	0.4 ppm
ARB report (1-hr)	1 ppm	0.8 ppm	0.4 ppm
ARB report (8-hr)	0.1 ppm	0.3 ppm	0.1 ppm

Source: Sierra Research

Table 4.4- 30. Assessment of Significance for Sulfur Dioxide : Airport Industrial Area Site

Measure of Significance	Level	Project-Related SO ₂ Levels	
		Generating Alternative 1	Generating Alternative 2
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	1,674 tons/year	1,224 tons/year
SDOH/EPA Major Modification	40 tons/year		
SDOH/EPA BACT	40 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA Class I	2 µg/m ³ (annual)	20 µg/m ³	14 µg/m ³
	5 µg/m ³ (24-hr)	69 µg/m ³	49 µg/m ³
	25 µg/m ³ (3-hr)	137 µg/m ³	99 µg/m ³
SDOH/EPA Class II	20 µg/m ³ (annual)	20 µg/m ³	14 µg/m ³
	91 µg/m ³ (24-hr)	69 µg/m ³	49 µg/m ³
	512 µg/m ³ (3-hr)	137 µg/m ³	99 µg/m ³
SDOH/EPA <i>de minimis</i> (24-hr)	13 µg/m ³	69 µg/m ³	49 µg/m ³
SDOH/EPA significant (annual)	1 µg/m ³	20 µg/m ³	14 µg/m ³
SDOH/EPA significant (24-hr)	5 µg/m ³	69 µg/m ³	49 µg/m ³
SDOH/EPA significant (3-hr)	25 µg/m ³	137 µg/m ³	99 µg/m ³

Source: Sierra Research

Fine Particulates. The impacts of the proposed project on fine particulates are shown in Table 4.4-31. Once again, the data show that the proposed project results in significant impacts for this pollutant when compared to a zero baseline due to exceedances of many of the emissions/concentration-based significance thresholds.

4.4.9.4 Additional Mitigation Measures

As discussed above, the emission levels on which this evaluation of impacts is based assume use of a particular combination of emission control technologies. Technologies are available that can reduce emissions still farther, and their use would reduce ambient pollutant concentrations below the levels forecast. However, these more stringent controls would increase capital and operating costs. In many cases their use may cause additional impacts that may also be significant (e.g., chemicals handled on site, increased fuel consumption per megawatt-hour produced, etc.).

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Table 4.4- 31. Assessment of Significance for Fine Particulates: Airport Industrial Area Site

<i>Measure of Significance</i>	<i>Level</i>	<i>Project-Related PM₁₀ Levels</i>	
		<i>Generating Alternative 1</i>	<i>Generating Alternative 2</i>
<i>Emissions-Based Measures – Industrial Sources</i>			
SDOH/EPA Major Source	100 tons/year	411 tons/year	263 tons/year
SDOH/EPA Major Modification	15 tons/year		
SDOH/EPA BACT	15 tons/year		
<i>Concentration-Based Measures – Industrial Sources</i>			
SDOH/EPA Class I	4 µg/m ³ (annual)	5 µg/m ³	3 µg/m ³
	8 µg/m ³ (24-hr)	18 µg/m ³	11 µg/m ³
SDOH/EPA Class II	17 µg/m ³ (annual)	5 µg/m ³	3 µg/m ³
	30 µg/m ³ (24-hr)	18 µg/m ³	11 µg/m ³
SDOH/EPA <i>de minimis</i> (24-hr)	10 µg/m ³	18 µg/m ³	11 µg/m ³
SDOH/EPA significant (annual)	1 µg/m ³	5 µg/m ³	3 µg/m ³
SDOH/EPA significant (24-hr)	5 µg/m ³	18 µg/m ³	11 µg/m ³
<i>Measurement Accuracy and Reporting Precision</i>			
ARB accuracy (24-hr)	0.21 µg/m ³	18 µg/m ³	11 µg/m ³
ARB report (24-hr)	1 µg/m ³	18 µg/m ³	11 µg/m ³
ARB report (annual)	0.1 µg/m ³	5 µg/m ³	3 µg/m ³

Source: Sierra Research

4.4.10 CONCLUSIONS

The project-related emissions and changes in ambient air quality are expected to exceed the significance thresholds for some criteria pollutants and averaging periods for all site/generating technology combinations. This is to be expected from a power generating facility of this size. However, all of the site/generating technology combinations can comply with state and federal ambient air quality standards or increments.

4.4.11 OTHER AIR QUALITY-RELATED IMPACTS**4.4.11.1 Non-Criteria Pollutant Impacts**

As discussed in Section 4.4.3.3, Non-Criteria Pollutant Emissions section, emissions of non-criteria pollutants from the project will be minimized through the use of high quality fuel and efficient combustion processes and, for the coal-fired fluidized-bed boiler that is included in Generating Alternative 2, by the electrostatic precipitator that will be used for particulate control. These low emissions will be further diluted after they are emitted from the exhaust stacks. Impacts of non-criteria pollutants from the project are not expected to be significant.

4.4.11.2 Global Warming

Anticipated Non-Project Changes. Although scientific opinion is not unanimous, there is an emerging scientific consensus that human activities are increasing the concentration of infrared absorbing gases, e.g., carbon dioxide (CO₂) and several trace gases, in the atmosphere and that this is likely to lead to a measurable increase in average global surface temperature by the middle of the next century.

The EPA (U.S. Environmental Protection Agency, September 1998) estimates that global mean surface temperatures increased 0.6-1.2°F between 1890 and 1996. The 9 warmest years in this century all have occurred in the last 14 years. Of these, 1995 was the warmest year on record, suggesting the atmosphere has rebounded from the temporary cooling caused by the eruption of Mt. Pinatubo in the Philippines. The average temperature in Honolulu has increased 4.4 degrees F over the past century. Other observed environmental changes, including a decrease in Northern Hemisphere snow cover, a decrease in Arctic Sea ice, and continued melting of alpine glaciers, tend to corroborate the temperature data. Globally, sea levels have risen 4-10 inches over the past century, and precipitation over land has increased slightly. These and other data have led the Intergovernmental Panel on Climate Change to conclude that "...the balance of evidence suggests a discernible human influence on global climate."

Recent model calculations suggest that the global surface temperature could increase an average of 1.6-6.3°F by 2100, with significant regional variation (U.S. Environmental Protection Agency, September 1998). These temperature changes would be far greater than recent natural fluctuations, and they would occur significantly faster than any known changes in the last 10,000 years. The United States is projected to warm more than the global average, especially as fewer sulfate aerosols are produced. The models suggest that the rate of evaporation will increase as the climate warms, which will increase average global precipitation. They also suggest increased frequency of intense rainfall as well as a marked decrease in soil moisture over some mid-continental regions during the summer. Sea level is projected to rise by 6-38 inches by 2100.

Projections made by the Intergovernmental Panel on Climate Change and results from the United Kingdom Hadley Center's climate model (HadCM2) suggest that by 2100 temperatures in Hawaii could increase by 3°F (with a range of 1-5°F) in all seasons, slightly more in fall (U.S. Environmental Protection Agency, September 1998).

Future changes in precipitation in Hawaii are highly uncertain. This is because they depend in part on how El Niño might change, and no reliable projections of this are available. However, it appears possible that quite large precipitation increases could occur in summer (particularly) and fall. Other climate models may show different results, especially regarding estimated changes in precipitation.

The most obvious effect that this hypothesized increase in average global temperature could have on Hawaii is a rise in ocean level. It could also alter climatic patterns, and this, in turn, could have a number of secondary effects (e.g., changes in rainfall, increased air pollution, etc.).

Project-Related Effects. The proposed project will marginally increase the release of these greenhouse gases. The contribution it would make is so small that its effect would not be discernible. Nonetheless, these project-related releases could contribute to global warming.

4.5 HYDROLOGIC IMPACTS

4.5.1 TYPES OF IMPACTS ON SURFACE AND GROUNDWATER RESOURCES

Operation of the generating facilities at any of the three sites being considered will impact surface and groundwater resources in the following ways:

- a supply of 0.75 to 0.79 million gallons per day (MGD) must be committed to this new use;
- wastewater of 0.24 to 0.36 MGD must be disposed of in a satisfactory manner;
- storage and use of fuels onsite could impact surface or groundwater if there are spills or leaks; and
- the land use change from cultivated sugar cane to a power plant site will alter the quantity and quality of stormwater runoff.

Each of these impacts is discussed in this section.

4.5.2 COMMITMENTS OF SOURCES OF SUPPLY

4.5.2.1 Use of Surface Water Resources at the Puhi and Field 390 Sites

Water supply in the range of 0.75 to 0.79 MGD would be provided to the Puhi or Field 390 Sites from LPCO's irrigation system. This supply would come from the Upper or Lower Lihue Ditch. At either of these 17-acre sites, the net increase in surface water use would be the power plant's supply requirement less (i) the amount of wastewater returned for irrigation reuse and (ii) the amount of water now used for sugar cane irrigation which the power plant would displace. As shown in the tally below, the net increase in surface water use would be in the range of 0.3 to 0.4 MGD.

<i>Component of Water Use</i>	<i>Water Use by Generating Alternative (in MGD)</i>	
	<i>Alternative 1</i>	<i>Alternative 2</i>
Total Supply Requirement	0.75	0.79
Components that Lower Net Water Use:		
Wastewater Returned for Irrigation Reuse	0.23	0.36
Sugar Cane Irrigation Displaced	0.12	0.12
Net Increase in Surface Water Use	0.40	0.31

Note: The amount displaced sugar cane irrigation use is estimated for 17 acres at 7,000 GPD/acre.

For reasons summarized below, LPCO's historical use of surface water before and since the late 1980s demonstrate that this additional supply can be accommodated by LPCO's irrigation system without an adverse impact. Water diverted at the Upper Lihue Ditch's Waiahi Stream intake averaged 25 to 30 MGD up to and through most of the decade of the 1980s. Since that time, due to conversions from furrow to drip irrigation and the withdrawal of some fields from cultivation, the diverted flow has been in the range of 18 to 20 MGD, a reduction of 7 to 10 MGD. The projected net increase of 0.3 to 0.4 MGD for the power plant could easily be accommodated by this system.

At the Puhī Site, supply would either come directly by gravity from the Upper Lihue Ditch, a distance of 0.5 miles, or it would be pumped from the Lower Lihue Ditch over a distance of 1.1 miles. Unlike the longer, pumped delivery route, gravity delivered directly from the Upper Lihue Ditch would not have the benefit of reservoir storage.

A drawback to the gravity delivery alternative is that the uppermost section of the Upper Lihue Ditch (i.e., from its Waiahi Stream intake to the point where it crosses Hanamaulu Stream) is susceptible to landslides. Equipment access for repairs is difficult, so supply can be cut off for a week or more at a time. During such outages, a supplemental source would be necessary. One possibility would be to divert or pump water from Hanamaulu Stream and the adjacent unnamed stream to the south. Streamflow recordings made in a dry period this year indicate that their combined base flow would be adequate. Flow of both the streams empties into Kapaia Reservoir 0.5 to 0.7 miles downstream of their respective Upper Lihue Ditch crossings, ultimately to be used by the Lower Lihue Ditch system. If such diversions were made, even if only for short-term emergency use, approval of the State Commission on Water Resource Management (CWRM) would be required. A Stream Alteration Permit and possibly an amendment to the *Interim Instream Flow Standards* would also be required. The affected reaches of the streams would be the 0.5- to 0.7-mile distance from the diversions to Kapaia Reservoir.

At the Field 390 Site, supply would come from Kapaia Reservoir via two possible fashions. The first is by gravity from the Aii Reservoir, necessitating construction of a 1.4-mile long pipeline. The second is pumping from the Lower Lihue Ditch, a shorter distance of 0.5 miles with a relatively modest pumping lift. In either case, the supply would originate from Kapaia Reservoir and the quantities available for this use are more than adequate. Kapaia Reservoir receives water released from the Upper Lihue Ditch, typically in the range of 5 to 10 MGD. It also receives runoff from the 2.1 square mile basin naturally tributary to it. Based on runoff-rainfall relationships of gaged streams in the Lihue Basin, this natural runoff is on the order of 5 to 7 MGD as year-round average.

In the event that cultivation of sugar cane is terminated and it is not replaced by other agricultural uses which warrant operating and maintaining LPCO's irrigation system, KE would have to assume responsibility for continuing the supply of surface water for either the Puhī or Field 390 Sites. Since KE would need only a small fraction of the water that LPCO now uses for agriculture, it would need to maintain only part of the existing system. Sufficient flow in the Upper Lihue Ditch could be obtained with diversions from the Hanamaulu and unnamed adjacent streams. Adequate supply for the Lower Lihue Ditch would be provided by the streams naturally tributary to Kapaia Reservoir. For this possible "without LPCO" scenario, there is a clear advantage to using the Lower Lihue Ditch since no field changes or new permits would be required.

4.5.2.2 Use of Groundwater Resources at the Airport Industrial Area Site

The power plant at this location would displace the sugar cane presently cultivated on the site. This would stop the consumption of the approximately 0.12 MGD of surface water used for irrigation. In lieu of the surface water, the facility would require 0.75 to 0.79 MGD of groundwater. None of the process wastewater would be available for reuse; it would be disposed of via onsite injection wells.

If proven feasible, new supply wells would be developed along the western and/or southern boundary of the site (depending on the groundwater gradient), with a spacing of about 300 feet between wells. If capacities are similar to the wells developed for the Kauai Lagoons Resort, the 0.75 to 0.79 MGD requirement could be provided by two wells with a third providing standby capacity. Because of their location, these new wells would not adversely impact existing uses of groundwater. All of the Department of Water's (DOW) production wells above Lihue and in Puhī are more than 2.5

miles away. DOW's sites for well development in Hanamaulu are also more than two miles inland. Groundwater levels at all of these inland well sites are substantially higher than the 100-foot elevation of the Airport Industrial Area Site. The nearest wells are those of the Kauai Lagoons Resort which are 1.2 miles to the south. Due to expected groundwater flow directions (toward Hanamaulu Bay at the Airport Industrial Area Site and toward Nawiliwili Bay at Kauai Lagoons), little or no interference among these wells is anticipated.

If the new wells are not able to provide all of the water that is needed, the balance would be obtained from wells at the Kauai Lagoons Resort. The Resort's Well No. 1 (State No. 5821-03), which is outfitted with a 350 GPM (0.5 MGD) pump, would be used for this purpose. It would be the easiest point of connection for the power plant and it is the furthest from the Resort's irrigation system. The Resort could accommodate this use because its other sources are adequate to meet the irrigation requirements of its two 18-hole golf courses. The golf courses' primary source of supply is effluent from the County's Lihue Wastewater Treatment Plant, currently averaging about 1.3 MGD. With the commitment of all or a portion of Well 1 to the power plant, the Resort's Wells 2 and 3 (State Nos. 5821-04 and 5820-01), which have a combined capacity of 0.8 MGD, would still be available for golf course use.

4.5.3 DISPOSAL OF PROCESS WASTEWATER

4.5.3.1 Puhi and Field 390 Sites

Process wastewater, in the range of 0.23 to 0.36 MGD, would be returned from either the Puhi Site or Field 390 Site to the Lower Lihue Ditch. A short distance downstream, the ditch empties into DeMello Reservoir which has a 10 to 15 million gallon (MG) storage capacity. Wastewater, diluted by mixing with the normal flow of surface water in the Lower Lihue Ditch, would then be used at LPCO's mill or for irrigation.

The quality of the surface water that would be typically used at either site is shown in detail on Table 4.5-1. During periods of wet weather, constituent concentrations would be changed as shown on Table 4.5-2. The only significant differences are the higher levels of turbidity and suspended solids during wet weather, necessitating use of mechanical filtration pre-treatment. Based on these constituent levels for the raw water supply, the anticipated process water quality would be as shown on Table 4.5-3. The primary change in quality would be the several-fold increase in the levels of constituents already in the raw water supply. Very minute concentrations of chemicals would also be added to minimize scaling and other types of fouling of the treatment and generating equipment. The quality of this process wastewater would be acceptable to use directly in the mill or for irrigation without dilution. However, when it is returned to the LPCO system for reuse, it would be diluted more than 20 fold as a result of mixing with the other water in the irrigation system.

In the event that sugar cane cultivation ceases and is not replaced by other agricultural uses which warrant operating and maintaining the LPCO irrigation system, other reuse of the process wastewater would have to be found. This could be accomplished by converting sugar cane fields to irrigated pasture of sufficient area to utilize all of the process water. About 200 acres and the continued use of DeMello Reservoir for wet weather storage would be necessary to ensure an adequate means of disposal.

Table 4.5 - 1. Dry Weather Surface Water Source Quality.

Constituent	Units	Location at Which Sample Collected		
		Upper Lihue Ditch	Lower Lihue Ditch	De Mello Reservoir
Total Alkalinity	mg/l as CaCO ₃	20.2	21.2	20.6
Ammonia - Nitrogen	mg/l as N	2.8	1.4	5.6
Bicarbonate Alkalinity	mg/l as CaCO ₃	20.2	21.2	20.6
Total Organic Carbon	mg/l as C	1.38	1.78	2.05
Chloride	mg/l	20	13	14
pH	std. units	7.27	7.14	7.25
Nitrate - Nitrogen	mg/l as N	47.6	42.7	39.9
Total Nitrogen	mg/l as N	362.6	354.9	359.1
Total Phosphorus	mg/l as P	23.3	26.4	29.5
Silica	mg/l as SiO ₂	5.33	5.10	4.79
Total Silica	mg/l as SiO ₂	5.53	5.28	4.82
Specific Conductance	microsiemen/cm	87	86	88
Sulfate	mg/l	0.159	0.181	0.401
Turbidity	ntu	2.8	5.7	6.3
Total Dissolved Solids	mg/l	43	42	43
Total Suspended Solids	mg/l	2.33	6.20	2.53
Fluoride	mg/l as F	0.027	0.027	0.028
Barium	mg/l	<0.001	<0.001	<0.001
Cadmium	mg/l	<0.003	<0.003	<0.003
Calcium	mg/l	3.10	3.39	3.05
Chromium	mg/l	<0.003	<0.003	<0.003
Copper	mg/l	<0.002	<0.002	<0.002
Iron	mg/l	<0.010	0.741	0.430
Lead	mg/l	0.002	<0.002	0.002
Magnesium	mg/l	3.52	3.61	3.38
Manganese	mg/l	<0.001	<0.001	0.003
Potassium	mg/l	0.438	<0.50	<0.50
Selenium	mg/l	<0.002	<0.002	<0.002
Silver	mg/l	0.003	0.009	<0.002
Sodium	mg/l	6.65	6.51	6.39
Tin	mg/l	<0.50	<0.50	<0.50
Zinc	mg/l	0.007	<0.002	<0.002
Mercury	mg/l	<0.0002	<0.002	<0.002

Note: Samples were collected on January 9, 1998 by TNWRE. Analyses of the metals was done by Associated Laboratories in Orange, California. All other analyses were done by Marine Analytical Specialists in Honolulu.

Source: Compiled by Tom Nance Water Resource Engineering, Inc.

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Table 4.5 - 2. Comparative Dry and Wet Weather Water Quality of the Upper Lihue Ditch.

<i>Constituent</i>	<i>Units</i>	<i>Dry Weather Sample of 1/9/98</i>	<i>Wet Weather Sample of 11/3/95</i>
Total Alkalinity	mg/l as CaCO ₃	20.2	28.2
Ammonia - Nitrogen	mg/l as N	2.8	0.38
Bicarbonate Alkalinity	mg/l as CaCO ₃	20.2	28.1
Total Organic Carbon	mg/l as C	1.38	Not Tested
Chloride	mg/l	20	12
pH	std. units	7.27	7.30
Nitrate - Nitrogen	mg/l as N	47.6	1.33
Total Nitrogen	mg/l as N	362.6	2.19
Total Phosphorus	mg/l as P	23.3	0.50
Silica	mg/l as SiO ₂	5.33	6.46
Total Silica	mg/l as SiO ₂	5.53	6.61
Specific Conductance	microsiemen/cm	87	100
Sulfate	mg/l	0.159	26
Turbidity	ntu	2.8	1,150
Total Dissolved Solids	mg/l	43	49
Total Suspended Solids	mg/l	2.33	10,685
Fluoride	mg/l as F	0.027	0.041
Barium	mg/l	<0.001	0.003
Cadmium	mg/l	<0.003	0.0009
Calcium	mg/l	3.10	10.85
Chromium	mg/l	<0.003	0.006
Copper	mg/l	<0.002	0.004
Iron	mg/l	<0.010	0.213
Lead	mg/l	0.002	0.007
Magnesium	mg/l	3.52	1.26
Manganese	mg/l	<0.001	0.0035
Potassium	mg/l	0.438	3.08
Selenium	mg/l	<0.002	0.0002
Silver	mg/l	0.003	<0.00003
Sodium	mg/l	6.65	5
Tin	mg/l	<0.50	Not Tested
Zinc	mg/l	0.007	0.026
Mercury	mg/l	<0.0002	0.0001

Note: Both sets of samples were collected by TNWRE. Analyses of the metals was done by Associated Laboratories in Orange, California. All other analyses were done by Marine Analytical Specialists in Honolulu.

Source: Compiled by Tom Nance Water Resource Engineering, Inc.

Table 4.5 - 3. Expected Wastewater Quality for the Puhi and Field 390 Sites Utilizing Surface Water as the Source of Supply

<i>Water Quality Constituent</i>	<i>Units</i>	<i>Quality of Raw Water Supply</i>	<i>Wastewater Quality</i>	
			<i>Generating Alternative 1</i>	<i>Generating Alternative 2</i>
Major Constituents of the Source Supply				
Calcium	mg/l	3.2	6.0	4.0
Magnesium	mg/l	3.6	7.0	4.6
Sodium	mg/l	6.6	38	24
Potassium	mg/l	0.4	0.6	0.4
Sulfate	mg/l	0.17	12	7
Chloride	mg/l	17	32	22
Nitrate(as N)	mg/l	45	10	10
Silica (as SiO ₂)	mg/l	5.4	9	6
Total Dissolved Solids	mg/l	43	230	150
Total Suspended Solids	mg/l	4.3	>50	>50
pH	pH Units	7.2	6 to 9	6 to 9
Oil and Grease	mg/l	negligible	negligible	negligible
Constituents Added During Water Processing				
RO Antiscalant	mg/l	--	<0.001	<0.001
RO Bisulfate	mg/l	--	<0.001	<0.001
Boiler Cyclohexylamine	mg/l	--	<0.001	<0.001
Boiler Phosphate	mg/l	--	<0.001	<0.001
Boiler Hydroquinone	mg/l	--	<0.001	<0.001
Notes:				
1. The raw water supply constituent levels are an average of the Upper and Lower Lihue Ditch samples as shown in Table 4.5-2.				
2. Wastewater quality is based on analyses by Stone and Webster, December 1995.				

Source: Compiled by Tom Nance Water Resource Engineering, Inc.

4.5.3.2 Airport Industrial Area Site

With groundwater as the source of supply at the Airport Industrial Area Site, dissolved constituent levels would be higher in both the raw water and the process wastewater than if surface water were the source. Estimated constituent levels for raw water supply and process washwater for disposal are presented in Table 4.5-4 using the quality of Wells 1 and 2 at the Kauai Lagoons Resort as a guide. Concentrations in the filter and reverse osmosis reject water would make the process wastewater slightly brackish, although it would still be suitable for most irrigation use. At this site, however, all of the process wastewater would be put into disposal wells and delivered to strata about 300 to 500 feet below sea level. The receiving groundwater at these depths may also be slightly brackish.

Ultimately this water would find its way into the ocean at some distance offshore. Due to its original chemistry and the dilution that would occur in the receiving water, no adverse impact is anticipated.

4.5.4 DISPOSAL OF DOMESTIC AND SANITARY WASTEWATER**4.5.4.1 Puhi Site**

Domestic and sanitary wastewater, anticipated to average about 1,500 gallons per day, would be treated in a septic tank and the liquid fraction would be disposed of in a leach field. The State Department of Health (SDOH) requires that the wastewater disposal system be set back 1,000 feet from any drinking water source. At the Puhi Site, the only drinking water well within 1,000 feet is DOW's Garlinghouse Tunnel (State No. 5823-01). The 1000-foot setback requirement would only allow the leach field to be located at the western end of the site. Elevations at this end of the Puhi Site are between 325 and 330 feet and are the highest anywhere on the property. Since there is a slope across the site from west to east, wastewater would be delivered by gravity to a septic tank near the lower, east end of the site. Its liquid effluent would be pumped back across the site to the disposal field on the higher west end.

Depending upon the actual depth to groundwater and the stratigraphy beneath the west end of the Puhi Site, the leach field percolate would either move laterally (to the south) and seep into Nawiliwili Stream or it would move down into the underlying groundwater body. Key elevations and distances to consider are:

- The subsurface leach field is at elevation 325 feet.
- Directly to the south, Nawiliwili Stream is at elevations of 230 to 240 feet and is on the order of 500 feet away from the probable leach field location.
- The skimming tunnel of DOW's Garlinghouse Tunnel facility is on the south side of Nawiliwili Stream and at an elevation below the invert of the stream.
- The elevation of the Garlinghouse Tunnel floor is 187 feet.
- As Nawiliwili Stream flows past this tunnel, its elevation drops from 220 to 200 feet.

Given these elevations and distances, it is conceivable that the groundwater gradient caused by DOW's pumping from the tunnel could draw leach field percolate into it. Should this occur, the subsurface travel distance would be more than 1,000 feet. Moreover, based on a disposal rate of 1,500 GPD compared to DOW's pumping rate of Garlinghouse Tunnel, the dilution would be 650 to 1,300 fold.

Table 4.5 - 4. Expected Wastewater Quality for the Airport Industrial Area Site Utilizing Groundwater as the Source of Supply

<i>Water Quality Constituent</i>	<i>Units</i>	<i>Quality of Raw Water Supply</i>	<i>Wastewater Quality</i>	
			<i>Generating Alternative 1</i>	<i>Generating Alternate 2</i>
Major Constituents of the Source Supply				
Calcium	mg/l	40	75	50
Magnesium	mg/l	45	90	60
Sodium	mg/l	70	400	250
Potassium	mg/l	6	9	9
Sulfate	mg/l	9	500	400
Chloride	mg/l	200	400	260
Nitrate(as N)	mg/l	2.6	0.6	0.6
Silica (as SiO ₂)	mg/l	30	950	633
Total Dissolved Solids	mg/l	450	2,400	1,500
Total Suspended Solids	mg/l	<0.5	>50	>50
pH	pH Units	7.0	6 to 9	6 to 9
Oil and Grease	mg/l	Negligible	Negligible	Negligible
Constituents Added During Water Processing				
RO Antiscalant	mg/l	--	<0.001	<0.001
RO Bisulfate	mg/l	--	<0.001	<0.001
Boiler Cyclohexylamine	mg/l	--	<0.001	<0.001
Boiler Phosphate	mg/l	--	<0.001	<0.001
Boiler Hydroquinone	mg/l	--	<0.001	<0.001
Notes:				
1. The raw water supply constituent levels estimates are based on analysis of water from Well Nos. 1 and 2 in the Kauai Lagoons Resort.				
2. Wastewater quality estimate is based on analyses by Stone and Webster, December 1995.				

Source: Compiled by Tom Nance Water Resource Engineering, Inc.

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4.5.4.2 Field 390 Site

If the DOW ultimately deepens its Hanamaulu 1 test well (State No. 0022-01) and puts it into production, the required 1,000-foot setback would prevent use of 300 feet of the north end of the Field 390 Site for leach field disposal. This would not create a problem, however. The north end of the site is at the highest elevation (280 to 285 feet). The leach field would be located at the south end, an additional 1,000 feet away from the well and about 25 to 30 feet lower in elevation (250 to 255 feet).

Leach field discharge would either seep into Hanamaulu Stream or reach the underlying groundwater table. The stream meanders between 500 and 1,100 feet to the south of the prospective leach field location. Its invert declines from 160 to 130 feet in elevation as it passes the southern end of the site, or about 90 to 120 feet lower than the leach field itself. Actual water table elevations below the site are unknown, but a gradient to the south toward Hanamaulu Stream as the receiving water is plausible. In any case, there are no existing or planned drinking water wells down-gradient.

4.5.4.3 Airport Industrial Area Site

The west-to-east slope across this site (from 115 feet at its west end to 90 feet at the east end) suggests that the appropriate leach field site would be along the eastern property boundary. Since the process wastewater disposal wells would also be located there, they would theoretically provide an alternative means of subsurface disposal for domestic and sanitary wastewater. However, use of a leach field would simplify the Underground Injection Permit (UIC permit) for the wells and would enable all disposal to be by gravity.

If underlying groundwater conditions are similar to those beneath the Kauai Lagoons Resort, the upper, semi-confined groundwater body will be within several tens of feet of the ground surface and would be the receiving water for leach field percolate. Other than supply for the power plant, there are no current or planned uses of this groundwater source in the near vicinity. Its points of natural discharge are assumed to be along the shoreline or some distance offshore, but they are not known exactly.

4.5.5 POTENTIAL LEAKS OR SPILLS OF FUELS

Fuel oil will be trucked to, stored within, and piped around the site to the various generating units. Effective fuel containment measures will be required to avoid contaminating groundwater or surface water. Double linear systems with alarms as described below would be employed at whichever site is ultimately chosen.

- The primary containment devices would be storage tanks and pipelines. By using time-tested proper design and materials and by diligently pursuing an inspection and maintenance program, the chance of leakage from these primary containments would be minimized.
- Additional protection would be provided by a system of secondary containment and leak detection sensors connected to alarms. Secondary containment would be provided around tanks and pipelines to prevent the spread of petroleum in the unlikely event it should escape the primary containment. The combination of sensitive leak detection and high quality composite liners for secondary containment reduces the probability of petroleum escaping offsite and into the environment to a very low level.

Federal (CFR 40 §110 and §112) and State (HAR, Title 11, Chapter 451) rules and regulations have been promulgated to prevent oil pollution and to create procedures regarding discovery and

notification of oil releases. When it prepares detailed construction plans for the facility, KE will submit a Spill Prevention Control and Countermeasure (SPCC) plan to the SDOH. This plan will:

- Identify all areas and equipment with the potential for fuel or lube oil spills, leaks, or other releases;
- For each identified potential release point:
 - describe the containment system,
 - identify possible spill routes,
 - describe contingency actions and special precautionary measures KE would take, and
 - establish procedures to maximize compliance with Federal and State rules and regulations.
- Describe prevention and control procedures, including maintenance, monitoring, personnel training, and regular inspections and testing; and
- Identify spill response and notification procedures.

The system described above, when operated in compliance with applicable rules and regulations, makes fuel leakage from the facility highly unlikely. However, it does not address potential spills from trucks hauling fuel to the site. Among the three sites being considered, the Puhi Site raises the greatest concern in this regard due to its proximity to the Garlinghouse Tunnel along Nawiliwili Stream. Department of Transportation regulations that govern the design and operation of tanker trucks require that they carry spill containment devices and materials. Fire Department personnel are trained in pollution control in the event of accidents. KE would maintain additional trained personnel and supplies on-site that would be used to supplement the materials carried on the trucks during their drive from the harbor to the proposed power plant site.

4.5.6 CHANGES IN QUANTITY & QUALITY OF STORMWATER RUNOFF

4.5.6.1 Change in Ground Cover and Runoff Propensity

Sugar cane is presently cultivated at all three sites being considered. The Puhi and Field 390 Sites are drip-irrigated whereas the Airport Industrial Area Site is furrow-irrigated. Conversion of approximately 14.5 acres from sugar cane to a power plant at any of these sites would be a change to the following types of ground surfaces:

<i>Type of Ground Cover</i>	<i>Acres</i>
Impervious:	
Pavement and Roofs	7.3
Containment Areas (Using Oil/Water Separators)	2.2
Pervious:	
Gravel and Roofs or Equipment Which Drain to Gravel Areas	5.2
<i>Subtotal</i>	<i>14.7</i>
Natural Vegetation	<u>2.3</u>
GRAND TOTAL	17.0

The Soil Conservation Service (SCS) Curve Number (CN) method can be used to quantify the expected change in runoff propensity brought about by this change in land surface. The soil on the Puhi and Field 390 Sites is classified as hydrologic class A. The soil on the Airport Industrial Area

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Site is hydrologic class B. The changes in ground cover by construction of the power plant would result in the changes in the SCS CN values shown in Table 4.5-5.

Table 4.5 - 5. Prospective Changes in SCS Runoff (CN) Values

<i>Land Use/Ground Cover</i>	<i>Puhi and Field 390 Sites (Class A Soil)</i>	<i>Airport Industrial Area Site (Class B Soil)</i>
Sugar cane (Contoured Planting)		
Limited Cover	65	75
Partial Cover	25	59
Complete Cover	6	35
Weighted Average (Rounded)	32	56
Power Plant Site		
Contaminant Areas (2.2 Ac.)	95	95
Pavement and Roofs (7.3 Ac.)	95	95
Gravel Areas (5.2 Ac.)	39	61
Perimeter Landscaping (2.3 Ac.)	39	61
Weighted Average (Rounded)	70	80

4.5.6.2 Increase in Stormwater Runoff Volume

To illustrate the increase in stormwater runoff volume, three storm events as defined by the Weather Bureau's "Rainfall Frequency Atlas of the Hawaiian Islands" (Technical Paper No. 43, 1962) were chosen: 2-year, 6-hour; 10-year, 6-hour; and 50-year, 6-hour. At each of the three potential sites, storm rainfall amounts are slightly different:

Location	Storm Rainfall (Inches)		
	2-Year, 6-Hour	10-Year, 6-Hour	50-Year, 6-Hour
Puhi Site	4.5	7.0	9.5
Field 390 Site	4.7	7.3	9.8
Airport Industrial Area Site	4.3	6.9	9.4

Comparative runoff volumes for these rainfall events before and after conversion from sugar cane to a power plant site can be computed using the SCS method and the parameter values presented above. These differences in runoff volumes, expressed in acre-feet, would be as shown in Table 4.5-6.

Table 4.5 - 6. Estimated Changes in Storm Runoff.

Land Use	Storm Runoff Volumes (acre-feet)		
	2-Year, 6-Hour	10-Year, 6-Hour	50-Year, 6-Hour
Puhi Site:			
Sugar cane	0.004	0.446	1.473
Power Plant	2.371	5.126	8.185
Increase	2.367	4.680	6.712
Field 390 Site:			
Sugar cane	0.013	0.542	1.628
Power Plant	2.574	5.481	8.565
Increase	2.561	4.939	6.937
Airport Industrial Area Site:			
Sugar cane	0.996	3.051	5.535
Power Plant	3.247	6.520	9.843
Increase	2.251	3.469	4.308

Source: Tom Nance Water Resource Engineering

These calculations show that there would be a substantial percentage increase in runoff volume from a 17-acre power plant site at any of the three sites being considered (see Table 4.5-7). However, as evidenced by the watershed sizes and approximate runoff volumes in Nawiliwili and Hanamaulu Streams presented below, this increase is generally less than one percent for the Puhi and Field 390 Sites. At the Airport Industrial Area Site, runoff would be discharged into the adjacent sugar cane stormwater system, at least on an interim basis until the surrounding areas are industrialized and a stormwater conveyance system is constructed.

4.5.6.3 Change in Stormwater Discharge Points

With sugar cane cultivation, stormwater containment is provided by small perimeter earthen berms on the lower sides of each of the three sites. Depending on the magnitude of the rainfall event, overtopping of the berms at low points on the perimeter does occur.

At the Puhi Site, the overtopping runoff drops into Nawiliwili Stream or its tributary gulch at the eastern end of the site. This vertical drop from the site into the stream is 80 to 100 feet at the west end but only about 15 feet into a gully at the east end. With the power plant's construction at this site, all runoff would be conveyed from west to east across the property and conveyed into the tributary gully. It would require a drop structure that would include energy dissipaters to reduce flow velocities into the gully.

At the Field 390 Site, most runoff currently discharges at a topographic low point about midway along the southern boundary. The vertical drop from there into Hanamaulu Stream is about 100 feet. With conversion to a power plant, a more cost effective discharge point would be at the southwest corner of the site. The vertical drop there would be 90 feet and the length of the discharge structure would be about 350 feet. Energy dissipaters would be required along and at the bottom of this structure.

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Table 4.5 - 7. Comparative Runoff Volumes.

Power Plant Site	Runoff in acre-feet by Storm Event		
	2-Year, 6-Hour	10-Year, 6-Hour	50-Year, 6-Hour
Puhi Site:			
Increase Due to Power Plant (Ac-Ft)	2.367	4.680	6.712
Nawiliwili Stream at Site			
Runoff Volume (Ac-Ft)	79.0	183.1	310.4
Percent Increase	3.0	2.6	2.2
Nawiliwili Stream at Shoreline Discharge			
Runoff Volume (Ac-Ft)	237.9	607.5	1049.1
Percent Increase	1.0	0.8	0.6
Field 390 Site:			
Increase Due to Power Plant (Ac-Ft)	2.561	4.939	6.937
Hanamaulu Stream at Site			
Runoff Volume (Ac-Ft)	417.4	974.2	1571.6
Percent Increase	0.6	0.5	0.4
Hanamaulu Stream Shoreline Discharge			
Runoff Volume (Ac-Ft)	649.6	1620.4	2723.7
Percent Increase	0.4	0.3	0.3
Notes:			
(1) Sizes of the Nawiliwili and Hanamaulu watersheds were given previously.			
(2) For illustrative purposes, it has been assumed that the Nawiliwili and Hanamaulu basins have CN values of 55. Respective rainfalls have been taken as the value at the center of the basin.			

Source: Tom Nance Water Resource Engineering

The ground at the Airport Industrial Area Site slopes from west to east. Sugar cane fields between the site and the shoreline provide two potential stormwater discharge points which could be utilized until the adjacent area is developed and a stormwater conveyance system is constructed. Runoff from these fields is diverted into a retention sump at their *makai* end. If runoff overtops the sump, it crosses Ahukini Road or cascades down the valley wall to Hanamaulu Bay.

The stormwater discharges described above would be directed into or ultimately reach regulated bodies of water (Nawiliwili Stream, Hanamaulu Stream, and/or the shoreline). These will require National Pollution Discharge Elimination System (NPDES) permits. Coverage will come under the general permit for discharges associated with industrial activities. This will entail the preparation and approval of a Stormwater Pollution Control Plan (SWPCP) that will contain the following:

- A description of the facility and all associated drainage conveyances and patterns of flow;
- Identification of all sources of potential pollution;
- Design of Best Management Practices (BMPs) to mitigate pollution; and
- A BMP implementation plan.

4.5.6.4 Change in Stormwater Runoff Quality

Runoff from sugar cane fields typically has high turbidity, high suspended solids, and higher-than-background levels of fertilizer chemicals such as nitrate. The conversion to a power plant site will provide a more stable land surface which will not be susceptible to soil loss by erosion. Using drainage structures to deliver runoff to the stream or gully below would also eliminate the erosion which occurs when runoff overtops perimeter berms and cascades down steep slopes. These changes mean the power plant runoff is likely to have lesser turbidity, suspended solids, and fertilizer chemicals than does runoff from the existing agricultural fields.

On the other hand, runoff from the power plant will have the potential of being contaminated by fuel oil, lube oil, and other wash-waters. Minimizing, if not eliminating, the escape of these pollutants, will require effective use of BMPs.

4.6 IMPACTS ON VEGETATION

4.6.1 PROJECT COMPONENTS ABLE TO IMPACT VEGETATION

The principal means through which the proposed project could affect vegetation is through ground clearance and the erection of new structures. These would either occur, or be initiated during the construction phase. Factors related to the ongoing operation of the facilities (e.g., noise, wastewater discharges, vehicular traffic, and other emissions associated with the ongoing operation of the facilities) do not have the potential to cause significant effects of this nature.

4.6.2 IMPACTS ON FLORA — PUHI SITE

As noted in Chapter 3, KE planted trees around the perimeter of the site to create a visual barrier between it and surrounding areas. There is a line of ironwood trees over 15 feet tall along the lower (Nawiliwili Stream) side of the property. Ironwood, koa (*Acacia koa*) and *Eucalyptus sp.* are planted along the cane haul road side of the site. It is expected that the ironwoods will have reached a height of nearly 30 feet by 2002, when the first generating unit is expected to be operational. The koa will be about 15 feet high by that time. The anticipated tree heights at maturity for the different species of trees that have been planted as a screen are: ironwood, 60 feet; eucalyptus, 100 feet; and koa, 45 feet. Maturity is about 20 to 25 years for these species.

Most of this site is actively cultivated in sugar cane. The species that are present in the few naturally vegetated areas are common introduced species. No endangered botanical species are present on this site. Consequently, no impact on important botanical resources is expected should this site be selected for development.

4.6.3 IMPACTS ON FLORA — FIELD 390 SITE

As described in Section 3.5, this site is cultivated in sugar cane and the vegetation on immediately adjacent areas is comprised of common introduced species. The nearest wetlands are small, man-made ponds located upgradient of the site, and they would not be affected by the proposed development. There are no endangered or federally listed plant species in the area that would be affected.

4.6.4 IMPACTS ON FLORA — AIRPORT INDUSTRIAL AREA SITE

As described in Section 3.5, this site is cultivated in sugar cane and the vegetation on immediately adjacent areas is comprised of common introduced species. No listed or endangered species are present that could be affected.

4.7 IMPACTS ON FAUNA

4.7.1 PROJECT COMPONENTS ABLE TO IMPACT FAUNA

The principal means through which the proposed project could affect fauna is through ground clearance and the erection of new structures. The latter includes electrical power transmission lines (poles and towers) linking the facilities to KE's electrical power transmission grid. These either would occur, or be initiated, during the construction phase. Because of the project's design, factors related to the ongoing operation of the facilities (e.g., noise, wastewater discharges, vehicular traffic, and emissions associated with the ongoing operation of the facilities) do not have the potential to cause significant effects of this nature.

Both Dark-rumped Petrels and Newell's Shearwaters cross the eastern coastline of Kauai across a broad front and in relatively large numbers during the breeding season. While none were seen directly over any of the three sites under consideration during the course of the survey conducted for this project, several Dark-rumped Petrel were seen flying over Hanamaulu Gulch just north of the Airport Industrial Area Site. Based on long-term observations of the behavior of this species, it is likely that they occasionally overfly all of the sites. Exterior lighting can disorient both species of seabirds; this is especially true of fledgling birds flying to sea in the fall. When disoriented, they can collide with manmade structures. If the collision does not kill them outright, the dazed birds are easy prey to feral mammals.

The electrical transmission lines and supporting towers are the most significant aspects of the proposed Lihue Energy Service Center from the perspective of potential effects on terrestrial and avian biota. Many investigators believe that collision with utility structures is the second most significant cause of mortality of these seabird species in Hawaii (Day and Cooper, 1995; Cooper and Day, 1994, Ainsley and Podosky, 1993).¹⁷

Studies on the Hanalei coast suggest that topographic features such as ridges and valleys affect the movement of both Newell's Shearwaters and Dark-rumped Petrels as they move between the land and sea, funneling them into relatively narrow corridors (Day and Cooper, 1995). Results of these studies indicate that the potential for these birds to collide with electrical transmission lines is greatest when the lines are parallel to the shoreline. They also suggest that vertical cable arrays (i.e., arrangements where the electrical conductors are arranged one-above-the-other) present more of a barrier than do horizontal cable arrays (where the conductors are located side-by-side).

4.7.2 IMPACTS ON FAUNA — PUHI SITE

As discussed in Chapter 3, the Puhi Site is already a disturbed habitat. It does not offer an unusual or particularly important habitat for wildlife. The transmission lines needed to connect generating facilities located at this site with the existing transmission system are short (a single segment across Nawiliwili Stream Gulch). Because this line would be perpendicular to the shoreline, it has limited potential to interfere with the movement of seabirds.

While survey results indicate that the Hawaiian hoary bat is present in the gully adjacent to this site, it is unlikely that development of the proposed facilities would have a deleterious effect on the species. This is principally because it does not involve changing the vegetation in the gulch, which provide both roosting and feeding habitat. Unlike the seabirds discussed above, which have are known to collide with manmade structures, bats are uniquely adapted to navigating in tight quarters when visibility is low, and they are not disoriented by artificial lighting. In fact, by attracting insects from nearby areas, on-site lighting at the proposed facilities could serve to concentrate the insects on which the bats prey, making it easier for them to forage.

4.7.3 IMPACTS ON FAUNA — FIELD 390 SITE

From the perspective of its potential effects on fauna, development of the Lihue Energy Service Center on the Field 390 Site is similar to the Puhi Site. It is already a disturbed habitat, and it does not offer an unusual or particularly important habitat for wildlife. The existing topography would prevent runoff from the site from entering the small manmade wetlands located north of the cane haul road crossing of Hanamaulu Gulch. The only known pathway through which project-related activi-

¹⁷ The primary cause of mortality in both species is thought to be predation by alien mammalian species at the nesting colonies.

ties could affect these manmade wetlands is through an accident by fuel trucks using the road to transport fuel to and from the site.

The transmission lines needed to connect the first generating unit that would be constructed at this site run along the existing cane haul road. KE would replace existing poles that carry distribution lines with taller poles that carry both transmission and distribution lines, minimizing the potential for adverse effect from that aspect of the change. However, the modification would increase the number of wires present. This, and the fact that the wires run perpendicular to Hanamaulu Gulch, increases the possibility that Newell's Shearwaters and Dark-rumped Petrels could collide with the structures. The routing of the additional transmission lines that would ultimately be needed to serve this site at full build-out has not yet been determined. However, it is almost certain to involve the construction of transmission lines that run perpendicular to the shoreline and which cross valleys that may be used by Newell's Shearwaters and Dark-rumped Petrels on their way to sea. KE will undertake environmental studies of potential transmission line routes and design features when it seeks the additional permits and approvals these additional transmission facilities will require.

While bats were not observed at this location during the field survey that was conducted, the habitat in the adjacent gulch is suitable for their use. If they are present, the discussion of potential effects on this species at the Puhī Site applies here as well.

4.7.4 IMPACTS ON FAUNA — AIRPORT INDUSTRIAL AREA SITE

From the perspective of its potential effects on fauna, development of the Lihue Energy Service Center on the Airport Industrial Area Site is similar to the other two sites. It is already a disturbed habitat, and it does not offer an unusual or particularly important habitat for wildlife.

The first phase of construction at this site would require the construction of a new electrical power transmission line connecting the generating station with the existing Hardwoods Substation north of Hanamaulu Stream. An aboveground connection, which would be the least expensive, would entail a crossing of Hanamaulu Gulch near the shoreline. For reasons discussed previously, such a line would have the potential to affect Newell's Shearwaters and Dark-rumped Petrels as they move between the mountains and the sea. Because the crossing is relatively close to the shoreline, where the concentration of such movements is greatest, transmission lines serving this location may constitute a greater potential hazard than those serving the other locations.

4.8 IMPACTS ON AQUATIC BIOTA

4.8.1 PROJECT COMPONENTS ABLE TO IMPACT AQUATIC BIOTA

Electrical power generating facilities involve activities that, under certain circumstances, have the potential to affect aquatic biota. For reasons discussed below, such effects are unlikely from any of the alternatives under consideration.

4.8.1.1 Construction Period Direct Effects

All three sites are located on upland areas. They are several hundred feet or more away from streams, wetlands, and surface water bodies. Consequently, none of the generating facilities under consideration would directly affect aquatic resources through filling, new diversions, or direct discharges.

The electrical power transmission lines that would connect the generating facilities to the existing electrical grid would be supported on steel towers. These towers have small footprints, and designers have a great deal of flexibility with respect to their placement. Consequently, construction of these off-site transmission facilities will not entail disturbance of aquatic habitat or substantial areas of land that could generate harmful runoff.

Water supply and wastewater disposal lines will be constructed connecting the generating sites with off-site water sources and wastewater disposal areas at the Puhi and Field 390 Sites. Such off-site facilities may also be needed at the Airport Industrial Area Site depending upon the results of further engineering studies. None of these lines will pass through aquatic habitats, and construction activities related to them will not increase runoff or sedimentation with the potential to affect such habitats. Similarly, the use of existing access roads for all alternatives means that adverse impacts from new road construction are avoided for all alternatives.

4.8.1.2 Operational Period Direct Effects – Water Withdrawals

The water that would be used by facilities at the Puhi and Field 390 Sites would be obtained from existing surface water diversions. Since it would not involve new in-stream construction and would not alter streamflow, this water use does not have the potential to impact aquatic biota. Water for the Airport Industrial Area Site would be obtained either from on-site wells or from existing wells on the Kauai Lagoons Golf Course. In either case, the supply wells would draw from a deep aquifer that discharges naturally far offshore. Increased withdrawals from them do not have the potential to affect aquatic biota.

4.8.1.3 Operational Period Direct Effects – Wastewater Discharge

Injection Wells. As discussed in Section 4.5, wastewater from the proposed facilities would consist principally of reject water from the demineralizer system. This water would not contain any constituents not already found in the supply water; instead, they would simply be found in slightly higher concentrations. If the wastewater is disposed of through injection wells, as it might be at the Airport Industrial Area Site, the large volume of groundwater that discharges naturally beneath the area before entering the ocean offshore would dilute it. The volume, quality, and location of the discharge are such that this does not have the potential to affect aquatic resources. Disposal wells *makai* of the Kaunualii Highway is also a possibility at the Puhi Site, and the same conclusions are applicable to this.

Irrigation Re-Use. Discharge into the existing LPCO irrigation system is the planned method of wastewater disposal at the Field 390 Site and an alternate wastewater disposal method for the Puhi Site. Once it enters the irrigation system, it would mix with other water in the system and be used to irrigate fields. This does not have the potential to affect aquatic resources.

Stormwater Discharge. All of the sites are located atop broad upland interfluves. The proposed facilities would not alter the overall drainage pattern. Consequently, the only way in which they could affect aquatic biota would be by changing the volume of runoff or by altering water quality. For reasons outlined below, there is little potential for this to occur.

As discussed in Section 4.5, the three sites under consideration are part of much larger drainage basins. These basins include both extensive agricultural and natural area and urban development. Development of the proposed facilities will slightly increase the volume of surface runoff during rainfall events. However, the change will be much too small to have a noticeable effect on stream-flow volumes and, therefore, on stream habitat.

Currently, sugar cane is cultivated on all three sites. The 18-month cultivation cycle involves several months when the fields are either completely bare or have juvenile crops that do not protect the soil from the erosive effect of heavy rainfalls. By increasing the amount of paved area and providing permanent landscape planting, the proposed facilities will actually decrease the amount of sediment leaving the sites.

The proposed project involves the storage and use of petroleum products and chemicals that are not used in the present agricultural activities. The presence of these substances poses a potential threat to aquatic biota should they find their way into water bodies. As discussed in Section 4.5, existing Federal and State regulations applicable to industrial facilities such as the proposed Lihue Energy Service Center mandate the use of secondary containment structures, best management practices, and other measures designed to prevent contaminants from entering the stormwater that leaves the site. Because of this, the only way for substantial amounts of pollutants to reach aquatic biota would be for a double failure to occur. First, the primary containment or pollution control measure would have to fail. Then, this would need to be followed by a failure of the secondary containment. Such failures are extremely unlikely.

4.8.2 GENERAL DISCUSSION OF PROBABLE EFFECTS ON AQUATIC BIOTA

As indicated above, there are few circumstances under which the proposed project could affect aquatic biota significantly. However, even a small risk may be undesirable if the resource that could be affected is particularly rare or important. A review of the information from the *Hawaii Stream Assessment: A Preliminary Appraisal of Hawaii's Stream Resources* (National Park Service, December 1990) presented in Chapter 3 shows that they are not. More specifically:

- Nawiliwili Stream (into which pollutants would flow if they were released from the Puhi Site) is not known to possess significant aquatic resources or to have excellent riparian resources.
- Hanamaulu Stream (into which pollutants would flow if they were released from the Field 390 Site), is not listed as a candidate for protection.
- The coastal waters into which pollutants would flow if stormwater escaped from the off-site containment system serving the Airport Industrial Area Site was evaluated as part of studies conducted during preparation of LPCO's recent rezoning applications for its lands in this area (Brock, July 1994). That report notes that the nearshore area that would be affected if stormwater runoff from this site overflowed the retention basins has low coral cover and poorly developed marine communities that are unlikely to be affected by such changes.

4.9 IMPACTS ON HISTORIC AND ARCHAEOLOGICAL RESOURCES

4.9.1 PROJECT COMPONENTS ABLE TO IMPACT RESOURCES

Construction of the generation, electrical power transmission, and other facilities has the potential to affect historic and archaeological resources directly if it physically disturbs remains. Indirect impacts are possible if construction or operation of the facilities entails noise or other emissions that adversely affect the ambience of remains or the context within which they are seen or used.

4.9.2 POTENTIAL IMPACTS — PUHI SITE

As described in Chapter 3, all of the land that comprises this site has been extensively modified. Most is presently in sugar cane cultivation. The part that is not contains a reservoir. The transmission line across Nawiliwili Stream will be supported on poles within areas that have already been cleared. The Historic Preservation Division of the State Department of Land and Natural resources has confirmed construction and operation of the Lihue Energy Service Center at this location would have no significant effect on historic or cultural resources.

4.9.3 POTENTIAL IMPACTS — FIELD 390 SITE

The Field 390 Site has been modified during the course of many years of intensive sugar cane cultivation. The field survey and investigation of documentary sources that was conducted for the project did not reveal the presence of any historic or cultural resources. Consequently, the consulting archaeologist concluded that development of the proposed Lihue Energy Service Center at this location would have no significant effect on these resources. The electrical transmission line that would be needed initially would be routed along an existing roadway. Its construction does not have the potential to adversely affect known historic or cultural resources. Full build-out at this site will require the construction of additional transmission facilities northward to Kapaa.

Three possible transmission line routes are outlined in Chapter 2 of this report, but no detailed studies of archaeological, historical, or cultural resources along those alignments has been conducted. Of the three, the alternative that would take a new transmission line north from the Field 390 Site along the base of Kalepa Ridge involves the longest distance through areas that have not been intensively cultivated. KE would undertake these studies as part of a comprehensive transmission line routing study when it determines that the additional transmission capacity will be needed within the following five years.

4.9.4 POTENTIAL IMPACTS — AIRPORT INDUSTRIAL AREA SITE

LPCO has cultivated sugar cane on the Airport Industrial Area Site for many years. Documentary research and field studies conducted for this project did not reveal the presence of any historic or archaeological remains in the area.

The preferred routing of the transmission lines needed for the first generating unit extends north from this site along Kuhio/Kapule Highway to the Lydgate Substation, passing the Wailua Golf Course. The results of previous investigations in that area indicate that there is a high probability of finding human remains in the area fronting the golf course. If underground transmission facilities are to be built in this area, KE will consult with the State Historic Preservation Division to develop a satisfactory monitoring program and will comply with the provisions of the agreed-upon program.

The transmission line that would be installed as part of the first phase of development on this site would be able to accommodate up to about 100 megawatts of generating capacity. Additional trans-

mission capacity would be required to support full build-out at this location. Two possible transmission line routes are outlined in Chapter 2 of this report, but no detailed studies of archaeological, historical, or cultural resources along those alignments has been conducted. KE would undertake these studies as part of a comprehensive transmission line routing study when it determines that the additional transmission capacity will be needed within five years.

4.10 IMPACTS ON TRANSPORTATION FACILITIES

This section describes the effects that the proposed Lihue Energy Service Center would have on existing and planned transportation facilities in the region. While the focus is principally on land transportation facilities (i.e., roads and highways), the discussion also covers air and water transportation.

4.10.1 PROJECT COMPONENTS ABLE TO IMPACT TRANSPORTATION FACILITIES

4.10.1.1 Construction Activity

As described in previous chapters, the proposed facilities will be constructed over a period of several decades. Construction will involve the importation of several relatively large pieces of equipment. These include the combustion turbines, electrical generators, diesel engines, and boilers. Many smaller pieces of equipment will be needed as well. These will have to be imported to the Island, principally by barge through Nawiliwili Harbor or Port Allen, and transshipped by truck to the site. While the number of such trips will be low, some will require oversize vehicles. Construction will also involve the daily movement of construction workers and supervisors to and from the site.

4.10.1.2 Project Operations

As the proposed facilities become operational, they will generate vehicular traffic on an on-going basis. Three types of activities would generate the vast majority of the vehicular traffic associated with the proposed facilities:

- employees reporting to or leaving from work;
- employees being dispatched to the field and returning to their respective baseyards; and
- fuel trucks travelling between fuel unloading and storage facilities and the Lihue Energy Service Center site.

A small number of vendors and others would also travel to and from the generating and T&D baseyard facilities. However, the number of such trips would be small relative to those listed above.

4.10.2 TRAFFIC IMPACT ASSESSMENT METHODOLOGY

The methodology outlined below was used to evaluate the effect that the proposed Lihue Energy Service Center would have on vehicular traffic and roadway service levels at each of the three sites being considered.

- First, trip-generation rates were developed that could be used to estimate the number of project-related trips at the entrance to the facility by time-of-day and type of trip.
- Next, estimates of non-project traffic volumes were obtained from the forecasts contained in the State Department of Transportation's *Kauai Long-Range Land Transportation Plan* (Austin, Tsutsumi & Associates, Inc., May 1997).

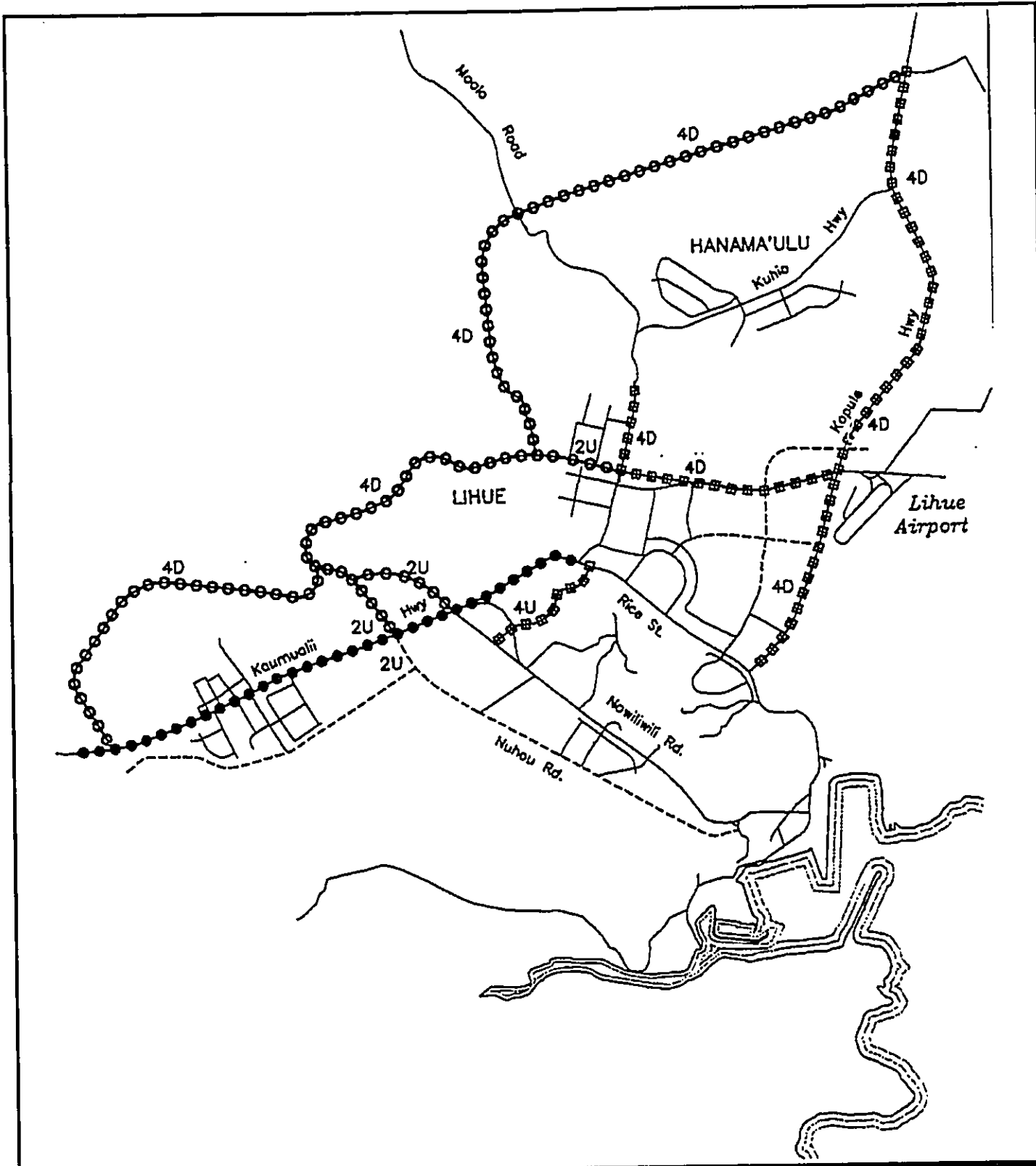
- Finally, these estimates were used to determine the extent to which project-related traffic would affect the level-of-service (LOS) on area roadways. The evaluation took into account the changes in the highway network that will result from implementation of the State Department of Transportation's recommended capital improvement program.

While the first generating unit at the Lihue Energy Service Center could enter operation as early as mid-2002, full build-out (and, therefore, the full traffic impact of the proposed improvements) would not occur until after 2020. Because of this, the impact analysis had to account for planned changes to the roadway system that State and County governments plan to make between now and that time. To account for these changes, we assumed that the roadway improvements that the *Kauai Long-Range Transportation Plan* recommended for implementation by the year 2020 would be in place (Austin, Tsutsumi & Associates, Inc.: Table 32). These are shown in Figure 4.10-1.

The following recommended changes are particularly important for the proposed project. The numbers in parentheses indicate the recommended phase/time period for implementation.

- ***Recommendation.*** *Widen Kaunualii Highway to a four-lane divided highway between Koloa Road and Kuhio Highway/Rice Street intersection.* This would increase the capacity of the roadway segment to which the access road from the Puhi Site would connect. If the timing coincided, the work needed to realign the road crossing from its present location at Rapozo Drive to a position opposite Nawiliwili Road could be undertaken as part of the larger highway project rather than as a separate undertaking. (Phase 1/1996-2000)
- ***Recommendation.*** *Realign Ahukini Road to connect to Ehiku Street and widen to a four-lane divided roadway between Kuhio Highway and Kapule Highway.* This would improve the roadway that would be used by fuel trucks travelling between the Field 390 Site and Nawiliwili Harbor. (Phase 2/2001-2005)
- ***Recommendation.*** *Widen Kuhio Highway to a four-lane divided highway between Ehiku Street and Eha Street.* This would improve the roadway that would be used for some employee work commuting and business trips. (Phase 2/2001-2005)
- ***Recommendation.*** *Widen Kapule Highway to a four-lane divided highway between Rice Street and Kuhio Highway.* This would increase the capacity of the road that would be used by fuel trucks travelling between Nawiliwili Harbor and the Field 390 and Airport Industrial Area Sites. This roadway would be used for some of the other trips associated with the Airport Industrial Area Site as well. (Phase 2/2001-2005)
- ***Recommendation.*** *Construct the four-lane divided Lihue-Hanamaulu mauka bypass road with two-lane connector roads to Ehiku Street, Nawiliwili Road, and proposed Nuhou Road.* This road would follow essentially the same route as the existing cane haul road that passes along the mauka side of the Puhi and Field 390 Sites. It would provide direct service to those sites, eliminating the cane haul road access that would be used for the initial generating unit that would be constructed at the Lihue Energy Service Center.

In addition to the Department of Transportation's highway improvement plans, AMFAC/JMB's long-range conceptual development plans for the land on which the Puhi Site and Field 390 Site are located also has a bearing on traffic issues. Those plans include two road circulation concepts. These are reproduced in Figures 4.10-2 and 4.10-3.



PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 Austin, Tsutsumi & Associates, Inc.
 May 1997.

LEGEND:

- PHASE 1 (1996 - 2000)
- ■ ■ ■ PHASE 2 (2001 - 2005)
- ⊖ ⊖ ⊖ ⊖ PHASE 3 (2006 - 2020)
- 2U 2-LANE, UNDIVIDED
- 4U 4-LANE, UNDIVIDED
- 4D 4-LANE, DIVIDED

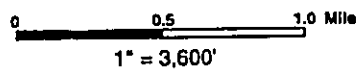
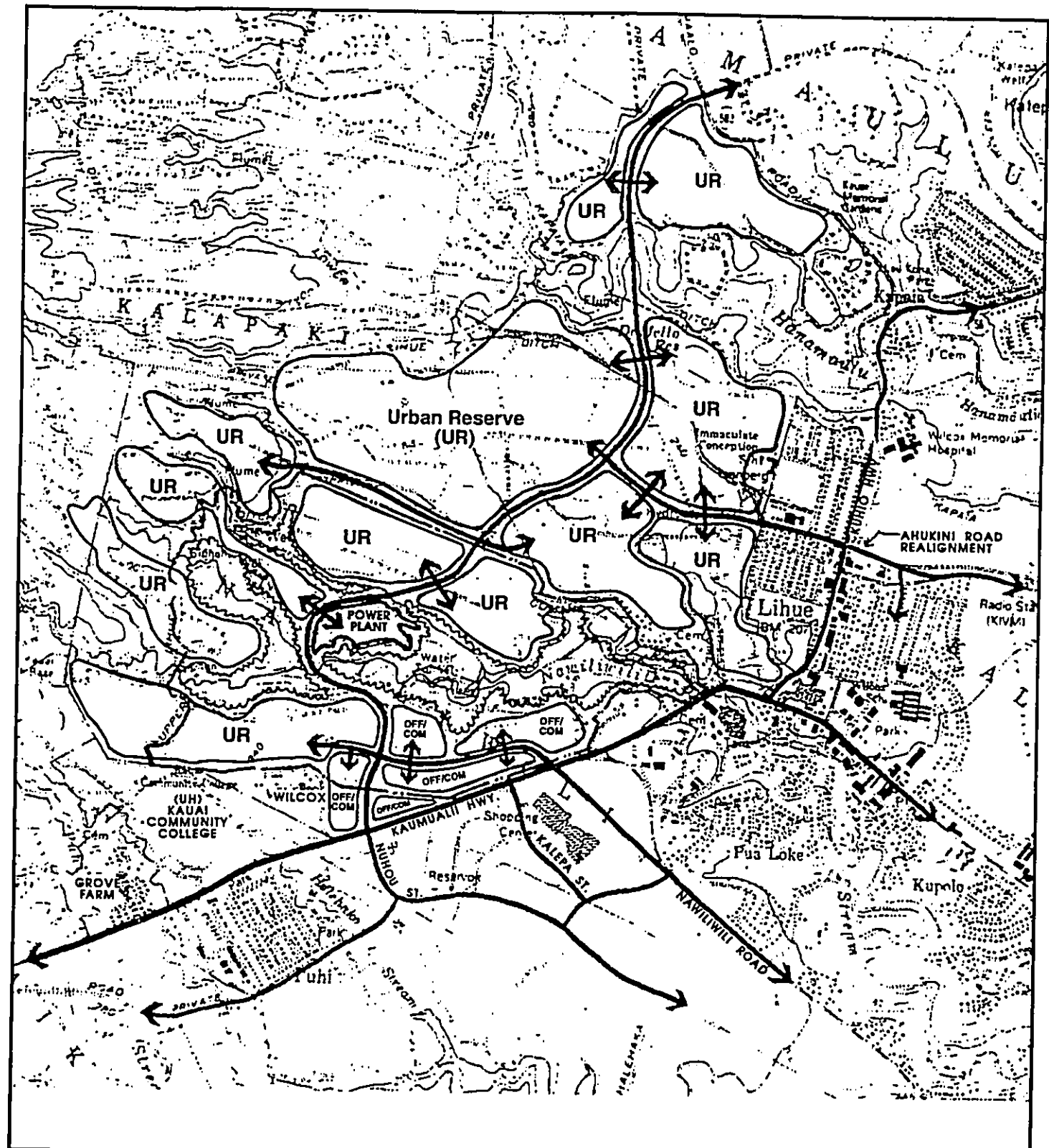


FIGURE 4.10-1:

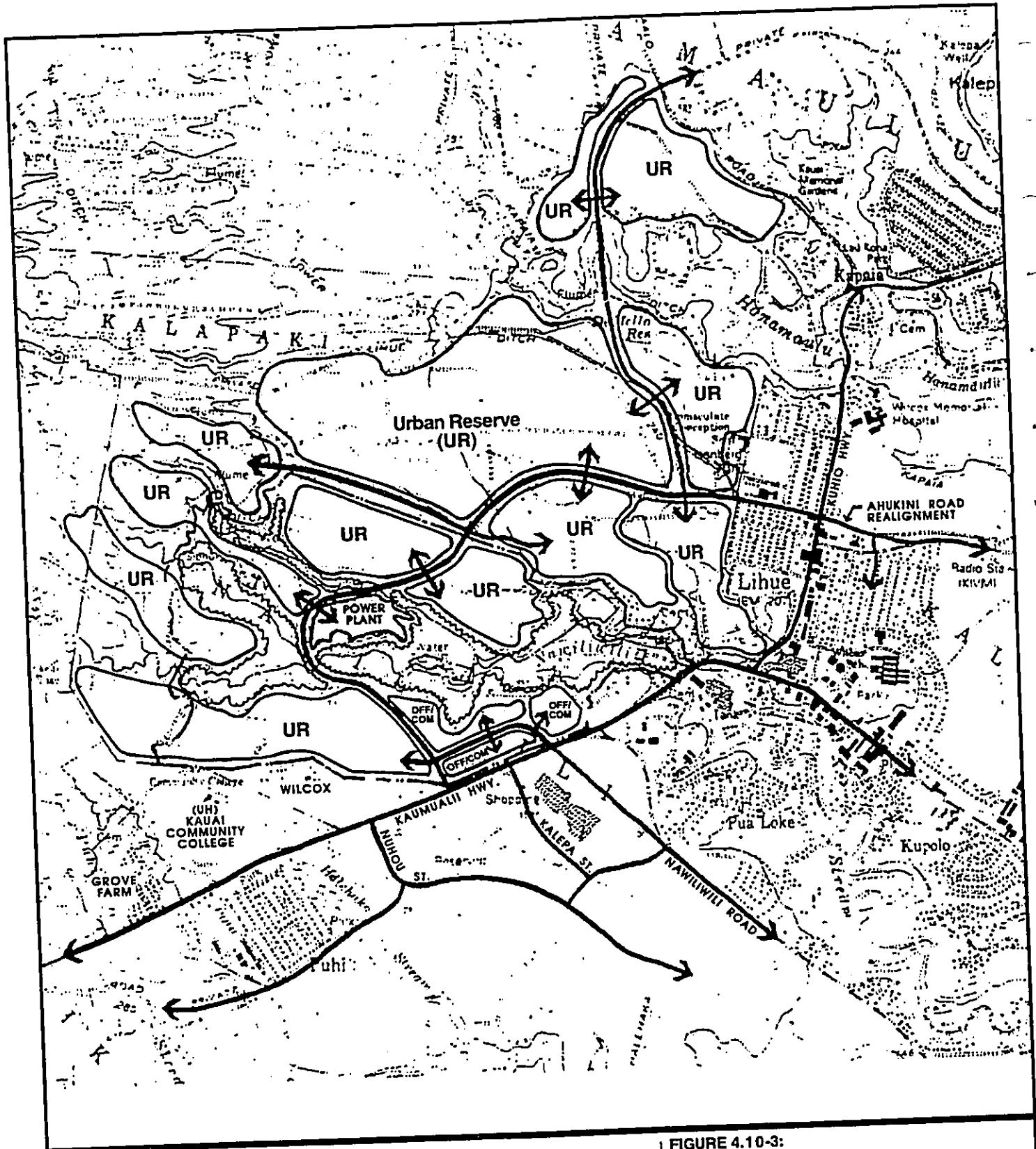
**Recommended Highway
 Improvements: Kauai Long-
 Range Land Transportation Plan**

Kauai Electric
 Lihue Energy Service Center



<p>PREPARED FOR: Kauai Electric A Division of the Citizens Utilities Company</p>	<p>LEGEND:</p>	<p>FIGURE 4.10-2:</p>
<p>PREPARED BY: Planning Solutions, Inc. Pacific Data Digitizing</p>	<p>UR Urban Reserve</p>	<p>Amfac/JMB Concept A: Cross-Intersection at Nuhou Street</p>
<p>SOURCE: PBR Hawaii, June 7, 1994.</p>	<p>0 1000 2000 Feet 1" = 2,100'</p> <p style="text-align: center;">N ↑</p>	<p>Kauai Electric Lihue Energy Service Center</p>

P00 Lihue Energy Service Center, April 1992, Concept A, 11.13.94



PREPARED FOR:
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 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 PBR Hawaii, June 7, 1994.

LEGEND:

UR Urban Reserve

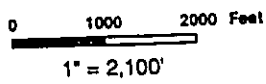


FIGURE 4.10-3:

**Amfac/JMB Concept B:
 T-Intersection at Kaumualii
 Highway**

Kauai Electric
 Lihue Energy Service Center

4.10.3 VEHICULAR TRIP-GENERATION

4.10.3.1 Data Sources

Vehicular trip-generation rates for electrical power generating facilities can vary widely depending upon the size, type, and location of the generating units. Fortunately, most of the technologies under consideration for the Lihue Energy Service Center are similar to those already used at the Port Allen Generating Station. Consequently, detailed information collected at that facility provides a good model for estimating trip-generation rates for the proposed facilities.¹⁸ Because the Port Allen facility includes a T&D facilities baseyard, it provides a good source of trip-generation information for that aspect of the project as well.

As noted in Chapter 3, fuel is delivered to the Port Allen Generating Station through a pipeline that connects fuel unloading and storage facilities at Port Allen with storage tanks located immediately *makai* of the Generating Station. Consequently, the existing facility does not provide a good source of information concerning traffic related to fuel deliveries to the Lihue Energy Service Center. Instead, vehicular traffic related to the delivery of fuel was estimated on the basis of forecast fuel consumption and assumptions about the kinds of vehicles that would be used for the delivery. The routing of fuel truck trips was planned to maximize safety and minimize potential adverse impacts on traffic and land uses close to the travel routes.

4.10.3.2 Production Department Trip-Generation Rates

Approximately 32 employees operate the power generation facilities at the Port Allen facility. They comprise the staff of KE's "Production Department". On average, 26 to 28 persons (approximately 85 percent of the total Production Department workforce) are present during some part of any given weekday; between 9 to 11 workers (approximately 30 percent of the total workforce) typically come to work at some point on a given weekend-day.

Production Department workers at the Port Allen Generating Station are assigned to one of three shifts. The shift start and stop times, as well as the approximate number typically present on each shift at the time the survey was conducted, are as follows:

<i>Shift to Which Assigned</i>	<i>Number of Workers</i>	<i>Percent of Total</i>
6:00 a.m. to 2:00 p.m. shift and managerial staff	20	62%
2:00 p.m. to 10:00 p.m. shift	6	19
10:00 p.m. to 6:00 a.m. shift	6	19
24-Hour Total =	32	100

The survey of Production Department workers at the Port Allen Generating Station that was conducted on December 1 through 7, 1996, indicated that the workers made from 63 to 77 one-way vehicle-trips per workday during this period. The 32 workers in the Production Department averaged

¹⁸ Profiles for each type of facility-related traffic sources were developed based on a survey conducted at the Port Allen generating station and baseyard. Each employee was asked to track their arrivals, departures, and destination by day, by time, and by vehicle type over a period of one week. The results were subsequently compiled and used to develop the trip-generation profiles used in the traffic impact analysis.

approximately 2.2 one-way vehicle-trips/day/person. This average includes all types of trips (e.g., commuting, job-related travel, breaks, etc.).

As one would expect from the shift hours, the inbound trips were concentrated in three periods (see Table 4.10-1).

- Approximately 45 percent of the inbound trips occurred between 5:00 a.m. and 6:59 a.m.; an additional 10 percent occurred between 7:00 a.m. and 7:59 a.m. These consisted principally of workers arriving at the facility for the start of the day shift.
- Roughly 30 percent of the inbound trips occurred between 11:00 a.m. and 1:59 p.m. Most of the inbound trips between 11:00 a.m. and 11:59 a.m. were made by individuals returning to the facility after making work-trips off-site. The inbound trips made between 12:00 p.m. and 12:59 p.m. were primarily individuals returning to the facility after driving off-site for lunch. The inbound trips made between 1:00 and 1:59 p.m. were principally individuals arriving for the afternoon-evening shift.
- Finally, approximately 12 percent of the inbound trips occurred between 9:00 p.m. and 9:59 p.m. Virtually all of these trips were made by workers arriving for the night shift.

Outbound trips by Production Department also reflect the shift-nature of the operations, although they showed somewhat more time-variability than the inbound trips.

- On average, approximately 11 percent of the total daily outbound trips occurred between 6:00 a.m. and 7:00 a.m. These represent workers returning home at the end of the night shift.
- Approximately 18 percent of the outbound trips occurred between 11:00 a.m. and 1:00 p.m. Most of these were clustered around noon. In general, they represent workers driving off-site for lunch.
- One-third of all outbound-trips occur between 2:00 and 3:59 p.m. This represents workers leaving at the end of the day shift. The 5:00 p.m. to 5:59 p.m. period shows another small burst in outbound trips (9 percent of the daily total). This represents production managerial and office staff who do not work on a shift basis.
- The last period of outbound trips (11 percent of the daily total) occurs between 10:00 and 10:59 p.m. This represents evening-shift workers leaving at the end of their workday.

The data obtained from the survey of Production Department workers at the Port Allen Generating Station points to several important conclusions concerning trip generation by facilities such as those proposed for the Lihue Energy Service Center.

- First, the generating facilities are not large trip generators. During the hour at the Port Allen Generating Station with the highest number of arrivals and departures,¹⁹ employees of the 100-megawatt capacity facility make fewer than 20 one-way vehicle-trips.
- Second, trips to and from the electrical generating facilities tend to be made at off-peak hours, i.e., at times when the roads that serve them are not at their busiest. In the morning, for example, the entrance to the facility is busiest between 5:30 a.m. and 6:30 a.m., well before the 7:00 to 8:00 a.m. peak on most of Kauai's roadways. The same is true in the afternoon, when the facility's peak traffic hours are between 2:00 p.m. and 3:59 p.m.

¹⁹ This is 6:00 a.m. to 7:00 a.m., when 30 percent of the daily in-bound trips and 11 percent of the daily outbound trips occur.

Table 4.10 - 1. Time Distribution of Vehicle-Trips From KE's Port Allen Facilities.

Time Period	Production Department		T&D Baseyard	
	In	Out	In	Out
0:00 to 0:59	0.0%	0.0%	0.7%	0.0%
1:00 to 1:59	0.0%	0.0%	0.0%	0.2%
2:00 to 2:59	0.0%	0.0%	0.0%	0.0%
3:00 to 3:59	0.0%	0.0%	0.7%	0.9%
4:00 to 4:59	0.0%	0.0%	0.0%	0.0%
5:00 to 5:59	15.4%	0.0%	1.1%	0.0%
6:00 to 6:59	29.7%	11.2%	34.1%	0.2%
7:00 to 7:59	10.3%	0.5%	10.8%	7.4%
8:00 to 8:59	1.0%	1.0%	1.1%	17.2%
9:00 to 9:59	0.0%	1.5%	2.5%	2.5%
10:00 to 10:59	0.5%	0.5%	1.4%	2.2%
11:00 to 11:59	7.2%	10.7%	8.5%	12.8%
12:00 to 12:59	11.8%	7.6%	9.2%	6.5%
13:00 to 13:59	10.8%	0.5%	5.3%	3.6%
14:00 to 14:59	0.5%	13.7%	4.8%	3.6%
15:00 to 15:59	0.5%	19.3%	19.9%	32.4%
16:00 to 16:59	0.0%	6.1%	0.0%	8.7%
17:00 to 17:59	0.0%	9.1%	0.0%	1.1%
18:00 to 18:59	0.0%	2.5%	0.0%	0.4%
19:00 to 19:59	0.5%	4.6%	0.0%	0.0%
20:00 to 20:59	0.0%	0.5%	0.0%	0.2%
21:00 to 21:59	11.8%	0.5%	0.0%	0.0%
22:00 to 22:59	0.0%	10.2%	0.0%	0.0%
23:00 to 23:59	0.0%	0.0%	0.0%	0.0%

Source: Compiled by Planning Solutions, Inc. based on data collected by KE between December 1 and December 8, 1996.

4.10.3.3 Transmission and Distribution Department Trip-Generation Rates

Workers at KE's existing T&D facilities were surveyed to determine appropriate trip-generation factors for the T&D baseyard component of the proposed Lihue Energy Service Center. A total of 45 T&D workers participated in the survey.

Unlike the generating facilities, which are staffed continuously, the T&D baseyard is normally a single-shift, weekday-only operation. Employees do come in at other times to handle emergencies, but that is the exception rather than the rule. The normal T&D Department work day begins at 7:00 a.m. and ends at 3:00 p.m. As a result, the busiest hour in the inbound direction (accounting for 34% of

PROBABLE IMPACTS OF THE PROPOSED ACTION

the inbound total) is between 6:00 a.m. and 6:59 a.m. Similarly, the busiest hour in the outbound direction (accounting for 32% of the outbound total) is between 3:00 and 3:59 p.m.

4.10.3.4 Trip Origin/Destination Characteristics

The results of the survey of KE's T&D workers showed that about 43% of daily commuting trips for those workers begin or end in residential areas located east of the Port Allen Generating Station up to and including Lihue. These residential areas include Kalaheo, Omao, Lawai, and Lihue. Approximately one-quarter of the commute trips start in areas north of Lihue, principally Kapaa.

KE would continue to operate its existing generating facilities at Port Allen after the new generating units at the Lihue Energy Service Center are placed in service. This, together with the fact that the first unit likely to begin operation in the new complex would be operated by an independent power producer (IPP) means that staffing of the new facility would be by new hires. For the purpose of this analysis, it is reasonable to assume that the location of the residence of these workers (and, therefore, their commuting patterns) would be distributed roughly in proportion to the Island's population. To insure consistency with other long-range transportation planning, this analysis assumes that this will be in accordance with the following forecast in the *Kauai Long-Range Land Transportation Plan* (Austin, Tsutsumi & Associates, Inc., May 1997: Table 25).

In general, the destinations of trips that T&D Department personnel make during the course of their work day are a function of the geographic distribution of the company's customers. For the Lihue Energy Service Center, this was assumed to be the same as the forecast population distribution shown in Table 4.10-2. The routes that these vehicles are expected to follow on their way to and from each of the sites are shown in Figure 4.10-4. Note that this drawing distinguishes between routes that would be followed by trucks and vehicles used by facility staff and those that would be followed by the fuel trucks discussed in the following section.

4.10.3.5 Fuel Truck Trips

Trucks would transport the fuel used by the generating units from the fuel tanks where it would be stored immediately after it is unloaded from the barges that would bring it to Kauai. KE's estimate of the amount that would be needed and the resulting number of truck trips is shown in Table 4.10-3. The routes that would be followed by these trucks on their way to and from each of the sites are shown in Figure 4.10-4.

Table 4.10 - 2. Forecast Year 2020 Population and Employment by District.

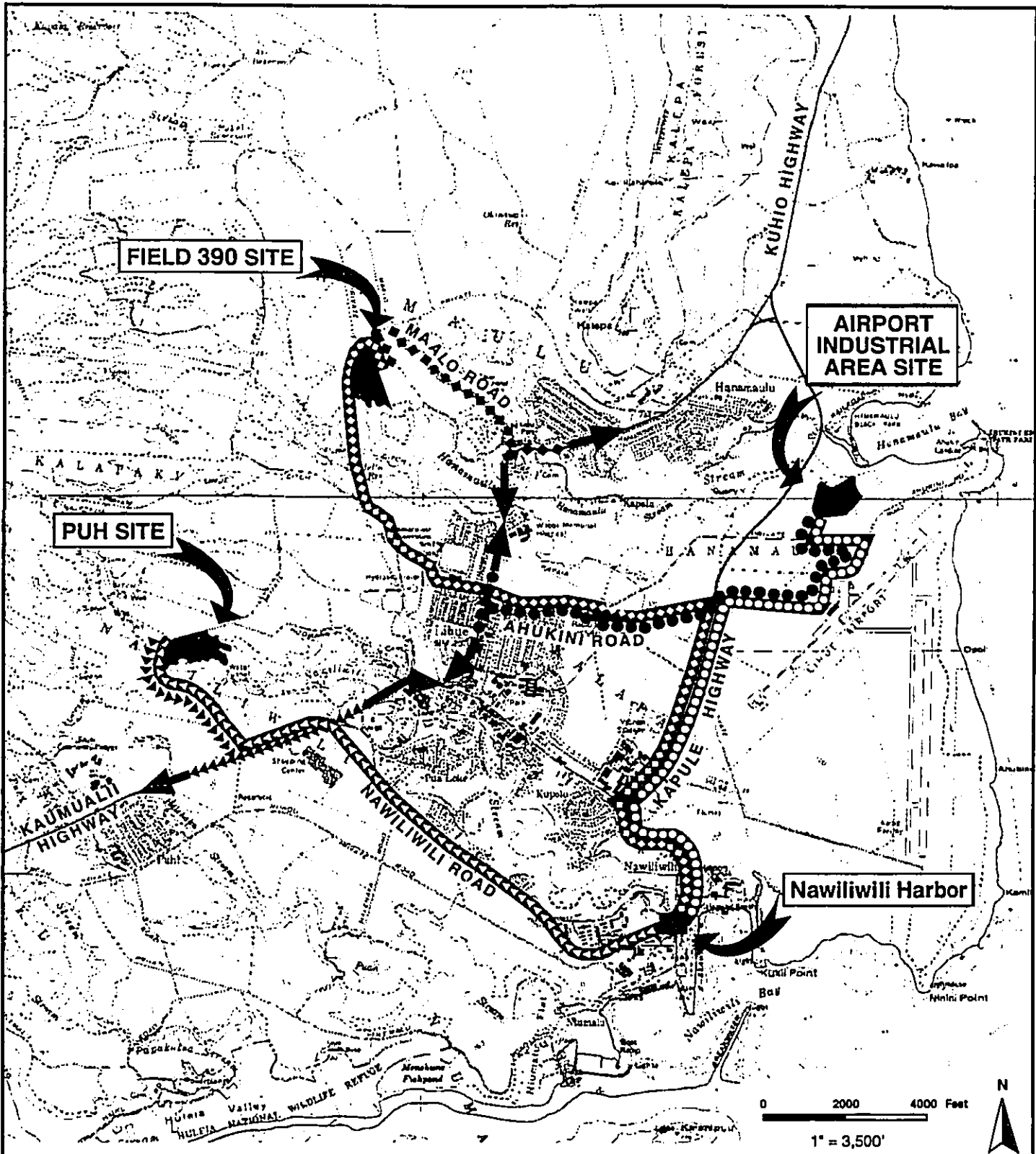
District	Population		Employment	
	Number	% of Island Total	Number	% of Island Total
Waimea	9,454	11.0	4,399	9.0
Koloa	23,462	27.3	10,041	20.6
Lihue	19,930	23.2	21,789	44.8
Kawaihau	21,425	24.9	8,215	16.9
Hanalei	11,671	13.6	4,249	8.7
Total	85,942	100.0	48,693	100.0

Source: *Kauai Long-Range Land Transportation Plan* (Austin, Tsutsumi & Associates, Inc., May 1997: Table 25).

Table 4.10 - 3. Fuel Truck Trips by Generating Unit.

Item	Unit of Measurement	Type of Generating Unit			
		Advanced Steam-Injected CT	Diesel	Dual-Train Combined Cycle	Fluidized Bed Coal
Number of Units: Generating Alternative 1	Number of Generating Units	2	4	1	0
Number of Units: Generating Alternative 2	Number of Generating Units	2	4	0	1
Fuel Type	n/a	Naphtha	Diesel	Diesel	Coal
Rated Output	Megawatts	26.4	11.7	58	24
Availability	Percent	94.0%	94.0%	94.0%	94.0%
Annual Operating Time	Hours	8,234.4	8,234.4	8,234.4	8,234.4
Capacity Factor	Percent	95.0%	90.0%	95.0%	95.0%
Energy Produced	Megawatt-Hours/Year	206,519	86,708	453,715	187,744
Heat Rate of Unit	BTU/Kilowatt-Hours	8,700	8,700	8,700	11,500
Heat Content of Fuel	BTU/Gallon of Fuel	115,000	137,500	137,500	n/a
	BTU/Pound of Fuel	n/a	n/a	n/a	12,000
Fuel Consumption Rates	Gallons of Oil/Hour	1,997	740	3,670	
	Gallons of Oil/Day	47,928	17,767	88,076	
	Tons of Coal/Day	n/a	n/a	n/a	276
Fuel Truck Capacity	Gallons of Oil	8,000	8,000	8,000	n/a
	Tons of Coal	n/a	n/a	n/a	20
Truck Trips Per Day @ Full Load:					
Generating Alternative 1	Round-Trips	12.0	8.9	11.0	n/a
Generating Alternative 2	Round-Trips	12.0	8.9	0.0	13.8

Source: Kauai Electric



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 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 USGS 7.5' Lihue Quadrangle, 1983.
 USGS 7.5' Kapaa Quadrangle, 1983.

LEGEND:

- ▬▬▬▬ Preferred Site: Fuel Truck Route
- ◀◀◀◀ Preferred Site: Other Vehicles Route
- ▬▬▬▬ Field 390 Site: Fuel Truck Route
- ◆◆◆◆ Field 390 Site: Other Vehicles Route
- ▬▬▬▬ Airport Site: Fuel Truck Route
- Airport Site: Other Vehicles Route

FIGURE 4.10-4:

Principal Access Routes Used To Access Sites

Kauai Electric
 Lihue Energy Service Center

FOU Local Energy Service Center; Fig. 10-4 Principal Routes; 3-8-84

4.10.3.6 Vehicular-Trip Generation Summary

The trip-generation information presented above was used to estimate average daily and peak-hour traffic into and out of the Lihue Energy Service Center. Table 4.10-4 summarizes those estimates.

4.10.4 FORECAST NON-PROJECT TRAFFIC VOLUMES

The project-related trips shown in Table 4.10-4 are for full development of the proposed facilities. This will not occur for several decades. During that period, it is anticipated that HDOT will make the planned highway improvements discussed earlier in this section and that planned growth on Kauai will increase non-project vehicular traffic volumes on the affected roadways.

Table 4.10-6 shows the forecasts of average daily and peak-hour traffic volumes at screenlines in the Lihue area. These traffic forecasts (which are from the *Kauai Long-Range Land Transportation Plan*, Austin, Tsutsumi & Associates, Inc., May 1997, Table 31) are based on the forecast population and employment shown in Table 4.10-5. As can be seen by the "% Change" columns in the table, the forecasts assume that considerable growth in population and employment will occur over the 26-year period of the forecast. Because the traffic forecasts are based on land use forecasts that already assume development of the land on which the proposed Lihue Energy Service Center would be built, they already account for the vehicle-trips that it would produce. Nonetheless, to be conservative, the impact discussion that follows treats project-related trips as additions to the forecast numbers. In reality, this slightly over-estimates the probable effects.

4.10.5 IMPACTS ON ROADWAYS — PUHI SITE

4.10.5.1 Planned Access Road Improvements

Access to the Puhi Site is via one of LPCO's main cane haul roads.²⁰ At present, that roadway crosses Kaunualii Highway at an unsignalized intersection a short distance west of Kalepa Street.

As shown in Figures 4.10-2 and 4.10-3, AMFAC/JMB's long-range master plan for this area calls for the eventual realignment of this road. One concept calls for the maintenance of an intersection at the existing location, as well as the addition of a new connection at the existing Kaunualii Highway/Nawiliwili Road intersection. The other concept calls for connections at Nawiliwili Road and at Nohou Street. This last concept is consistent with the roadway connections shown in the *Kauai Long-Range Land Transportation Plan* (Austin, Tsutsumi & Associates, Inc., May 1997: Figure 17).

While this connection will eventually provide good access to the Puhi Site, it will not be ready by mid-2002 when KE plans to have the first generating unit at the new site in service. Because of this, KE plans to construct a temporary connector road along the *mauka* side of Kaunualii Highway. This temporary connector road would begin at the existing cane haul road and run eastward to a point opposite Kalepa Street, where it would turn to intersect Kaunualii Highway opposite Kalepa Street. This intersection is already signalized, allowing the connection to be made without disrupting existing traffic patterns.

²⁰ This road is most often referred to as "Lower Cane Road". It continues on the southern side of Kaunualii Highway, intersecting Nuhou Road approximately one-quarter mile *makai* of the highway.

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Table 4.10 - 4. One-Way Vehicle-Trips at Facility Entrance.

	Vehicle-Trips/ 24-Hours			Vehicle-Trips in A.M. Peak-Hour of Adjacent Roads (7:00 a.m. to 8:00 a.m.)			Vehicle-Trips in P.M. Peak-Hour of Adjacent Roads (4:00 p.m. to 5:00 p.m.)		
	In	Out	Total	In	Out	Total	In	Out	Total
Vehicle-Trips per Production Employee	1.1	1.1	2.2	.113	.005	.118	0.0	.067	.067
Vehicle-Trips per T&D Employee	2.0	2.0	4.0	.216	.148	.364	0.0	.174	.174
One-Way Vehicle-Trips by Type of Vehicle									
Cars and trucks	123	123	246	13	7	20	0	10	10
Fuel Trucks	35	35	70	3	3	6	2	2	4
TOTAL	158	158	316	16	10	26	2	12	14
<p>Note: Production Department rates reflect typical staffing with personnel on leave. T&D estimates are for period when all workers were present.</p> <p>Vehicle-Trips shown are for Generating Alternative 2, which requires three more fuel truck trips per day than Generating Alternative 1.</p>									

Source: Compiled by Planning Solutions, Inc. based on results of survey at Port Allen Generating Station.

Table 4.10 - 5. Forecast Change in Population: 1994-2000.

District	Population			Employment		
	1994	2020	% Chng.	1994	2020	% Chng.
Waimea	7,298	9,454	29.5%	2,531	4,399	73.8%
Koloa	13,698	23,462	71.3%	3,530	10,041	184.4%
Lihue	11,158	19,930	78.6%	11,430	21,789	90.6%
Kawaihau	18,452	21,425	16.1%	4,762	8,215	72.5%
Hanalei	7,677	11,671	52.0%	1,949	4,249	118.0%
Total	58,283	85,942	47.5%	24,202	48,693	101.2%

Source: *Kauai Long-Range Land Transportation Plan* (Austin, Tsutsumi & Associates, Inc., May 1997: Tables 6 and 25).

4.10.5.2 Effect on Traffic Volumes

A comparison of the number of vehicle trips generated by the Lihue Energy Service Center (see Table 4.10-4) with the total traffic volumes forecast in the *Kauai Long-Range Land Transportation Plan* (see Table 4.10-6) shows that the facility would have little effect on traffic volumes. For example, even if all of the vehicles travelling to and from the site were to use the segment of Kaumualii Highway *makai* of the Puhi Site, they would represent only 1.5 percent of the total forecast volume of more than 21,000 vehicle-trips per day. Since a very substantial portion of the trips beginning or ending at the Lihue Energy Service Center are likely to be made over alternate routes (e.g., the Hanamaulu Bypass Road), traffic related to the proposed facility is likely to represent no more than 1 percent of the forecast total daily traffic on this segment of Kaumualii Highway.

Because most of the vehicle-trips to and from the proposed facilities would be made at off-peak hours, project-related traffic would represent an even smaller percentage of peak-hour traffic at these locations. Using the most conservative assumption, i.e., that all trips to and from the site would be via the segment of Kaumualii Highway *makai* of the Puhi Site, they would represent approximately 1% of the traffic during the morning peak hour and 0.7% of the traffic during the afternoon peak hour. When the fact that many trips would be made using the Hanamaulu Bypass Road rather than Kaumualii Highway is taken into consideration, it is clear that the project-related traffic would represent an even smaller proportion of total traffic during those hours.

In any case, the presence or absence of trips to and from the Puhi Site does not affect the level of service that the roadways would provide. With the highway improvements that are planned, they would remain at the high levels shown in Table 4.10-6 with or without the Lihue Energy Service Center.

4.10.6 IMPACTS ON ROADWAYS — FIELD 390 SITE

4.10.6.1 Planned Access Road Improvements

Access to the Field 390 Site is via another of LPCO's main cane haul roads.²¹ That road extends from the LPCO yard on the northwest side of Lihue (where all of the company's trucks bringing cane from the fields unload) north across Maalo Road to an intersection with the company's Kalepa Ridge haul road.

AMFAC/JMB's long-range master plan for this area calls for this road right-of-way to serve future urban development in the area. Until then, the road will continue to be used for agricultural purposes. The *Kauai Long-Range Land Transportation Plan* (Austin, Tsutsumi & Associates, Inc., May 1997; Figure 17) calls for the eventual construction of a 4-lane divided highway past the site as part of the Lihue-Hanamaulu Bypass Road project.

²¹ This road is often referred to as "Sugar Cane Road". It connects with the Lower Cane Road that passes the Puhi Site via West Cane Road and Laurie Lane.

Table 4.10 - 6. Forecast Year 2020 Highway Traffic Conditions at Selected Screenlines.

LOCATION	DIR	DAILY				AM PEAK HOUR				PM PEAK HOUR			
		VOL	CAP	V/C	LOS	VOL	CAP	V/C	LOS	VOL	CAP	V/C	LOS
PUHI SCREENLINE													
Kaumualii Hwy	EB	10843	19200	0.56	B	1040	1920	0.54	B	567	1920	0.30	A
	WB	10865	19200	0.57	B	734	1920	0.38	B	734	1920	0.38	B
Nohou Road	EB	3903	12800	0.30	A	334	1280	0.26	A	185	1280	0.14	A
	WB	3901	12800	0.30	A	183	1280	0.14	A	195	1280	0.15	A
Lihue-Hanamaulu Bypass	EB	12479	21600	0.58	B	723	2160	0.33	A	917	2160	0.42	B
	WB	12499	21600	0.58	B	724	2160	0.34	A	1183	2160	0.55	B
HANAMAULU SCREENLINE													
Kapule Hwy	SB	12553	19200	0.65	C	1245	1920	0.65	C	757	1920	0.39	B
	NB	12312	19200	0.64	C	524	1920	0.27	A	1229	1920	0.64	C
Kuhio Hwy.	SB	3656	9000	0.41	B	414	900	0.46	B	247	900	0.27	A
	NB	3886	9000	.43	B	414	900	0.46	B	247	900	0.27	A
Lihue-Hanamaulu Bypass	EB	11671	21600	0.54	B	730	2160	0.34	A	892	2160	0.41	B
	WB	11667	21600	0.54	B	376	2160	0.17	A	854	2160	0.40	B

Notes: Am Peak-Hour capacities reflect contra-flow conditions. Screenline locations are shown on Figure 3.12-2.

Source: Austin Tsutsumi & Associates, Inc. (May 1997), *Kauai Long-Range Land Transportation Plan*, Table 31.

The Lihue-Hanamaulu Bypass Road project and associated connector roads called for in the *Kauai Long-Range Land Transportation Plan* will eventually provide excellent access to the Field 390 Site. However, they are in the third phase of the recommended capital improvement program for Kauai. Consequently, they will not be in place by mid-2002 when KE needs to have the first generating unit at the new site in service. Because of this, KE plans to access this site using the existing cane haul road past the site. The haul road is designed for heavy trucks would be used by all fuel trucks. Other trips associated with the first generating would be made using this road or Maalo Road. In the latter event, they would pass through the unsignalized Kuhio Highway/Maalo Road intersection in Hanamaulu.

4.10.6.2 Effect on Traffic Volumes and Roadway Level-of-Service

The discussion of the potential effects of developing the Lihue Energy Service Center at the Puhī Site noted that the proposed facilities would generate a relatively small number of vehicle-trips (316 one-way trips on a typical weekday at full build-out, fewer on weekends). It also emphasized that the great majority of these trips would occur at off-peak hours on the surrounding roadways. The same would be true if the facilities are developed at the Field 390 Site.

If all of the vehicle-trips beginning or ending at the proposed generating and T&D facilities were to take Maalo Road to Kuhio Highway, they would represent approximately four percent of the forecast

2020 volume on the highway. If all of the trips were made on the Lihue-Hanamaulu Bypass Road, they would represent an even smaller proportion of the total traffic volume (about 1.2 percent).

However, because a large proportion of the vehicle-trips that are now made on Kuhio Highway (and which cause it to be congested during peak traffic periods) would be diverted onto the Lihue-Hanamaulu Bypass Road, the total volume and the level-of-service (LOS) on Kuhio Highway would be substantially better than at present (7,542 trips per day in 2020 versus 13,780 trips per day now and B in 2020 versus the present D). The forecast average daily LOS on the Lihue-Hanamaulu Bypass Road (B) would be good as well (see Table 4.10-4)).

As pointed out in the discussion of the Puhi Site, the fact that the proposed facilities generate most of their trips at off-peak hours means that the project's effect on peak-hour volumes and level-of-service would be even smaller than its effect on overall service levels. The 26 vehicle-trips that it would generate during the morning peak-hour represent 3.2 percent of the forecast morning peak-hour volume on Kuhio Highway and 1.4 percent of the forecast morning peak-hour volume on the Lihue-Hanamaulu Bypass Road. More importantly, since the trips would be split between the two roadways, the 26 vehicle-trips constitute only 1.4 percent of the total forecast Year 2020 traffic on Kuhio Highway and the Lihue-Hanamaulu Bypass Road. The facility would contribute only 14 vehicle-trips during the afternoon peak hour. This represents only 0.6 percent of the forecast Year 2020 afternoon peak-hour vehicle-trips. The forecast LOS on all of the Lihue-area highways that would carry vehicles to and from the Field 390 Site would be B or better.

4.10.7 IMPACTS ON ROADWAYS — AIRPORT INDUSTRIAL AREA SITE

4.10.7.1 Planned Access Road Improvements

Access to the Airport Industrial Area Site is presently via another of LPCO's main field roads (the "East Cane Road") and another road that extends north from it past the Airport Industrial Area Site to the edge of Hanamaulu Gulch. From there the road turns westward, running along the edge of the Gulch, passing under the Kapule Highway Bridge over Hanamaulu Stream, and terminating in the construction yard located just *mauka* of the highway bridge. These roads presently connect the area with the main cane receiving area on the west side of Kuhio Highway, crossing Kapule Highway in the process.

AMFAC/JMB has obtained "Urban" zoning for this area from the State and "General Industrial" zoning from the County for the entire area between Kapule Highway and Lihue Airport. It has not yet developed detailed plans for the roadway improvements, but the planning concept for the Airport Industrial Area described in the rezoning process calls for the principal access to be via a new road that would intersect Ahukini Road *mauka* of the entrance to Lihue Airport. Until AMFAC/JMB decides to proceed with its planned redevelopment of the area, LPCO will continue to use the existing roads for agricultural purposes.

The roadway improvements described above will not be in place when the first generating unit is scheduled to be on line in mid-2002. Consequently, access to the initial phase of power plant development at this site would be via the existing paved cane haul roads to Ahukini Road north of the helicopter facilities at Lihue Airport. This segment of Ahukini Road serves the County Transfer Station, the Ahukini Point boat landing, and other industrial uses. The Airports Division has proposed improvements to the roadway as part of a planned realignment of the portion of the roadway near the helicopter facilities. Even without those improvements, the traffic volume on it is suffi-

ciently low that the road would provide adequate service for the limited traffic generated by the Lihue Energy Service Center and other area users.²²

The Kapule Highway/Ahukini Road intersection is already signalized. The *Kauai Long-Range Land Transportation Plan* (Austin, Tsutsumi & Associates, Inc., May 1997: Figure 17) calls for Kapule Highway to be widened to four lanes during the 2001 to 2005 time period (i.e., during Phase 2 of the recommended highway capital improvement program). The Kapule Highway/Ahukini Road intersection would be modified to accommodate the additional lanes at that time. More importantly, widening Kapule Highway from two lanes to four lanes would be accompanied by signalization of the Kapule Highway/Rice Street intersection. This would improve the intersection performance for left-turn movements from Kapule Highway onto Rice Street southbound (i.e., toward Nawiliwili Harbor).

4.10.7.2 Effect on Traffic Volumes and Roadway Level-of-Service

Developing the Lihue Energy Service Center on the Airport Industrial Area Site would result in the same number of vehicle-trips as would its development on the two other sites (316 on a typical weekday, fewer on weekends). As with the other two sites, relatively few of these trips would occur during the busiest traffic hours on the adjacent roadways (26 trips during the morning peak hour and 14 trips during the afternoon peak hour).

As shown in Table 4.10-4, the forecast Year 2020 average daily traffic on Kapule Highway is 24,865, or about two-thirds of its capacity of 38,400. Even if all of the trips generated by the Lihue Energy Service Center were to use Kapule Highway, they would represent only about 1.2 percent of that amount. Project-related trips represent approximately 1.5 percent and 0.7 percent of the forecast morning and afternoon peak-hour traffic on Kapule Highway. Since a substantial proportion of facility trips would probably use a route other than Kapule Highway, the actual percentages would be even lower.

4.10.8 IMPACTS ON HARBOR FACILITIES

4.10.8.1 Fuel Oil Deliveries

The fuel that would be used at the Lihue Energy Service Center would be imported to Kauai via barge. Assuming the use of 40,000 barrel-capacity barges, full build-out of the Lihue Energy Service Center with a design similar to that of Generating Alternative 1 would increase the number of fuel barge trips to Nawiliwili Harbor by approximately one per week.²³ Providing petroleum fuel for Generating Alternative 2 would require approximately one fuel barge trip every ten days. Existing harbor facilities can accommodate the increase if the fuel supplier optimizes its operations for that purpose.

4.10.8.2 Coal Deliveries

Alternative 2 would also require the importation of approximately 100,000 tons per year of coal. A probable delivery schedule for this fuel has not been established. However, given the economics of

²² The Airports Division of the State Department of Transportation is considering realigning the segment of Ahukini Road that passes the helicopter facilities. This would improve the geometrics of the roadway and provide vehicles a route that did not take them past the local roads serving airport tenants.

²³ At the present time, petroleum products are delivered by Smith Marine and by Sause Brothers on barges having capacities of 40,000 barrels to 70,000 barrels. The vessels used will undoubtedly change in the future, and barges with greater capacities may be employed. To be conservative, this calculation assumes a 40,000 barrel capacity.

interisland shipping, it seems likely that deliveries would be made at one- or two-month intervals (i.e., 6-12 barge trips per year).

4.10.9 IMPACTS ON AIR TRANSPORTATION

None of the alternatives under consideration would generate significant amounts of passenger or cargo traffic at Kauai's airports. Consequently, the only mechanism through which the proposed project could affect air transport is by obstructing the airspace used by the aircraft that provide this service. Most of the facilities that comprise the Lihue Energy Service Center are too low to be of concern. However, a few exceed the height of the structures that are typically found on Kauai.

The facilities that are of greatest concern are those that exceed a height of 60 to 70 feet, the maximum allowed in the Agricultural and General Industrial zoning districts without a variance. Only three types of structures under consideration exceed those heights. They are:

- The exhaust stacks (up to 100 feet high for the combustion turbines and diesels and up to 165 feet high for the coal-fired unit)²⁴.
- The building housing the fluidized bed boiler that is included in Alternative 2 only (100- to 110-foot high).
- The electrical transmission line poles (90- to 100-foot high).

The Federal Aviation Administration's (FAA) Federal Aviation Regulations (FAR) Part 77.13, *Construction or Alteration Requiring Notice*, sets forth "imaginary surfaces." These are used to identify construction or alteration proposals that require notification to the FAA on FAA Form 7460-1. The regulations require that for runways longer than 3,200 feet (i.e., both runways at Lihue Airport), a project proponent must notify the FAA in advance of any construction or alteration proposal which is higher than an imaginary surface extending outward and upward for a horizontal distance of 20,000 feet at a slope of 1 foot upward for every 100 feet outward from the nearest point of the nearest runway.

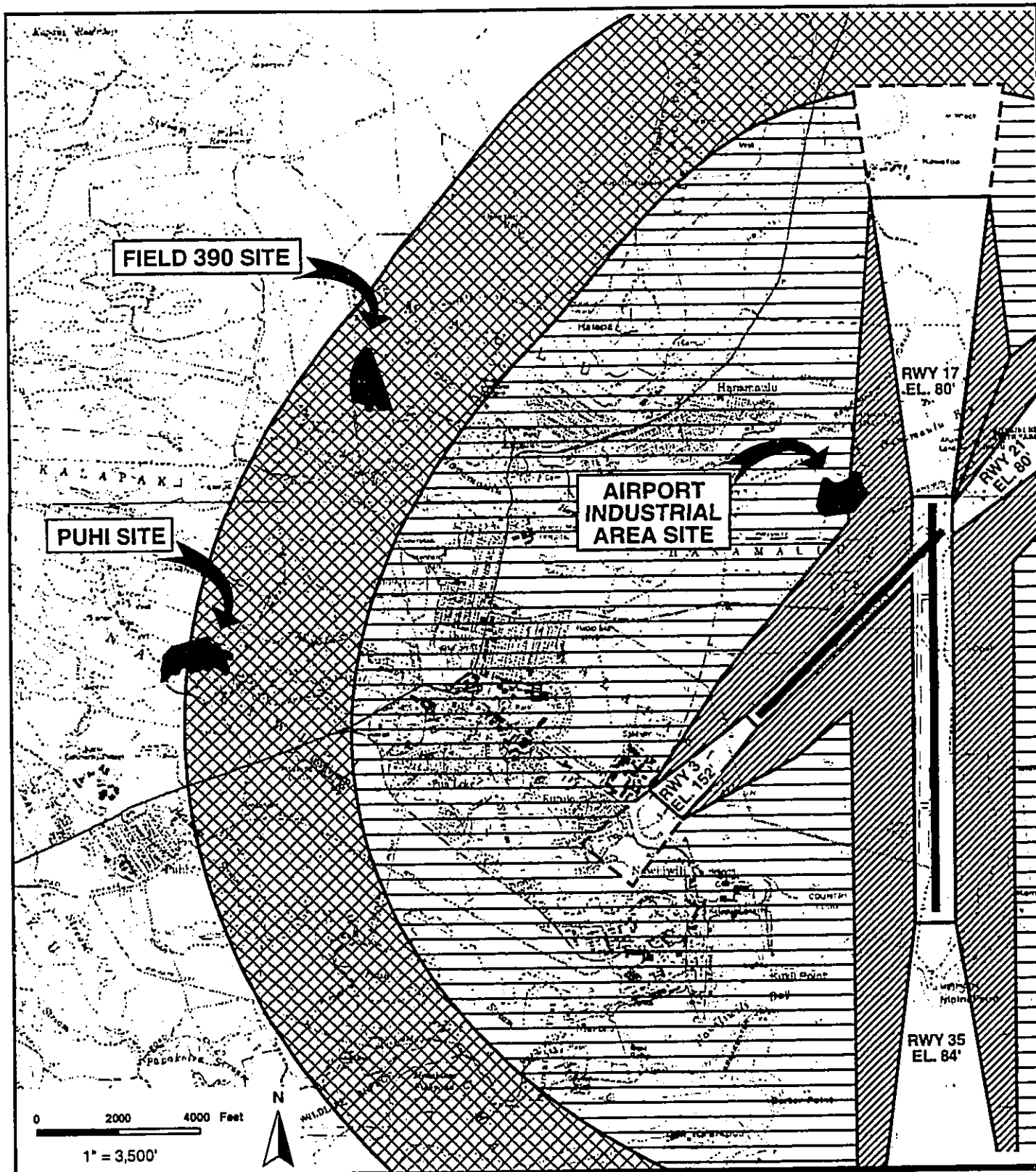
The State Department of Transportation's Airport Airspace Plan for Lihue Airport dated July 16, 1990, shows the imaginary surfaces around that facility.²⁵ These imaginary surfaces also indicate the extent to which structures and terrain might require special markings (e.g., obstruction lights) or might constitute a hazard to air navigation. In general, structures that do not "penetrate" (i.e., exceed the elevation of) the imaginary surfaces do not have the potential to adversely affect air navigation.

Relevant portions of the Airport Airspace Plan are reproduced in Figure 4.10-5. The following items are particularly relevant to the Lihue Energy Service Center.

- The "primary surface" extends outward for a distance of 250 feet from the centerline of Runway 3-21 and 1,000 feet from the centerline of Runway 17-35 and for 200 feet beyond their ends.
- The "horizontal surface" around the airport is at an elevation of 302 feet. It extends outward for a distance of 10,000 feet from the runway centerline for the full length of the "primary surface".

²⁴ Note that this is the ultimate height of the exhaust stacks that would be needed at full build-out. A lower stack (probably 60-70 feet high) would be used when the first unit is installed. This would be raised later if needed as additional generating units are installed. The exact height of each stack will be determined at the time KE seeks air permits for the individual units.

²⁵ This map is part of the FAA-approved Airport Layout Plan (ALP) for Lihue Airport.



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 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 USGS 7.5' Lihue Quadrangle, 1983
 USGS 7.5' Kapaa Quadrangle, 1983
 State Department of Transportation
 Airports Division, 1990

LEGEND:






-  Runway
-  Approach Surface
-  Transitional Surface (Slope 7:1)
-  Horizontal Surface (EL. 302)
-  Conical Surface (Slope 20:1)

FIGURE 4.10-5:

Lihue Airport Airspace Plan

Kauai Electric
 Lihue Energy Service Center

- The “approach surface” extends outward from the ends of the primary surfaces. It is 10,000 feet long on the approach ends of Runways 17 and 21, and 50,000 feet long on the approach end of Runway 35. It is 5,000 feet long on the approach end of Runway 3. The slope of this surface varies from runway to runway.
- “Transitional surfaces” extend upward 1 foot vertically for each 7 feet horizontally from the edge of the primary surfaces and the approach surfaces to their intersection with the “horizontal surface”.
- A “conical surface” extends outward for a distance of 4,000 feet from the edge of the horizontal surface, sloping upward 1 foot vertically for each 20 feet horizontally.

The Airport Airspace Plan was reviewed to determine the extent to which the height of the tall structures that could be constructed for the Lihue Energy Service Center might penetrate the various imaginary surfaces, thereby raising concerns about potential effects on air navigation. Conclusions with respect to each of the three sites are discussed below.

4.10.9.1 Puhi Site

The highest point on the Puhi Site is approximately 330 feet above sea level. This is situated at the top of the cut in which the haul road passes around the western side of the property. The lowest point, about 290 feet above sea level, is at the far eastern edge of the parcel. Since many of the taller structures are planned for the upper portions of the site, a base elevation of 325 above sea level was assumed for the purpose of this analysis.

The western one-third of the Puhi Site lies outside all of the “imaginary surfaces” shown on the Airspace Plan. The remainder lies within the conical surface. The area on which the tallest structures are planned is in the last 500 feet of the conical surface, i.e., 3,500 feet from the edge of the horizontal surface. At that location, the conical surface is 477 feet above sea level (302 feet plus 3,500 feet/20). Subtracting the ground elevation of 325 feet from this indicates that structures on the eastern side of the site could be up to 150 feet high and still remain beneath this imaginary surface. Locations on the outer edge of the conical surface could be up to 175 feet high.

The only structure that has the potential to exceed or penetrate this “imaginary surface” is the exhaust stack for the coal-fired fluidized bed unit that is part of Generating Alternative 2 (estimated at up to 165 feet high). The conceptual site plan for Generating Alternative 2 places this structure farthest from the Airport, and it is likely that the height of the conical surface at the exact point where it would be constructed is sufficiently high to allow this. However, because the calculations indicate that it is close to the limit, a precise determination on this issue cannot be made until more detailed engineering plans are available. Nonetheless, even if the surface is penetrated it is reasonable to conclude that the proposed facilities could be developed at this location so long as they are properly marked and lighted in accordance with FAA regulations.

4.10.9.2 Field 390 Site

The ground on this site slopes gently from north-northwest to south-southeast, from a height of approximately 285 feet above sea level at its upper end near the LPCO cane haul road to approximately 250 feet above sea level at its southern end adjacent to the Hanamaulu Stream gulch. The taller structures are planned for the portion that lies beneath an elevation of approximately 275 feet.

The Field 390 Site lies between 2,000 feet and 3,000 feet from the inner edge of the conical surface. At the 2,000-foot mark, the conical surface is 402 feet above sea level (302 feet plus 2,000 feet/20). At the 3,000-foot mark it is 50 feet higher. Subtracting the lowest ground elevation of 250 feet from

402 feet indicates that at this point structures could be up to 152 feet high and still remain beneath this imaginary surface. Facilities constructed nearer the outer edge of the site could be up to 167 feet high (452 feet minus 285 feet) and remain beneath the transitional surface.

As was true of the Puhi Site, the only structure which could exceed these heights is the exhaust stack for the coal-fired fluidized bed unit that is part of Generating Alternative 2 only (estimated at up to 165 feet high). More detailed engineering is needed before a final determination can be made for this unit. Nonetheless, even if the surface is penetrated it is reasonable to conclude that the proposed facilities could be developed at this location so long as they are properly lighted in accordance with FAA regulations.

4.10.9.3 Airport Industrial Area Site

Of the three locations that are being considered, the Airport Industrial Area Site is by far the closest to the airport. Consequently, its potential impacts on air navigation are of greatest concern.

As shown in Figure 1-5, this site ranges from 95 to 120 feet above sea level. This places it below the airport elevation of 152 feet above sea level, but above the existing 80 and 88-foot elevations of the nearest runway ends. As shown in Figure 4.10-5, the portion of the Airport Industrial Area Site closest to the airport is within the transitional surface. The remainder of the site is within the area controlled by the horizontal surface elevation of 302 feet above sea level.

Subtracting the highest ground elevation at the Airport Industrial Area Site (120 feet) from the height of the horizontal surface (302 feet) indicates that structures less than 182 feet high would not penetrate the horizontal surface regardless of where on the site they were constructed. None of the structures that would be constructed as part of the Lihue Energy Service Center project would exceed that limit.

The following facts are relevant to a determination of the extent to which structures constructed on the Airport Industrial Area Site might penetrate the transitional surfaces:

- The north end of Runway 17 (the portion of the primary surface closest to this site) is 80 feet above sea level.
- The transitional surface extends outward and upward from the edge of the primary surface at a 7:1 slope (i.e., 1 foot upward for each 7 feet outward).
- The ground elevation on the portion of the site that lies within the transitional surface is approximately 95 to 100 feet above sea level.
- The closest point on the portion of the site that lies within the transitional surface is approximately 1,200 to 1,300 feet from the edge of the primary surface. At that point the transitional surface is approximately 170 to 185 feet above the elevation of the primary surface (i.e., 250 to 265 feet above sea level).
- The part of the site located along the outer boundary of the transitional surface is approximately 1,550 feet from the edge of the primary surface. At that point the transitional surface is at an elevation of 302 feet above sea level.

Subtracting the elevation (approximately 100 feet above sea level) of the ground in the area where the tallest of the proposed structures would be located from the elevation of the horizontal surface (302 feet above sea level) indicates that structures on the Airport Industrial Area Site that are along the outer edge of the transitional surface could be up to 220 feet high without penetrating it. Structures on the portion of this site that are closest to the runway could be up to 170 feet high

without penetrating the surface. The latter is 5 feet more than the anticipated 165-foot height of the tallest structure (the exhaust stack for the coal-fired generating unit in Generating Alternative 2).

While the preceding calculations indicate probable compliance with existing FAA standards, pilots who operate helicopters out of Lihue Airport have expressed concern about the effect that construction of tall structures on this site could have on the safety of their operations.

A planner for the Lihue Energy Service Center project met with representatives of the State Airports Division and the helicopter operators on February 3, 1998. The purpose of the meeting was to:

- Determine what concerns (if any) the helicopter operators had with respect to the development of power generation facilities near the airport.
- Determine which locations within the airport industrial area *makai* of Kapule Highway were best from the helicopter operators' viewpoint, and which were worst.
- Identify design provisions that would lessen any objections the helicopter operators did have.

The operators expressed a desire to keep all of the area between the helipads and the Hanamaulu Stream in open space. While there was no unanimity, the majority indicated that they preferred that the facilities be developed closer to Kapule Highway than to the extension of the airport runway centerlines. They also expressed a strong preference for locations placing the tallest structures closest to the tree line along the edge of Hanamaulu Gulch and for keeping the building heights as close as possible to the height of the existing trees (approximately 60- to 70-feet).

The helicopter operators expressed at least as much concern for the electrical transmission lines as they did for the stacks and other power generation facilities. One of their principal routes is through the saddle of Kalepa Ridge, and they do not want any more overhead transmission lines in that area than are now present. They are particularly concerned about periods when the clouds are very low. They operate under visual flight rules (VFR) and must stay beneath the clouds. Because of this, structures at this location that are substantially higher than the existing trees concern them.

4.11 NOISE IMPACTS

4.11.1 INTRODUCTION

4.11.1.1 Project Components Able to Impact Noise Environment

Several aspects of the project have the potential to affect noise levels. These include:

- Operation of the generating units and ancillary facilities that make up the Lihue Energy Service Center;
- Project-related vehicular traffic on the roads that provide access to the site; and
- Construction activities.

Of these, the first has the greatest potential to cause adverse impacts. Consequently, the bulk of the discussion that follows focuses on it.

4.11.1.2 Assumed Generating Equipment Noise Levels

As discussed in Chapter 2 of this report, only conceptual plans are available for the proposed facilities. Consequently, the noise consultant for the project (CSTI Acoustics) made a number of assumptions concerning the noise profiles of the various pieces of equipment that would be used. These assumptions are summarized below. In general, they assume that key equipment would incorporate the quietest practical options (e.g., high-quality silencers, low-noise motors, low-noise fans, sound-attenuating turbine enclosures).

- Combustion Turbines. With two exceptions, the noise analysis used the noise source data for the LM-2500 combustion turbines that Stewart & Stevenson (S&S) provided. Those data represent anticipated noise levels from S&S' equipment in a standard enclosure. The first exception was for the turbine intake. The noise consultant found that the S&S noise data for this was much higher than the levels they had measured in the field. Consequently, they used their field measurements for this item rather than the data S&S provided. The second exception was that the analysis assumed that the units that would be installed in Lihue would have a better (i.e., quieter) silencer on the generator cooling vent than the one included in S&S' standard package.
- Heat Recovery Steam Generators. CSTI Acoustics calculated the noise from this unit based on measurements of a similar, but different, unit. Although the HRSGs produce relatively low noise levels compared to some of the other equipment that would be present, their large size results in a high sound power level (L_w). The HRSG also acts as a silencer for the combustion turbine exhaust, and the analysis used the reduction recommended by Johnson (1994) to account for this.
- Diesel Engines. Diesel engine noise was based on noise data that Wartsila provided for its Wartsila Vasa 12V46 engine (personal communication from Chris Whitney). The analysis assumed the unit would use the same kind of silencer on the exhaust as is used on the existing diesel generating units at KE's Port Allen Generating Station. It also assumed that a silencer would be used on the intake and that there would be four radiators per engine, each with a sound level of 45 dBA at 40 meters. Finally, the analysis assumed that the engines would be enclosed in the same kind of solidly constructed metal building with acoustically treated ventilation openings and sound absorptive treatment on interior surfaces as are used on the diesel building at Port Allen.
- Fluidized Bed Generating Unit. CSTI Acoustics estimated boiler noise using the algorithms recommended in the *Electric Power Plant Environmental Noise Guide* (Bolt Beranek & Newman, 1984). It estimated boiler fan noise using information from the same source; the estimates assumed use of a single forced-draft fan and a single induced-draft fan. The same was done for

sound from the steam turbine. The analysis for the fluidized bed generating unit assumed that the boiler building would be of light construction and would have no special acoustical treatment.

- Air-Cooled Condensers. CSTI assumed that quiet fans would be used for these.
- Coal-Crusher. Noise source data for the crusher was obtained from the *Electric Power Plant Environmental Noise Guide*. That source is for coal mills operating at 13 to 36 metric tons per hour throughput. To account for the smaller size of the crusher that would be used for this project, the assumed noise source level given in that report was reduced by 10 dB in each octave band.
- Transformers. The analysis assumed a sound level of 70 dBA at 3 feet from each transformer. It used the transformer sound spectrum shape given in the *Electric Power Plant Environmental Noise Guide*.

4.11.1.3 Acoustical Terminology

Sound is a complex phenomenon, and many technical terms have been developed for use in characterizing it. Definitions of terms used in this discussion are as follows:

- A-Weighted Sound Level (dBA). The sound level, in decibels, read from a standard sound-level meter using the "A-weighting network". The human ear is not equally sensitive in all octave bands. The A-weighting network discriminates against the lower frequencies according to a relationship approximating the auditory sensitivity of the human ear at moderate sound levels.
- Day-Night Average Sound Level (DNL or Ldn). This is the sound level that is "averaged" over a 24-hour period after penalizing nighttime noise by increasing sound levels recorded between 10:00 p.m. and 7:00 a.m. by 10 dB.²⁶ The penalty for nighttime noise is intended to account for a community's increased sensitivity to noises that occur when most people are sleeping.
- Decibel (dB). This is the unit that is used to measure the volume of a sound.²⁷ The decibel scale is logarithmic, which means that the combined sound level of 10 sources, each producing 70 dB will be 80 dB, not 700 dB. It also means that reducing the sound level from 100 dB to 97 dB requires a 50 percent reduction in the sound energy, not a 3 percent reduction. Perceptually, a source that is 10 dB louder than another source sounds about twice as loud. Most people find it difficult to perceive a change of less than 3 dB.
- Frequency (Hz). The frequency of a sound is the number of vibrations (or oscillations in air pressure) per second. It is expressed in hertz.
- Octave frequency band. A group or band of frequencies that encompasses an octave. An octave (in acoustics as in music) is defined as a range of frequencies extending from one frequency to exactly double that frequency. A person with good hearing can typically hear within the range of 9 octave bands. These range from very low frequencies (about 30 Hz, which is the rumble produced by the largest organ pipes) to high frequencies approaching 15,000 Hz (the shrill tone of a television). The following bands are within the normal range of human hearing:

²⁶ The level of the ratio of the time-average integral of the squared instantaneous A-weighted sound pressure during a 24-hour period after multiplying by ten the values from 10 p.m. to 7 a.m. to the product of the squared reference pressure and 86,400s in decibels.

²⁷ The sound pressure level in decibels is equal to twenty times the logarithm to the base ten of the ratio of the pressure of the sound measured to a reference pressure of 20 micropascals, or 0.0002 dynes per square centimeter.

PROBABLE IMPACTS OF THE PROPOSED ACTION

Octave Band No.	Frequency Range (in Hz)	Center Frequency (in Hz)
0	22 to 44	31.5
1	44 to 89	63
2	89 to 177	125
3	177 to 355	250
4	355 to 710	500
5	710 to 1,420	1,000
6	1,420 to 2,840	2,000
7	2,840 to 5,680	4,000
8	5,680 to 11,360	8,000

- **Sound Pressure Level (SPL or L_p)**. Sound pressure is the minute fluctuations in atmospheric pressure which accompany the passage of a sound wave. These fluctuations on the ear's tympanic membrane are transmitted to the inner ear and cause the sensation of audible sound.
- **Sound Power Level (SWL, PWL, or L_w)**. This is the total amount of acoustical energy radiated by a source into the atmosphere per unit time. The L_w is calculated using the size of a sound source as well as its sound pressure. It is useful in predicting sound levels at long distances from the source.

4.11.2 APPLICABLE NOISE STANDARDS

Hawaii Administrative Rules (HAR) Title 11, Chapter 46, Section 4 (§11-46-4) defines the maximum permissible community sound levels in dBA. These differ according to the kind of land uses that are involved (as defined by zoning districts) and time of day (daytime or nighttime). They are as shown in Table 4.11-1.

The maximum permissible sound levels specified in HAR §11-46-4(b) apply to any excessive noise source emanating within the specified zoning district, and at any point at or beyond the property line of the premises in a manner deemed appropriate by the Director of the State Department of Health (SDOH).

All three sites are on Class C land (the least restrictive category). However, all abut Class A areas (the most restrictive category). SDOH staff have indicated that the Department would enforce the regulations on the basis of the noise levels experienced at noise-sensitive receptors and that they would use the levels shown in the table to determine compliance. SDOH staff indicated that because there are no noise-sensitive receptors in the Class A open space areas that are immediately adjacent to the sites, noise levels in these areas that are above the 45 dBA nighttime level shown in the table would not constitute a violation. A violation would occur if the facilities caused noise levels at residential areas to exceed the 45 dBA nighttime limit regardless of how far the residences are from the power plant site.

Table 4.11 - 1. Hawaii Administrative Rules §11-46 Noise Limits.

<i>Zoning District</i>	<i>Noise Limit (in dBA)</i>	
	<i>Daytime (7:00 a.m. to 10:00 p.m.)</i>	<i>Nighttime (10:00 p.m. to 7:00 a.m.)</i>
Class A: Areas equivalent to lands zoned residential, conservation, preservation, public space, open space, or similar type	55	45
Class B: All areas equivalent to lands zoned for multi-family dwellings, apartment, business, commercial, hotel, resort, or similar type.	60	50
Class C: All areas equivalent to lands zoned agriculture, country, industrial, or similar type.	70	70

4.11.3 EXISTING NOISE LEVELS

Chapter 3 contains a general discussion of existing community noise levels. No site-specific measurements of existing noise levels have been conducted at the areas surrounding the sites.²⁸ Instead, for the purpose of this analysis background noise levels at noise-sensitive receptor locations were assumed to be typical of "quiet" areas as measured elsewhere in the State. This is a "worst-case" assumption. Hence, actual impacts are unlikely to exceed those reported here. Further discussion of environmental factors affecting the propagation of project-related noise are discussed in Section 4.11.5.

4.11.4 NOISE FROM PLANT OPERATIONS

CSTI Acoustics calculated community noise levels that would result from operation of the proposed facilities at each of the three sites under consideration. The calculations were performed using "SoundPlot", CSTI's proprietary noise model. SoundPlot uses the sound power levels of each sound source and the three-dimensional coordinates of sound sources and receivers. The model considers the effect of:

- geometric spreading, in which sound levels are reduced 6 dB for every doubling of the distance from the sound source,
- atmospheric absorption, a phenomenon in which primarily high-frequency sounds are absorbed as they travel through the air, and
- anomalous excess attenuation, an effect of small-scale meteorological variations that results in sound reduction through destructive interference.

²⁸ Environmental noise levels vary greatly over time depending upon such factors as the intensity of activity in nearby areas, wind speed, traffic volumes on nearby roadways, and aircraft flyby events. Consequently, characterizing differences in these background noise levels at all receptor locations is impractical.

SoundPlot does not consider the effects of wind, thermal inversions, or vegetation. While it is capable of calculating the effect of barriers, this function was not used for the present analysis.²⁹ Since barriers and vegetation actually can provide significant sound attenuation, the SoundPlot modeling results can be considered a "worst practical case" for community noise levels. Actual community noise levels are expected to be lower than the modeled estimates. CSTI Acoustics has used SoundPlot to predict community noise levels around dozens of power plants and other noise sources. The model uses industry-standard algorithms for predicting sound levels, and its results have been verified by comparing the calculated (modeled) results with actual sound measurements.

The resulting noise contours are shown in Figures 4.11-1 and 4.11-2.³⁰ Noise levels at specific locations are also provided in Table 4.11-2. The ability of each site/generating alternative to comply with the HAR §11-46 noise standards is discussed below.

4.11.4.1 Puhi Site

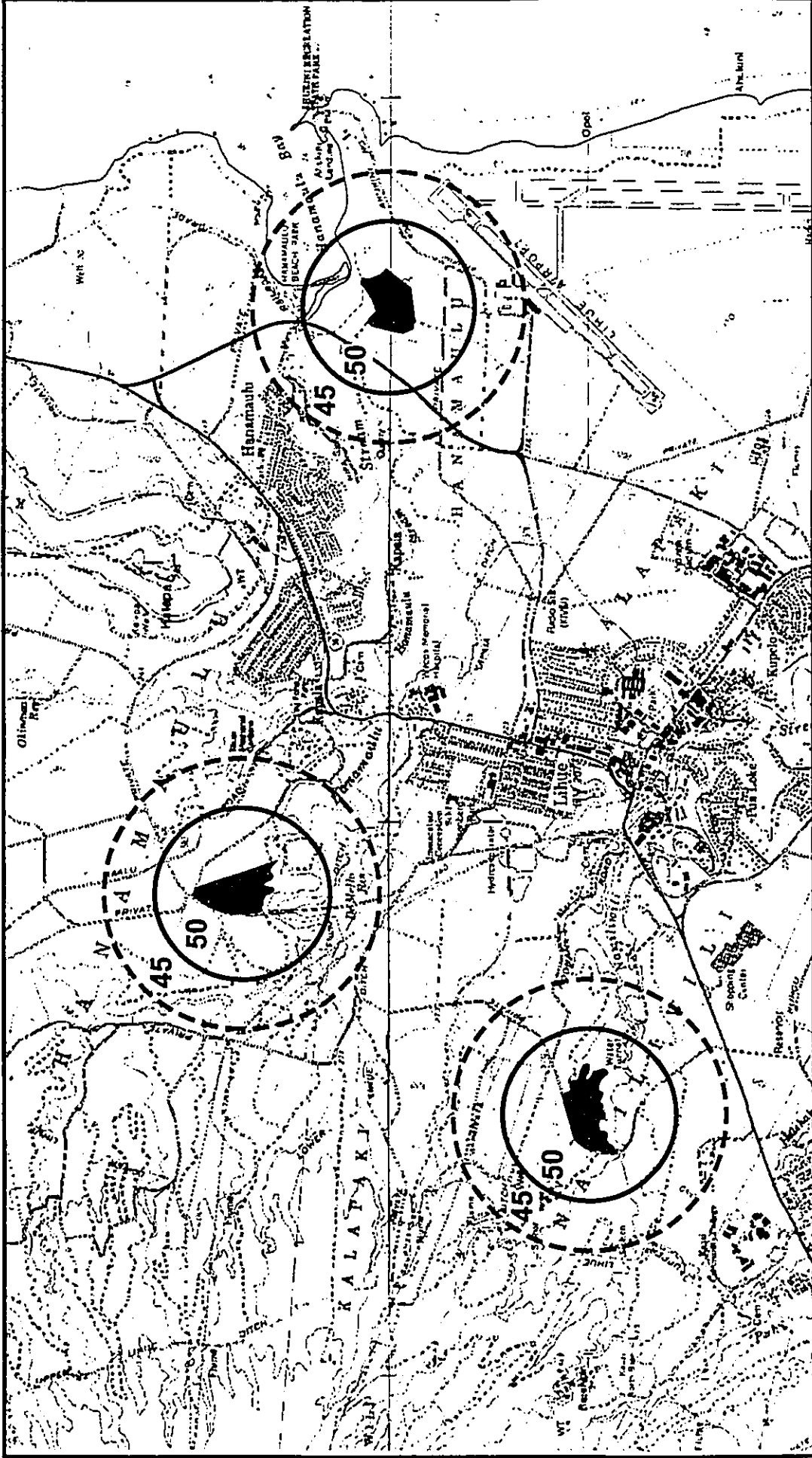
As shown by Figures 4.11-1 and 4.11-2, both generating alternatives would produce noise in excess of 50 dB at the boundaries of this potential site for the Lihue Energy Service Center. Generating Alternative 1 is 2 to 3 dBA louder than Generating Alternative 2. This is due primarily to the greater number of combustion turbines in this alternative. The 45 dBA contour, which indicates the distance beyond which the most stringent SDOH noise limit (45 dBA) would be met, is approximately 2,600 feet (0.5 mile) from the center of the site.

Compatibility With Existing Uses. As shown in Table 4.11-2, a single residential unit is the only existing noise-sensitive use at which noise levels might exceed the 45 dBA threshold. The residence is in a deep gully, however, and it is quite possible that the topographic difference would provide sufficient attenuation to keep project-related noise below that level.

Compatibility With Possible Future Uses. As discussed in Chapter 3, the area surrounding the Puhi Site is currently owned by AMFAC/JMB. It is presently in agricultural use and is zoned for that purpose. AMFAC/JMB has prepared a conceptual long-range master plan for the area that suggests possible future urbanization of much of the land surrounding the power plant (PBR Hawaii, October 17, 1994). The drawings in the conceptual master plan (which is reproduced in Appendix A) call for office and commercial uses of the non-gulch land between the Puhi Site and Kaunualii Highway. However, they are not specific concerning future uses of the other areas near the site, designating them only as "Urban Reserve". The text of the conceptual master plan states:

²⁹ Possible barrier effects were not considered in this analysis for a variety of reasons. These include the fact that many of the sound sources are so tall that barriers would not provide effective noise reduction, vegetation can reflect noise over the tops of barriers, wind effects can negate the effectiveness of barriers that work well during calm conditions, and reflected noise can negate the effect of barriers.

³⁰ Because the analysis for the Puhi Site showed that Generating Alternative 1 produces the highest community noise levels, noise contours for the two other sites were plotted only for that generating alternative.



PREPARED FOR:
 Kauai Electric
 A Division of the
 Citizens Utilities Company

PREPARED BY:
 Planning Solutions, Inc.
 Pacific Data Digitizing

SOURCE:
 USGS 7.5' Lihue Quadrangle, 1983.
 USGS 7.5' Kapaa Quadrangle, 1983.

FIGURE 4.11-1:
**Maximum A-Weighted Noise
 Contours: Generating Alternative 1**

Kauai Electric
 Lihue Energy Service Center

0 2000 4000 Feet
 1" = 2,800'

N

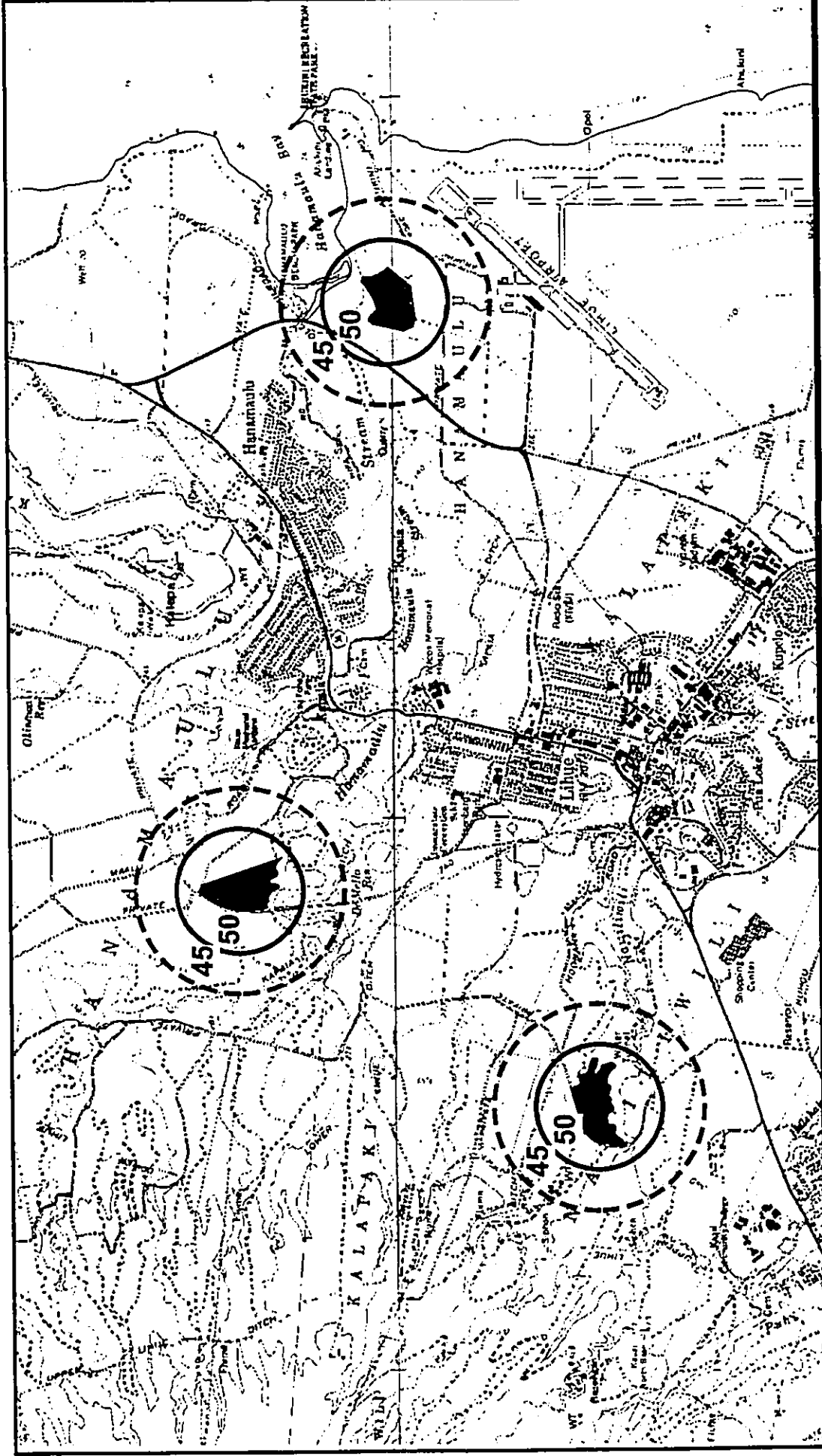
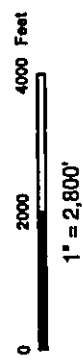


FIGURE 4.11-2:

**Maximum A-Weighted Noise
Contours: Generating Alternative 2**

Kauai Electric
Lihue Energy Service Center



PREPARED FOR:

Kauai Electric
A Division of the
Citizens Utilities Company

PREPARED BY:

Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:

USGS 7.5' Lihue Quadrangle, 1983.
USGS 7.5' Kapaa Quadrangle, 1983.

Table 4.11-2. Summary of Calculated Noise Levels at Specific Locations by Generating Alternative and Site.

<i>Power Plant Site</i>	<i>Generating Alternative</i>	<i>Receptor Location</i>	<i>Sound Level (dBA)</i>
PUHI SITE	1	Nearest House In Valley	40-51
		Restaurant off Kaumualii Highway	44
		Hoomana Road Homes	40
		Kauai Community College	40
		Homes <i>Makai</i> of Kauai Community College	38
	2	Nearest House In Valley	38-49
		Restaurant off Kaumualii Highway	41
		Hoomana Road Homes	38
		Kauai Community College	37
		Homes <i>Makai</i> of Kauai Community College	35
FIELD 390 SITE	1	Kauai Memorial Gardens	46
		Building Near De Mello Reservoir	46
		Nearest Residences	40
		Other residences	39
	2	Kauai Memorial Gardens	43
		Building Near De Mello Reservoir	43
		Nearest Residences	37
		Other residences	36
AIRPORT INDUSTRIAL AREA SITE	1	Hanamaulu Beach Park	45-51
		Nearest Residences	44-46
	2	Hanamaulu Beach Park	42-48
		Nearest Residences	41-43

Note: The range of values given for "Nearest House In Valley" for the Puhi Site reflects the influence of different assumptions concerning the "barrier effect" that might result from the residence's location in a deep valley. The highest sound level shown assumes no barrier effect. The lower number shown assumes that there would be a barrier effect. The range of values given for the Airport Industrial Area Site reflect different assumptions governing the barrier effect from topography.

Source: CSTI Acoustics

Areas designated as 'Urban Reserve' on the Concept Plan comprise the moderately sloped areas of land (most of which is currently under sugar cultivation) which extend upslope from Lihue Town. These areas are envisioned primarily as a residential extension of Lihue Town and could include supporting uses such as light industrial, commercial/office, recreational, and public facilities. Under the Kauai General Plan, these areas could be designated as "Urban Mixed Use", "Urban Residential", and "Rural Residential" uses. Generally, "Urban Mixed Use" areas would be concentrated in areas adjacent to the major roadways and intersections. Adjacent to these areas would be "Urban Residential" areas, with "Rural Residential" located on the higher upland areas within the study area. The two large gulches which separate the urban reserve areas would remain as major open space elements.

The Office/Commercial uses that are called for in the AMFAC/JMB conceptual plan are compatible with the project-related noise levels shown in Figures 4.11-1 and 4.11-2. The light industrial, recreational, and public facilities mentioned as possible uses within the Urban Reserve areas are also compatible with the forecast power plant noise levels. However, residences, which are also mentioned as a possible use within the areas designated "Urban Reserve" that are closest to the project site, may not be compatible with the calculated future noise levels. If power generation facilities are constructed on the Puhi Site, it will be important for County and State land use agencies to prevent noise-sensitive development from being undertaken within areas that could be exposed to power plant-related noise in excess of 45 dBA. So long as this is done, the power plant would remain a compatible use.

4.11.4.2 Field 390 Site

As shown in Figure 4.11-1, the 45 dBA contour for Generating Alternative 1 is approximately the same distance (2,600 feet) from the center of the site as was the case for the Puhi Site. The 45 dBA contour for Generating Alternative 2 (which as noted previously is slightly quieter) is also the same distance from the center of the Field 390 Site as it was from the Puhi Site (2,000 feet).

Compatibility With Existing Uses. As shown in Table 4.11-1, there are no existing noise-sensitive uses within the 45 dBA noise contour around the Field 390 Site for Generating Alternative 2. For Generating Alternative 1 (which is slightly louder), CSTI's noise modeling indicates that the nearest buildings (offices at Kauai Memorial Gardens and a small structure near De Mello Reservoir) would be exposed to noise levels of approximately 46 dBA. This is well below the SDOH 50 dBA night-time standard for commercial uses. No existing residences are within the 45 dBA contour for either generating alternative at the Field 390 Site.

Compatibility With Possible Future Uses. The area surrounding the Field 390 Site is currently owned by AMFAC/JMB and is used for sugar cane cultivation. AMFAC/JMB's conceptual master plan (see above) designates approximately 100 acres adjacent to the intersection of the cane haul road and Maalo Road, including the property that comprises the Field 390 Site, as "Urban Reserve." The narrative portion of the plan suggests that the landowner's planners (PBR Hawaii, October 17, 1994) had residential uses in mind for this area. Residential use would not be compatible with noise from the generating alternatives that are under consideration for the Field 390 Site. Other uses that are indicated as appropriate for the "Urban Reserve" areas would be compatible with power plant use of the site.

4.11.4.3 Airport Industrial Area Site

Figures 4.11-1 and 4.11-2 show noise contours for both generating alternatives on the Airport Industrial Area Site. The contours are the same distance from the center of the site as those around the Puhi Site and the Field 390 Site.

Note that these contours are only for the power plant. Because of this site's location close to the active runways at Lihue Airport, existing noise levels are greatly influenced by noise from aircraft operations. The Airports Division of the State of Hawaii Department of Transportation is presently updating the master plan for the Airport and is preparing aircraft noise contours for existing and forecast operations. However, these were not available at the time this analysis was conducted. Aircraft noise contours were prepared as part of AMFAC/JMB's planning for its Lihue-Hanamaulu lands. They indicate that in 1995, the Airport Industrial Area Site was subject to aircraft noise levels of approximately 65 DNL. They also demonstrate that aircraft noise will continue to be the dominant noise source in areas that would be affected by power plant noise in excess of 45 dBA.

Compatibility With Existing Uses. As shown in Table 4.11-2, there are no existing residences within the 45 dB noise contour that would result from Generating Alternative 2 on the Airport Industrial Area Site. CSTI's noise modeling indicates that the nearest houses would experience noise levels of approximately 41 to 43 dBA; Hanamaulu Beach Park would experience noise levels of approximately 42 to 48 dBA depending upon the barrier effect provided by the cliff. The most stringent SDOH noise limit is 45 dBA. CSTI's modeling shows that Generating Alternative 1 could produce noise levels above 45 dBA at the beach park and in the closest home (see the noise contours in Figure 4.11-1 and Table 4.11-2). Whether or not this occurs will depend upon the exact effect that the complex topography has on the propagation of power plant noise.

Compatibility With Possible Future Uses. The area surrounding the Airport Industrial Area Site is currently owned by AMFAC/JMB and is used for sugar cane cultivation. AMFAC/JMB has obtained Urban and Industrial zoning for the land that is south and west of the site, and Lihue Airport lies to the east. The recent rezoning would allow residential development in some areas on the *mauka* side of Kapule Highway. Depending upon the exact layout that is used for the design, some of these could be within the area that would be exposed to power plant noise of 45 to 50 dBA. This would be compatible for multi-family dwellings, but could be incompatible if single-family dwellings are developed there.

It is worth noting that the narrow band of potentially incompatible land use is immediately adjacent to Kapule Highway and in an area that would experience noise from aircraft operations at Lihue Airport. Traffic and aircraft noise would often exceed the noise level that would be produced by the power plant.

4.11.5 POTENTIAL EFFECT OF FACTORS INFLUENCING SOUND PROPAGATION

Several factors that influence sound propagation can lead to levels of environmental noise that are different than those shown in Figures 4.11-1 and 4.11-2. As sound travels from one point to another, it actually takes several different paths simultaneously as it curves through the atmosphere and reflects off the ground. At the sound receiver location, the sound from the different paths recombines. Depending upon the phase of the sound waves, the resulting sound level may be higher or lower than would be predicted with a noise model that does not account for these factors. CSTI Acoustics used the SoundProp noise model developed by the U.S. Army Construction Engineering Laboratories (CERL) to assess the effects that atmospheric conditions (such as wind turbulence, temperature, and humidity) and ground conditions (vegetation) could have on sound propagation from the proposed

facilities.³¹ The CERL noise model was based on detailed scientific research concerning the effects of these environmental factors.

Table 4.11-3 summarizes the magnitude of the potential effects of each of several variables, showing the extent to which they could cause noise levels to differ from those shown in the drawings. In general, these factors result in lower sound levels than those shown in Figures 4.11-1 and 4.11-2. The main reasons for the differences are that the model used to develop the sound contours plotted in the figures assumed that the ground would be a hard, sound-reflective surface and that the atmosphere would be still, with no thermal or velocity gradients.

4.11.5.1 Wind Effects

The power plant noise levels presented in Section 4.11.4 do not account for possible wind effects, i.e., they assume calm conditions. The presence of wind can affect potential noise impacts in two ways. First, it can cause sound to propagate further in the downwind direction (and less far in an upwind direction) than would occur under calm conditions. Secondly, the noise it produces as it passes through vegetation increases background noise, potentially masking noise from power plant operations. In general, sound travelling upwind from a sound source will curve away from the ground, greatly reducing sound levels. Conversely, sound travelling downwind will tend to curve down to the ground, causing higher noise levels in the downwind direction than would otherwise occur.

4.11.5.2 Ground Cover Effects

The kind of ground cover also affects the manner in which sound propagates from a source. If the ground is hard and reflective (as is the case when it is paved, for example), sound tends to bounce along the ground surface, creating higher downwind sound levels than would otherwise be the case. Thick vegetation, on the other hand, tends to absorb, rather than reflect, sound. The sound that does reflect off the soft ground can be out of phase with the sound travelling just above the ground, and this can significantly reduce the level of sound under all wind conditions. CSTI Acoustics' analysis assumed hard ground cover at the power plant and thick vegetation between the power plant and the sound receptors.

4.11.5.3 Destructive and Constructive Interference

SoundProp considers the effect of destructive and constructive interference between the direct sound path from the source to the receiver and that reflected off the ground. The modeling did not consider any possible barrier effects either from buildings or from topography. Since some barrier effects are likely to occur, this is a conservative assumption (i.e., it means that the calculated noise levels are likely to be higher than those that would actually be experienced).

³¹ The SoundProp computer program uses 1/3-octave band sound power levels for a sound source (the sound source levels for all of the equipment in each generating alternative were combined and used as input to the program). The program calculates the community sound level based on the height of the sound source (an average height of 4 meters was used for this modeling), the height of the sound receiver (an ear elevation of 1.5 meters was used for this analysis), and the type of ground surface (see discussion in Section 4.11.5.2).

Table 4.11 - 3. Effect of Environmental Factors on Noise Propagation.

Generating Alternative	Sound Propagation Conditions	Forecast Sound Levels (dBA) by Distance from Site (in feet)					
		260	410	660	1,040	1,640	2,620
SoundPlot Modeling	Alternative 1	66	63	58	54	50	44
	Alternative 2	64	61	57	52	47	42
Generating Alternative 1	No Wind	64	59	52	44	37	30
	<i>Difference</i>	-2	-4	-6	-10	-13	-14
	ISO 9613-2	66	61	57	53	48	43
	<i>Difference</i>	0	-2	-1	-1	-2	-1
	Downwind	65	61	59	50	45	38
	<i>Difference</i>	-1	-2	+1	-4	-5	-6
Generating Alternative 2	Upwind	57	50	43	35	28	20
	<i>Difference</i>	-9	-13	-15	-19	-22	-24
	No Wind	63	57	50	42	35	28
	<i>Difference</i>	+1	-4	-7	-10	-12	-14
	ISO 9613-2	63	59	55	50	45	41
	<i>Difference</i>	-1	-2	-2	-2	-2	-1
Generating Alternative 2	Downwind	62	59	56	47	43	36
	<i>Difference</i>	-2	-2	-1	-5	-4	-6
	Upwind	54	47	40	33	25	18
	<i>Difference</i>	-10	-14	-17	-19	-22	-24

Note: The "difference" row shows the difference between the sound levels calculated using SoundPlot (see the first two rows of the table and the discussion in Section 4.11.4) and those calculated using alternate sound propagation conditions modeled with CERL's SoundProp. Negative numbers indicate that the SoundPlot estimate exceeds that of the calculation made using various assumptions about wind speed and direction.

Source: CSTI Acoustics

4.11.5.4 Thermal Inversions

Thermal inversions in the atmosphere can also cause sound to curve back to the ground, causing higher noise levels than would otherwise be the case. In general, their effect on sound propagation is on the same order of magnitude as that from wind. Thermal inversion effects differ from wind in three notable ways:

- They can cause sound to propagate farther in all directions, not just in a single (downwind) direction.
- Thermal inversions on Kauai occur much less frequently than do the kinds of wind conditions that can cause increased noise propagation.
- Thermal inversions tend to occur during the nighttime and when wind speeds are low. Consequently, they have their greatest effect in situations where the background noise levels are low and people are most sensitive to environmental noise.

4.11.5.5 Implications of Environmental Factors

As shown in Table 4.11-3, the noise levels predicted by the CERL model (which accounts for environmental factors) tend to be lower than those predicted by the SoundPlot model. This is true under virtually all environmental conditions, even for downwind receptors. In the few instances where the CERL estimate is higher than SoundPlot's, the difference is only 1 dB. This difference is imperceptible to the human ear.

KE is committed to seeing that the design its facilities are sensitive to community noise concerns. It will conduct further noise analyses during the detailed design of the generating facilities to confirm that the equipment that is specified is capable of meeting the applicable noise limits. Noise reduction measures in addition to those assumed for this analysis will be included as necessary.

4.11.6 NOISE FROM PROJECT-RELATED TRAFFIC

As discussed in Section 4.10, operation of the proposed facilities would have little effect on the volume of traffic on surrounding roadways. Hence, with the following exception, traffic noise from the proposed project is small.

While overall traffic noise is not substantial, operation of the Lihue Energy Service Center will involve the operation of a substantial number of trucks. Most of the light and medium trucks are associated with the T&D baseyard that is planned for a portion of the site. The SDOH has established noise limits for vehicles operated on Oahu (HAR §11-42), but these do not presently apply to vehicles operated on Kauai (see Table 4.11-4). Nonetheless, because the limits reflect noise levels that are achieved by the vehicles that KE has in its T&D automotive fleet, the SDOH-mandated levels for Oahu serve as a good indicator of the kinds of vehicle noise source levels that can be expected from those vehicles.

Table 4.11 - 4. State Department of Health Noise Limits for Light Vehicles Operated on Oahu.

<i>Posted Speed Limit (in mph)</i>	<i>Noise Limit in dBA by Measurement Distance</i>		
	<i>20 feet</i>	<i>25 feet</i>	<i>50 feet</i>
0-25	77	75	69
30	79	77	71
35	81	79	73
40	83	81	75
45	85	83	77
50	87	85	79
55	89	87	81
60	91	89	83

Source: HAR §11-42-7.

Fuel transport to all of the sites would be by heavy truck.³² Because such trucks are typically measurably louder than passenger vehicles, noise from them is of particular concern. HAR §11-42 specifies noise limits for heavy vehicles operating on roadways on Oahu (see Table 4.11-5). While these limits are not legally enforceable on Kauai, they are based on truck manufacturer equipment specifications. Consequently, they provide an indication of the kinds of noise source levels that are achievable with new vehicles. Vehicles often become slightly noisier as they age, and the fuel truck transport fleet could include some vehicles that might not meet the nighttime noise limits shown in the table.

Table 4.11 - 5. HAR §11-42 Vehicular Noise Limits for Heavy Vehicles on Oahu.

<i>Posted Speed Limit</i>	<i>Time Periods When Applicable</i>	<i>Noise Limit in dBA by Measurement Distance</i>		
		<i>20 feet</i>	<i>25 feet</i>	<i>50 feet</i>
35 mph or less	6:00 a.m. - 6:00 p.m.	92	90	84
	6:00 p.m. - 10:00 p.m.	92	90	84
	(10:00 p.m.- 6:00 a.m.), Holidays and Sundays	81	77	73
> 35 mph	All	92	90	84
Truck Routes	All	96	94	88

Source: HAR §11-42-8.

³² Heavy vehicles are defined as vehicles which have a gross vehicular weight rating of 10,000 pounds or greater.

PROBABLE IMPACTS OF THE PROPOSED ACTION

KE is seeking to mitigate the potential adverse effects of project-related vehicular noise by specifying the use of cane haul roads and truck routes by trucks transporting fuel to the site and by limiting fuel transport to non-noise-sensitive hours (i.e., 7:00 a.m. to 9:00 p.m.).³³ This will keep trucks away from noise-sensitive areas during times when noise from the fuel trucks could be most intrusive.

4.11.7 CONSTRUCTION NOISE

Earthmoving equipment, *e.g.*, bulldozers and diesel-powered trucks, would probably be the loudest equipment used during construction (assuming that pile driving will not be required). In cases where construction noise exceeds, or is expected to exceed, the SDOH's "maximum permissible" property line noise levels, a permit must be obtained from the SDOH to allow the operation of construction equipment, power tools, etc., which emit noise levels in excess of "maximum permissible" levels. Specific permit restrictions for construction activities are:

- No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels...before 7:00 a.m. and after 6:00 p.m. of the same day, Monday through Friday.
- No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels...before 9:00 a.m. and after 6:00 p.m. on Saturday.
- No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels on Sundays and on holidays.

In addition, construction equipment and on-site vehicles or devices whose operations involve the exhausting of gas or air, excluding pile hammers and pneumatic hand tools weighing less than 15 pounds, must be equipped with mufflers.

4.12 IMPACTS ON SCENIC AND AESTHETIC RESOURCES

This section discusses the effect that construction and operation of the proposed facilities would have on the scenic and aesthetic resources of the Lihue area. It begins with a review of the project-related structures and activities that have the greatest potential to affect these resources. It then describes the methodology that was used to identify and evaluate these effects. Finally, it presents a site-by-site discussion of the anticipated effects and the measures that can be taken to mitigate them.

4.12.1 PROJECT COMPONENTS ABLE TO IMPACT SCENIC & AESTHETIC RESOURCES

4.12.1.1 Structures and Activities

The proposed project is industrial in nature. Some of the structures (*e.g.*, the buildings in the T & D baseyard, the warehouses, and the administrative offices) are relatively low and closely resemble the kinds of structures found in light industrial areas throughout the Island. Other structures (most notably the fuel storage tanks, the coal storage pile, and the building housing the diesel units) are higher and bulkier; however, they are still within the range of heights and sizes allowed without a variance in areas that are zoned General Industrial. With an overall height of up to 110 feet, the building housing the coal-fired fluidized-bed boiler that is part of Generating Alternative 2 is the tallest of the buildings that could be constructed on the Lihue Energy Service Center Site and the most likely to stand out visually. The exhaust stacks would be thin compared to the other structures, but they are

³³ This limitation is more restrictive than the 10:00 p.m. to 6:00 a.m. time period that the State Department of Health regulations consider most noise-sensitive.

necessarily the tallest structures on the site. Consequently, they would be visible from the greatest number of places.³⁴

Nearly all of the activities that would take place on the project site following its construction occur indoors. Because of this, they have little potential to cause adverse visual effects. Vehicles arriving and leaving the facility would be the most obvious activity. These include cars carrying employees to and from the plant site, trucks operating out of the T&D facilities, and trucks carrying fuel to the plant site. As discussed elsewhere in this report, the volumes are not high. Consequently, their movement does not have the potential for significant visual impacts.

The new transmission lines that would connect the Lihue Energy Service Center to KE's existing electrical transmission grid would be mounted on steel poles of the sort that are used throughout the Island. These poles would be from 85 to 105 feet high and 2 to 3 feet in diameter (see Figure 2-12 for an illustration of a typical pole).

4.12.1.2 Visible Emissions

As discussed in the air quality sections of this report, SDOH regulations limit visible emissions (not including uncombined water vapor) from the proposed facilities to no more than 20% opacity. In addition, the regulations require that: (i) plant operators take "reasonable precautions" to prevent particulate matter emissions during construction or material handling and (ii) "best practical operation or treatment" (e.g., water or chemical dust suppressants, paving of roads, and the installation of hoods and fabric filter dust screens) be implemented to prevent visible emissions of fugitive dust beyond the property line.

In general, exhaust emissions from the proposed facilities would not appear as a distinct plume. However, as discussed in the air quality impact section of this report, there are certain combinations of plant operating and meteorological conditions (e.g., generating unit startup and high humidity/low wind speed) that may cause a light-colored water-vapor plume to be visible. Visible plumes of this sort would occur infrequently and would be short-lived; they would be far less apparent than the exhaust plume from sugar mills. Consequently, such plumes are not discussed further below.

4.12.2 VISUAL IMPACT ASSESSMENT METHODOLOGY

The visual impact assessment had several principal objectives. The most important were to:

- Identify the locations from which the proposed facilities would be visible.
- Determine the extent to which their presence would cause a significant change to the existing visual environment.
- Identify measures that could be taken to screen the facilities from view or otherwise mitigate potentially adverse effects.

The number of site/generating technology combinations being considered, as well as the many changes to surrounding areas that are expected over the decades during which the facilities would be developed made it necessary to approach these objectives in a sequential fashion. This approach is summarized below.

³⁴ The external exhaust stack diameters and heights for the various units are estimated as follows:
Advanced Steam-Injected CT, initially 50 to 70 feet high and 10 feet in outside diameter (at base), 90-100 feet maximum;
Dual-Train Combined-Cycle, 90-100 feet high and 18 feet in diameter (at base);
Diesel, 90-100 feet high and 4 feet in diameter (throughout height);
Fluidized-Bed Coal Unit, 165 feet high and 16 feet in diameter (at base).

The first step involved a computer screening analysis. This was conducted using available information concerning topography, project location, and facility height and layout. The analysis used computerized elevation data from the U.S. Geological Survey for the Lihue and Kapaa 7.5-minute quadrangles. The approximate location of the three sites was established using visual references that could be seen on the ground and on the digitized maps. The reference points included existing roads, drainage features, and existing structures. The approximate location and height of the structures and equipment that would be developed on each of the sites was established using the conceptual sites layouts shown in Figures 2-1, 2-2, 2-3, and 2-4, and information on structure heights from Table 4.4-10.³⁵

Because this computer screening used only topographic information, it did not consider the substantial visual barriers provided by vegetation, buildings, and other structures. Photographs and field observations provided the information needed to account for these factors. This information was collected from two points of view:

- (1) The first entailed taking photographs from a helicopter that hovered over the center of each of the sites at four different heights above the ground (25 feet, 50 feet, 100 feet, and 150 feet). These heights correspond generally to the structure-height categories noted above. By documenting the geographic areas that could be seen from these points, the photographs indicated the locations from which it would be possible to see a structure of that height if it were developed on each of the three sites.
- (2) The second point of view was represented by a set of photographs taken from selected vantage-points on the ground looking toward the various sites. The principal goal was to visit locations from which other screening techniques indicated the proposed facilities might be visible and to determine the extent to which other factors (such as existing vegetation, existing structures, or topographic differences not evident at the resolution of the USGS data) might affect that visibility.

The results of the screening analysis are summarized Section 4.12.3. The discussion of each site begins with a review of the areas which the computer screening indicated were of greatest concern. This is followed by a detailed discussion of the findings for each site. Drawings (one for each of the three sites) are used to highlight points made in the discussion. Readers may also find it useful to refer to the 11" by 17" aerial photograph of the Lihue area reproduced in Appendix B of this report.

4.12.3 RESULTS OF VISUAL IMPACT SCREENING ANALYSIS

4.12.3.1 Puhi Site Visual Impact Screening Results

The computer screening analysis indicated that the areas from which the potential visibility of proposed power generation facilities on the Puhi Site is of greatest concern are situated *mauka* of Kaumualii and Kuhio Highways (see Figure 4.12-1). It showed that from the Puhi area (the closest residential area *makai* of the highway) only the tallest structures were potentially visible. The computer screening also indicated potential visibility from the densely developed residential subdivisions that make up central Lihue and from residential areas in the upper portions of Hanamaulu. Potential visual effects on each of these areas are discussed further below.

³⁵ To simplify the screening process, structure heights were generalized using the following categories: (i) up to 10 meters (33 feet); (ii) 10 meters to 15 meters (30 feet to 50 feet); (iii) 15 meters to 30 meters (50 feet to 100 feet), and; (iv) 30 meters to 50 meters (100 feet to 165 feet).

Area Immediately Mauka of the Puhi Site. Development on the Puhi Site would be most visible from the areas immediately to the north. Sugar cane is presently cultivated on that land, a use which is visually compatible with locating the Lihue Energy Service Center on the Puhi Site.

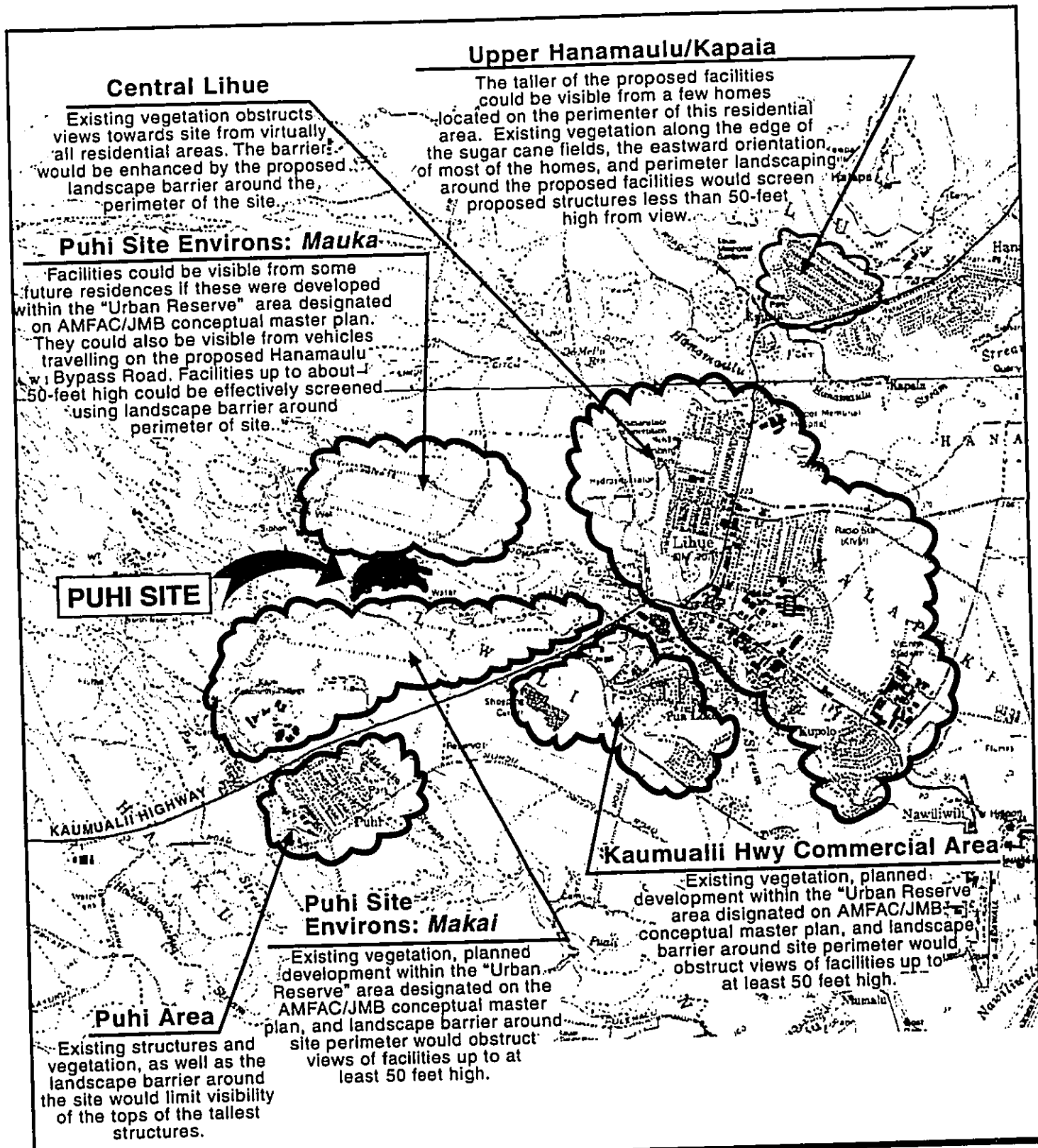
The AMFAC/JMB conceptual master plan for its *mauka* land in Lihue (Figures 4.10-2 and 4.10-3) designates the area *mauka* of the Puhi Site as "Urban Reserve", a classification that, in this area means probable residential uses (see text of the plan in Appendix A). Because the ground slopes upward in this area, it would be difficult to completely screen the tallest of the proposed facilities (generally those higher than about 60 to 70 feet) from view by residents of homes if they were developed in this area.

AMFAC/JMB's conceptual master plan for this area envisions a major new roadway passing along the *mauka* side of the Puhi Site. The *Kauai Long-Range Land Transportation Plan* shows this as part of the Lihue-Hanamaulu Bypass Road and recommends that it be constructed in the 2006-2020 time frame. Because the highway would pass close to the site, it would be relatively easy to provide a landscape buffer that would screen the generating facilities from vehicles passing close by. It would be more difficult to hide the higher structures from view from vehicles approaching the site from the east, however. To accomplish this, it would be necessary to maintain a dense mass of trees on either side of the roadway for a considerable distance.

Area Between the Puhi Site and Kaumualii Highway. Nawiliwili Stream Gulch is immediately *makai* of the Puhi Site. Vegetation growing along the sides of the Gulch and the line of trees that KE has planted along much of the perimeter of the power plant site would screen the view of structures up to approximately 50-feet-high from the highway. The office and commercial development that the AMFAC/JMB master plan calls for in the area between the Lihue Energy Service Center site and Kaumualii Highway could also screen power plant structures that might otherwise be visible above the tree tops. However, the analysis suggests that the tallest structures that are being considered for the Lihue Energy Service Center site (principally the 110-foot high boiler building and 165-foot-high stack that are part of the fluidized bed coal generating unit included in Generating Alternative 2) would be visible from vehicles eastbound on Kaumualii Highway in areas where the power plant facilities are not screened by trees or other vegetation planted relatively close to the highway.

The existing electrical power transmission lines through this area have sufficient capacity to accommodate approximately 100 MW of additional generating capacity (65 to 80 percent of the total that is planned for the Lihue Energy Service Center). Consequently, no new power lines would be required for many years. When additional transmission capacity is needed, it would be provided through an additional above-ground line within KE's existing transmission line corridor. This would cause only marginal change in the existing appearance.

Kauai Community College, Kilohana, and Other Uses to the West. Results of the computer screening analysis indicated that the proposed facilities could affect the views from these areas. Subsequent field surveys from the ground and in the air showed that, for reasons summarized below, most of these effects are unlikely to occur.



Central Lihue

Existing vegetation obstructs views towards site from virtually all residential areas. The barrier would be enhanced by the proposed landscape barrier around the perimeter of the site.

Upper Hanamaulu/Kapaia

The taller of the proposed facilities could be visible from a few homes located on the perimeter of this residential area. Existing vegetation along the edge of the sugar cane fields, the eastward orientation of most of the homes, and perimeter landscaping around the proposed facilities would screen proposed structures less than 50-feet high from view.

Puih Site Environs: Mauka

Facilities could be visible from some future residences if these were developed within the "Urban Reserve" area designated on AMFAC/JMB conceptual master plan. They could also be visible from vehicles travelling on the proposed Hanamaulu Bypass Road. Facilities up to about 50-feet high could be effectively screened using landscape barrier around perimeter of site.

PUHI SITE

Kaumuallii Hwy Commercial Area

Existing vegetation, planned development within the "Urban Reserve" area designated on AMFAC/JMB conceptual master plan, and landscape barrier around site perimeter would obstruct views of facilities up to at least 50 feet high.

Puih Site Environs: Makai

Existing vegetation, planned development within the "Urban Reserve" area designated on the AMFAC/JMB conceptual master plan, and landscape barrier around site perimeter would obstruct views of facilities up to at least 50 feet high.

Puih Area

Existing structures and vegetation, as well as the landscape barrier around the site would limit visibility of the tops of the tallest structures.

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Kauai Electric
A Division of the
Citizens Utilities Company

PREPARED BY:
Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:
USGS 7.5' Lihue Quadangle, 1983.
USGS 7.5' Kapaia Quadangle, 1983.

LEGEND:

 Areas of potential visual impact

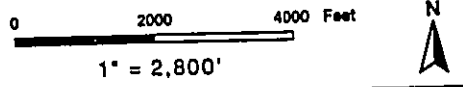


FIGURE 4.12-1:

Puih Site: Visual Impacts

Kauai Electric
Lihue Energy Service Center

PUIH Lihue Energy Service Center, Fig. 4.12-1, Puih Visual Impacts, 1988

Existing vegetation on the western side of Nawiliwili Stream Gulch already limits views of the site from Kauai Community College and Kilohana Plantation. This vegetation also provides a screen for the possible future school site that the Department of Education has identified in that area. The vegetation is particularly effective as a screen because it is located close to potential viewers and, therefore, blocks the line-of-sight between Kauai Community College and Kilohana Plantation and even the tallest structures that are being considered for the Lihue Energy Service Center. However, there are a few gaps in the vegetation, and the taller structures on the Puhi Site could be visible through them if the gaps are not eliminated. Depending upon its exact nature, it is possible that the urban development that the AMFAC/JMB long-range conceptual plan calls for in this area could provide the screening that is needed to block these views. If it does not, a vegetative screen established within the AMFAC/JMB development would be effective.

Even without off-site vegetation, the line of trees that KE has already planted along the perimeter of its Puhi Site will eventually screen all but one of the buildings that are being considered. The exception is the 110-foot-high boiler building that is part of the fluidized-bed coal unit included in Generating Alternative 2. Because of its height and bulk, it would not be possible to completely screen that structure. The exhaust stacks for some of the units would be visible as well, but their narrow cross-section limits the magnitude of the effect that they could have on views.

Central Lihue. Follow-up field visits to central Lihue showed that existing structures and vegetation already blocked views of the Puhi Site from virtually all of the residential areas of Lihue that the computer analysis had indicated might be affected. Because the vegetation is located close to viewers, it is effective for virtually all structure heights.

Upper Hanamaulu. Follow-up visits to the upper Hanamaulu areas that the computer analysis had highlighted as potential impact areas confirmed that the proposed facilities would be visible from several of the rim lots in that area. However, the two-mile distance between the Puhi Site and these lots, the orientation and landscaping of many of the residences on them, and the line of trees that KE has already planted along the perimeter of the Puhi Site would mitigate potential effects on residents of these areas.

4.12.3.2 Field 390 Site Visual Impact Screening Results

The computer screening analysis of the Field 390 Site showed that the existing topography would block views of this site from most areas south of a line extending along Rice Street and to the west-northwest.³⁶ It indicated that the greatest potential for visual impacts as a result of power plant development on this site would occur on the existing residences along Kanakelu and Noi Streets and the rim lots in upper Hanamaulu (Laukona Street). Those areas are approximately one mile from the project site. The screening also indicated that the facilities could be visible from much of the area along the northern side of Ahukini Road east of Kuhio Highway. This area is presently in agricultural use, but the County recently rezoned the portion between Kuhio Highway and Kapule Highway to permit residential use. Potential visual effects on each of these areas are discussed further below. Figure 4.12-2 highlights visual features mentioned in the discussion of the Field 390 Site.

³⁶ The computer analysis indicated the possibility that development on the site would also be visible from the area immediately adjacent to Kaumualii Highway near the Kukui Grove Shopping Center. However, ground checks showed that existing vegetation already blocked such views.

Field 390 Environs

Facilities could be visible from residences if these were developed within the "Urban Reserve" area designated on AMFAC/JMB conceptual master plan. They could also be seen from vehicles travelling on the proposed Hanamaulu Bypass Road and makai-bound on Maalo Road. Facilities up to about 50-feet high could be effectively screened using landscape barrier around perimeter of site and along western side of Maalo Road.

Upper Hanamaulu/Kapaia

Only the tallest structures would be visible, and only from a few residential lots along the perimeter of the subdivision. This is due to the barrier effect of existing vegetation close to the residences, the eastward orientation of many of the homes, and the perimeter landscaping planned around the facilities.

FIELD 390 SITE

Central Lihue

The taller of the proposed facilities would be visible from a few homes located near the Kanekelu and Noi Street intersection. Existing vegetation along the edge of the sugar cane fields and the eastward orientation of most of the homes limits the number of viewpoints. In addition, the landscape barrier planned around the proposed facilities would screen structures less than 50-feet high from view.

PREPARED FOR:
Kauai Electric
A Division of the
Citizens Utilities Company

PREPARED BY:
Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:
USGS 7.5' Lihue Quadrangle, 1983.
USGS 7.5' Kapaia Quadrangle, 1983.

LEGEND:



Areas of potential visual impact

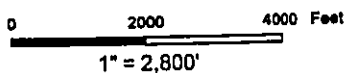


FIGURE 4.12-2:

Field 390 Site: Visual Impacts

Kauai Electric
Lihue Energy Service Center

Central Lihue (Kanakelu and Noi Streets). Existing single-family residences and the Immaculate Conception School line the *mauka* side of these streets. Most of these are single-story buildings. Screening vegetation along the field edge blocks views toward the Field 390 Site from the school and from nearly all of the homes. The majority of the homes are oriented away from the fields as well (i.e., they do not have windows affording views in the direction of the possible power plant site). A few homes, particularly those located near the intersection of Kanakelu and Noi Streets, do have views toward this Site (which is approximately 4,000 feet away). The buildings that are along the field edge obstruct views towards the Field 390 Site from all of the lots to the southeast, eliminating any potential for adverse visual effects on them.

Photographs taken from a helicopter hovering above the Field 390 Site indicate that existing vegetation will most likely obstruct views of power plant structures less than 30 feet high from this area. The tops of power plant structures that are in the 30- to 50-foot high range (e.g., the fuel storage tanks) may be visible from the homes noted above, but it is only the tallest structures (i.e., the exhaust stacks and the boiler building for the fluidized bed unit) whose height and/or bulk will make those two structures widely visible. Their height also makes it impractical to use landscaping to screen them from distant viewers.

Upper Hanamaulu Rim Lots (Laukona Street) and Laukona Park. Existing single-family residences along the western portion of Laukona Street and Laukona Park are also approximately 4,000 feet (0.8 mile) from the Field 390 Site. Existing vegetation along the western edge of the park obstructs views from it toward the potential power plant site. Natural vegetation and home landscaping, as well as the eastward orientation of many of the homes, also limits views from them toward the Field 390 Site. However, it is visible from some locations.

Results of the helicopter survey from the Field 390 Site showed that the topography and existing vegetation will make it impossible to see structures on it that are less than 30 feet high from this location. Vegetation and topography would be nearly as effective at obstructing views of power plant structures in the 30- to 50-foot high range.³⁷ When combined with new tree plantings that KE plans along the perimeter of the site, the vegetative screen would make it difficult to see these structures.

Higher structures (the exhaust stacks in all alternatives and the boiler building for the fluidized bed coal unit included in Generating Alternative 2) would be more visible. Because of their narrow cross-section and distance, most of the exhaust stacks would be hard to see from this vantage point.³⁸ Because of its height and bulk, the boiler building that is part of the fluidized-bed coal unit would be noticeably more visible than any of the other structures that KE is considering. Moreover, these same factors make it impossible to screen the boiler building from distant viewers.

Existing Agricultural Fields Surrounding the Site. The computer and photographic analyses showed that structures on this site would be quite visible from the adjacent fields. This is of little consequence at the moment because of the nature of the activities that occur on these fields and the limited public access to these private lands. However, the AMFAC/JMB conceptual master plan discussed

³⁷ 50 feet is the maximum height Kauai County's Comprehensive Zoning Ordinance stipulates for structures in this zoning district; taller structures would require a variance.

³⁸ This conclusion assumes that: (i) the emissions comply with the State Department of Health's 20 percent opacity limit and (ii) atmospheric conditions are such that water vapor in the emissions does not condense to form a plume. KE is committed to the first of these, and the results of preliminary analyses indicate that atmospheric conditions in Lihue are such that the stacks would rarely, if ever, produce a vapor plume of the sort that can often be seen from the Lihue Plantation Mill.

PROBABLE IMPACTS OF THE PROPOSED ACTION

previously (see Figures 4.10-2, 4.10-3, and Appendix A) contains two elements that could alter this in the future.

- The first is the "Urban Reserve" areas that it identifies around the site. From a visual standpoint, residential development on this land (which are among the uses the AMFAC/JMB master plan contemplates) would be incompatible with the industrial uses that are planned for the Lihue Energy Service Center.
- The second is the arterial roadway (which follows the existing cane haul road past the site) which the AMFAC/JMB conceptual plan indicates would serve this long-range development. That roadway would increase the number of vehicles passing the site and, therefore, the number of people who would see the industrial facilities constructed on it.

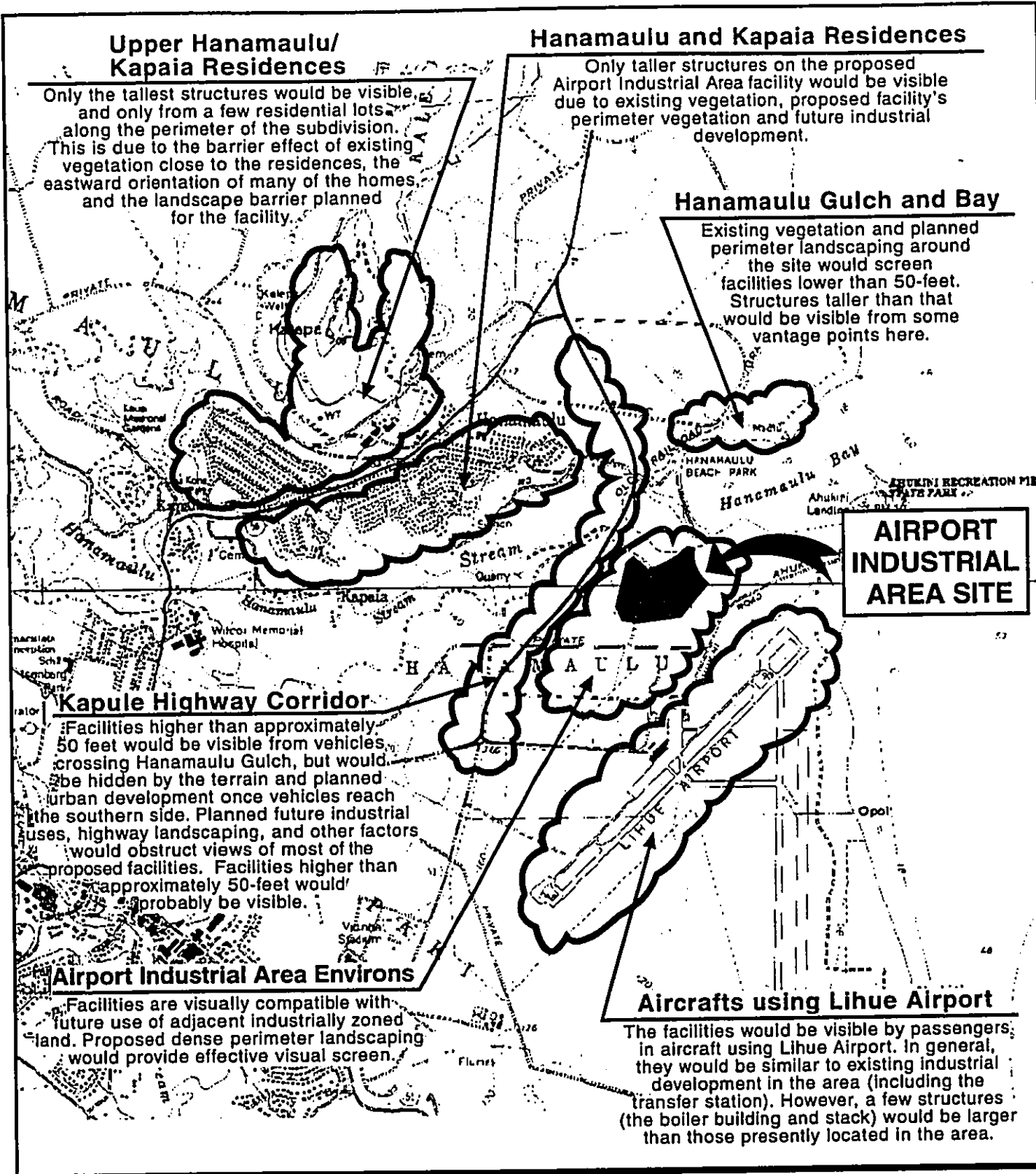
Maalo Road. Maalo Road passes several hundred feet north of the Field 390 Site. It provides vehicle access to Waimea Falls and is, therefore, an important tourist route. Because the portion of Maalo Road that is below its intersection with the main cane haul road that passes along the western side of the Field 390 Site is in a cut, the existing topography obstructs views of the project site from that area. Moreover, by the time the proposed facilities could be seen from cars *mauka*-bound for the Falls, the vehicles would be past the site, making it more difficult to see. Occupants of *makai*-bound vehicles would be at approximately the same elevation as the power plant site and headed directly toward it as they approach the main cane haul road/Maalo Road intersection. Without mitigation, they would have an unobstructed view of the proposed facilities.

Field investigations showed that mitigation of this impact is possible. The line of trees and shrubbery that KE has planned around the perimeter of the site would provide a partial screen; this would be effective for buildings up to at least 30 feet high. Off-site plantings along the western side of Maalo Road above its intersection with the Main Cane Haul Road would be needed to provide complete screening for the taller buildings that are planned for the Lihue Energy Service Center. Properly planned and maintained, such a vegetative screen could make it difficult to see any but the largest of the proposed structures from the roadway.

4.12.3.3 Airport Industrial Area Site Visual Impact Screening Results

The computer screening analysis of the Airport Industrial Area Site showed that the existing topography would block views of this site from most areas south of Ahukini Road. It indicated that the greatest potential for visual impacts as a result of power plant development at this location would be of four sorts. The first is on views from existing residences along the southern side of Hanamaulu. The second is on views from potential future uses of adjacent agricultural land that was recently rezoned for urban use. The third is on views from vehicles travelling on Kapule Highway and from aircraft using Lihue Airport. The fourth is on the northern side of Hanamaulu Bay and Valley. Potential visual effects on each of these are discussed below. Figure 4.12-3 highlights visual features mentioned in the discussion below.

Hanamaulu Residences. The computer screening indicated that the power plant site might be visible from existing single-family residences along parts of Laukona Street, Hoohuki Street, and Palikea Street. The closest of these is within approximately 3,000 feet of the Airport Industrial Area Site. The aerial survey showed that existing vegetation obstructs views of the lower structures that are planned for the site (i.e., those less than 20- to 30-feet high). Taller structures would be visible if additional screening is not provided. The line of trees that KE plans to develop around the perimeter of its site will help screen the proposed facilities from this direction.




PREPARED FOR:
Kauai Electric
A Division of the
Citizens Utilities Company

PREPARED BY:
Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:
USGS 7.5' Lihue Quadrangle, 1983.
USGS 7.5' Kapaa Quadrangle, 1983.

LEGEND:

 Areas of potential visual impact

0 2000 4000 Feet
1" = 2,400'



FIGURE 4.12-3:

**Airport Industrial Area Site:
Visual Impacts**

Kauai Electric
Lihue Energy Service Center

In time, the industrial structures that AMFAC/JMB expects it will eventually develop within its recently rezoned Airport Industrial Park will provide some additional screening from this direction as well. The amount of the screening that occurs will depend upon the height of the structures that are developed (the existing zoning allows up to 50 feet without a variance, but most development within such areas on Kauai has typically been lower).

Neither existing vegetation nor project-related landscaping nor AMFAC/JMB's planned development within the Airport Industrial Area will completely screen the highest structures that could be developed on this site from view from the Hanamaulu area. As previously discussed, the exhaust stacks' narrow cross-section will minimize their visibility. But there is little that can be done to mitigate the visual effect of the boiler building that is part of the fluidized bed coal unit that is part of Generating Alternative 2. That structure would rise well above the tree line and all other structures in the area.

Two transmission alternatives are under consideration for this site. One would use above-ground poles and lines; the other alternative would employ underground transmission line from the power plant site to the Hardwoods substation north of Hanamaulu Stream. The underground alternative (which includes placing a segment of the transmission line within a conduit suspended beneath the highway bridge, would have virtually no visual effect. Overhead lines would be visible from the highway and elsewhere.

Adjacent Urban-Zoned Land. Visually, the proposed facilities are compatible with the likely future uses of the industrially zoned land that lies between the Airport Industrial Area Site and Kapule Highway. AMFAC/JMB's recently approved development proposal for the land *mauka* of Kapule Highway calls for a mixture of uses of that area.³⁹ It designates most of the area fronting Kapule Highway Industrial (I-L) and General Commercial (C-G). A portion of the frontage is zoned Residential (R-8).⁴⁰ However, the landowner's plan for the Kapule Highway frontage of the roadway indicates that park and recreational uses will be developed in this area. The few structures on the Airport Industrial Area Site that might be otherwise be visible from this location could easily be screened from view by landscaping along the *makai* side of the proposed park's frontage with Kapule Highway.

Views from Vehicles and Aircraft. Kapule Highway is heavily used by both residents and visitors. The Airport Industrial Area Site is closest to the segment approaching the bridge across Hanamaulu Stream. That highway bridge approach is in a cut which obstructs views from the road toward the power plant site. Occupants of vehicles northbound on the bridge are facing away from the site, minimizing visual impacts as an issue for them. Occupants of vehicles crossing the bridge southbound can look toward the site. The existing line of trees along the top of the southern side of the valley provides an effective screen for most of the structures that might be developed on the Lihue Energy Service Center Airport Industrial Area Site. However, the tops of the generating units' exhaust stacks and the fluidized bed boiler building would extend above the tree line and be visible from approaching vehicles. The effect of Generating Alternative 1 (whose tallest building is just under 50 feet) would be minimal. For this generating alternative, only the top of the exhaust stacks (which would eventually be up to 100 feet high) would protrude up to 40 feet above the tree line. The 110-foot high boiler building and the 165-foot high exhaust stack that are part of Generating Alternative 2 would extend far above the tree line, however, and these would be quite visible from approaching vehicles as they cross the bridge. If the electrical transmission line connecting this site

³⁹ The County Council approved the new zoning designations for the area in Ordinance PM-326-96.

⁴⁰ R-8 Residential Zoning allows up to 8 single-family residences per acre.

to KE's electrical grid crosses the valley on poles (rather than being attached to the highway bridge), it too, would be visible from vehicles crossing the bridge.

This site is immediately adjacent to the Lihue Airport, the principal gateway to the Island. It is readily visible from aircraft using both of the Airport's runways. Visually, the character of the Lihue Energy Service Center would be similar to that of Kauai County's adjacent solid waste transfer station and other uses that have already been developed in the area. Some of the proposed facilities are similar to other structures that are likely to be developed on the "General Industrial" zoned land within the Airport Industrial Area. The exceptions are the exposed mechanical equipment, fuel storage tanks, exhaust stacks, and the large boiler building and tall stack that are included in Generating Alternative 2. Those structures would stand out relative to all others in the area with the possible exception of the Lihue Airport Federal Aviation Administration Control Tower.

Hanamaulu Gulch and Bay. The existing line of trees along the top of the southern side of Hanamaulu Gulch will make it impossible to see structures lower than about 70 feet in height from Hanamaulu Beach and Bay. The tops of structures above that height could be visible from certain locations.

4.13 EFFECTS ON ECONOMIC ACTIVITY

4.13.1 CONSTRUCTION EXPENDITURES AND EMPLOYMENT

The anticipated construction cost of the 26.4 MW Advanced Steam-Injected combustion turbine that is planned as the first unit on the site is on the order of \$30 million. This estimate includes the cost of the electrical substation and transmission line needed to connect it to KE's existing transmission grid.⁴¹ Because forecasts indicate that the next additional unit will not be needed until 2014 at the earliest, KE has not prepared specific engineering cost estimates for subsequent units. However, assuming a similar dollar cost per MW of capacity, the total construction cost for the generation portion of the project is likely to be on the order of \$135 to \$170 million. Based on current forecasts, this cost would be spread over at least 30 to 40 years. The T&D facilities that would be constructed on a portion of the Lihue Energy Service Center site are estimated to cost up to \$3 million. Most of this expenditure would occur within the next five years.

4.13.2 OPERATIONAL EXPENDITURES AND EMPLOYMENT

KE estimates that up to 30 persons could be employed at the generating component of the Lihue Energy Service Center at full build-out. Far fewer persons, probably on the order of 6 to 10, would be needed for the first generating unit. More staff would be hired as additional units are brought on line. In some cases, an individual might split his or her time between the Company's Port Allen facilities and the new site, particularly in the early years when only a small number of the planned units are operating.

As many as 45 persons could ultimately staff the T&D facilities. While some of these may represent additional employees, many would be transferred from existing locations. Consequently, they do not represent a net gain in employment.

The amount that KE will spend to operate the facilities will depend upon many factors that cannot be precisely estimated at the present time. However, an order-of-magnitude estimate can be developed

⁴¹ The transmission line cost included in this figure is for the Puhi Site. The transmission line connection to the Field 390 and Airport Industrial Area Sites will be somewhat higher.

PROBABLE IMPACTS OF THE PROPOSED ACTION

by assuming that (in 1998 dollars) they will be at or below the company's present costs per megawatt-hour of electricity produced. Assuming that is the case, the following operation and maintenance (O&M) expenditures can be anticipated:

<i>Cost Item</i>	<i>Annual Expenditures at Full Build-Out (1998 \$)</i>
Salaries and Wages	4,600,000
Materials and Services	3,000,000
Fuel	28,000,000
Total	35,600,000

4.14 IMPACT ON PUBLIC FACILITIES

4.14.1 INTRODUCTION

The Lihue Energy Service Center is a quasi-public facility. For the most part it will help meet the community's needs rather than place additional burdens on them. However, its operation will require connections to some existing utility systems, and its presence will expand the need for some public services. Finally, the employment and economic activity that it would generate would support additional households with consequent secondary (indirect) effects. The following subsections address each of these consequences in turn. Because the Lihue Energy Service Center would serve, rather than induce, development, the discussion focuses principally on primary effects.

4.14.2 WATER SUPPLY

The Lihue Energy Service Center would rely largely, and possibly entirely, on its own sources of water. Consequently, it would place little burden on the Kauai County Department of Water's (DOW) water system. This is true regardless of the Site/Generating Alternative combination.

At the Puhi Site, and subject to DOW approval, the facility could obtain water for domestic purposes (amounting to no more than a few thousand gallons per day even at complete build-out) from the existing DOW water line that crosses the Puhi Site.⁴² There are no existing municipal supply lines serving the other sites. Consequently, KE will rely on its own sources at these locations, at least initially.⁴³ The Airport Industrial Area Site is part of AMFAC/JMB's Airport Industrial Area. A new water supply system will be installed for that area as it is developed, and it is likely that the Lihue Energy Service Center would seek to use that system as a source of potable water once it is completed. Reject water from the reverse-osmosis water treatment system that is part of the proposed facility is of sufficiently high quality to be used for irrigation.

⁴² Use of the municipal system for this purpose is desirable because of the costly water quality testing requirements that are placed on drinking water sources. Thus, while the purity of the water from the facility's on-site water treatment system meets the drinking water standards, it would be more economical for the facility to use water from the municipal system for domestic purposes when it is available from nearby facilities.

⁴³ AMFAC/JMB's conceptual land use plan for its *mauka* lands and its more concrete plan for the area within which the Airport Industrial Area Site is located suggest that the municipal water system may be extended to serve the Field 390 and Airport Industrial Area sites at some time in the future. KE will explore the technical and economic feasibility of connecting to this system if and when the extension occurs.

4.14.3 WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL

Present plans call for the Lihue Energy Service Center to collect, treat, and dispose of all the wastewater it generates using its own facilities. Consequently, the proposed action will not affect existing or planned public wastewater collection, treatment, or disposal systems. The potential impacts of the private systems that KE will use for these purposes are discussed in Section 4.5.

4.14.4 TELECOMMUNICATIONS

There is no telecommunication service to any of the three sites at the present time. Because of this, KE will need to install these facilities in conjunction with its development of the site. No detailed plans for telecommunication service will be prepared until the site has been selected and approved. However, the Hawaiian Telephone Company has indicated to KE that it would have no difficulty providing telecommunications service to any of the locations under consideration for the Lihue Energy Service Center.

4.14.5 POLICE AND FIRE SERVICE AND PUBLIC SAFETY

All three of the sites being considered for the Lihue Energy Service Center are within a mile of areas already served by the Kauai County Police and Fire Departments. However, because none of the sites are presently developed, the proposed project would expand the area requiring service.

There is little difference between the alternatives from the viewpoint of police service. All would be secure facilities with perimeter fencing, lockable gates, and other security controls. All are relatively close to roadways that the Department now patrols and would eventually be accessible by good, all-weather roadways.

The Kauai County Fire Department's Lihue Fire Station (located on Rice Street near the center of Lihue) would provide the first response to fires at any of the three locations under consideration for the Lihue Energy Service Center. It is about the same distance from all of the sites being considered. The proposed design includes fire water storage and other fire protection facilities required by the County Building Code and by other applicable ordinances and regulations. The flammable materials that would be used on-site would be stored in accordance with the fire code.

4.14.6 HEALTH CARE FACILITIES

All of the sites are within 1.5 miles of Wilcox Memorial Hospital. That facility offers complete medical, surgical, and support services. It includes an emergency center that is open 24 hours per day and extensive diagnostic equipment. Ambulances could reach the hospital from any of the sites in less than 10 minutes.

4.14.7 SCHOOLS

As discussed elsewhere in this chapter, the proposed generating facilities would employ approximately 30 people at full build-out. The first phase would employ fewer than 10. If the T&D baseyard and shops are constructed as planned, they would employ up to 45 people. However, these represent existing employees who are presently based elsewhere on the Island. Consequently, they do not represent a net increase in employment. An increase of 30 jobs, phased-in over a period of several decades, would not have a significant effect on the demand placed on the educational system.

Several existing schools are located in Lihue. These include Kauai High and Intermediate School near Nawiliwili Harbor, Elsie H. Wilcox School on Hardy Street in Lihue, and King Kaumualii School in Hanamaulu. The Kauai Community College, part of the University of Hawaii, is located

PROBABLE IMPACTS OF THE PROPOSED ACTION

mauka of Puhi. The State Department of Education (DOE) is about to begin constructing the Kauai Middle School in Puhi adjacent to Kaumualii Highway; the school has a planned opening date of August 2000.

As part of its long-range planning program, the DOE has identified an area on the *mauka* side of Kaumualii Highway near the Kauai Community College as a possible site for an elementary school to be opened in the year 2005 or later. The DOE has identified other possible sites for this school as well, most notably one on AMFAC/JMB land *mauka* of Kapule Highway that was recently rezoned for urban uses. Regardless of the location, the school is not programmed to open until the year 2005 or later (Beppu, November 9, 1998). Before making a decision on the location of this school, the DOE will conduct a site selection study and prepare an environmental assessment.

The approximate distances between the three locations being considered for the Lihue Energy Service Center and existing schools are as follows:

School/Location	Approximate Distance (in miles)		
	Puhi Site	Field 390 Site	Airport Industrial Area Site
Wilcox Elementary School – Lihue	1.8	1.6	1.8
King Kaumualii Elementary School – Hanamaulu	2.8	1.6	0.7
Kauai Middle School – Puhi (Open 2000)	0.6	2.0	3.1

The Puhi Site is (by a small margin) the closest to an existing school site. It is followed by the Airport Industrial Area Site and the Field 390 Site, in that order. Potential environmental impacts on the areas in which the schools are located are addressed as part of the overall impact analysis presented in earlier sections of this chapter.

4.14.8 RECREATIONAL FACILITIES

The Airport Industrial Area Site is the only location under consideration that is close to an existing recreational facility. It is just a few hundred yards from Hanamaulu Beach Park and approximately 0.5 mile from Ahukini Recreation Pier State Park.

Existing vegetation and structures obstruct views of the site from Ahukini Landing, although the tops of the highest structures that are planned might be visible from certain vantage-points. Initially, access to the Lihue Energy Service Center site would be via the same roadway used to reach the pier. During this period, persons driving to the boat landing facilities would mix with vehicles travelling to and from KE's facilities. In view of the small volume of traffic that either would generate, as well as the other industrial traffic that uses the road, this would not represent a substantial change from present conditions. Access routes could change when the landowner implements its plans for development of the Airport Industrial Area. Depending upon the manner in which this is accomplished, it could separate industrial area traffic from vehicles travelling to and from Ahukini Landing.

The tall line of ironwood trees along the southern side of Hanamaulu Gulch screens the Airport Industrial Area Site from view from Hanamaulu Beach Park. This helps maintain a pristine setting along the shoreline despite the relatively intense activity that takes place in the agricultural fields and nearby airport. These trees would continue to form an effective screen for the lower structures that make up the Lihue Energy Service Center. The tallest structures, particularly the tops of the exhaust stacks and the tall boiler building that is part of Generating Alternative 2, would be visible from portions of the Park, however. Under unusual situations (low winds and low waves), it is possible that

some noise from plant operations could be audible as well. The noise level would be substantially lower than the levels produced by aircraft operating from Lihue Airport.

4.14.9 SOLID WASTE

4.14.9.1 Solid Waste from T&D Baseyard

As previously discussed, the T&D Baseyard facilities proposed for the Lihue Energy Service Center would accommodate activities that KE now conducts elsewhere on the island. Consequently, their operation would generate no additional solid waste and would not affect County landfill operations. The generating units do represent an additional use. Consequently, their operation does have the potential to increase the load at County landfills.

4.14.9.2 Solid Waste from Electrical Generating Facilities

Oil-Fired Generating Units. On the basis of its experience at the Port Allen Generating Station, KE anticipates that the 150 MW of oil-fired capacity and T&D Facilities included in Generating Alternative 1 would produce 1-2 cubic yards of municipal solid waste per day (approximately 10 cubic yards per week) at full build-out. KE estimates that Generating Alternative 2's oil-fired generating units would produce slightly less solid waste, but the difference would probably be no more than a few cubic yards per week. In accordance with its practice at Port Allen, KE would contract with a private solid waste management company for the collection and disposal of this refuse. The contractor would pick up the refuse once each week and haul it to the Kekaha Landfill for disposal. No hazardous material is present in this waste stream.

Coal-Fired Generating Unit. The coal-fired unit that is part of Generating Alternative 2 would produce substantially more solid waste, principally in the form of ash from the combustion process. The majority of the solid waste generated by a coal-fired generating unit of the sort KE is consists of ash and limestone from the fluidized-bed combustion process. The exact amount will depend upon the specific character of the coal that is available. Based on the probable coal consumption rate, between 10 and 15% of the fuel input is likely to wind up as ash. Based on estimates of the heat rate of the coal, the usage pattern of the unit, and other factors, it is likely that the 25-megawatt coal unit would generate approximately 1-2 tons per day of waste. This waste has not been classified as hazardous and generally can be land-filled so long as state leachate control regulations are met (Black & Veatch, 1996: 543). The properties of the ash are such that it is often suitable for use as an aggregate, and some facilities have even marketed the ash as a soil conditioner.

CHAPTER 5

OTHER ALTERNATIVES TO THE PROPOSED ACTION

5.1 FRAMEWORK FOR CONSIDERATION OF ALTERNATIVES

Hawaii Administrative Rules HAR, §11-200-17 (the Department of Health's Environmental Impact Statement Rules) addresses the content requirements of draft and final environmental impact statements (EIS). Subsection §11-200-17(f) states:

(f) The draft EIS shall describe in a separate and distinct section alternatives which could attain the objectives of the action, regardless of cost, in sufficient detail to explain why they were rejected. The section shall include a rigorous exploration of the environmental impacts of all such alternative actions. Particular attention shall be given to alternatives that might enhance environmental quality or avoid, reduce, or minimize some or all of the adverse environmental effects, costs, or risks. Examples of alternatives include:

- (1) The alternative of no action;*
- (2) Alternatives requiring actions of a significantly different nature which could provide similar benefits with different environmental impacts;*
- (3) Alternatives related to different designs or details of the proposed action which would present different environmental impacts;*
- (4) The alternative of postponing action pending further study; and*
- (5) Alternative locations for the proposed project.*

In each case the analysis shall be sufficiently detailed to allow a comparative evaluation of the environmental benefits, costs, and risks of the proposed action and each reasonable alternative. For any agency actions, the discussion of alternatives shall include, where relevant, those alternatives not within the existing authority of the agency.

As discussed in Chapter 1, the State Public Utility Commission's (PUC) rules governing the Integrated Resource Planning (IRP) process make the consideration of alternatives an integral part of Kauai Electric's (KE) annual planning process. The generating alternatives described in Chapter 2 of this report are the outgrowth of that process and of the consultation that KE has had with the community. The impact analysis presented in Chapter 4 of this report addresses different generating technologies and locations in accordance with items (2), (3), and (5) above. Other alternatives are discussed below:

- Section 5.2 addresses the No-Action Alternative [item (1) above].
- Section 5.3 discusses enhanced energy conservation (Demand-Side Management) measures [Items (2) and (3) above]. These are also reviewed in Chapter 1 of this report.
- Section 5.4 summarizes the status of generating facilities being constructed by Independent Power Producers (IPPs) that are expected to make energy available to KE for distribution to its customers.
- Section 5.5 discusses postponing the action [item (4) above].

OTHER ALTERNATIVES TO THE PROPOSED ACTION

- Section 5.6 provides additional discussion on the status of renewable energy options [item (2) above].

5.2 NO-ACTION ALTERNATIVE

In the context of the Lihue Energy Service Center project, the "no-action alternative" means that KE would take no steps to bring the demand and supply of electricity into balance. It would neither increase the source capacity nor actively seek to reduce demand through promotion of conservation or other means. The no-action alternative would not allow KE to meet the energy needs of Kauai's residents, thereby jeopardizing the health, safety, and welfare of the community. This is inconsistent with the company's PUC charter, which makes KE the designated electrical utility for the island of Kauai. Consequently, "no-action" is not a viable alternative. Over the short-term, the island's need for electrical power would be met by the electricity that Kauai Power Partners (the IPP with which KE has contracted for the next unit addition) is obligated to provide.¹ Over the long term, however, additional generating capacity will be needed if the utility is to continue to supply reliable power to its customers. This implies that effects similar to those described here are likely to be experienced elsewhere on Kauai.

The "no-action" alternative would avoid all of the impacts described in Chapter 4 of this report. The existing uses on the sites are assumed to continue, however. Since sugar cane is presently being cultivated on all three, this means that impacts from such things as noise from agricultural operations, particulates released during burning of the cane prior to harvesting, truck traffic, water use for irrigation, addition of chemical fertilizers and pesticides, accelerated soil erosion during the time between harvesting and establishment of the new sugar cane crop, and other similar effects would continue as they have in the past.

5.3 ENHANCED CONSERVATION (DEMAND-SIDE) ALTERNATIVE

As discussed in Chapter 1 of this report, energy conservation measures are an inherent part of the actions that KE proposed in its *1997 Integrated Resource Plan (1997 IRP)* and in other submittals to the PUC. The Commission subsequently approved several of KE's proposed programs, and the company is now implementing these to meet customer needs. The forecasts presented in Chapter 1 assume that these conservation measures will reduce energy use. If they do not, the peak demand for electrical power in 2004 is expected to be at least 5 megawatts greater than would otherwise be the case. This will slightly accelerate the time frame within which the next unit addition is needed.

KE's proposal to the PUC included all of the Demand-Side Management programs it believed were likely to be cost-effective. It could propose additional conservation measures, but it cannot recover the costs of such measures unless the PUC approves them. Because they would result in higher electrical power costs than the measures that have been proposed and may not be practical or acceptable to KE's customers (e.g., banning air-conditioning, prohibiting the use of second refrigerators, etc.), it is not known if such measures would be approved even if KE were to propose them.

The kinds of environmental effects that would result from additional energy conservation depend entirely upon the nature of the measures that produce them.

¹ This assumes that KPP will be successful in its efforts to permit its generating unit at a site other than one of the Lihue Energy Service Center sites discussed here.

- If consumers were simply to lower electrical consumption by reducing their use of lights, water heating units, kitchen appliances, and other equipment, then the only effect would be foregoing the enjoyment they presently receive from their use of these items.
- If, on the other hand, KE's customers do not reduce their use of such equipment but instead substitute more energy-efficient electrical equipment or equipment that does not require electrical energy for the items they presently use, then they could maintain the level of enjoyment and convenience that they presently have, but at the cost of purchasing and maintaining new equipment. The effect that this choice could have on the physical and biological environment depends upon the nature of the equipment that is substituted, the kinds of processes that are used in its manufacture, the location in which it is manufactured, and other factors.

Because of the many ways in which conservation could be achieved (see the discussion in KE's 700-page 1997 *Integrated Resource Plan*), it is not possible to address specific impacts here. Suffice it to say that the first approach to reducing energy use, i.e., simply doing fewer things with powered equipment, has virtually no adverse environmental effects (although it would presumably affect the perceived quality of life for many of KE's customers). The environmental effects that could result from the second approach (using more efficient or renewable energy-powered equipment) will depend upon the specific manner in which this is accomplished. The information presently available to KE indicates that neither approach is capable of permanently forestalling the need for additional generating capacity.

5.4 INDEPENDENT POWER PRODUCERS

5.4.1 KAUAI POWER PARTNERS

As discussed in Chapter 2, KE has signed a power purchase agreement with Kauai Power Partners (KPP) for the provision of 26.4 MW of firm capacity. KPP was selected based on its response to a competitive Request for Proposals (RFP) that allowed bidders to specify the technology and fuel that they would use. KPP has formally notified KE that it will consider the three sites addressed in this report as possible locations for its generating unit. It has further stated that it would locate its facilities on KE's Lihue Energy Service Center site if KE is able to obtain the approvals for the site that are needed to allow KPP to meet its July 1, 2002 contract deadline and if development at that location is not materially more expensive than building at a separate KPP site option.

While KPP is committed to considering the proposed Lihue Energy Service Center as a possible location for its unit, it has secured options on land in Koloa and in Port Allen so that it can construct the generating unit it is obligated to provide on a site other than the three that KE is considering for the Lihue Energy Service Center.² KPP has concluded initial discussions with potential fuel suppliers, collected the meteorological data it would need to prepare air permit applications for these sites, and has otherwise positioned itself to proceed in a timely fashion with its project. Because uncertainty remains concerning the outcome of the permitting process for the Lihue Energy Service Center, KPP has indicated that it must file time-critical permit applications for both site options (Koloa and Port Allen) no later than the first quarter of 1999.

The KPP generating unit will not meet all of KE's objectives for its proposed Lihue Energy Service Center. Instead, it is equivalent to only one of the numerous generating units that KE's plans would accommodate. Consequently, while this unit will insure that KE is able to meet its customers'

² Because its contract is for only a fifth of the generating capacity that KE needs for the future, KPP is able to consider locations that are not consistent with KE's broader goals for the Lihue Energy Service Center.

energy needs over the short-term, it is not a substitute for, or alternative to, the entire project. Nonetheless, as a stand-alone project, it does represent a "reduced-scale" alternative to proceeding with the generating portions of the Lihue Energy Service Center at this time.

5.4.2 HAWAIIAN INTEGRATED TECHNOLOGIES/PLASMA ENVIRONMENTAL TECHNOLOGIES

Hawaiian Integrated Technologies (HITECH), L.L.C., another IPP, competed against KPP and the other potential bidders to whom KE distributed its RFP. While HITECH lost to KPP on the basis of demonstrated reliability, KE nonetheless elected to sign a surplus energy purchase agreement with it. That company (which subsequently changed its name to Plasma Environmental Technologies, or PET) has announced plans to construct and operate a power plant at Port Allen that would be fueled by municipal solid waste. KE's contract with PET calls for it to purchase electricity from that firm's proposed facility only when PET is producing more than it needs to operate its own facility. KE would pay PET only for the electrical energy that is actually delivered to its transmission grid; it would not pay a demand charge.³ If PET's facility is completed and can be operated successfully, KE's customers will benefit from the favorable contract terms.

Because PET would not provide firm power to the utility, it is not a viable alternative to even a portion of the Lihue Energy Service Center project.

5.5 ALTERNATE TIME FRAMES

The timing of the proposed project is tied to the forecast increase in the demand for electricity. As described in Chapter 1, KE has also evaluated scenarios involving load growth rates that are slower and faster than the baseline scenario on which its development plan is based. Only the low-growth scenario might significantly delay the need for the proposed project. Moreover, even the low-growth scenario would not do this unless Lihue Plantation Company (LPCO) continues to provide 14 MW of firm power to the system. In view of the possibility that LPCO may curtail operations in the foreseeable future and/or that the Demand-Side Management (DSM) programs may reduce electrical energy less than anticipated, KE believes it is essential that it be prepared to add generating capacity in accordance with its present schedule. That schedule calls for the next generating unit to be on line by July 1, 2002. Permitting must proceed now if that schedule is to be met. At the same time, to protect its customers against the uncertainty present in any forecast, KE's contract with KPP allows KE (at the utility's sole option) to delay the addition of KPP's 26.4 MW unit by as much as two years (i.e., until 2004). This provision allows KE to avoid the premature addition of the KPP unit to its capital base, thereby saving its customers money.

5.6 ALTERNATE GENERATING TECHNOLOGIES

KE considered a range of generating technologies during preparation of its 1997 IRP. These included technologies that it categorized as conventional, renewable, and other. Table 5.6-1 shows selected characteristics of these options.

Most of the fossil fuel-fired generating technologies shown in the table are included in at least one of the two generating alternatives whose impacts are evaluated in Chapter 4 of this report. KE evaluated

³ A "demand charge" is an amount that a utility pays to an energy supplier for providing generating capacity that the utility is free to call upon in accordance with an agreed-upon schedule. When an energy supplier is only willing or able to provide energy to the utility under conditions of the supplier's own choosing, the utility must typically have its own generating units ready to meet the demand. In such cases, it pays the energy supplier only for the electrical energy it actually uses.

renewable energy alternatives both individually and as part of its analysis of the "Energy Sufficiency/Environmental Scenario" that is discussed in Section 8.5 of the 1997 IRP. This scenario:

...is intended more as a sensitivity to compare the costs and rankings of plans that include a greater amount of DSM and renewable options relative to the base line assumptions. The self-sufficiency assumption contained in this scenario places a greater emphasis on developing resources that may not necessarily be cost-effective in the short-term, but may prove to lower KE's risk in the future. [1997 Integrated Resource Plan, page 8-33]

Even with the additional weighting given to environmental and energy self-sufficiency factors (which, in Kauai's situation means renewable energy), KE found this scenario to be more costly than the DSM/conventional generating facility program it has proposed.

KE will continue to explore renewable energy options during its tri-annual (every three years) update of its 1997 IRP. It will also continue to be receptive to proposals from IPPs who wish to provide electrical power generated using renewable resources.

Table 5.6 - 1. Kauai Electric 1997 Integrated Resource Plan Resource Option Characteristics.

Generating Technology	Size (MW)	Capital Cost (\$/kW)	Fixed O&M (\$/kW-yr)	Variable O&M (\$/MWh)	Fuel Type	Average Heatrate (Btu/kWh)
Combustion Turbine-Simple Cycle	23 - 24	1,105-1,120	6.00-17.04	0.30-0.32	#2 Oil	10,129-11,750
Combustion Turbine-Combined Cycle	29 - 30	1,547-1,606	100.2-102	5.28-5.46	#2 Oil	8,616-8,659
Coal-Fired Steam	24	1,630	96	0.63	Coal	11,501
Oil-Fired Steam	24	1,630	96	0.54	#6 Oil	11,501
Diesel Engine	10 - 22	1,105-1,477	56.52-65.04	1.07-4.72	#2 Oil	7,769-8,543
Biomass (KE Built)	11	2,000	n/a	68-83	Bagasse	10,500-12,100
Biomass (IPP)	20-23	n/a	240-477	29.60-49	Bagasse	10,655-14,500
Wind (KE Built)	10	950-1,300	22.7	6.80	Wind	n/a
Photovoltaics	3	3,200-6,000	4	1.5	Sunlight	n/a
Solar Dish	10	1,500-1,705	14.7-16.3	7.5-8.4	Sunlight	n/a
Lower Wailua Hydro (IPP)	6.6	n/a	n/a	Avoided Cost	Water	n/a
Fuel Cell	2-10	1,440-3,790	9.8-12	n/a	Naphtha	5,600-9,760
Battery Energy Storage	0.5-5	870-1,300	2.2-2.4	n/a	n/a	n/a
Plasma Arc (Experimental)	10	n/a	n/a	Avoided Cost	Waste	n/a

Source: Kauai Electric 1997 Integrated Resource Plan, Table 7.2.

CHAPTER 6

CONSISTENCY WITH LAND USE PLANS, POLICIES, AND CONTROLS

6.1 HAWAII STATE PLAN

The Hawaii State Plan is intended to guide the long-range development of the State of Hawaii by:

- Identifying goals, objectives, and policies for the State and its residents;
- Establishing a basis for determining priorities and allocation of resources; and
- Providing a unifying vision to enable coordination between the various counties' plans, programs, policies, projects and regulatory activities to assist them in developing their county plans, programs, and projects and the State's long-range development objectives.

The State Plan is a policy document. It depends upon implementing laws and regulations to achieve its goals. Section 226-18 of the State Plan establishes objectives and policies for energy facility systems. The ones most relevant to the proposed Lihue Energy Service Center are discussed below.

§226-18 (a) *Planning for the State's Facility Systems with regard to energy/telecommunications shall be directed towards the achievement of the following objectives:*

- (1) *Dependable, efficient, and economical statewide energy and telecommunication systems capable of supporting the needs of the people.*
- (2) *Increased energy self-sufficiency.*

§226-18 (b) *To achieve the energy/telecommunication objectives, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable power and telecommunication services to accommodate demand.*

§226-18 (c) *To further achieve the energy objectives, it shall be the policy of the State to:*

- (1) *Support research and development as well as promote the use of renewable energy sources.*
- (2) *Ensure a sufficient supply of energy to enable power systems to support the demands of growth.*
- (3) *Promote the prudent use of power and fuel supplies through conservation measures including: (A) Development of cost-effective demand-side management programs; (B) Education; and (C) Adoption of energy-efficient practices and technologies.*
- (4) *Ensure that the development or expansion of power systems and sources adequately consider environmental, public health, and safety concerns and resource limitations.*

Discussion. As discussed in Chapter 1 of this report, Kauai Electric's (KE) 1997 *Integrated Resource Plan (1997 IRP)* provides the Company with its principal long-range planning framework. The IRP process insures that the Company considers renewable energy sources, Demand-Side Management (DSM) programs, education, and non-economic factors in developing additional generating units such as those that are part of the proposed Lihue Energy Service Center. Site-specific

environmental factors that bear on the choice of generating technologies and locations are discussed in Chapter 4 of this report.

The Lihue Energy Service Center is envisioned as a master-planned site on which the company will be able to develop generating units as they are needed over a period of several decades. This will allow it to minimize the proliferation of power transmission lines that could result if it were to take a short-term perspective and consider only its immediate needs in choosing the location of its units. By establishing a second generating station that is closer to the center of its electrical load and is geographically separated from its existing generating facilities in Port Allen, KE will increase both the efficiency and reliability of its electrical power system.

6.2 STATE MODEL ENERGY CODE

The Department of Business, Economic Development, and Tourism maintains the State's Model Energy Code, *Energy Efficient Standard for Buildings*. The code's goal is to reduce Hawaii's consumption of oil, reduce the amount of fossil fuel being utilized and ultimately effect significant savings in utility costs throughout the State. The code is intended for residential and commercial structures; it does cover industrial processes. KE intends to adhere to the precepts of the model code to the extent practicable. Most of the structures that comprise the Lihue Energy Service Center would not need air-conditioning, a major component of the energy demand for buildings.

6.3 CHAPTER 205, HRS - LAND USE LAW

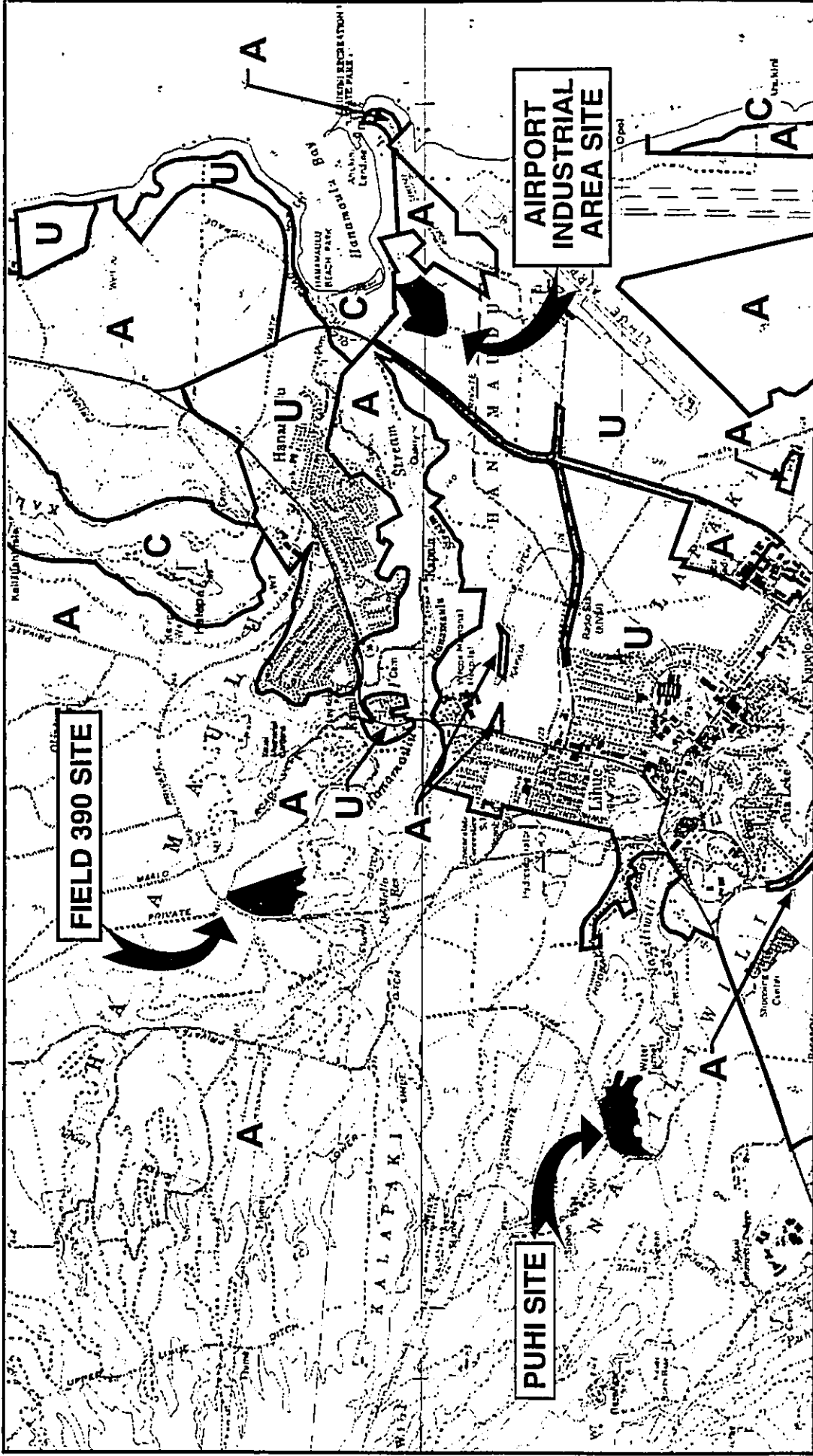
Chapter 205, Hawaii Revised Statutes (HRS), establishes the State Land Use Commission (SLUC) and gives this body the authority to designate all lands in the State as Urban, Rural, Agricultural, or Conservation District lands. The Counties make all land use decisions within the Urban Districts in accordance with their respective County general plans, development plans, and zoning ordinances. The Counties also regulate land use in the State Rural and Agricultural Districts, but within the limits allowed by Chapter 205.¹ The existing State Land Use District boundaries near the three sites are shown in Figure 6-1.

6.3.1 GENERATING FACILITIES

6.3.1.1 Puhi Site and Field 390 Site

The Puhi Site and the Field 390 Site are in the State Agricultural District. The proposed public utility use is allowable within the Agricultural District with a Special Permit. Because the area that would be used for the proposed facilities is less than 15 acres, the County is responsible for deciding whether to issue this permit. It will use the information contained in this environmental impact statement in arriving at its decision.

¹ Thus, they may limit the intensity of use within the Rural or Agricultural Districts, but they may not permit uses or intensities of uses within those Districts that are inconsistent with the State Land Use law.



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 Kauai Electric
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PREPARED BY:
 Planning Solutions, Inc.
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SOURCE:
 USGS 7.5' Lihue Quadrangle, 1983.
 USGS 7.5' Kapaa Quadrangle, 1983.
 State Land Use Commission, October 1998.

LEGEND:

- A Agricultural District
- C Conservation District
- U Urban District

FIGURE 6-1:
 State Land Use District Boundaries

Kauai Electric
 Lihue Energy Service Center

0 2000 4000 Feet
 1" = 2,800'

N

6.3.1.2 Airport Industrial Area Site

The Airport Industrial Area Site is in the State Urban District. The proposed uses are permitted in the Urban District. The re-districting of AMFAC/JMB's property was part the SLUC's action on a petition that included additional parcels. The SLUC's decision and order contained a number of conditions of approval. The landowner is responsible for complying with those conditions. Because the re-districting approval covers such a large area, it is unlikely that the landowner will have met all of the conditions of approval before KE must begin work on the first phase of the Lihue Energy Service Center project. Many of the conditions have to do with areas that would not be affected by the proposed utility project. Nevertheless, if it appears likely that the Airport Industrial Area Site may be used for the proposed project, the landowner and KE must confirm that the actions they propose to take before beginning the project will satisfy the SLUC's conditions of approval.

6.3.2 OTHER FACILITIES

The proposed project involves several supporting facilities located away from the power plant site. These include electrical power transmission lines, water supply facilities, access roads, and wastewater disposal facilities. All of these are permitted land uses in the locations in which they are planned, although most will require one or more permit approvals.

The electrical power transmission line that is needed to connect the Airport Industrial Area Site to KE's existing power transmission system crosses Hanamaulu Gulch. Because Hanamaulu Gulch is in the State Conservation District, a Conservation District Use Permit from the State Department of Land and Natural Resources is needed for this crossing. As discussed in Chapter 2 of this report, two possible alignments are being considered. One would place the transmission line beneath the existing Kapule Highway Bridge across the Gulch. The other would involve a new above-ground transmission line across it. Neither will involve disturbance of land within the Conservation District.

6.4 KAUAI COUNTY GENERAL PLAN

6.4.1 GENERAL PROVISIONS

The Kauai County General Plan is the primary policy document covering the long-range and comprehensive development, land use, and allocation of land and water uses within the County. It serves as the enabling legislation establishing the framework, parameters, constraints, and guidelines for the County's Development Plans, Comprehensive Zoning Ordinance, infrastructure master plans, and capital improvement programs. The General Plan also establishes the geographic areas of the County which are intended to be used or developed for various general purposes such as agriculture, open space, communities, and resorts. Other ordinances and regulations regulate specific uses within these areas.

6.4.2 APPLICABLE LAND USE DESIGNATIONS

6.4.2.1 Puhi and Field 390 Sites

Figure 6-2 shows the General Plan land use designations for the Lihue area. The Puhi Site and the Field 390 Site are in an area classified "Agricultural". §7-3-3.3(d) of the Kauai County General Plan states that lands included within the agricultural classification are to be predominantly used or held in reserve for agricultural activities. Public utility facilities are allowable on land classified as agricultural.

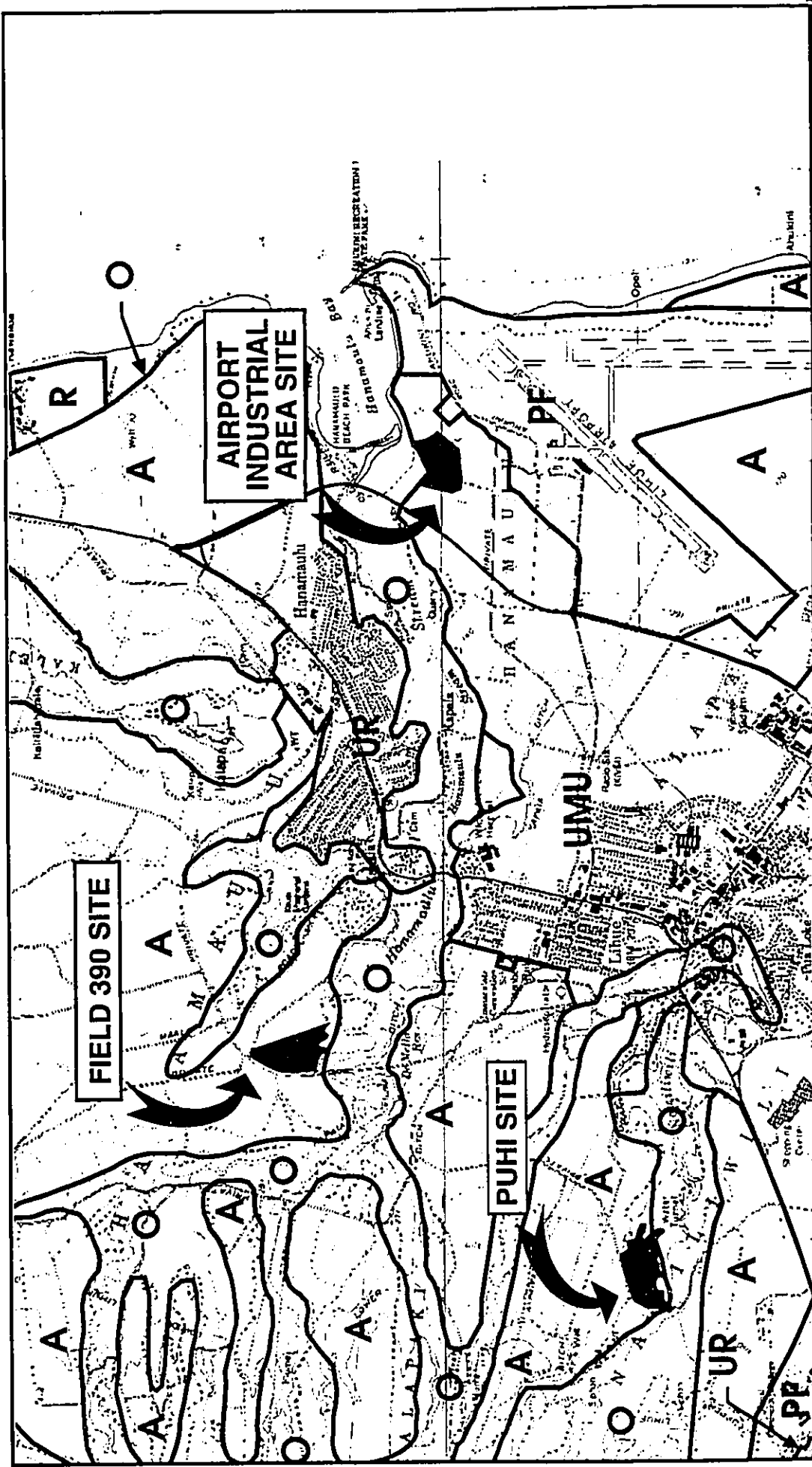


FIGURE 6-2:

Kauai County General Plan

Kauai Electric
Lihue Energy Service Center

LEGEND:

A	Agricultural	R	Resort
O	Open	UMU	Urban Mixed Use
PF	Public Facilities	UR	Urban Residential

0 2000 4000 Feet N

1" = 2,800'

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A Division of the
Citizens Utilities Company

PREPARED BY:
Planning Solutions, Inc.
Pacific Data Digitizing

SOURCE:
USGS 7.5' Lihue Quadrangle, 1983.
USGS 7.5' Kapaa Quadrangle, 1983.
Kauai County Planning Department, April 1998.

P00 Line Energy Service Center, 1982 2000 General Plan 2-8-88

6.4.2.2 Airport Industrial Area Site

The Kauai County General Plan designates the area within which the Airport Industrial Area Site is located as "Urban Mixed Use" (UMU). §7-3-3.3(d)(6) of the General Plan allows ". . . *industrial, commercial, and transportation facilities necessary to support and complement county-wide functions*" within Urban Mixed Use areas. The proposed facilities are consistent with this provision.

6.4.3 OTHER RELEVANT PROVISIONS OF THE GENERAL PLAN

6.4.3.1 Energy

The General Plan calls on the County to develop programs that will make it more self-sufficient in producing energy and less dependent upon the use of imported energy sources. While the Lihue Energy Service Center would depend upon fossil fuels, the units that are proposed are more energy-efficient than those presently being used to generate electricity on the Island. Consequently, it will decrease the amount of imported fuel used per unit of electricity consumed. Moreover, the fuel-flexibility that is built into the combustion turbines and the Center's ability to accommodate a coal-fired unit will make the utility better able to select the most economical fuels available.

6.4.3.2 Historic, Archaeological, and Cultural Resources

The General Plan makes it County policy to protect significant historic, archaeological, and cultural resources. As discussed in Chapters 3 and 4 of this report, the sites that are being considered as locations for the Lihue Energy Service Center do not contain significant historic, archaeological, and cultural features.

6.4.3.3 Physical Infrastructure

The General Plan seeks to insure that public infrastructure is not unduly burdened by development. The proposed facilities are largely self-sufficient with respect to their infrastructure (i.e., essentially all of the infrastructure they require would be installed by KE as part of the development). This includes water sources, wastewater disposal facilities, access roads, and drainage facilities. Consequently, they will not place a burden on public infrastructure.

6.5 KAUAI COUNTY ZONING ORDINANCE

Chapter 8 of the Kauai County Code contains the island's Comprehensive Zoning Ordinance (CZO). The CZO provides standards and regulations for land development and the construction of buildings and other structures. Its purpose is to promote development that is compatible with the Island's scenic beauty and environment and to preclude inadequate, harmful, or disruptive conditions.

From a land use perspective, the Lihue Energy Service Center can be thought of in two different ways. The first is as a public facility. The second is as an industrial-type facility.

- Public facilities are allowed in most zoning districts with a Use Permit. Other uses and structures that the planning Director finds to be similar in nature to those specifically listed and appropriate to the District are also allowed.²
- Industrial facilities are specifically permitted in the Industrial District. The "General Industrial District" provides for the kinds of activities that are anticipated for the Lihue Energy Service

² §8-1.5 of the CZO defines a "utility facility" as a use or structure used directly in distribution or transmission of utility services.

Center. §8-6.1.3(b) makes "private and public utilities and facilities" permitted uses within the General Industrial District.

The following subsections discuss the zoning situation with respect to each of the sites that KE is considering (Figure 6-3, 6-4, and 6-5).

6.5.1 PUHI SITE

The Kauai County Planning Department provided specific directions concerning the appropriate land use approval process for the Puhi Site (see Section 1.3.2.3 of this report). It stated:

Although the Special permit allows in most instances urban land uses in non-urban areas, this procedure would be preferred over a General Plan, Land Use District Boundary, and Zoning Amendment petition because the spot urban land use amendments that would be necessary to accommodate the power plant will conflict with the existing agricultural zoning and long-range land use patterns of the surrounding area. Furthermore, the County would have the ability to control the range of possible uses on the 17 acres through the use and special use permits as long as the site remains in agricultural zoning.

Subsequent discussions with the County during preparation of this report revealed an inconsistency between the zoning noted in the Planning Department's letter and the zoning map on file with the Department (see Figure 6-3). The latter showed an "Open" classification for the parcel. Because an "Open" classification would have been inconsistent with both the present use and with the General Plan's Agricultural designation, KE and the landowner sought clarification of the matter as provided for in §8-2.2(e)(5) of the CZO. After reviewing the material that was submitted, the Planning Department concluded that the Puhi Site is within the Agriculture District. The interpreted Agriculture District zoning boundary is shown on Figure 6-4.

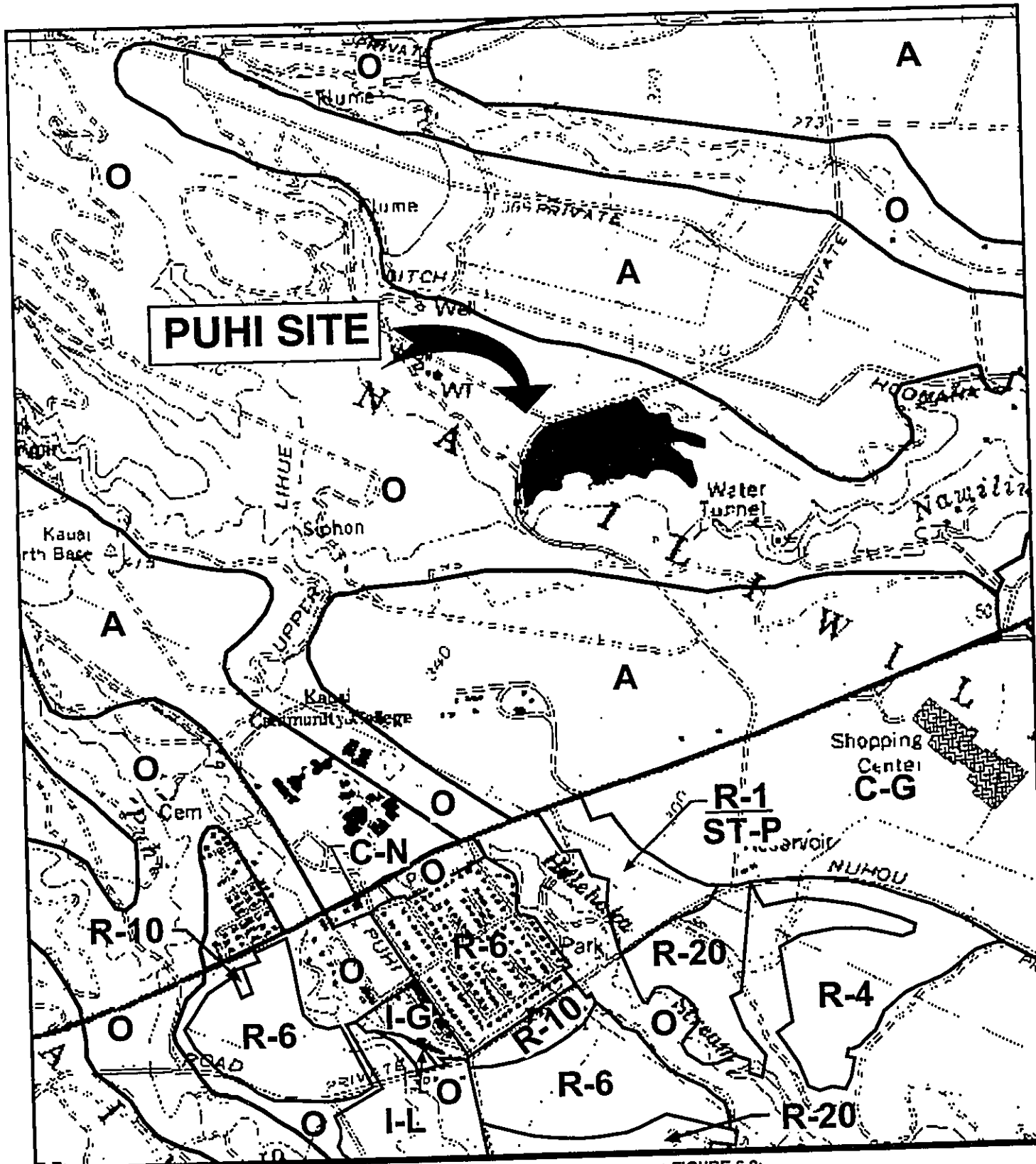
6.5.2 FIELD 390 SITE

The County zoning for the Field 390 Site is also Agriculture, and this site is not immediately adjacent to existing urban areas (see Figure 6-5). The Kauai County Planning Department has indicated that, for the reasons cited in its letter concerning the Puhi Site, it would prefer to have KE seek approval of the facility as a special use within the Agriculture zone (and State Agricultural District) rather than seek re-zoning to Industrial at the present time.

6.5.3 AIRPORT INDUSTRIAL AREA SITE

The Airport Industrial Area Site is in an area zoned "General Industrial". Section 8-6.1.3(b) of the CZO state that "private and public utilities and facilities" are permitted uses within the General Industrial District (see Figure 6-5). The General Industrial designation for this site was granted as part of rezoning approved for a larger area.³

³ Ordinance No. PM-326-96.



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PREPARED BY:
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SOURCE:
 USGS 7.5' Lihue Quadrangle, 1983.
 USGS 7.5' Kapaa Quadrangle, 1983.
 Kauai County Planning Department,
 April, 1998.

LEGEND:

- | | |
|------------------|--|
| A Agriculture | O Open |
| C Commercial | R Residential |
| C-N Neighborhood | R-# Maximum # of dwelling units per acre of land |
| C-G General | ST Special Treatment |
| I Industrial | ST-P Public |
| I-G General | ST-R Scenic/Ecological |
| I-L Limited | |

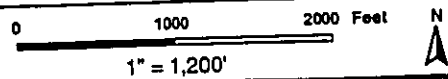


FIGURE 6-3:

**Kauai County Zoning:
 Puihi Site**

Kauai Electric
 Lihue Energy Service Center

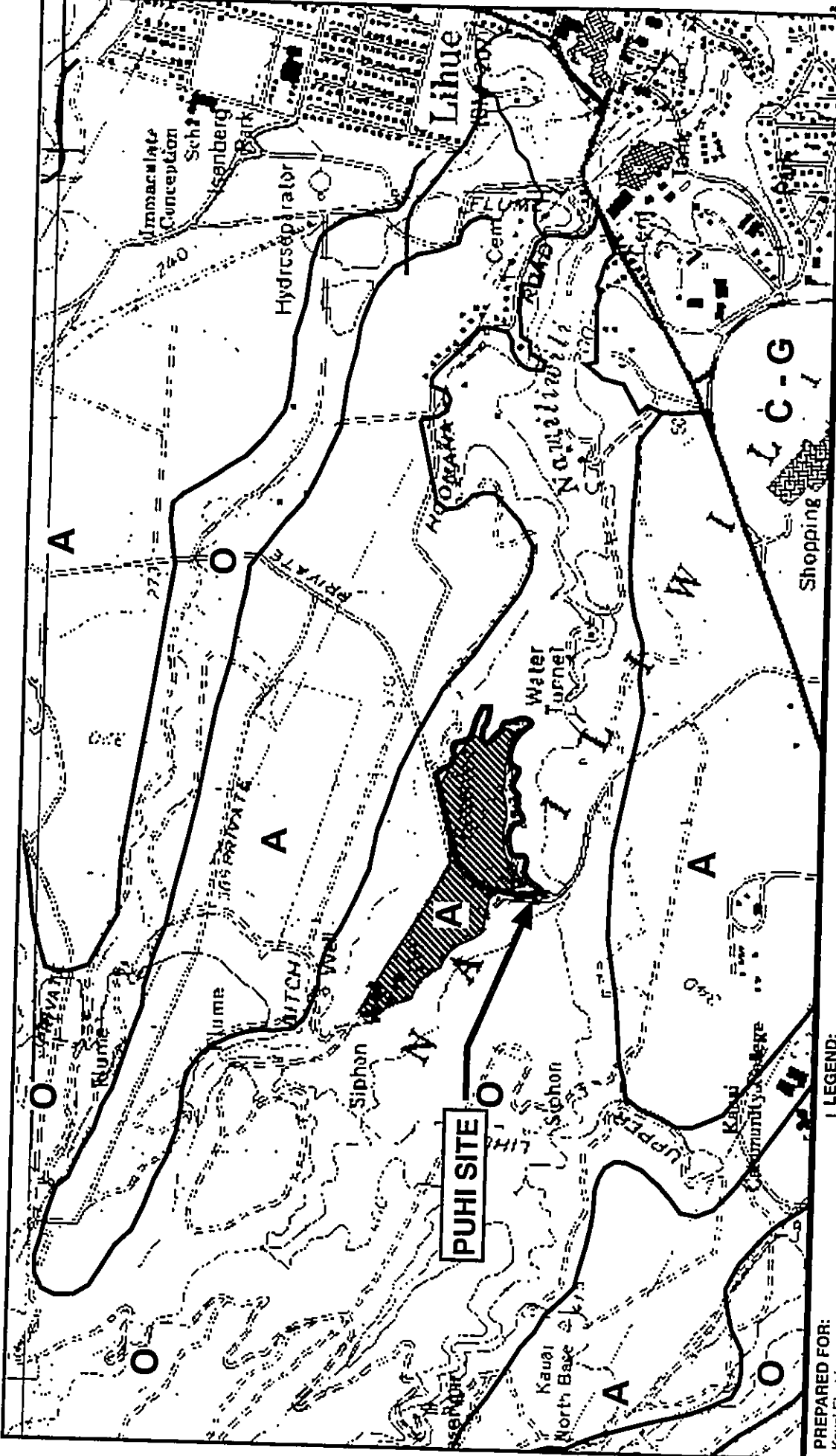


FIGURE 6-4:

**Kauai County Zoning Interpretation:
Puhi Site**

Kauai Electric
Lihue Energy Service Center

LEGEND:

- A Agriculture
 - C Commercial
 - C-G General
 - O Open
- Agriculture District Zoning Interpretation**



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SOURCE:
USGS 7.5' Lihue Quadrangle, 1983.
USGS 7.5' Kapaa Quadrangle, 1983.
Kauai County Planning Department,
April, 1998 and December 7, 1998.

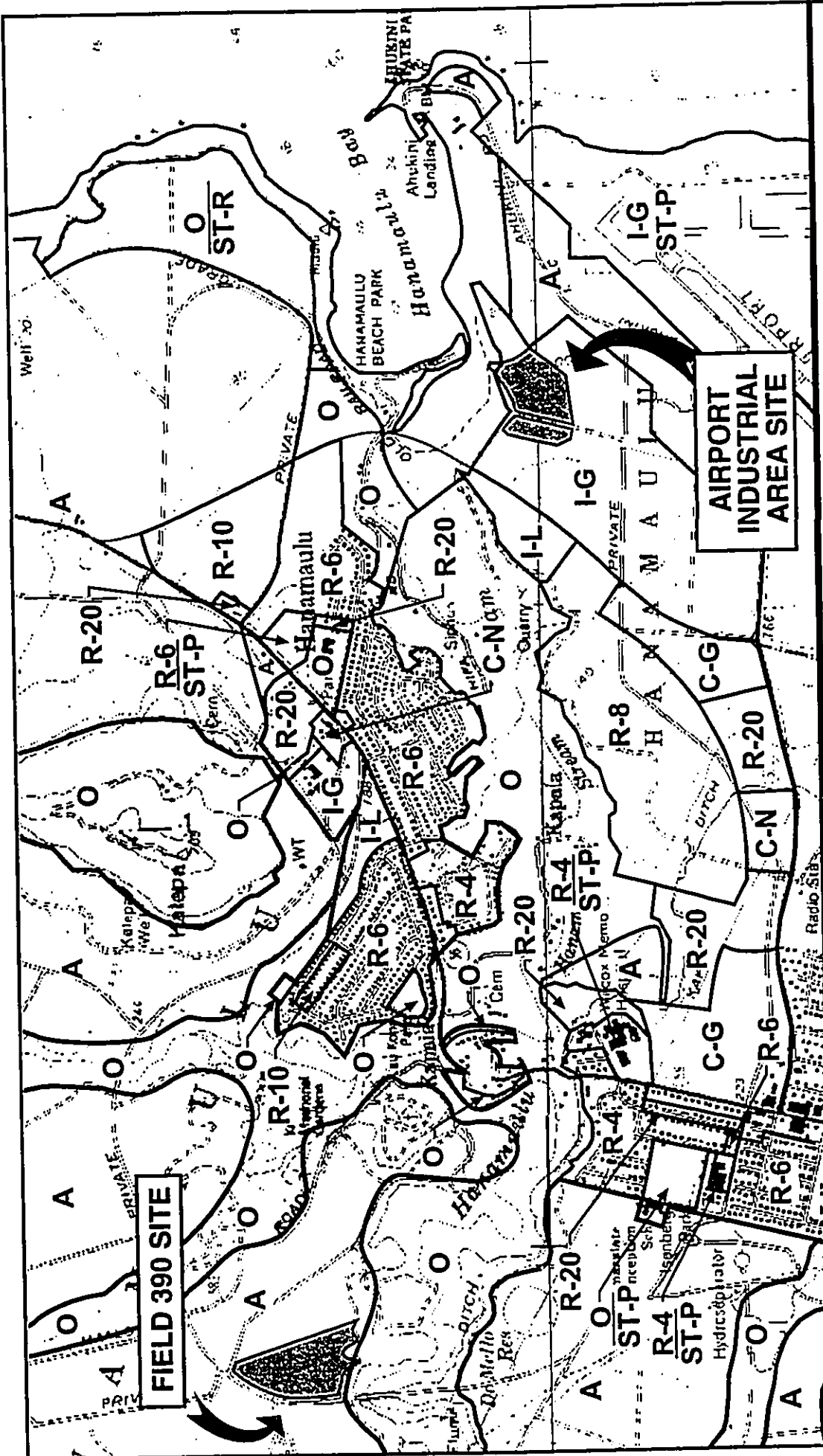


FIGURE 6-5:
Kauai County Zoning: Field 390 and Airport Industrial Area Sites

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SOURCE:
 USGS 7.5' Lihue Quadrangle, 1983.
 USGS 7.5' Kapaa Quadrangle, 1983.
 Kauai County Planning Department, April 1998.

LEGEND:

A	Agriculture	O	Open
C	Commercial	R	Residential
C-N	Neighborhood	R-#	Maximum # of dwelling units per acre of land
C-G	General	ST	Special Treatment
I	Industrial	ST-P	Public
I-G	General	ST-R	Scenic/Ecological
I-L	Limited		

0 2000 4000 Feet
 1" = 2400'

N

Kauai Electric
 Lihue Energy Service Center

The rezoning ordinance contains numerous conditions of approval. Because the landowner has not yet decided to move forward with redevelopment of this area, not all of these conditions have been satisfied. It now appears likely that KE may need to proceed with the first phase of the Lihue Energy Service Center project before the landowner (AMFAC/JMB) is ready to proceed with other development within the industrially zoned land *makai* of Kapule Highway. If this occurs and the Airport Industrial Area Site is selected, it will be necessary to determine what actions will be required to satisfy the conditions on an interim basis.

6.6 SPECIAL MANAGEMENT AREA REGULATIONS

All of the sites that KE is considering as possible locations for the Lihue Energy Service Center are located outside the Special Management Area.

6.7 HAWAII COASTAL ZONE MANAGEMENT PROGRAM

The objectives of the Hawaii Coastal Zone Management (CZM) Program are set forth in Chapter 205A, *Hawaii Revised Statutes*. The program is intended to promote the protection and maintenance of valuable coastal resources. All lands in Hawaii are classified as valuable coastal resources. The Office of Planning administers the CZM program.

At the present time, KE has not identified a project-related activity that would subject the project to the Federal consistency review process. However, it is possible that subsequent engineering will identify the need for an off-site infrastructure improvement that could be subject to CZM review. If that occurs, KE will submit a project-specific permit application and CZM consistency certification. A general discussion of the Lihue Energy Service Center's consistency with each of the objectives and policies of Hawaii's CZM Program follows below.

6.7.1 RECREATIONAL RESOURCES

Objective: Provide coastal recreational opportunities accessible to the public.

Discussion: None of the sites under consideration is along the shoreline. The Puhi Site and the Field 390 Site do not have the potential to affect the resources suitable for coastal recreation.

The Airport Industrial Area Site does not abut the shoreline, but it is near Hanamaulu Bay.

- It is not near and does not otherwise involve a dedicated public right-of-way.
- Hanamaulu Beach Park extends to within approximately 1,000 feet of the northern boundary of this site.
- Hanamaulu Stream is located in the gulch that lies adjacent to the northern boundary of the site. However, no storm runoff or other discharges from the proposed project would enter it.
- Construction and operation of the proposed facilities would not occur in or affect surf sites or popular fishing areas.
- As noted above, the facilities are relatively close to Hanamaulu Beach Park. A dense line of existing trees would screen facilities that are less than 50-feet high from view from the park. Taller structures could be visible from certain locations within the park depending upon the final design. The only structures in Generating Alternative 1 that would exceed that height are the exhaust stacks (approximately 100 feet high). Because the boiler building that is part of Generating Al-

ternative 2 would be 110 feet high, and the exhaust stack for that facility would be approximately 165 feet high. Both would be visible from portions of the Beach Park.

6.7.2 HISTORIC RESOURCES

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

Discussion: None of the sites is within historic or cultural districts. Neither do they contain sites that are listed (or have been nominated for listing) on the Hawaii of National register of historic places. The sites are not within or near a Hawaiian fishpond or historic settlement area. All of the generating sites under consideration have been surveyed by an archaeologist, and survey results have shown that construction and operation of the proposed generating facilities would not affect historic or cultural resources. KE is considering the possibility of an underground transmission line from the Airport Industrial Area Site to the Hardwood Substation. This line would pass through an area where subsurface remains have been discovered. Archaeological monitoring may be required along this alignment if this generating site and transmission alternative is used.

6.7.3 SCENIC AND OPEN SPACE RESOURCES

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

Discussion: The Puhi and Field 390 Sites are too far from the shoreline to affect the quality of coastal scenic or open space resources. As noted above, structures on the Airport Industrial Area Site that exceed the height of the existing trees along the edge of Hanamaulu Gulch could be visible from portions of the Hanamaulu Bay shoreline. For Generating Alternative 1, only the tops of the exhaust stacks would be visible (i.e., the 50 feet or less that would extend above the top of the trees). For Generating Alternative 2, the upper half of the 110-foot-high boiler building for the coal-fired fluidized bed generating unit and the uppermost 100 feet of the exhaust stacks for that facility would also be visible. Some of the structures would be visible from portions of Kapule Highway, the nearest coastal roadway, so long as the intervening land remains vacant. If that land is developed for general industrial use as allowed under current zoning, the structures that are erected will block the site-line seaward from the highway before reaching the generating facilities. Both generating alternatives at the Airport Industrial Area Site would require a new electrical power transmission line connecting the facilities to the existing Hardwood substation north of Hanamaulu Stream. One of the alternatives being considered involves above-ground electrical transmission lines that would be visible from the highway.

6.7.4 COASTAL ECOSYSTEMS

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

Discussion: None of the alternatives under consideration involves activities within the Shoreline Setback Area or dredge or fill. All of the sites under consideration are located on upland areas adjacent to gulches that contain perennial streams (Nawiliwili and Hanamaulu Streams). None of the locations under consideration provides habitat for endangered species of plants, birds, or mammals. Neither do they contain wetlands. None of the sites is situated in or abuts a Natural Area Reserve, marine Life Conservation District, or estuary.

All of the alternatives involve modest amounts of grading on previously disturbed land. All will require facilities for the disposal of the sanitary waste that is generated on-site. One alternative under consideration for the Airport Industrial Area Site (which is below the Underground Injection Control line) involves the use of injection wells to dispose of wastewater.

The Puhi and Field 390 Sites will involve the use of surface water from the existing Lihue Plantation system. This water will be treated to raise the quality to the extremely high level required for use in the generating units. The reject water from the treatment system (which would only contain constituents present in the original source water) would be returned to Lihue Plantation's irrigation system for reuse.

6.7.5 ECONOMIC USES

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

Discussion. The Lihue Energy Service Center would provide facilities that are essential to the State's economy in locations that KE believes are suitable for that purpose. It: (i) would not take place in a port or harbor, (ii) is not within a designated tourist destination area, (iii) does not relate to commercial fishing or seafood production, and (iv) does not relate to seabed mining. The facilities are being designed to minimize adverse social, visual, and environmental effects on the coastal management area.

All of the sites under consideration are presently in agricultural use. The State and County recently rezoned the area on and around the Airport Industrial Area Site to allow general industrial use. If facilities are developed on either the Puhi Site or the Field 390 Site, the work would be done under a special use permit. In any case, County approval will be required.

6.7.6 COASTAL HAZARDS

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

Discussion: None of the sites under consideration is in an area that is subject to coastal hazards. They are not:

- on or abutting a sandy beach;
- within a potential tsunami or flood inundation area;
- within a potential subsidence hazard area; or
- in an area that has experienced shoreline erosion.

6.7.7 MANAGING DEVELOPMENT

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

Discussion: KE has voluntarily prepared this as a Chapter 343 document despite the fact that the proposed action did not involve one of the "triggers" that normally subjects an action to that review. It has held two public meetings during preparation of the document to insure that it was aware of public concerns. Finally, in response to concerns raised during this consultation, KE added two additional locations to those under consideration. These activities, as well as others that the Company undertakes as part of the Integrated Resource Planning process and its normal consultation with the Island community are intended to promote communication and public participation.

6.7.8 CONCLUSION

Based on the foregoing, KE believes that the Lihue Energy Service Center complies with the approved Hawaii Coastal Zone Management Program and will be implemented in a manner consistent with that program.

6.8 OTHER REGULATORY CONTROLS OR PERMITS

The Lihue Energy Service Center will require numerous environmental and land use permits and approvals. These are listed in the Executive Summary of this report.

CHAPTER 7

OTHER CHAPTER 343 TOPICS

Hawaii Administrative Rules §11-200-17 establishes the content requirements for draft environmental impact statements. Most of these topics have been dealt with in the preceding sections of this report. This chapter addresses the few that do not fit neatly into any of the previously defined categories.

7.1 SECONDARY AND CUMULATIVE EFFECTS

The proposed power generation and Transmission and Distribution (T&D) baseyard facilities are intended to serve Kauai Electric's (KE) customers. The plan provides for the construction of new generating units on a single site over a period of many years. With one exception — the construction of additional electrical transmission lines at the time the generating capacity exceeds the capacity of the existing transmission lines into which it feeds — the proposed action is not directly related to other possible actions by KE except as discussed in the report. This report identifies the transmission corridors that KE considers most likely. However, because the transmission facilities needed to accommodate electrical power in excess of the existing system capacities would not be constructed for two decades or more, KE has not yet undertaken the detailed routing study needed to identify specific alignments or to evaluate specific impacts.

As is presently the case, KE will continue to purchase fuel, certain maintenance services, and other items from independent suppliers. Particularly in the case of fuel, these suppliers may construct new facilities or modify existing facilities in order to meet the additional demand that this would represent. This report addresses those effects that are reasonably foreseeable, e.g., increased harbor traffic resulting from greater imports of petroleum products. However, it does not speculate about the potential effects of specific actions that suppliers may (or may not) take in order to provide these services to KE. In general, most such ancillary activities would be subject to their own land use approval and permitting processes, and their effects would be evaluated before they are approved.

At full build-out, the generating units (total capacity of approximately 150 (MW) that are part of Alternative 1 would consume up to 1.5 times the amount of fuel that is presently consumed at the Port Allen Generating Station. Generating Alternative 2, which has a lower ultimate capacity (approximately 118 MW, 25 MW from coal) would consume slightly less fuel than is presently burned at the Port Allen Generating Station. All of this fuel would be transported to Kauai, probably by ocean-going barges. Private industry and the State have implemented a number of programs designed to insure the safety of interisland fuel transport, and the record of the carriers is good with respect to spill prevention. Nonetheless, it is impossible to completely eliminate the risk of accident during transport and loading/unloading. Consequently, by increasing the use of fossil fuel, the Lihue Energy Service Center will marginally increase the potential for oil spills and their accompanying environmental damage.

The construction and operation of the Lihue Energy Service Center does not involve the extension of electrical power service into new areas. Neither does it involve the provision of services not previously available to KE's customers. Moreover, while plans for the facility reflect the results of system-wide analyses conducted as part of the Integrated Resource Planning (IRP) process and detailed planning studies for KE's next unit addition, they will not lower the cost of electricity to the point where it might attract new industries or otherwise stimulate growth. The proposed action is not expected to affect the Island or region's population significantly. As discussed in the review of poten-

tial noise effects presented in Chapter 4, operation of the facilities on either the Puhi Site or the Field 390 Site would produce noise levels that could influence the types of future land uses that are most appropriate on immediately adjacent land.

The Puhi Site and the Field 390 Site are on land that is presently designated for agricultural use; only the Airport Industrial Area Site is presently zoned Urban/Industrial. The landowner's long-range plans call for eventual urbanization of the areas around the Puhi and Airport Industrial Area Sites. However, many approvals are needed before that could occur. In the meantime, at the County's request KE has applied for approval of the project as a special use within the State Agricultural District. This insures that approval of the project will not set a precedent for non-agricultural use of adjacent areas.

7.2 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

As discussed in Chapter 1 of this report, KE believes that there are substantial advantages to establishing a new generating station near Lihue to complement its existing facilities at Port Allen. It has chosen this approach over an incremental approach that could result in single generating units being constructed at multiple locations around the Island or to continued concentration of the Island's generating capacity at Port Allen. It believes the scattered approach is likely to lead to higher long-term costs, exposure of more people to the kinds of emissions inevitably associated with fossil fuel-fired electrical power generation, and a need to transport fuel long distances on public highways, among other effects.

KE's plans for the proposed facilities do not foreclose any options. They allow it to accommodate a wide range of generating types, and they permit phased development of both the generating facilities and the transmission lines needed to serve it. This is intended to give the utility the flexibility to respond efficiently and economically to changes in the economics of power generation.

Nonetheless, establishment of the Lihue Energy Service Center does entail a commitment of Company resources to a centralized generating site. If the economics of power generation and distribution should change in unanticipated ways so that alternative, decentralized, power generation technologies become more viable, it is possible that some of its investment in the project could be underutilized. Construction of the facility on any of the sites under consideration also makes it unlikely that the selected location would ever return to its present agricultural use.

The Puhi Site is close to the Kauai Department of Water Supply's Garlinghouse Tunnel. KE has incorporated state-of-the-art features into the proposed fuel storage system to limit the potential for fuel leaks and to maximize the likelihood that any leaks that might occur are discovered and dealt with before the fuel escapes the containment and enters the environment.

7.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The use of fossil fuels for power generation involves the consumption of a non-renewable resource (petroleum or coal), the emission of air pollutants, and the commitment of land to urban/industrial uses. The technologies that are proposed use air-cooling. Nonetheless, they require water on an ongoing basis for power generation and emissions control. That commitment will continue for the operating life of the units. Chapters 2 (which describes the proposed facilities) and 4 (which discusses the potential effects) describe the magnitude of that commitment.

The types of generating units planned for the Lihue Energy Service Center involve proven technologies. The incidence of accidents at facilities using such technologies is small, but it is not zero.

KE would design its facilities to meet the most stringent applicable building codes. There is little risk of earthquake at the sites, and they are far outside flood hazard areas. Concerns related to fuel spills and leaks, explosion or the release of dangerous air pollutants, and other hazards are discussed in Chapter 4.

7.4 RATIONALE FOR PROCEEDING DESPITE UNAVOIDABLE ADVERSE EFFECTS

Chapter 4 describes the environmental effects that could result from construction and operation of the proposed facilities. KE is committed to avoiding or mitigating adverse effects to the greatest extent practical within the limits of its other responsibilities. As Kauai's chartered public utility, the company is obligated to meet the electrical power needs of the Island's residents and businesses. It cannot do so without causing some adverse effect. KE does not believe that there are alternatives that would achieve the same goals with fewer environmental effects.

7.5 PERSONS PREPARING THE EIS

Table 7-1 lists the persons, firms, and organizations who helped prepare the Draft EIS.

Table 7- 1. List of Persons Preparing the Environmental Impact Statement.

<i>Name of Person</i>	<i>Organization</i>	<i>Qualifications</i>	<i>Responsibility</i>
Perry J. White	Planning Solutions, Inc.	BA History/Economics MA Regional Planning 25 years experience	EIS Project Manager & Principal Author
Esme Corbett-Suzuki	Planning Solutions, Inc.	B.S. Applied Mathematics/ Computer Science 15 Years Experience	Project Planner & Author
Renee Louis	Pacific Data Digitizing	BA Geography MA Geography	GIS and Graphics
David Morgan	Kauai Electric	BS Marine Engineering 18 years experience	KE Project Manager
Mike Yamane	Kauai Electric	BS Electrical Engineering 9 years experience	Transmission/ Distribution
Arno Bommer	CSTI Acoustics	BS Architectural Design 11 years experience	Noise
Robert Bruce	CSTI Acoustics	BS Electrical Engineering MS Electrical Engineering 32 years experience	Noise
Thomas Nance	Tom Nance Water Resource Engineering	BA Political Science BS Engineering MS Engineering 30 years experience	Hydrology, Water Supply, Wastewater Disposal
Winona Char	Winona Char & Associates	BA Botany MS Botanical Sciences 26 years experience	Botany
Reginald David	Pacific Biological Survey	15 years experience	Wildlife Biology
Nancy McMahon	Explorations Associates Ltd.	MA Archaeology >10 years experience	Archaeology
Nancy Matthews	Sierra Research	BA Physical Sciences 22 years experience	Air Quality Impacts
Gary Rubenstein	Sierra Research	BS Engineering 25 years experience	Air Quality Impacts

Source: Compiled by Planning Solutions, Inc.

CHAPTER 8 PARTIES CONSULTED

8.1 EIS PREPARATION NOTICE

Kauai Electric (KE) prepared an *Environmental Assessment (EA)* for the Lihue Energy Service Center in July 1997 and filed it with the Kauai County Planning Department. The Planning Department subsequently requested that KE prepare an *Environmental Impact Statement (EIS)* for the project and filed an *Environmental Impact Preparation Notice (EISPN)* with the Office of Environmental Quality Control (OEQC). OEQC published an announcement of the determination in the July 23, 1997, edition of *The Environmental Notice*. KE sent copies of the EA, together with a written request for comments, to the organizations and individuals identified by a "Y" in the second column of Table 8-1.¹

Written comments on the *EA/EISPN* and testimony at a voluntary town meeting that KE held on August 21, 1997, led the company to investigate possible alternate locations for the proposed facilities. At the conclusion of its investigation, KE added the Field 390 Site and the Airport Industrial Area Site to the 17-acre site it had originally proposed. It then held a second informal town meeting on May 6, 1998, to inform the public of the additional sites. Advance notice was published in the newspaper and given over the radio for both meetings. Together, the meetings afforded individuals who had concerns about one or more of the possible locations an opportunity to speak. At KE's request, the Office of Environmental Quality Control published a notice about the two additional sites under consideration in the June 8, 1998 edition of *The Environmental Notice*.

8.2 PARTIES COMMENTING ON THE EA/EISPN

Table 8-1 identifies the individuals and organizations who submitted written comments during the initial consultation period. In most cases these comments came in response to KE's written requests. In a few instances, KE received written comments from individuals who it had not previously contacted (identified by a "N" in the second column of Table 8-1). The "Letter Number" shown in the third column of Table 8-1 corresponds to the numbering of the response letters reproduced in Appendix C.

8.3 PARTIES COMMENTING ON THE DRAFT EIS

The Office of Environmental Quality Control published an announcement of the availability of the *Draft Environmental Impact Statement (DEIS)* in the December 23, 1998 edition of *The Environmental Notice*. Copies of the *DEIS*, together with a letter requesting comments, were sent to potentially interested parties as indicated in Table 8-2. That table also identifies the organizations and individuals who submitted written comments and shows the order in which the comment and response letters are reproduced in Appendix D. (For ease of reference, the index at the beginning of Appendix D lists the comment and response letters in the order in which they appear.) Note that a few comments were received from individuals and organizations who were not sent their own copies of the *DEIS*. These individuals either based their comments on copies of the *DEIS* they obtained from public libraries or other sources or were commenting on the proposed project on the basis of information obtained from sources other than the *DEIS*.

¹ Some of those agencies/individuals/organizations listed in Table 8-1 did not request a copy of the *EA/EISPN* but sent comments letters regarding the proposed facility.

PARTIES CONSULTED

Table 8 - 1. Parties Sent EA/EISPN and Whether Written Comments Were Received.

<i>KAUAI COUNTY</i>	<i>EA/EISPN Sent?</i>	<i>Response Letter Number</i>	<i>Type of Comment</i>
Mayor	Y	—	—
Office of Economic Development	Y	14	NC
Fire Department, Fire Chief's Office	Y	6	C
Kauai County Housing Agency	Y	—	—
Kauai Civil Defense Agency	Y	—	—
Planning Department	Y	24	C
Public Works Department, County Engineer	Y	—	—
Department of Transportation	Y	—	—
Department of Water	Y	21	C
Kauai County Council, Office of the Chairman	Y		
<i>PRIVATE SECTOR/COMMUNITY GROUPS</i>			
American Lung Association, Director of Environmental Health	Y	—	—
The Garden Island Newspaper, Editor	Y	—	—
Honolulu Advertiser, Editor	Y	—	—
Honolulu Star-Bulletin, Editor	Y	—	—
Native Hawaiian Legal Corporation	Y	—	—
Environment Hawaii	Y	—	—
Native Hawaiian Advisory Council	Y	—	—
Sierra Club, Kauai Chapter	Y	34	—
Island School	Y	—	—
Life of the Land	Y	—	—
Kauai Outdoor Circle	Y	25	C
Public Utilities Commission, Kauai Office	Y	—	—
Ms. Linda Shigeta	Y	36	C
Ms. Judy Dalton	N	35	C
Mr. Raymond Chuan	Y	27	C
Ms. Carol Bain	N	23	C
Joan & Larry Heller	N	19	C
Mr. Robert McCaig	N	20 & 40	C
Ms. Janet Ashkenazy	Y	15	C
Mr. Gaylord Wilcox	N	12	C
Mr. Robert Nishek	N	29	C
Ms. Virginia Newell	N	30	C
Ms. Pamela Jayne	N	33	C
Ms. Connie Copenhauer	N	32	C
Mr. Fred Atkins	Y	—	—
Mr. G. Woodgard	N	31	C

PARTIES CONSULTED

Table 8-1 (continued) Parties Sent EA/EISPN and Whether Written Comments Were Received.

<i>Federal Agencies</i>	<i>EA/EISPN Sent?</i>	<i>Letter Number</i>	<i>Type of Comment</i>
U.S. Dept. of Agriculture, Soil Conservation Service, State Conservationist	Y	—	—
U.S. Army Corps of Engineers, Pacific Ocean Division	Y	8	NC
U.S. Dept. of the Interior, Fish & Wildlife Service	Y	11	NO
U.S. Dept. of the Interior, National Parks Service	Y	—	—
U.S. Dept. of Commerce, National Marine Fisheries Service	Y	—	—
U.S. Dept. of Transportation, Federal Aviation Administration	Y	—	—
U.S. Geological Survey, Water Resources Division	Y	5	NC
U.S. Dept. of the Navy, Naval Base Pearl Harbor	Y	39	C
<i>State Agencies</i>			
Dept. of Accounting & General Services	Y	7	NC
Dept. of Agriculture, Director	Y	—	—
Dept. of Business, Economic Development, & Tourism, Director	Y	—	—
Dept. of Business, Economic Development, & Tourism, Energy Office	Y	37	C
Dept. of Defense, Director	Y	—	—
Dept. of Education, Superintendent	Y	10	C
Dept. of Hawaiian Home Lands	Y	18	NO
Dept. of Land & Natural Resources, Director	Y	13	C
Dept. of Land & Natural Resources, Aquatic Resources Division	Y	9 & 26	C
Dept. of Land & Natural Resources, State Historic Preservation Officer	Y	2 & 28	NO
Dept. of Health, Environmental Management Division	Y	38	C
Dept. of Transportation, Highways Division	Y	3	C
Dept. of Transportation, Airports Division	Y	4	NC
Dept. of Transportation, Director	Y	3	C
Office of Hawaiian Affairs, Administrator	Y	16	C
University of Hawaii, Water Resources Research Center	Y	—	—
University of Hawaii, Environmental Center	Y	—	—
Dept. of Budget & Finance	Y	—	—
Office of Environmental Quality Control	Y	22	C
Kauai Community College	Y	—	—
State Land Use Commission	Y	1	C
Dept. of Business, Economic Development, and Tourism, Office of Planning	Y	37	C
Table Notes: EA/EISPN Sent indicates whether the individual/agency was sent a copy of the EA/EISPN. The "Letter Number" refers to the response letters reproduced in Appendix C. The Letters used in the "Type of Comment" column have the following meaning: NC = No comment at this time; C = Comment;; "NO = No objection at this time; NI = No impact.			

PARTIES CONSULTED

Table 8 - 2. Parties Sent Copies of the Draft EIS and Whether Written Comments Were Received.

<i>Person or Organization</i>	<i>DEIS Sent?</i>	<i>Comment Letter No.</i>
KAUAI COUNTY EXECUTIVE BRANCH		
Mayor	Yes	None
Office of Economic Development	Yes	None
Fire Department, Fire Chief's Office	Yes	01
Kauai County Housing Agency	Yes	None
Kauai Civil Defense Agency	Yes	None
Planning Department	Yes	15
Police Department	Yes	None
Public Works Department, County Engineer	Yes	None
Department of Transportation	Yes	None
Department of Water	Yes	20
KAUAI COUNTY COUNCIL		
Kauai County Council, Office of the Chairman	Yes	None
Chair Economic Development Comm., Kauai County Council	Yes	None
COMMUNITY GROUPS		
American Lung Association, Director of Environmental Health	Yes	None
The Garden Island Newspaper, Editor	Yes	None
Honolulu Advertiser, Editor	Yes	None
Honolulu Star-Bulletin, Editor	Yes	None
Native Hawaiian Legal Corporation	Yes	None
Environment Hawaii	Yes	None
Native Hawaiian Advisory Council	Yes	None
Sierra Club, Kauai Chapter	Yes	06
Island School	Yes	None
Life of the Land	Yes	18
Outdoor Circle	Yes	None
Sierra Club Legal Defense Fund	Yes	None
INDIVIDUALS		
Ms. Judy Dalton	Yes	None
Mr. Raymond Chuan	Yes	27
Ms. Carol Bain	Yes	48
Joan & Larry Heller	Yes	40
Mr. Robert McCaig	Yes	None
Ms. Janet Ashkenazy	Yes	14
Mr. Gaylord Wilcox & Ms. Carol Wilcox	Yes	16
Ms. Linda Rosehill	Yes	
Ms. Linda Shigeta	Yes	12
Mr. Barnes Riznik & Ms. Ba Riznik	Yes	26
Mary M. Cooke	No	28
Mr. Richard Jasper	No	36
Dean K. McRaine & Malone B. McRaine	No	37
Mr. Tim Brause	No	38
Mr. Robert O. Ferris	No	39
Dr. Arnold B. Nurock, M.D.	No	41
Ms. Margery H. Freeman	No	42

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<i>Person or Organization</i>	<i>DEIS Sent?</i>	<i>Comment Letter No.</i>
Mr. Frances N. Frazier	No	43
Ms. Gabriela Taylor	No	44
Ms. Danie McReynolds	No	45
Mr. Keith Hutchens	No	46
Ms. Nancy L. Bunyan	No	47
PRIVATE SECTOR ORGANIZATIONS		
Mr. Michael Furokawa, Contractors Association of Kauai	Yes	25
Kauai Business Report	Yes	None
Kauai Lagoons Resort	Yes	None
Mr. Fred Atkins, Kilohana	Yes	30
Ms. Dorothy Bekeart, Amfac Land Company	Yes	None
Mr. Alan Smith, Grove Farm Company	Yes	None
Mr. Gary Baldwin, Kauai Economic Development Board	Yes	None
Mr. Lyle Wilkinson, Kauai Coffee Company	Yes	32
Kauai Chamber of Commerce	Yes	None
Amfac Sugar, Kauai	Yes	11
Kauai Power Partners	Yes	None
International Brotherhood of Electrical Workers	Yes	31
Ms. Gina Wong, Plan Pacific (Kauai County General Plan Update Consultant)	Yes	None
Princeville Resort	Yes	13
Ventura Development Corporation	Yes	21
A&B Properties, Inc.	Yes	22
Chevron	Yes	24
Gay & Robinson, Inc.	Yes	50
FEDERAL AGENCIES		
U.S. Dept. of Agriculture, Soil Conservation Service, State Conservationist	Yes	49
U.S. Army Corps of Engineers, District Engineer, Honolulu District	Yes	None
U.S. Dept. of the Interior, Fish & Wildlife Service, Ecological Services	Yes	None
U.S. Dept. of the Interior, National Parks Service, Pacific Island Office	Yes	None
U.S. Dept. of Commerce, National Marine Fisheries Service, Pacific Area Office	Yes	None
U.S. Dept. of Transportation, Federal Aviation Admin., Honolulu District Office	Yes	08
U.S. Geological Survey, Water Resources Division, Honolulu	Yes	None
U.S. Dept. of the Navy	Yes	23
STATE AGENCIES		
Dept. of Accounting & General Services	Yes	03
Dept. of Agriculture, Chairman	Yes	None
Dept. of Budget & Finance	Yes	None
Dept. of Business, Economic Development, & Tourism, Director	Yes	None
Dept. of Business, Economic Development, & Tourism, Energy Office	Yes	None
Dept. of Business, Economic Development, & Tourism, Office of Planning	Yes	05
Dept. of Commerce & Consumer Affairs	Yes	None
Dept. of Defense, Director	Yes	07
Dept. of Education, Superintendent	Yes	04
Dept. of Hawaiian Home Lands	Yes	10
Dept. of Land & Natural Resources, Land Management Division	Yes	17
Dept. of Land & Natural Resources, Aquatic Resources Division	Yes	None
Dept. of Land & Natural Resources, Historic Preservation Div., State of Hawaii	Yes	34
Dept. of Health, Environmental Management Division	Yes	35
Dept. of Transportation, Highways Division	Yes	None

PARTIES CONSULTED

<i>Person or Organization</i>	<i>DEIS Sent?</i>	<i>Comment Letter No.</i>
Public Utilities Commission, Kauai Office	Yes	None
Public Utilities Commission, State of Hawaii	Yes	19
Dept. of Transportation, Airports Division, State of Hawaii	Yes	29
Dept. of Transportation, Director, State of Hawaii	Yes	09
Office of Hawaiian Affairs, Administrator	Yes	None
University of Hawaii, Water Resources Research Center	Yes	None
University of Hawaii, Environmental Center	Yes	None
Office of Environmental Quality Control	Yes	33
Office of the Governor, Kauai Representative	Yes	None
Kauai Community College	Yes	None
State Land Use Commission	Yes	02
Dept. of Budget & Finance	Yes	None
<i>ELECTED REPRESENTATIVES, STATE</i>		
Senator Avery Chumbley, State Senate	Yes	None
Representative Hermina Morita	Yes	None
Senator Jonathan Chun	Yes	None
Representative Ezra Kanofo	Yes	None
<i>LIBRARIES</i>		
Hanapepe Public Library	Yes	None
Princeville Library	Yes	None
Koloa Public Library & School	Yes	None
Lihue Regional Library	Yes	None
Kapaa Public Library	Yes	None
Waimea Public Library	Yes	None
Dept. of Business, Economic Development, & Tourism	Yes	None
Hawaiian Collection, Hamilton Library, University of Hawaii	Yes	None
Hawaii State Library	Yes	None
Legislative Reference Bureau Library	Yes	None
Notes: "DEIS Sent?" indicates whether the individual/agency was sent a copy of the DEIS. The "Letter Number" refers to the comment/response letters reproduced in Appendix D. The parties who were not sent copies of the DEIS either based their comments on information obtained from other sources or reviewed copies of the DEIS in libraries.		

Source: Compiled by Planning Solutions, Inc.

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Final Environmental Impact Statement

**KAUAI ELECTRIC
LIHUE ENERGY SERVICE CENTER**

APPENDIX A

**AMFAC/JMB Puhi Master Plan:
Kauai Electric Power Plant**



PURPOSE

As required by the County of Kauai Planning Department and Planning Commission for subdivision approval for the Kauai Electric Power Plant site, this conceptual master plan was prepared to evaluate local and regional circulation related to the power plant and future urban expansion uses. Amfac/JMB has no immediate plans to phase out sugar production in the study area and thus has no immediate plans for urban expansion in the study area. Nonetheless, a long-term conceptual master plan, which by its nature is subject to change, was requested by the Planning Department and Planning Commission to assist their regional and island-wide planning efforts.

To address the County of Kauai's long-term planning concerns, the primary objectives of the study were:

- 1) Determine alternative by-pass roadway routes mauka of Lihue Town, including but not limited to: extension of Ahukini Road/Ehiku Street to Puhī, and a by-pass road from Puhī to Hanamaulu or beyond.
- 2) Determine alternative road alignments for access between the proposed Kauai Electric Power Plant and future by-pass road.
- 3) Determine local roadway intersection locations and circulation in the vicinity of Kaunualii Highway that would service Amfac/JMB's lands in the Puhī area.
- 4) Identify future urban expansion land use areas in relation to the proposed circulation system.

SITE ANALYSIS

The study area encompasses approximately 1,800 acres of land under the ownership of The Lihue Plantation Company, Limited (Amfac/JMB). These lands, referred to as the "mauka lands" are bordered by Kuhio Highway and Kaunualii Highway to the east, Maalo Road to the north, and the Kauai Community College and Gaylord's Restaurant to the south. Included in this study is a 17-acre parcel, which is the site for the future Kauai Electric Power Plant.

Topography and Land Use

Except for German Hill, a small cluster of residential units located along the northern makai edge of Nawiliwili Gulch, most of the land within the study area is under sugar cultivation. The moderately sloped sugar lands are separated into three distinct areas by two large gulches which bisect the project area in a mauka/makai direction. A gulch which encompasses tributaries of the Hanamaulu Stream is located in the northern portion of the site. The other gulch is located on the southern end of the site and encompasses the Nawiliwili Stream and its tributaries (which branch off into three smaller streams). Some of the areas along the sides of this gulch are used for truck farm production.

Flooding/Drainage

The Flood Insurance Rate Map (FIRM) of 1987, identifies a majority of the study area as Zone X "areas determined to be outside the 500-year flood plain." Areas identified as being subject to flooding are concentrated primarily in the gulch areas. The makai portion of the Nawiliwili Stream is identified as Zone AE "special flood areas inundated by the 100-year flood." A portion of this area is also included within the floodway.

Slopes

Elevation within the study area ranges from approximately 140 feet mean sea level to about 480 feet mean sea level. The study area is moderately sloped with an average slope of 3%. Steeper sloped areas are present alongside the gulches, where slopes of 25% or greater are present.

Soils

According to the USGS Soil Conservation Service, soils within the study area are primarily of the Puhi series. This series consists of well-drained soils on uplands on the island of Kauai. These soils developed in material derived from basic igneous rock. They are nearly level to steep. Elevations range from 175 to 500 feet. The annual rainfall amounts to 60 to 80 inches. The mean annual soil temperature is 73 degrees F. Puhi soils are geographically associated with Lihue and Kapaa soils.

Under the Agricultural Lands of Importance to the State of Hawaii (ALISH), most of the study area (which is currently under cane cultivation) is identified as "Prime Agricultural Land" and is defined as "...land best suited for the production of food, feed, forage, and fiber crops. This class of land has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed (including water management) according to modern farming methods. Prime agricultural land gives the highest yields with the lowest inputs of energy or money and with the least damage to the environment".

According to the University of Hawaii Land Study Bureau's Detailed Land Classification-Island of Kauai, a majority of the study area is classified as "B" which reflects its present use under sugar cane cultivation.

Vegetation

Except for the gulches, the land within the study area is primarily under sugar cultivation. The gulch areas are densely vegetated, with some areas along the sides of the Nawiliwili Gulch under banana and other truck crop production.

Water Resources/Water Quality

The Upper Lihue Ditch is located along the mauka, western end of the study area. The Lower Lihue Ditch and Kapaia Ditch traverse the northern portion of the study area. The study area is located mauka of the Underground Injection Control (UIC) line which precludes the use of injection wells for disposal of domestic and non-domestic wastewater. A number of drinking water well sites are located at the mauka, western end of the site (near the Upper Lihue Ditch). Drinking water wells are also located in the gulch bordering Nawiliwili Stream.

Visual Resources

The most significant view from within the study area is the view of the mountains which border Nawiliwili Bay. Landforms to the north (Mt. Waialeale) and to the east (Kalepa Ridge) are also visible from the study area.

Land Use Classification

Except for a small residential area along the northern, makai edge of Nawiliwili Gulch (German Hill), the study area is classified as Agricultural under the State Land Use Classification. Under the Kauai County General Plan, portions of the study area are within the Agriculture District, with the remaining portion in the Open District. Land use designations for the study area under the Lihue Development Plan are primarily Agriculture and Open, with the exception of a small portion designated as Residential Single Family (German Hill). Under the Kauai County Zoning Ordinance, the German Hill area is zoned Special Planning Area, the remaining portions of the site are zoned Agriculture and Open.

Historic/Archaeological Resources

Archaeological surveys have not been conducted for most of the study area. Because most of the project area's land surface has been extensively disturbed in the past, due to agricultural cultivation, it is unlikely that archaeological resources will be encountered. However, staff at the State Historic Preservation Division did mention that there is a high probability of encountering archaeological/cultural resources in former kuleana lands near stream areas.

Circulation

Kuhio Highway, located makai and to the east of the project area, is the primary arterial roadway which provides access from Lihue Town to North and East Kauai. Primarily a two lane road north of Eha Street, the highway widens to four-lanes south of Eha Street. It terminates at its intersection with Kaunualii Highway and Rice Street. Kaunualii Highway, which borders the makai, southeastern portion of the project area, is the primary arterial highway providing access to South and West Kauai. This two-lane highway terminates at the intersection of Kuhio Highway and Rice Street.

The major collector roadways which provide access to the two highways include: Rice Street, Ahukini Street and Nawiliwili Road. Rice Street is a two-lane roadway with parking on both sides. It serves as a collector street between Lihue Town and the Nawiliwili Harbor area. Nawiliwili Road is a two-lane road between the Nawiliwili Harbor area and Kaumualii Highway. It provides direct access to the Kukui Grove Shopping Center and Grove Farm's Lihue/Puhi Project District. Ahukini Road is a two-lane roadway which provides access from Lihue Airport and terminates at Kuhio Highway.

In addition to the roadways discussed above, access to Kaumualii Highway will be provided via a number of roadways within Grove Farm's Lihue/Puhi Project District. These roadways include: Kalepa Street (existing 60-foot R.O.W.), Nuhou Street (proposed 80-foot R.O.W.), Nani Street (existing 50-foot R.O.W.), Puhi Road (existing 60-foot R.O.W.), and Anonui Street (existing 54-foot R.O.W.). Of these roadways, Nuhou Street has been planned by Grove Farm as a "major roadway" within the Project District, and provides the best access to their lands due to its central location and direct accessibility to both the eastern and western portions of the Project District. (Grove Farm Properties, Inc. Affidavit of Greg Kamm Before the Land Use Commission of the State of Hawaii. 23 November 1993.)

Surrounding Land Uses

Adjacent land uses include land currently in sugar cane cultivation to the north and west (mauka) of the study area. These lands are primarily under the ownership of The Lihue Plantation Company, Limited. Lands to the south of the study area are owned by the State of Hawaii and the Ethel K. Wilcox Trust. Land uses on these properties include educational facilities (Kauai Community College) and commercial activities (Gaylord's Restaurant). Residential development in the town of Lihue borders the eastern end of the property. The Lihue Sugar Mill is located along the southeast side of the project area. Also, Grove Farm's Kukui Grove Shopping Center and their on-going development of the Lihue/Puhi Project District straddles the makai side of Kaumualii Highway along the south and southeast edge of the site. Existing and proposed land uses within the 932.5-acre project district include: single and multi-family residential, commercial, golf course, parks, and light industrial uses.

LIHUE TRAFFIC CIRCULATION STUDY

The Lihue Traffic Circulation Study (Austin, Tsutsumi and Associates, Inc. 1987) was prepared to define a long-range transportation plan for the Lihue area. The study focuses on conceptual alternative highway improvements to accommodate traffic demands projected for the year 1996 and 2006. Amongst the improvements proposed in the plan is a mauka by-pass between Kapaia and Nawiliwili Road. Also, the plan proposes to realign Ahukini Road to intersect Kuhio Highway opposite Ehiku Street, and to extend Ehiku Street to the mauka by-pass road.

The mauka by-pass would serve to divert traffic between North Kauai and West Kauai around Lihue Town and to improve access between North Kauai and Kukui Grove. The by-pass roadway was envisioned to be a two-lane highway with paved shoulders and a 150-foot right-of-way to provide for future expansion. Its south terminus is located at the intersection of

Kaumualii Highway and Nawiliwili Road, at Kukui Grove Shopping Center. Its north terminus would be located in Kapaia. The study also mentions considering extending the by-pass highway beyond Nawiliwili Road to Puhi (before connecting up to Kaumualii Highway), and around Hanamaulu (possibly connecting up to Kapaa). The mauka by-pass was estimated at \$16.5 million (1987) not including right-of-way acquisition costs. The preliminary alignment would include four bridges comprising two-thirds of the total construction costs. Due to the high cost associated with this roadway alignment, a more detailed analysis of the alignment was recommended in the conclusion of the study.

In addition to the mauka by-pass roadway, the plan makes specific recommendations for roadway and intersection improvements along Kaumualii Highway. For the year 1996, the plan recommends widening Kaumualii Highway to four lanes, two in each direction, between Kuhio Highway and some point west of Puhi. The four-lane widening would accommodate the increased traffic demand resulting from the Grove Farm Development, the Kauai Community College and from overall growth of West Kauai. For the year 2006, the plan recommends the construction of double right turn lanes from Kaumualii Highway, inbound, to Nawiliwili Road; and double left turn lanes from Kaumualii Highway, westbound, to Nawiliwili Road; double left turn lanes from Nawiliwili Road to Kaumualii Highway, westbound. The study notes that this intersection would still remain an unresolved problem short of a six-lane widening of Kaumualii Highway, or extending the Mauka Bypass to Puhi.

ALTERNATIVE CONCEPT PLANS

Information from the site analysis and Lihue Traffic Circulation Study served as elements which helped in the formulation of alternative concept plans. As proposed in the Lihue Traffic Circulation Study, the Ahukini Road realignment, which provides direct access from the airport and Lihue Town, serves as the primary link to the by-pass road from the east side of the project area. The alignment of the by-pass roadway utilizes the existing cane haul road crossing over Nawiliwili Stream to minimize costs associated with the construction of a new bridge crossing along other areas of the gulch. For the southwest terminus of the by-pass road, two factors influenced the selection of intersection options. First, routing the by-pass road beyond the southwestern end of the project area would be difficult due to both topography and the limited utility of lands. Also, the intersection location needed to be planned so as to avoid increased congestion along Kaumualii Highway (near the Kukui Grove Shopping Center).

Two conceptual master plan alternatives resulted from the analysis discussed above. These alternatives were refined through field verification and discussions with the County of Kauai; and staff at Amfac/JMB; Lihue Plantation Company, Limited; and Citizens Utility/Kauai Electric. The two conceptual master plans alternatives are discussed below.

Concept A (Cross-Intersection at Nuhou Street). This option provides an arterial by-pass road with direct access to lands in the north (in Hanamaulu). Refer to Figure 1. Access to the east side of Lihue Town will be provided from the proposed realignment of Ahukini Street which would intersect Kuhio Highway opposite Ehiku Street, and then connect-up with the by-pass roadway. The by-pass road would pass directly adjacent to the power plant site, following the location of

the existing cane haul road, and connecting up to the Nuhou Street intersection at Kaunualii Highway. This alternative would require access through the Ethel K. Wilcox Trust land. This roadway alignment would serve to by-pass traffic generated from Lihue Town and the Kukui Grove Shopping Center. In addition, it provides direct access to lands within Grove Farm's Lihue/Puhi Project District. Direct access to the Kukui Grove Shopping Center would be provided by an extension of Nawiliwili Road linking into the by-pass road.

Due to the long-term nature of this study (Amfac/JMB has no immediate plans to phase out sugar production in the study area), the land uses identified in the study area were limited in scope to four categories which include: the power plant, commercial/office areas, urban reserve areas, and open space. Centrally located within the study area, the 17-acre power plant facility is tucked-away in a parcel located mauka of the proposed by-pass roadway. This allows for direct access to the facility from the by-pass roadway. Commercial/office uses are concentrated in the southern, makai portion of the site (near the Nuhou Street and Nawiliwili Road intersection), on about 70 acres of land. These uses, which could be categorized as "Urban Mixed Use" under the County of Kauai General Plan, would tie-in directly with commercial and office activities located directly makai of Kaunualii Highway. Areas designated as "urban reserve" on the Concept Plan comprise the moderately sloped areas of land (most of which is currently under sugar cultivation) which extend upslope from Lihue Town. These areas are envisioned primarily as a residential extension of Lihue Town and could include supporting uses such as light industrial, commercial/office, recreational, and public facilities. Under the Kauai General Plan, these areas could be designated as "Urban Mixed Use", "Urban Residential", and "Rural Residential" uses. Generally, "Urban Mixed Use" areas would be concentrated in areas adjacent to the major roadways and intersections. Adjacent to these areas would be "Urban Residential" areas, with "Rural Residential" located on the higher uplands within the study area. The two large gulches which separate the urban reserve areas would remain as major open space elements.

Concept B (T-intersection at Kaunualii Highway) This alternative provides a by-pass roadway which connects Lihue Town via Ahukini Road which would be redesigned to intersect Kuhio Highway opposite Ehiku Street. Refer to Figure 2. Connection to lands north of the site (in Hanamaulu) would be via a mauka roadway connection at a T-intersection to the by-pass roadway. The by-pass roadway would pass directly adjacent to the power plant site, following the existing cane haul road through the gulch, and connect up with Kaunualii Highway at a T-intersection between the intersection of Nuhou Street and Kalepa Street. Compared to Concept A, this alternative would not require encroachment into other properties, but would not provide as direct an access into the Lihue/Puhi Project District. Also, a connection to the by-pass roadway from the Kukui Grove Shopping Center would be provided via an extension of Nawiliwili Road.

The land uses identified for Concept B are identical to those identified in Concept A. The 17-acre power plant facility is located in the same area as it is in Concept A and would also be directly accessible to the by-pass roadway. Again, commercial/office uses (which could be categorized as "Urban Mixed Use" under the County of Kauai General Plan) are concentrated in the southern, makai area of the site (near the T-intersection and Nawiliwili Road intersection), on about 70 acres of land. The moderately sloped urban reserve areas (which could be designated as

"Urban Mixed Use", "Urban Residential", and "Rural Residential") are envisioned primarily as a residential extension of Lihue Town and could include residential supporting uses such as light industrial, commercial/office, recreational, and public facilities. The two large gulches which separate the urban reserve areas would remain as open space.

PREFERRED ALTERNATIVE

Alternative A is the preferred alternative as it provides a by-pass route with direct access from Hanamaulu to Puhi with access to Lihue Town via a realigned Ahukini Road. The Nuhou Street intersection appears to be a better solution because it provides two complete intersections, as opposed to adding an additional intersection between the two existing intersections (Concept B). Also, the intersections are located at a greater distance from one another which provides fewer interruptions for traffic along Kaumualii Highway. This alternative requires the acquisition/condemnation of a roadway right-of-way through the Wilcox Trust property. However, if the by-pass roadway's termination at Kaumualii Highway needs to be located within Amfac/JMB's properties, then the t-intersection alternative should be implemented.

A more detailed traffic analysis and updating of the Lihue Traffic Circulation Study would ultimately determine the optional by-pass road alignment and Kaumualii Highway intersection configurations.

CONCLUSION

A more detailed study of the proposed Lihue mauka by-pass roadway crossing over Nawiliwili Gulch should be conducted to investigate its feasibility in relation to vertical and horizontal alignment. To accommodate a roadway of the magnitude envisioned in the Lihue Traffic Circulation Study, it is likely that the existing vertical and horizontal alignment through the gulch will need to be adjusted. Major modifications to the existing cane haul road could significantly increase construction costs at this roadway crossing. As noted, additional traffic and preliminary engineering studies would assist in the further planning and design of the roadway alignment and intersection configurations.

To assist the County of Kauai Planning Department and Planning Commission in their regional and island-wide planning efforts, this study presents conceptual uses which appear appropriate for the study area at this time. Except for the location and size of the power plant, the remaining land uses identified in the study are conceptual in nature. For both Concept A and B, commercial/office areas are concentrated in the southern, makai portion of the site due to their potential relationship with commercial/office activities makai of Kaumualii Highway. These areas would consist primarily of residential and residential supporting uses. When future development of these areas is seriously considered, a more detailed study should be completed to identify the community growth needs and type of land uses appropriate. This will give Amfac/JMB a better understanding of the specific land uses requirements, infrastructure and phasing needs for their mauka lands.

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**KAUAI ELECTRIC
LIHUE ENERGY SERVICE CENTER**

APPENDIX B

Aerial Photograph of the Lihue Area



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Final Environmental Impact Statement

**KAUAI ELECTRIC
LIHUE ENERGY SERVICE CENTER**

APPENDIX C

EISPN Comment and Response Letters





Mr. Perry J. White
August 6, 1997
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STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION

PO Box 2339
Honolulu, HI 96804-2339
Telephone: 808-587-3822
Fax: 808-587-3827

August 6, 1997

Mr. Perry J. White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Environmental Impact Statement Preparation Notice
(EISP) for the Kauai Electric Lihue Energy
Service Center, Lihue, Kauai, THK 3-8-05-03: por. 4

We have reviewed the EISP for the subject project that was transmitted by your letter dated July 25, 1997, and have the following comments:

- 1) We confirm that the project site, as represented on Figure 1-1 of the EISP, is located within the State Land Use Agricultural District.
- 2) Based on review of the applicable tax map, it appears that the project site should be identified as THK 3-8-05: por. 3, and not THK 3-8-05-03: por. 4 as stated on page 1-1 of the EISP.
- 3) Page 1-14 of the EISP states that a Special Permit would be required for the subject project. Pursuant to the telephone conversation between Bert Saruwatari of my staff and yourself on July 30, 1997, we understand that the Special Permit would not be subject to approval by the Land Use Commission as the land area involved would be less than 15 acres. We suggest that the Draft EIS identify the project acreage involved and clarify that the Special Permit would be subject to the approval of the County of Kauai only.
- 4) We suggest that the Draft EIS include a map showing the project site in relation to the State Land Use District boundaries.

We have no further comments to offer at this time. We appreciate the opportunity to comment on the subject EISP.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

ESTHER UEDA
Executive Officer

EU:th

①

①



**P L A N N I N G
S O L U T I O N S**

1110 AUGER STREET SUITE 211
HONOLULU HAWAII 96813
PHONE 808 531-1288
FAX 808 532-1898

December 11, 1998

Ms. Esther Ueda, Executive Officer
Land Use Commission
Department of Business, Economic Development, and Tourism
State of Hawaii
235 South Beretania Street, 4th Floor
Honolulu, Hawaii 96813

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Ms. Ueda:

Thank you for your August 6, 1997 letter concerning the *Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISP/N)* for the Lihue Energy Service Center. We appreciate the time you spent reviewing the document. We also appreciate your correction of the TMK number.

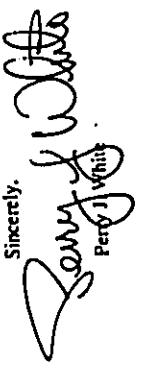
As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EA/EISP/N. After reviewing the responses it received to its written request for comments on the EA/EISP/N and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the Lihue Energy Service Center is enclosed for your review and comment. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

The document addresses the specific issues mentioned in your letter. Specifically:

- Section 6.3 states: *"The Preferred Site and the Field 390 Site are in the State Agricultural District. The proposed public utility use is allowable within the Agricultural District with a Special Use Permit. Because the area that would be used for the proposed facilities is less than 15 acres, the County is responsible for deciding whether to issue this permit."*
- Figure 6-1 in the DEIS shows the State Land Use District boundaries in the vicinity of the three sites under consideration.

The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the DEIS, please call me at 593-1288.

Sincerely,

Perry J. White

Enclosure

①

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

August 06, 1997

Mr. Perry White
Planning Solutions
1210 Auhu St. Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

SUBJECT: Chapter 6E-42, Historic Preservation Review -Draft EA/EIS
Preparation Notice: Lihue Energy Service Center (Kauai Electric)
TMK: 3-8-05-03: 4
Nawiliwili, Lihue, Kauai

The project area has been developed extensively for agricultural purposes. It is highly unlikely that historic sites are present in this disturbed area because of this previous development and existing location features (water tank and culvert). Thus, we believe that this project will have a "no effect" on significant historic sites.

If you have any questions, please call Nancy McMahon at 742-7033.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

NM: els

MARKET & WATER UTILITIES
BOARD OF LAND AND NATURAL RESOURCES



Gilbert Coloma-Agarron
DIRECTOR

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES CONSULTATION AND CONSERVATION AND RESEARCH DIVISIONS
ENVIRONMENTAL AFFAIRS DIVISION
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT DIVISION
PLANNING AND LAND DEVELOPMENT DIVISION



**P L A N N I N G
S O L U T I O N S**

1210 AUAHU STREET, SUITE 221
HONOLULU, HAWAII 96814
PHONE: 531-511-1200
FAX: 531-511-1133

Mr. Don Hibbard, Administrator
Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
33 South King Street, Sixth Floor
Honolulu, Hawaii 96813

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Hibbard:

Thank you for your August 6, 1997 letter [reference LOG: 19880/DOC: 9708NM03] concerning the Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISP/N) for the Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EA/EISP/N. After reviewing the responses it received to its written request for comments on the EA/EISP/N and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center is enclosed for your review and comment. The DEIS addresses the environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

Your letter concerning the original site noted that the parcel had been developed extensively for agricultural purposes and concluded that it is highly unlikely that historic sites are present in the disturbed area. The two additional sites have also been extensively cultivated, and the archaeological surveys that were conducted on them concluded that they do not contain significant cultural or historic remains. These findings are discussed in Sections 3.8 and 3.9 of the DEIS.

The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report, please call me at 593-1288.

Sincerely,

Perry J. White

Enclosure

(2)

BRUCE J. CAFFARO
OWNER



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

August 7, 1997

KAZU HAYASHIDA
DIRECTOR
DEPUTY DIRECTOR
Brian K. Hines
GLENN L. ODOJIO

IN REPLY REFER TO:
STP 8.8082



PLANNING SOLUTIONS

1210 AWAHI STREET, SUITE 221
HONOLULU, HAWAII 96813
PHONE: 593-5313/1288
FAX: 593-5313-1859

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

December 11, 1998

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Hayashida:

Thank you for your August 7, 1997, letter [reference STP 8.8082] concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the *Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISP/N. After reviewing the responses it received to its written request for comments on the EISP/N and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). Sections 3.12 and 4.10 address potential effects on transportation facilities, including roadways, harbors, and airports.

As discussed with Mr. Ellison Teshima of the Statewide Transportation Section of your Department, many new highways and other transportation facilities would be developed adjacent to the sites as the planned power generation facilities are developed incrementally over the next several decades. This necessitated dependence on information contained in planning documents for the area, particularly the *Kauai Long-Range Land Transportation Plan*.

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you or members of your staff would like to meet to discuss any of the issues discussed in the *DEIS* before responding, I would be happy to do so at your convenience.

Sincerely,

Perry J. White

Enclosure

Mr. Perry J. White
Planning Solutions
1210 Awaahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Request for Comments
EIS Preparation Notice: Lihue Energy Service Center

Thank you for your transmittal of July 25, 1997, requesting our review of the subject EIS preparation notice.

The proposed project will impact our State highway system and our State harbor system.

A traffic assessment should be prepared and submitted for our review and comment. Additionally, our Harbors Division should be a consulting party in the development of the Draft EIS document.

Thank you for the opportunity to comment.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

3

BRUNSWICK CAYE/MO
CORPORATION



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
AIRPORTS DIVISION
400 RODGERS BOULEVARD, SUITE 700
HONOLULU, HAWAII 96819-1880

August 7, 1997

Mr. Perry White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

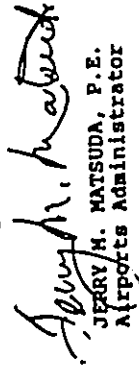
Dear Mr. White:


Subject: EIS Preparation Notice
Lihue Energy Service Center

We have reviewed the subject report and have no objections to this project.

Thank you for letting us review this report. Please have your staff contact Lynn Secones, Planner, at 838-8811 to clarify any questions you may have.

Sincerely,


JERRY M. MATSUDA, P.E.
Airports Administrator


JERRY M. MATSUDA,
DIRECTOR
DEPUTY DIRECTOR
GLENN M. ODOMOTO
BRIAN K. MINAMI

IN REPLY REFER TO:
AIR-EP
97-1249



P L A N N I N G
S O L U T I O N S

1210 AUAAHI STREET, SUITE 221
HONOLULU, HAWAII 96814
PHONE: 838-8811
FAX: 838-8811-1199

Mr. Jerry M. Matsuda, Airports Administrator
Department of Transportation
State of Hawaii
400 Rodgers Boulevard, Suite 700
Honolulu, Hawaii 96819-1880

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

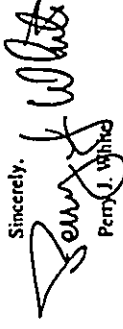
Dear Mr. Matsuda:

Thank you for your August 7, 1997, letter [reference AIR-EP 97.1249] concerning the *Environmental Impact Statement Preparation Notice (EISPN)* for the *Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document, and we are pleased that the Airports Division has no objections to the facilities if they are constructed as described in the *EISPN*.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the *EISPN*. After reviewing the responses it received to its written request for comments on the *EISPN* and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). Sections 3.12 and 4.10 address potential effects on transportation facilities, including roadways, harbors, and airports. Portions of the discussion of potential effects on operations at Lihue Airport are based on information provided by Mr. Ben Schlapak and other members of your planning and engineering sections. They also contain information obtained at a meeting with Lihue Airport helicopter operators that was arranged by your engineering staff.

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you or members of your staff would like to meet to discuss any of the issues discussed in the *DEIS* before responding, or if you have any questions you would like to discuss over the telephone, please call me at 593-1288.

Sincerely,

Perry J. White

Enclosure

4



United States Department of the Interior

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

July 31, 1997

Mr. Perry J. White
Planning Solutions
1210 Auahi St., Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Environmental Assessment/Environmental Impact Statement
Preparation Notice (EA/EISPN)
Kauai Electric Lihue Energy Service Center

The staff of the U.S. Geological Survey, Water Resources Division, Hawaii District, has reviewed the EA/EISPN, and we have no comments to offer at this time.

Thank you for allowing us to review the report. We are returning it for your future use.

Sincerely,

William Meyer
William Meyer
District Chief

Enc.



PLANNING
SOLUTIONS

1210 AUAAHI STREET, SUITE 221
HONOLULU, HAWAII 96814
PHONE 808 592 1288
FAX 808 592 1285

Mr. William Meyer, District Chief
Water Resources Division
U.S. Geological Survey
United States Department of the Interior
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Meyer:

Thank you for your July 31, 1997 letter concerning the Environmental Assessment (EA/Environmental Impact Statement Preparation Notice (EISPN) for the Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and understand that you had no comments to offer at that time.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISPN. After reviewing the responses it received to its written request for comments on the EA/EISPN and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center is enclosed for your review and comment. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). Topics that may be of particular interest to your Division are discussed in several parts of the report. Section 2.2.4 discusses technical aspects of the project that are particularly related to water resources. Section 3.3 describes existing hydrologic conditions. Finally, Section 4.5 discusses the effect that the proposed facilities are expected to have on water resources.

The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like to discuss it further before commenting, I would be happy to talk to you or a member of your staff. You may reach me at 593-1288.

Sincerely,
Perry J. White
Perry J. White

Enclosure

5

MARYANNE W. KUSAKA
MANAGER



COUNTY OF KAUAI
FIRE DEPARTMENT
MOULIHA BUILDING
444 KEE STREET, SUITE 200
LIHUE, KAUAI, HAWAII

DAVID K. SPROAT
FIRE CHIEF

August 11, 1997

Mr. Perry White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Fire Department Comments
EIS Preparation Notice
Lihue Energy Service Center

Thank you for your recent submittal requesting our comments for the aforementioned project. Primarily, the Kauai Fire Department is concerned with built-in safeguards for the fuel-handling facilities which were not elaborated upon in the presentation. We have secondary concerns with site access, circulation route(s) within the complex, and the adequacy of the fire flow protection available at the site. More detailed explanations follow.

1. **Fuel Storage/Use Facilities:** As presented, the plans covering Generating Alternative 1 and 2 are detailed and thorough. The safety provisions as explained on Page 2-17 adequately address the containment concerns in the event of a spill or leakage.

What is not covered are any proposed provisions for protection in the event of a fire. This might require the installation of on-site foam storage facilities with foam-generating equipment and ancillary piping provided to individual tanks and the berm areas. This consideration is essential in augmenting any on-site fire protection and provides the Fire Department with the means and ability to prevent a catastrophic disaster.

2. **Vehicular Refueling Operations - T&D Baseyard:** (Page 2-19) The installation of fuel storage tanks for vehicular/equipment refueling is an activity that requires a Permit

issued by the Fire Department (Applicable to the vented tanks in the Fuel Oil Storage) and installed according to standards in the Uniform Fire Code. Only the specific tank models approved for such use may be installed.

Certain manufacturers and models of Insulated Secondary Containment Tank Enclosure Assemblies as approved by the Fire Department are permitted for such installation. At the present time, Convault, Trusco SuperVault, and Lube Cube tank assemblies as specified are approved for installation in the County of Kauai. Berming is not required for these sites though the installation of vehicular bollard protection posts are required. The fueling area may be provided with drain and sump facilities in the event of a spill.

3. **Fire-Fighting Facilities:** (Page 2-20) We are not certain that the criteria used to determine fire flow and storage is correct. It appears that this facility would fall under the category of Light Industrial Use in determining the fire flow requirements. This greater consideration would equate to 3,000 GPM for 120 minutes = 360,000 gallons.

The capacity of the bermed tank storage area should factor-in a percentage based on standards for containing fire-fighting water in addition to the capacity of the largest tank.

4. **Fire Hydrant Layout:** We realize that the submitted plans are preliminary, but we desire to make input into the placement and location of these on-site fire hydrants to optimize our fire-fighting tactics.

5. **Access & Circulation Route:** This is an important consideration for conducting fire-fighting operations on-site and even for staging off-site.

6. **Other Fire Protection Systems & Considerations:** There was no mention of Extinguishing Systems for generating equipment and structures. These would mandate revisions to the on-site fire protection system.

We are but a small county fire department with limited resources, manpower and equipment. These enhancements will help us to save lives and minimize property damage. You may contact us (808-241-6511) if you have further inquiry. We look forward in working together towards finalizing the plans for this project.

Sincerely,

Mike Kano, Captain
Fire Prevention Bureau

David K. Sproat
Fire Chief

2 of 2

1 of 2



**P L A N N I N G
D E P A R T M E N T**

1110 KUALA STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
PHONE 533-1111
FAX 533-1555

December 11, 1998

Mr. David K. Sprout, Chief
Fire Department
County of Kauai
Suite 295 Mo'oikeha Building
Lihue, Kauai, Hawaii

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Chief Sprout:

Thank you for the August 11, 1997 letter that you and Captain Mike Kano sent to me concerning the Environmental Impact Statement Preparation Notice (EISP/N) for the Lihue Energy Service Center. We appreciate the time you, Mike, and other members of your staff spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISP/N. After reviewing the responses it received to its written request for comments on the EISP/N and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center is enclosed for your review and comment. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). It addresses the concerns identified in your letter to the extent practical. Preliminary responses to your comments follow below. However, a decision concerning the site is needed before the design of the fire protection systems can be completed.

(1) Fire Protection Provisions Fuel Storage/Use Facilities. The fuel storage and fuel handling facilities will meet applicable fire protection standards. This may entail the installation of on-site foam storage facilities with foam generating equipment and ancillary piping to the individual fuel storage tanks and the bermed areas. Once the EIS process is complete, KE expects to continue processing the permits and land use approvals it will need for the selected site. It or its design consultants will provide copies of the plans to your Department for review at that time.

(2) Vehicular Refueling Operations — T&D Baseyard. Thank you for the information you provided concerning the storage tanks for the T&D facilities. KE will adhere to the code requirements.

(3) Fire-Fighting Facilities. The 2,000 gallons per minute for 120 minutes (240,000 gallon) fire-water storage numbers contained in the EISP/N were based on preliminary engineering estimates. KE will inform the design engineer of your determination that the fire flow requirement will be based on Light Industrial Use and will be 3,000 gallons per minute for 120 minutes (360,000 gallons). The corrected figure has been included in the DEIS.

(4) Fire Hydrant Layout. Once the design engineer for the facility is selected and begins work, KE will provide the Fire Department with preliminary plans showing the proposed placement of the fire hydrants.

Page 2
Mr. David K. Sprout, Chief
December 11, 1998

(5) Access and Circulation Route. KE will ask the design engineer to discuss fire access and circulation factors with you as part of the detailed design process.

(6) Other Fire Protection Systems and Considerations. The proposed facilities will comply with the applicable fire codes.

Thank you again for your comments on the EISP/N. I hope this preliminary information addresses your concerns. The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning or would like to discuss anything before responding, please call me at 593-1288.

Sincerely,

Perry J. White

Enclosure

(6)

REYNOLDS & CLAYTON
ENGINEERS



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



SAM CALLEJO
COMPTROLLER
MARY PATRICK WATKINSON
INSPECTION CHIEF

(P) 1532.7



PLANNING
SOLUTIONS

1210 AUahi STREET, SUITE 1211
HONOLULU, HAWAII 96814
PHONE: 808 593-1288
FAX: 808 593-1956

December 11, 1998

AUG 13 1997

Mr. Perry J. White
Planning Solutions, Inc.
1210 Auahi Street
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Lihue Energy Service Center
Lihue, Kauai
EIS Preparation Notice

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

If there are any questions, please have your staff contact
Mr. Ronald Ching of the Planning Branch at 586-0490.

GORDON MATSUOKA
State Public Works Engineer

RC:ly
c: Mr. Dave Morgan
OEQC

Mr. Gordon Matsuoaka
State Public Works Engineer
Department of Accounting and General Services
State of Hawaii
P.O. Box 119
Honolulu, Hawaii 96810

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Matsuoaka:

Thank you for your August 13, 1997 letter (reference (P) 1532.7) concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the *Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document. We understand that you had no comments to offer at that time.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the *EISP/N*. After reviewing the responses it received to its written request for comments on the *EISP/N* and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you have any questions concerning the report or would like to discuss the project further before responding, please call me at 593-1288.

Sincerely,

Perry J. White

Enclosure

7



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

copy to
attention of

August 15, 1997

Planning and Operations Division

Mr. Perry J. White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Thank you for the opportunity to review and comment on the Environmental Assessment (EA) and Environmental Impact Statement Preparation Notice (EISP/N) for the Lihue Energy Service Center, Kauai. Since the project is still in its planning stage and the EA and EISP/N do not present any project-specific information, a thorough evaluation could not be completed at this time.

However, any work performed within the 100-year floodplain will have to adhere to the requirements of the Federal Emergency Management Agency. Additionally, the need for a Department of the Army permit will need to be determined based on the information submitted to us in the future as construction plans progress. We will need to review future documents as they become available so that this information can be provided to you.

Should you require additional information, please contact Ms. Jessie Dobinchick of my Technical Analysis Section at 438-7006.

Sincerely,

Paul Mizue, P.E.
Acting Chief, Planning
and Operations Division



**P L A N N I N G
S O L U T I O N S**

1110 AVAHI STREET, SUITE 221
HONOLULU, HAWAII 96814
PHONE 808 592-1700
FAX 808 592-1956

Lt. Colonel Wally Z. Walters
District Engineer
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858-5440

December 11, 1998

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Colonel Walters:

Thank you for your August 15, 1997 letter concerning the Environmental Assessment (EA) and Environmental Impact Statement Preparation Notice (EISP/N) for the Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document. We understand that the Corps' comments were limited to the preliminary information contained in the EA.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISP/N. After reviewing the responses it received to its written request for comments on the EISP/N and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center is enclosed for your review and comment. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information, please call me at 593-1288.

Sincerely,

Perry J. White

Enclosure

8

SEANAMU J. CAIETANO
Coordinator of Marine



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

August 5, 1997

Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

ATTN: Perry J. White,

We have reviewed the EA/EIS Preparation Notice provided as a prelude to the expansion of Kauai's electric generating capacity over the next 30 to 40 years. The proposed site is located about 0.6 miles inland of Kaunuauii Highway northeast of Puhi. We understand that sugarcane is presently being cultivated on most of the property.

Although the Preparation Notice describes briefly the proposed projects and the potential effects on the environment, we suggest the forthcoming EA/EIS discuss in detail potential short term impacts and propose specific means for averting or minimizing adverse effects, and provide possible mitigation or compensation for unavoidable damage to natural resource values. We have sent information we received from you to our biologist on Kauai in case additional comments are required.

Sincerely,

Eric Ohizuka
Eric Ohizuka, Acting Administrator
Division of Aquatic Resources

CONSERVATION
SOLUTIONS
BOARD OF LAND AND NATURAL RESOURCES
1210 AUAHU STREET, SUITE 221
HONOLULU, HAWAII 96814
PHONE 808 533-1288
FAX 808 533-1358

9



PLANNING
SOLUTIONS

1210 AUAHU STREET, SUITE 221
HONOLULU, HAWAII 96814
PHONE 808 533-1288
FAX 808 533-1358

December 11, 1998

Mr. William S. Devick, Acting Administrator
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Devick:

Thank you for your Division's August 5, 1997, letter concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the *Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the *EISP/N*. After reviewing the responses it received to its written request for comments on the *EISP/N* and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, § 11-200).

Sections 3.7 (Existing Conditions) and 4.8 (Impacts on Aquatic Biota) are particularly relevant to the concerns mentioned in your letter. The sections of the *DEIS* that discuss the hydrologic aspects of the Lihue Energy Service Center project may also be of interest.

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you or your staff have any questions concerning the report or would like to discuss the matter further before responding, please call me at 593-1288.

Sincerely,

Perry J. White
Perry J. White

Enclosure

9

RECEIVED
AUGUST 11 1997



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2180
HONOLULU, HAWAII 96814

1 of 2

10
RECEIVED
AUGUST 11 1997

OFFICE OF THE SUPERINTENDENT

August 8, 1997

Mr. Perry J. White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Lihue Energy Service Center EISPN

The Department of Education has plans to construct a new elementary school in Puhā approximately 2,200 feet away from the proposed energy service center (see attached map).

The draft EIS should include a discussion as to the extent, if any, to which the energy service center will affect the school site's air quality since it appears the center will be upwind from the school.

Thank you for the opportunity to comment. If you have any questions, please call Mr. Sanford Bepko at 733-4862.

Sincerely,

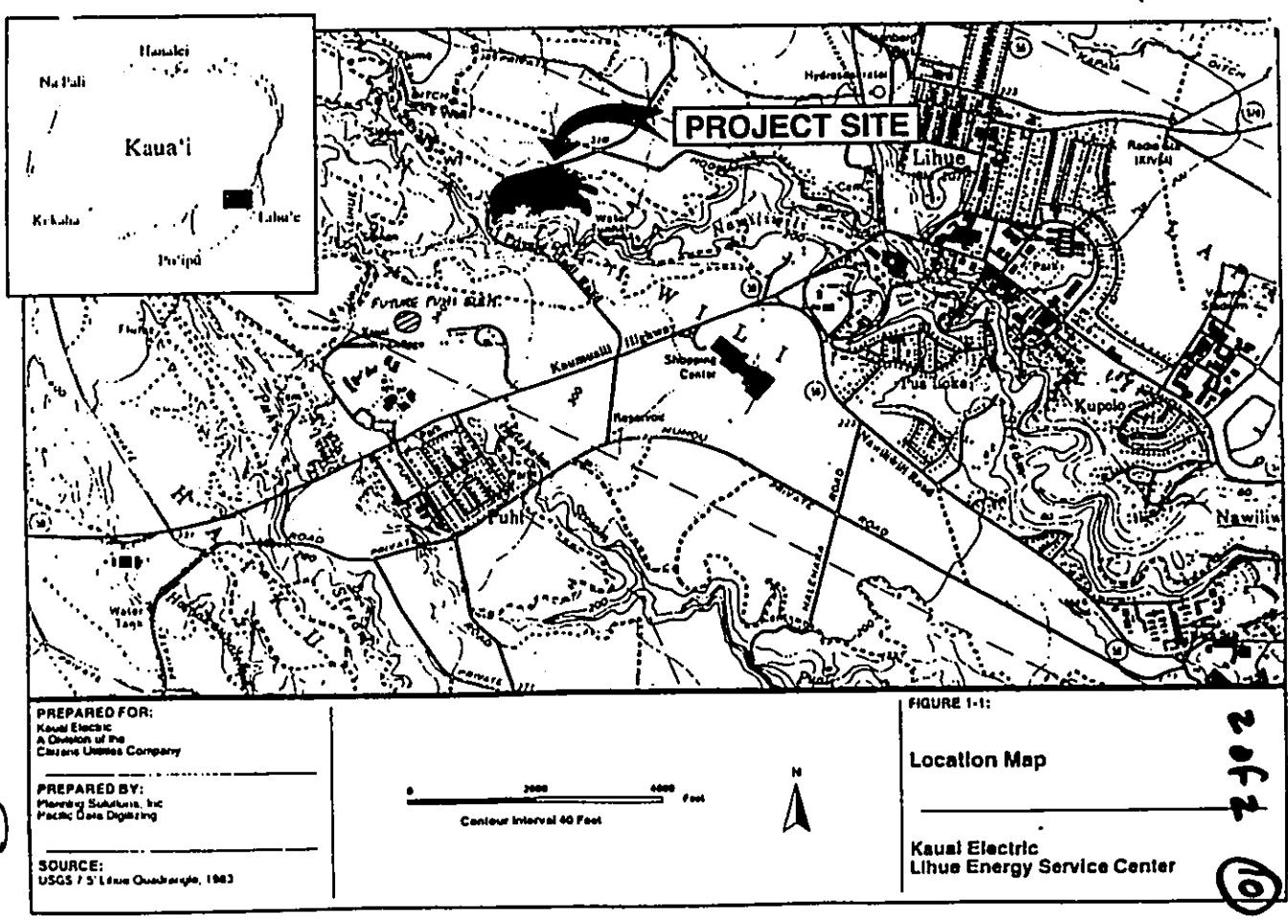
Herman M. Aizawa
Herman M. Aizawa, PhD
Superintendent

HMA:hy

Attachment

cc A Suga, OBS
A Naeck, KDO

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER





**PLANNING
SOLUTIONS**

1110 ANAHEI STREET SUITE 101
HONOLULU, HAWAII 96813
PHONE 808 533 1250
FAX 808 533 1555

Dr. Paul LeMahieu, Superintendent
Department of Education
P.O. Box 2360
Honolulu, Hawaii 96804

December 11, 1998

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Dr. LeMahieu:

Thank you for your Department's August 8, 1997, letter concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the *Lihue Energy Service Center*. We appreciate the time your staff spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISP/N. After reviewing the responses it received to its written request for comments on the EISP/N and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapapa and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

The DEIS notes that the area in your comment letter as a possible future school site is one of at least two being considered as a location for a new elementary school. It reflects information on the status of the project that we obtained during a telephone conversation with Mr. Sanford Beppu of your Department on November 9, 1998. Specifically, the discussion reads as follows:

Several existing schools are located in Lihue. These include Kawai High and Intermediate School near Nawiliwili Harbor, Elsie H. Wilcox School on Hardy Street in Lihue, and King, Kawmualii School in Hanamaulu. The Kawai Community College, part of the University of Hawaii, is located mauka of Puhi. The State Department of Education (DOE) is about to begin constructing the Kawai Middle School in Puhi adjacent to Kawmualii Highway; the school has a planned opening date of August 2000.

As part of its long-range planning program, the DOE has identified an area on the mauka side of Kawmualii Highway near the Kawai Community College as a possible site for an elementary school to be opened in the year 2005 or later. The DOE has identified other possible sites for this school as well, most notably one on AMFAC/JMB land mauka of Kapule Highway that was recently rezoned for urban uses. Regardless of the location, the school is not programmed to open until the year 2005 or later (Beppu, November 9, 1998). Before making a decision on the location of this school, the DOE will conduct a site selection study and prepare an environmental assessment.

The approximate distances between the three locations being considered for the Lihue Energy Service Center and existing schools are as follows:

Page 2
Dr. Paul LeMahieu, Superintendent
December 11, 1998

School/Location	Approximate Distance (in miles)		
	Preferred Site	Field 390 Site	Airport/Industrial Area Site
Wilcox Elementary School - Lihue	1.8	1.6	1.8
King Kawmualii Elementary School - Hanamaulu	2.8	1.6	0.7
Kawai Middle School - Puhi (Open 2000)	0.6	2.0	3.1

The Preferred Site is (by a small margin) the closest to an existing school site. It is followed by the Airport Industrial Area Site and the Field 390 Site, in that order. Potential environmental impacts on the areas in which the schools are located are addressed as part of the overall impact analysis presented in earlier sections of this chapter.

The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the DEIS or would like to discuss these or other school-related issues before responding, please call me at 593-1288.

Sincerely,

Perry J. White

Enclosure

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If you have any questions regarding these comments, please contact Fish and Wildlife Biologist Mick Castillo at (808) 541-3441. Please provide us with a copy of the Draft Environmental Impact Statement when completed.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS Ecoregion
300 ALA MOANA BOULEVARD, ROOM 3108
BOX 50088
HONOLULU, HAWAII 96850
PHONE: (808) 541-3441 FAX: (808) 541-3470

Sincerely,

Donald Brooks Harper
Donald Brooks Harper
Field Supervisor
Ecological Services

AUG 19 1997

In Reply Refer To: JMC

Planning Solutions
Attention: Perry J. White
1210 Auahi St., Suite 221
Honolulu, HI 96814

Re: Environmental Assessment/ Environmental Impact Statement Preparation Notice for the proposed Kauai Electric Lihue Energy Service Center

Dear Mr. White:

The U.S. Fish and Wildlife Service (Service) has reviewed the Environmental Assessment/ Environmental Impact Statement Preparation Notice for the Kauai Electric Lihue Energy Service Center. The proposed project consists of the construction and operation of new fossil-fuel fired electrical generating facilities and a transmission and distribution facilities baseyard on a 17-acre parcel near Lihue, Kauai. The project purpose is to create an electrical generating facility that, in concert with existing electricity generating facilities on Kauai, will meet projected energy demands for the island through the year 2019.

Facilities Kauai Electric proposes to construct include: a generating facility utilizing diesel fuel (alternative 1), or diesel fuel and coal (alternative 2); control houses, control rooms and support structures; water supply and wastewater disposal facilities including injection wells or some other means yet to be determined; fuel oil delivery and storage facilities; coal storage facilities (alternative 2); limestone storage units; an electrical switchyard; power transmission lines, and miscellaneous other support structures for the purposes of administration, maintenance, covered parking, warehousing, vehicle refueling, vehicle and parts washing, and fire-fighting.

Because the project will be located on a previously disturbed site, the Service does not anticipate significant adverse impacts to fish and wildlife resources to result from construction and operation of the proposed Lihue Energy Service Center. The Service appreciates the opportunity to comment.

(11)



**P L A N N I N G
S O L U T I O N S**

1215 KAHALA STREET, SUITE 121
HONOLULU, HAWAII 96816
PHONE: 808-933-1200
FAX: 808-933-1555

Field Supervisor, Ecological Services
Pacific Islands Ecoregion
Fish & Wildlife Service
Room 3122
300 Ala Moana Boulevard
Honolulu, Hawaii 96813

December 11, 1998

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Sir or Madam:

Thank you for your August 19, 1997, letter [reference JMC] concerning the *Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISP/N) for the Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document, and we are pleased that you concluded that the facilities described in that report would not have a significant adverse effect on fish and wildlife resources.

As you know from the *EISP/N*, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the *EISP/N*. KE reviewed the responses that it received to its written request for comments. It also considered concerns area residents expressed at the voluntary town meeting that KE held on August 21, 1997. Based on that input, the company decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaa and the other northwest of Lihue Airport. Sugar cane is presently cultivated on both of the additional sites, and they are otherwise similar to the original site that was described in the *EISP/N*.

A copy of the *Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). Wildlife resources are discussed in sections 3.5 and 4.7 of the *DEIS*.

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications before commenting, please call me at 593-1288.

Sincerely,

Perry J. Wolfe

Enclosure

(12)

Gaylord H. Wilcox

111 Royal Circle, Honolulu, Hawaii 96816 Phone (808) 737-0370 Fax (808) 732-2161

97 AUG 22 11:50

PLANNING DEPT.

Handwritten signature: Barbara Pendragon

Barbara Pendragon
County of Kauai, r
4444 Rice Street
Lihue, Hawaii 9676

August 20, 1997

RE: Kauai Electric's Lihue Energy Service Center

Dear Ladies and Gentlemen;

I would like to go on record as being opposed to the proposed site for the above facility. I believe the site needs to be farther away from peopled areas to ensure safety from the probable pollution the site will emit.

Of personal concern, as lessor of one of Kauai's attractions for both visitors and residents, I'm concerned about the likelihood of air pollution detracting from Kiihona's ambience and threatening its viability.

I'm sure there are other suitable sites in the vicinity.

Sincerely,

Handwritten signature: Gaylord H. Wilcox



**P L A N N I N G
S O L U T I O N S**

1110 AVAHI STREET, SUITE 211
HONOLULU, HAWAII 96814
PHONE 808 593 1288
FAX 808 593 1288

Mr. Gaylord H. Wilcox
111 Royal Circle
Honolulu, Hawaii 96813

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Wilcox:

Thank you for your August 20, 1997, letter to the Kauai County Planning Department concerning Lihue Energy Service Center. We appreciate the time you spent attending the public meeting Kauai Electric (KE) held in Lihue and drafting your comments.

As you know from the EISPN, Kauai Electric's initial plan focused on the 17-acre parcel identified in the EISPN. KE reviewed your comments and others that it received in response to its written request for comments. It also considered concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997. Based on that input, the company decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapala and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center is enclosed for your review. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). The treatment of potential air quality impacts, which were the focus of your comments, can be found in sections 3.4 and 4.4 of the DEIS.

The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288.

Sincerely,

Handwritten signature: Perry J. White

Perry J. White

Enclosure

(12)

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202 (13)



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 521
HONOLULU, HAWAII 96809
AUG 26 1997

AGRICULTURE DEVELOPMENT
PLANNING
WATER RESOURCES
SOLID AND SOLUBLE RESOURCES
CONSERVATION
CIVIL ENGINEERING
CONSTRUCTION
COMPLIANCE
ENVIRONMENTAL ASSESSMENT
HISTORIC PRESERVATION
LAND MANAGEMENT
PLANNING
WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

Mr. Perry J. White
Page 2

Our records show a well construction permit was approved for Grove Farm Properties, Inc. for Haiku Mauka Well (Well No. 5825-01) on December 18, 1996. A pump installation permit application must be made and approved prior to installation of a permanent pump in the well. If the selected alternative alters the bed or banks of streams, Kauai Electric must obtain a stream channel alteration permit pursuant to HAR §13-169-50.

Thank you for the opportunity to review and provide comments on the subject Environmental Assessment/Environmental Impact Statement Preparation Notice. Should you have any questions, please contact Patti Miyashiro of our Honolulu Land Division Office at (808) 587-0430.

File No. PM-97-057

Ref.:LD-PEM

Mr. Perry J. White
Planning Solution
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

HAWAII: Earth's Best!

Aloha,

MICHAEL D. WILSON

cc: Maui Land Board Member
Maui District Land Office

SUBJECT: Request for Comments - Environmental Assessment/Environmental Impact Statement Preparation Notice, Lihue Energy Service Center, Nawiliwili, Lihue, Kauai, The Map Key: 3-8-5; Por. 3

We have reviewed the Environmental Assessment/Environmental Impact Statement Preparation Notice for the subject project, and would like to offer the following comments:

Land Division - Engineering Branch

The proposed project site, according to the FEMA Community Panel Map No. 150003 0225 B, is located in Zone X (No shading). This is an area determined to be outside the 500-year flood plain (be more precise than just stating, "outside the designated flood hazard areas").

Commission on Water Resource Management (CWRM)

In general, the CWRM strongly promotes the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available, feasible, and there are no harmful effects to the ecosystem. Also, the CWRM encourages the protection of water recharge areas which are important for the maintenance of streams and the replenishment of aquifers.

We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.

A Well Construction Permit and a Pump Installation Permit from the CWRM would be required before ground water is developed as a source of supply for the project.

If the proposed project divers additional water from streams or if new or modified stream diversions are planned, the project may need to obtain a stream diversion works permit and petition to amend the interim instream flow standard for the affected stream(s).

(13)



**P L A N N I N G
S O L U T I O N S**

1115 ADAMS STREET SUITE 201
HONOLULU HAWAII 96813
PHONE 508-533-1200
FAX 508-533-1555

Mr. Michael D. Wilson
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

December 11, 1998

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Wilson:

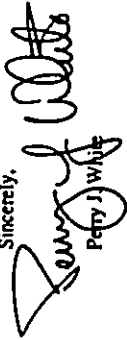
Thank you for your August 26, 1997, letter [reference PM-97-057] concerning the *Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISP/N)* for the *Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document and providing comments. We appreciate the information you provided concerning flood zones and the Commission on Water Resource Management (CWRM) permits that could be required.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the *EISP/N*. After reviewing the responses it received to its written request for comments on the *EISP/N* and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. It incorporates the information you provided. We are sending a separate copy directly to the Aquatic Resources Division together with our response to their comments on the *EISP/N*. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you have any questions concerning the *DEIS* or would like additional information or clarifications, please call me at 593-1288.

Sincerely,



Perry J. White

Enclosure

202 (5)

1082 (15)

P.O. Box 1204
5100 Mahalo Highway, fe-7
Lihue, HI 96766
241-3721

August 28, 1997

Editor
The Garden Island
Lihue, HI 96766

Editor:

Kauai Electric is making plans to build a new electrical generating plant with the rationale that future development will require more electricity. Unfortunately, K.E. plans for generating additional electricity are based on the traditional fossil fuels of petroleum and coal, both known to create serious damage to our environment, including the greenhouse effect which can no longer be considered a myth but a reality determined by hundreds of scientists at the recent worldwide environmental conference held in Washington D.C. Serious weather changes are being attributed to the greenhouse effect including the giant El Nino now threatening in the Pacific. Further, use of fossil fuels create other changes having very negative implications for decreased crop production as well as destruction of ocean fisheries due to ozone depletion, which allows ultraviolet radiation, destructive to crop, tree and other plant production as well as to the ocean food chain on which fish and ocean mammals depend. Of course, K.E. is claiming the proposed generating plant will produce cleaner electricity than its established facilities. They also claim that the proposed plant will promote the health and welfare of the people. Considering the proven damage of fossil fuel use, this is an absurd claim. In the great majority of cases, such corporate promises are neither kept nor realistic under current conditions of economics and technology.

Rather, alternative energy techniques have proven effective through repeated experience. The simplest is practice of conservation by taking care to turn off electricity when not in use as well as using energy conserving appliances. New and exciting clean energy production is a solution far preferable to electricity produced by damaging fossil fuels. In the bay area of Northern California are acres of windmills tirelessly producing electrical energy. I know of one private windmill producing energy on Kauai. More prevalent, however, are individual homes running entirely on photovoltaic power derived from the use of solar panels which directly provide electricity during the day as well as indirect storage of energy to a system of batteries such as golf cart batteries. One innovative individual has even managed to secure about 50 old A.T. & T. telephone batteries, huge power producing things which provide more electricity than he can use. He has no monthly electricity bill

either.

So why must we have an electric power plant which uses expensive and questionable fossil fuels when clean energy technology is already here? Perhaps it would be a whole lot better for Kauai to supplement what we do have with the cleaner and cheaper energy technologies. I get real suspicious when K.E. plans include research on weather patterns for the location of the proposed plant. Does this mean there will be emissions of some sort? Emissions have to go somewhere and will produce environmental damage further harmful to life on earth. A new power plant will have an adverse affect on all of Kauai due to pollution, unsightliness, increased traffic. If all this doesn't make an impression, the proposed plant will likely bring about an increase in household dirt and less clear air.

A little publicized informational meeting on the proposed plant was held August 21st. with deadline for public comment on August 22nd. This left precious little time for any sort of informed response, especially since the environmental assessment/environmental impact statement preparation notice was not made available to the public until August 26th at the Lihue Library. Fortunately, the public comment period has been extended to September 5, 1997. Letters regarding this environmental travesty should be sent to the following:

1. Office of Environmental Quality Control, 235 S. Beretania St., State Office Tower, Suite 702, Honolulu, HI 96813.
2. Kauai Electric Division, 4633 Pahee St., Lihue, HI 96766
3. Mr. Perry White, Planning Solutions, Inc., 1210 Awahi St., Honolulu, HI 96814.
4. Planning Department, 4444 Rice St., Suite 473, Lihue, HI 96766.

Sincerely,

Janet Ashkenazy

Janet Ashkenazy

cc: Office of Environmental Quality Control
Kauai Electric Division
Mr. Perry White, Planning Solutions, Inc.
Planning Department

(15)



**P L A N N I N G
S O L U T I O N S**

1110 KAHUNA STREET, SUITE 211
HONOLULU HAWAII 96813
PHONE 808 533-1188
FAX 808 533-1336

Ms. Janet Ashkenazy
P.O. Box 1204
Lihue, Hawaii 96766

December 11, 1998

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Ms. Ashkenazy:

Thank you for sending me a copy of your August 28, 1998 letter to the Editor of *The Garden Island* concerning the *Lihue Energy Service Center* project. I appreciate the fact that you took the trouble to keep us informed.

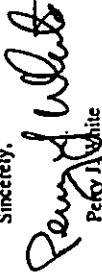
As you know from the EISPN, Kauai Electric's (KE) initial plan focused on a single 17-acre parcel near Puhi. KE reviewed the responses that it received to its written request for comments. It also considered concerns that you and other area residents expressed at the voluntary town meeting that KE held on August 21, 1997. Based on that input, the company decided to investigate other locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center* is enclosed for your review. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

Chapter 1 of the *DEIS* discusses the factors that KE considered before proposing the Lihue Energy Service Center. Chapters 2, 3, and 4 address the three Lihue-area sites that KE evaluated in detail. A further discussion of alternatives to the proposed project is presented in Chapter 5. KE's decision to pursue technologies involving the combustion of fossil fuels at the same time it increases its Demand Side Management (DSM) efforts and continues to contract with plantations that use renewable fuels is consistent with the Integrated Resource Planning (IRP) process mandated by the Public Utilities Commission. At the same time, KE is obligated to proceed with prudent plans for technologies that are most feasible under current economic and environmental conditions.

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288. I would be happy to discuss the proposed project with you.

Sincerely,


Peter White

Enclosure

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20216



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813-5249
PHONE (808) 594-1884
FAX (808) 594-1885

August 27, 1997

Mr. Perry J. White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, HI 96814

Letter to Mr. White
Page two

Please contact Lynn Lee, Acting Officer of the Land and Natural Resources Division, or Luis A. Manrique, should you have any questions on this matter.

[Signature]

Randall Ogata
Administrator

Sincerely yours,

[Signature]
Lynn Lee
Acting Officer,
Land and Natural
Resources Division

LM:lm

cc Trustee Clayton Hee, Board Chair
Trustee Abraham Aiona, Board Vice-Chair
Trustee Rowena Akana, Land & Sovereignty Chair
Trustee Haunani Apoliona
Trustee Billie Beamer
Trustee Frenchy DeSoto
Trustee Moses Keale
Trustee Colette Machado
Trustee Hannah Springer
CAC, Island of Kauai

Dear Mr. White:

Thank you for the opportunity to review the Environmental Impact Statement (EIS) Preparation Notice for Lihue Energy Service Center, Island of Kauai. Kauai Electric proposes to build new electrical generating and transmission and distribution facilities on a 17-acre parcel near the town of Lihue.

The Office of Hawaiian Affairs (OHA) has no objections at this time to the EIS Preparation Notice. But OHA intends to thoroughly review the EIS once the document is available for public review. OHA expects the EIS to fully address potential adverse impacts stemming from (i) fuel and coal storage facilities and management of fuel materials, (ii) limestone storage and processing and handling of limestone materials, (iii) emission of pollutants and other air contaminants from combustion turbines, (iv) handling and disposal of wastewater and other waste materials, (v) transmission and distribution lines.

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**P L A N N I N G
S O L U T I O N S**

1210 AVANI STREET, SUITE 221
HONOLULU, HAWAII 96813
PHONE 808 933-1210
FAX 808 933-1111

December 11, 1998

Ms. Lynn Lee
Land and Natural Resources Division
Office of Hawaiian Affairs
Suite 500
711 Kapiolani Boulevard
Honolulu, Hawaii 96813-5249

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Ms. Lee:

Thank you for your August 27, 1997 letter concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the *Lihue Energy Service Center*. We appreciate the time you and other members of OHA's staff spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the *EISP/N*. After reviewing the responses it received to its written request for comments on the *EISP/N* and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapapa and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

The *DEIS* covers all of the specific topics mentioned in your letter. Potential effects on air quality are contained in Section 4.4, for example, and the effect of disposal of wastewater and other materials is covered in Section 4.5. The report discusses the effect of project-related transmission lines as you requested.

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288.

Sincerely,

Perry White

Enclosure

KEAUAUOLA POINT
HONOLULU, HAWAII



STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 117
HONOLULU, HAWAII 96814

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION
P.O. BOX 117
HONOLULU, HAWAII 96814



PLANNING
SOLUTIONS

1210 AUAAHI STREET, SUITE 221
HONOLULU, HAWAII 96814
PHONE: 808 593-1155
FAX: 808 597-1558

December 11, 1998

August 28, 1997

Mr. Perry J. White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: EIS Preparation Notice: Lihue Energy Service Center
Thank you for allowing our review of the Environmental Assessment/Environmental Impact statement Preparation Notice for the proposed Lihue Energy Service Center project.

The proposed project will have no direct impact on programs and projects of this department. We have no objection to its implementation at this time.

Should you have any questions, please call Daniel Ornellas of our Planning Office at 586-3836.

Aloha,

Kali Watson

KALI WATSON, Chairman
Hawaiian Homes Commission

Mr. Kali Watson, Chairman
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center
Dear Mr. Watson:

Thank you for your August 28, 1997 letter concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the *Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document. We understand that the project as described in the *EISP/N* would have no direct impacts on your Department's programs or projects.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the *EISP/N*. After reviewing the responses it received to its written request for comments on the *EISP/N* and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you have any questions concerning the *DEIS* or would like additional information or clarifications before commenting, please call me at 593-1288.

Sincerely,

Perry J. White
Perry J. White

Enclosure

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December 11, 1998

**P L A N N I N G
S O L U T I O N S**

1210 AWAHI STREET, SUITE 221
HONOLULU, HAWAII 96814
PHONE: 808-592-1287
FAX: 808-592-1255



Joan and Larry Heller
P.O. Box 387
Lawai, HI 96765-0387

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Joan and Larry Heller:

Thank you for your August 31, 1997 letter concerning the *Lihue Energy Service Center*. We appreciate your interest in the project.

As you may know, Kauai Electric's (KE) initial plan focused on a single 17-acre parcel. After reviewing comments that it received from area residents, the company decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaa and the other northwest of Lihue Airport.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review. The *DEIS* addresses environmental issues associated with each of the three sites that KE is now considering. The *DEIS* also discusses the Integrated Resource Planning (IRP) process. This is the Public Utilities Commission-mandated program within which KE addresses decisions concerning such things as Demand-Side Management (conservation), renewable technologies, and customer energy self-sufficiency. KE would be happy to lend you a copy of its most recent IRP plan if you are interested in learning more about this program.

If you have any questions concerning the report or would like additional information, please call me at 593-1288. The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999.

Sincerely,

Perry White
Perry White

Enclosure

August 31, 1997

Planning Solutions, Inc.
1210 Awahi Street
Honolulu, HI 96814

Dear Mr. Perry White,

My husband Larry and I would like to convey our concerns regarding Kauai Electric's proposal to build an expensive and unnecessary fossil fueled power generating plant on the Puhi plain, here on Kauai. We would prefer that they seek other alternatives such as conservation, newer and cleaner power producing technologies (turbo), or assistance with customers interested in becoming more energy self-sufficient (solar) and selling their excess power back to the utility.

There is really no need for such a plant on this island now or in the near future even if they loose the power contributions from the sugar mills.

Any other information you could offer on this matter would be appreciated.

Sincerely,

Joan Heller
Larry Heller
Joan and Larry Heller

20

31 Aug 97

Kauai Planning Department
4444 Rice St Suite 473
Lihue, HI. 96766

FLANIHAN



**P L A N N I N G
S O L U T I O N S**

1111 AVAHI STREET SUITE 1111
HONOLULU HAWAII 96813
PHONE 595 5331 1100
FAX 595 5333 1100

Mr. Robert B. McCaig
2770 Miho Hae Loop
Koloa, Hawaii 96756

December 11, 1998

re: Proposed Kauai Power Plant

For the following reasons - I strongly oppose the placement of a Power Plant in the Puhii - Lihue area.

- a) The very nature of a power plant is heavy industrial - hence it should be located in industrial area - not in a pristine / residential / school / recreational area.
- b) A power plant requires large amounts of water - thus drawing from a limited source and then creating a disposal problem.
- c) They require fuel - in this case oil or coal - thus an advantage to being close to a source - not located where transportation creates traffic problems. Storage of fuel also creates visual &/or water &/or air pollution.

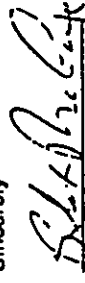
While, of course, we need power, however we don't need another heavy industrial area.

Port Allen is the place for plant expansion or replacement.

The only reason, I have heard stated, - that they should not build at Port Allen, is that they have reached the maximum of allowed air pollution at this location. Hence there logic seems to be - move on to another area we can pollute. With this type of thinking - what next? - it boggles the mind.

Again, please, early on, stop Kauai Electric's proposed Puhii plant location.

Sincerely


Robert B. McCaig
2770 Miho Hae Loop
Koloa, HI. 96756

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

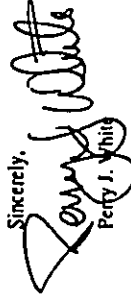
Dear Mr. McCaig:

Thank you for your August 31, 1997 letter concerning the placement of a power plant in the Puhii-Lihue area. We appreciate the time you spent preparing your comments.

As you know, Kauai Electric's (KE) initial plan focused on a single 17-acre parcel. After reviewing the written comments it received and the views area residents expressed at the town meeting that KE held on August 21, 1997, KE decided to investigate other possible locations for the proposed facilities. At the conclusion of its investigation, it added a second and third site to those it is considering: one site is west of Kapaia and the other site is northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998 to allow the public to comment on the two additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center* is enclosed for your review. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). These include the land use, fuel transport, water use, and siting issues mentioned in your letter.

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is January 22, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288.

Sincerely,

Percy J. White

Enclosure

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DEPARTMENT OF WATER
County of Kauai

"Water has no Substitute -- Conserve It!"

September 2, 1997

Mr. Perry J. White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, HI 96814

Dear Mr. White:

Subject: Environmental Assessment/Environmental Impact Statement
Preparation Notice August 28, 1997

We have reviewed the Environmental Assessment/Environmental Impact Statement Preparation Notice. We have the following comments:

1. The Garlinghouse Tunnel source is at risk of being under the influence of surface water. Therefore, the proposed facility by Kauai Electric is a serious threat to that water source (300 feet away) in particular. Because of the geologic variability in the area, the proposed power plant also threatens our nearby well fields. Contamination of source water is irreversible. Loss of any source water in that area would be catastrophic.
2. Wastewater of various types will be generated. The proposal listed several possibilities for its disposal. The tentative nature of the disposal process is of great concern. The distinct possibility of eventually using an injection well system poses a serious threat of contamination given the variable geologic nature of the area. Also, the proposed waste-sumps are a contamination risk as human error or mechanical failure is always possible.
3. The possibility of a fuel spill is a great risk. Even the best of safety precautions can fail (nothing is completely fail safe). Therefore, contamination of nearby Garlinghouse Tunnel is a distinct possibility.
4. The plant is designed to use about one million gallons of water per day. Where will that water come from? If a new well is developed to supply the plant, the withdrawal of that additional water may adversely affect the water production of the Department of Water's existing wells.

If there are any questions, please call Carl Arume at 245-5446.

Sincerely,



Ernest Y.W. Lau
Manager and Chief Engineer

CA:ec

Small Printing Co.
- 1519 Paa Loke Street, Lihue, Kauai, Hawaii or P. O. Box 1706, Lihue, HI 96744-3706 -
Phone No. (808) 265-9000 - Administration FAX No. (808) 244-9618 - Engineering/Field/Shop FAX No. (808) 244-5113



**P L A N N I N G
S O L U T I O N S**

1111 KUAHII STREET, SUITE 211
HONOLULU, HAWAII, 96813
PHONE: 808 533-1200
FAX: 808 533-1356

December 11, 1998

Mr. Ernest Y.W. Lau
Manager and Chief Engineer
Department of Water
County of Kauai
4398 Pua Loke Street
Lihue, Hawaii 96766

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Lau:

Thank you for your September 2, 1997 letter concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on a single 17-acre parcel. After reviewing the written comments it received from the Department of Water Supply and others, as well as the views area residents expressed at the town meeting that KE held on August 21, 1997, KE decided to investigate other possible locations for the proposed facilities. At the conclusion of its investigation, it added a second and third site to those it is considering: one site is west of Kapapa and the other site is northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998 to allow the public to comment on the two additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the Lihue Energy Service Center is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). Sections which may be of particular interest to you include Section 2.2.5 - Fuel Delivery and Storage, Section 3.3 - Hydrology, and Section 4.5 - Hydrologic Impacts.

KE has asked me to reemphasize how seriously it has taken the concerns you expressed about potential adverse effects on your Garlinghouse Tunnel water source. Soon after receiving your letter, KE engineers met with you to discuss your concerns and to describe the measures that they intended to incorporate into the design to prevent their project from affecting the DOW's water sources. KE also provided you a compendium of material on the proposed design and the effectiveness of the fuel oil containment measures that it includes. In transmitting this material to you, KE noted the following:

- *The best means of preventing petroleum pollution is to insure that the product remains within the primary containment device, whether storage tank or pipeline. This is done by using proper design, strong, durable materials, and a rigorous inspection and maintenance program. Our proposed facilities and operation plan do this.*
- *Regardless of the design and materials used in the primary containment facility, a breach is always possible. Because of this, our plans include sensors designed to quickly detect leaks in the primary containment vessel and sound an alarm. Meanwhile, the secondary containment that we will provide around both oil storage tanks and pipelines will keep escaped petroleum from spreading into the environment. As discussed in the [attached] scientific paper...., the combination of sensitive leak-detection systems and high quality secondary containment reduces*

Page 2
Mr. Ernest Y.W. Lau
December 11, 1998

the probability that petroleum will escape and contaminate surrounding land and water to an extremely low level.

- *The kinds of containment systems that will be incorporated in our facilities use proven technologies. The kind of double-liner system that is included in the design has been in use since 1974, when such a system was installed on a steep slope at a chemical plant in a seismically active area of France. Continuous monitoring of that facility over the past two decades has shown it to perform as designed, and the use of similar containment systems is widespread. A recent study by the U.S. Environmental Protection Agency estimates that over 83,000 aboveground storage tanks used liners at the beginning of 1996.*

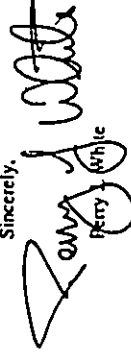
- *A 1992 report by the State of California Integrated Waste Management Department concludes that well designed, constructed, and inspected composite liner systems can protect groundwater from contamination.*

KE's letter to you noted that the materials it was providing did not directly address the issue of fuel spills from trucks hauling fuel to a power plant site. However, it pointed out several factors that it believes minimize the risk of harm to the DOW's water sources:

- *The volume of oil that is transported by any one truck is small, limiting the risk of pollution resulting from a fuel transportation accident.*
- *KE's fuel supplier would use trucks that comply with Department of Transportation regulations governing the design and operation of tanker trucks. These require that they carry spill containment devices and materials that would be used in the case of an accident.*
- *Fire Department personnel are trained in pollution control in case of accidents. They could quickly reach the site of any accident involving trucks serving the proposed Lihue Energy Service Center.*
- *KE has committed to maintaining additional trained personnel and supplies on-site that would be used to supplement the spill containment materials normally carried on fuel trucks.*

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is January 22, 1999. If you have any questions concerning the report or would like additional information or clarifications before commenting, please call me at 593-1288.

Sincerely,


Perry White

Enclosure

(21)

BENJAMIN J. CATELANO
Director



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

228 SOUTH BERTANAMA STREET
HONOLULU, HAWAII 96813
TELEPHONE: (808) 548-1119
FACSIMILE: (808) 524-1118



CLARY GILL
DIRECTOR

September 3, 1997

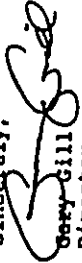
Mr. Dee M. Crovell, Director
Planning Department
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Subject: EISPN for the Kauai Electric Lihue Energy Service Center
Thank you for the opportunity to review the subject document. We have the following comments and questions.

1. The draft EIS should discuss how the proposed plant relates to Kauai Electric's long-term integrated resource management plan and demand side management programs and goals.
2. The draft EIS should describe in detail how the operations of the plant (emissions from stacks, fuel delivery, use of water resources, etc.) may impact the surrounding community.
3. The draft EIS should investigate how the project may restrict existing and potential land use in the vicinity of the site.
4. The draft EIS should illustrate the visual impacts of the proposed structures (buildings, emission stacks, fuel and water tanks, overhead transmission lines, etc.) from public places such as roads and lookouts. Photos of existing conditions taken from public view points are helpful in evaluating visual impacts. Renderings of future structures superimposed on photos of existing views should be provided.

Should you have any questions, please call Jeyan Thirugnanam at 586-4185.

Sincerely,


Gerry Gill
Director

c: Kauai Electric
Planning Solutions



**P L A N I M O
S O L U T I O N S**

1710 AWAHI STREET, SUITE 221
HONOLULU, HAWAII 96813
PHONE 595-533-1720
FAX 595-533-1888

December 11, 1998

Page 2
Mr. Gary Gill, Director
December 11, 1998

Thank you again for your letter and the other cooperation you have shown to us. If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288.

Sincerely,

Perry J. White

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Enclosure

Dear Mr. Gill:

Thank you for your September 3, 1997 letter concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISP/N. KE reviewed the responses that it received to its written request for comments. It also considered concerns area residents expressed at the voluntary town meeting that KE held on August 21, 1997. Based on that input, the company decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapapa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites. Your office was kind enough to publish an informational notice in its June 8, 1998 *Bulletin* informing the public of the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the Lihue Energy Service Center is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). The four issues noted in your letter are discussed principally in the following sections of the report:

- (1) The project's relationship to KE's *Integrated Resource Plan* and DSM Program is discussed in Chapter 1.
- (2) Chapter 4 discusses potential impacts on the surrounding community, including those resulting from emissions from stacks (Section 4.4), fuel delivery (Section 4.10), and uses of water (Section 4.5).
- (3) Land use issues are discussed in various parts of the report, as appropriate. The noise impact analysis (Section 4.11), for example, discusses land use implications of forecast noise levels. Chapter 6 discusses the project's consistency with land use plans, policies, and regulations.
- (4) The visual effects of the proposed facilities are discussed in detail in Section 4.12. Because of the large number of options the analysis addresses, we have not been able to include renderings superimposed on photos.

(22)

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September 4, 1997

Citizens Utilities, DBA: Kauai Electric
4633 Pahee Street, Lihue, HI 96766

ATT: Dave Morgan & Denny Polosky

RE: Input for the Kauai Electric Lihue Energy Service Center

I am reviewing a copy of the Environmental Assessment/Environmental Impact Statement Preparation Notice received by the Lihue Public Library August 26, 1997. Though I have tried to read carefully, some topics appear to be incomplete and leave me with major questions. Please consider the following input and respond.

First of all, I want to thank Kauai Electric and the parent company, Citizens Utilities, for looking and planning ahead for the energy needs and potential for this rural and isolated community. No doubt Citizens Utilities has experience in dealing with energy needs of rural areas such as Kauai, though none are more isolated and dependent upon the transportation of fuel as Hawaii.

As a resident of this island, I am concerned about the large demand (between .81 and .84 million gallons per day) for "extremely pure water", used to primarily cool the combustion turbines proposed by KE.

Though your planners in Honolulu, Planning Solutions, Inc., have provided various energy projection scenarios, I am most concerned that no projections for future water demand by this community are correlated. Question: What good will all this supply of energy be for business, industry or residents if the community affected does not have clean water supply? I would like these water use projections for both Lihue and the island to be done prior to the final EIS.

Another major concern is the site chosen, which is directly over a safe drinking water source for Lihue. The water tunnel, known as the Garling House water tunnel, is almost directly under this KE proposed site. The manager of the County of Kauai Water Department, Ernest Lau, is very concerned about this matter. As a Lihue area resident who likes to drink water, so am I.

Also, the State Safe Drinking Water department representative, Harold Eichelberger, said he has already informed Kauai Electric of his concerns with the same issue. The precious resource of safe drinking water for Lihue will be in jeopardy if the KE Lihue Energy Service Center goes through. He said that the chance of a major fuel or contaminate spill is extremely high over a five to ten year period for such a large combustion facility as described to him by KE. I don't think the assessment addresses this issue, and I don't see how an EIS could handle it for this site.

As far as dangerous water runoff, according to your assessment, "A gulch formed by Nawiliwili Stream forms its southern boundary. On the east, it ends in a depression that drains into a small tributary to Nawiliwili stream." An energy facility or fuel storage should never be placed near bodies of water or streams.

What if there were a big wind, such as a hurricane? So much for the coal storage facility walls. So much for the fuel storage tanks. So much for the other contaminants associated with this development located directly over the Lihue safe drinking water, and right next to a major stream all downhill leading into Kalapaki Bay. Can the EIS describe a defendable disaster preparedness scenario for this facility at this location?

Granted, there may be no rice, vegetable crops or taro growing in the valley below as native Hawaiians had only a few generations ago in the Lihue area. (Where is your cultural use assessment?) However, to have runoff from a toxic source such as this energy plant directly into a major stream bed is asking for health and environmental disaster. I believe Lihue to be the second largest population base on this island, and contaminated water is going to be hard to swallow.

These water issues are my major concern with the proposed site for the Kauai Electric Lihue Energy Service Center. The foul air from the coal burning facility will no doubt be addressed by those downwind with asthma and the elderly living in nearby Lihue Gardens. If the contracted planners currently located in Honolulu can answer these questions thoroughly and to the point in the final EIS, we could all benefit.

Finally, and perhaps most important, Article 11 of our State Constitution says we are to "strive to be self-sufficient". Do the KE planners know this? The Kauai General Plan must also comply with this goal, so there is no way this county can support the KE commitment to fossil fuels, such as coal. Your assessment states that your goal is to "electrify our life using fossil fuels". The idea is that we must reduce our dependence upon petroleum and upon all imported fossil fuels, which includes coal. Surely, Kauai Electric can write a better plan for a better site.

Thank you for your time and consideration.

Sincerely,
Carol D. Bain

Carol D. Bain (Puhi resident), PO Box 2320, Lihue, HI 96766

cc: Mayor Kusaka; Ernest Lau; Harold Eichelberger; Don Heacock; Linda Shigeta; Chris Cook; Garden Island Newspaper; Jerry White, Planning Solutions Inc.; and the Office of Environmental Quality Control

PS:

Listed next are a few other energy points to ponder, though all need more time to explore.

23

- Demand for more electricity is not in existence and KE projections are not realistic. Why the big rush to expand electric services?
- When will our rates go up again to pay for this big project of expansion? Your assessment says electric rates "may" even go down "someday". This is not very specific. What is this development going to cost and can KE be held accountable for it? In other words, once a price is decided, can KE come back to the public and the PUC, and say it is going to cost more, and more; and more?
- Is public going to have to pay for big electric infrastructure to attract big business-- Where is state oversight? Is PUC encouraging KE for plans to generate more electricity when it should reward KE for aggressive conservation instead
- What is the corporate contribution of Citizens Utilities to this community?
- Are there not other competitive utility service providers in US that can provide an alternative plan?
- Is this plan efficient? Has there really been thorough research into alternative supportive energy sources? Why not use KE planning resources to develop and lobby for tax incentives for electric conservation? When did KE research tidal/wind/solar technology? Why not a combination, or a 30 year plan that incorporates new R&D in these areas?
- Why the dependency on coal and diesel?
- Where is the innovated and aggressive approach to conservation? All I have seen is very mild encouragement to conserve, like to "turn off lights".
- What about that raise in our electric rates by over 40%? What did that pay for? Citizens Utilities corporate profits? (That certainly reminds me to turn off non-essential items, but that approach to energy conservation is not really helpful.)
- Do the monthly electric payments made to Kauai Electric/CU pay for the equipment and machinery being proposed? If these items are not owned by residents of Kauai, does the State of Hawaii own them, or does KE?
- After this new plant is developed, who owns this machinery and the generators? The residents of Kauai, the State, or Kauai Electric/Citizens Utilities?
- What will happen to the old power plant in Elele? Will it remain on-line? If not, will any of its machinery be sold? If so, who owns this machinery? Will these sales of this equipment, undoubtedly paid for by citizens of Kauai, not Citizens Utilities, be given to our County?
- Of the new development, who owns the new equipment and facilities after it is developed? The citizens of Kauai? Or the international corporation, Citizens Utilities dba Kauai Electric?
- Can citizens of this State or County buy these utilities and own them? Can the State or County of Kauai find a competent utilities and business manager that will consider the needs of the citizens above the profits of the stockholders?
- Should the PUC, and KE, be looking at other States, such as California, to see if they are finding innovative solutions to energy demand?
- Is it really true that is cost effective to bring in coal across the Pacific to the island of Kauai in an efficient manner as a fuel resource?
- Is this importing of large quantities of coal a means to subsidize and pay the corporate

- shippers (IE: A&B, Young Brothers and Matson) at the expense of Kauai residents? How much of the of KE stock is owned by Alexander & Baldwin. Or how much of A&B stock is owned by Citizens Utilities? Is there conflict of interest?
- Will the cost of coal rise in the future to possibly make this commitment to fossil fuel, coal, for our primary energy source questionable?
- What is the source for this coal? Will the coal come from another Citizen's Utilities holding so Kauai can get the coal at a low price. Or will the price fluctuate similar to the price fuel oil has. State Ombudsman, Chuck Tolo, told me Kauai once paid far more for fuel oil than any other energy facility in the state of Hawaii. How can we prevent that practice from occurring again?
- Are the generators being suggested in this assessment brand new models? Or have they been re-furbished from another use?
- Are these generators state of the art models and efficient producers of electricity?
- Compare these generators with others available for efficiency.

I realize a few of these questions may not be directly related to the Lihue Energy Service Center, but they need addressing. Perhaps some of these questions are answered in the assessment and I have overlooked it. If so, I apologize and please list the page number for me to find the answers to these specific questions. If not, please address my questions with clear answers in the final EIS. Thank you.

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**P L A N N I N G
S O L U T I O N S**

1210 AUGER STREET SUITE 211
HONOLULU HAWAII 96813
PHONE 808 533-1333
FAX 808 533-1338

December 11, 1998

Ms. Carol Bain
P.O. Box 2320
Lihue, HI 96766

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Ms. Bain:

Thank you for your September 4, 1997 letter concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the Lihue Energy Service Center. We appreciate the time you spent reviewing the document and formulating your comments.

As you know from the EISPN, Kauai Electric's (KE) initial plan focused on a single 17-acre parcel. KE reviewed the responses that it received to its written request for comments. It also considered concerns expressed at the voluntary town meeting that the company held on August 21, 1997. Based on that input, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapapa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the Lihue Energy Service Center is enclosed for your review. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). Equally important, it addresses the questions and issues noted in your letter as follows:

- **Water Use.** Water use by the proposed project and the effect that it would have on Kauai's water resources is discussed in a number of places in the report. Water use estimates may be found in Section 2.2.4. Section 3.3 discusses the hydrology of the area, and Section 4.5 discusses the effects that the proposed facilities would have on water resources. As you will see from a review of these sections, the water that the facility would use does not start out "extremely pure". In fact, the sources (surface water for the Preferred Site and the Field 390 Site, groundwater for the Airport Industrial Area Site) are non-potable. KE must treat the water before it becomes the "extremely pure water" needed for its equipment.
- **Potential Effects on Garlinghouse Tunnel.** KE shares your concern for the preservation of Kauai's potable water resources. Its own experience and data available to it from industry sources do not support your statement that "...the chance of a major fuel or contaminant spill is extremely high over a five to ten year period for such a large combustion facility as described to him by KE." In fact, KE's experience is that this type of accident is rare. Moreover, KE's conceptual design for the proposed facilities includes numerous provisions to insure that the kinds of accidental releases you mentioned do not occur. These include primary and secondary containment, leak detection sensors, continuous monitoring, and intensive training for personnel handling petroleum products. It has supplied extensive information to the Department of Water concerning these design elements. At the same time, it has increased the number of locations it is considering to include sites that are not near the Garlinghouse Tunnel water source.
- **Fuel Storage Near Bodies of Water of Streams.** It is not possible to find a location on Kauai that does not drain into a stream or body of water. Consequently, while the kind of site you suggest is

Page 2
Ms. Carol Bain
December 11, 1998

ideal, it is not a practical alternative for fuel storage facilities in Hawaii. To protect against the kind of harm you envisioned, the facility would use state-of-the-art storage facilities that provide both primary and secondary containment for the fuel. These would comply with U.S. Environmental Protection Agency guidelines that call for secondary containment equal to 110 percent of the volume of the largest tank. The specific containment method would be selected during the detailed design of the facility. The most common method used for fuel storage tanks is the use of a high-strength, flexible liner material in combination with an earthen berm. Pipelines used to transfer fuel from one tank to another within the site would be double-walled.

• **Dangerous Winds.** The proposed facility would be designed to withstand hurricane force winds of the sort mentioned in your letter. In this regard, it is worth noting that KE's Port Allen Generating Station survived the extremely high winds from hurricanes Iniki and Iwa without substantial damage, and with no fuel spills. The fuel storage and handling facilities at the proposed site would be designed to an even more stringent set of standards.

• **Air Emissions from Coal Facility.** The Sections 3.4 and 4.4 of the Draft EIS contain an in-depth discussion of the air quality issues associated with the proposed facilities. A careful reading of these will show that the fluidized-bed coal-fired technology that is among those that could be accommodated on the site has relatively low emissions of many contaminants. These would be well below those mandated by State and Federal regulations.

• **Self-Sufficiency.** KE is cognizant of the provisions of the State Constitution. Section 1 of Article 11 reads, in full: *For the benefit of present and future generations, the State and its political subdivisions shall conserve and protect Hawaii's natural beauty and all natural resources, including land, water, air, minerals and energy sources, and shall promote the development and utilization of these resources in a manner consistent with their conservation and in furtherance of the self-sufficiency of the State. All public natural resources are held in trust by the State for the benefit of the people.* Seen in its full context, the proposed project is entirely consistent with this constitutional provision. As you know, KE's resource planning is done within the context of the State of Hawaii Public Utilities Commission-mandated Integrated Resource Planning (IRP) process. The company begins its resource planning with a thorough evaluation of measures that can be taken to reduce demand through conservation and other measures. These are incorporated into its Demand Side Management (DSM) program (see Section 1.2.5 of the DEIS for a summary).

As explained in the DEIS, KE has proposed additional fossil-fuel fired generating units only after it determined that the needs of its customers could not be met through conservation or other DSM programs. It will continue this policy while it prudently provides for the kinds of technologies that are presently available. KE notes that nowhere in the EISPN does it state that the company's goal is "...to electrify our life using fossil fuels."

Thank you again for your comments. The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications before commenting, please call me at 593-1288.

Sincerely,

Perry White

23

Enclosure

MARYANNE W. KUSAKA
DIRECTOR



PLANNING DEPARTMENT

DEE M. CROWELL
PLANNING DIRECTOR
IAN K. COSTA
DEPUTY PLANNING DIRECTOR
TELEPHONE (808) 331-4437
FAX (808) 331-4499

(24)

Mr. Denny Polosky
Vice President & General Manager
Page 2
September 4, 1997

September 4, 1997

Mr. Denny Polosky
Vice President & General Manager
Kauai Electric
4463 Pahe'e Street
Lihue, HI 96766-2032

SUBJECT: Environmental Assessment/Environmental Impact
Statement Preparation Notice (EA/EISPN)
Kauai Electric Lihue Energy Service Center
TMK 3-8-5: por. 3 Lihue, HI

COPY

Thank you for extending the deadline for comments on the subject document until September 5, 1997. We have reviewed the EA/EISPN and have provided comments in three areas: procedural, environmental and technical.

1. Sec. 1.1, Overview of the Proposed Project, para. 2: The Tax Map Key for the parcel should read "TMK 3-8-05: por. 3".
2. Fig. 1-1: Although the map clearly indicates the property location, a more current map than 1983 would be preferable, if available.
3. Sec. 1.3.2.2, Property Purchase Agreement, para. 2: The subdivision application for creation of the proposed lot does not include consolidation with the abandoned Water Tank lot (Lot B), which is located within the parcel near the proposed offices. This parcel should be consolidated with the larger lot, if approved, or setbacks from property lines may be required.
4. Secs. 1.3.2.3, Confirmation of Approval Process (ref. Sec. 1.5, para. 1; Sec. 2.2.1.1, para. 2; Sec. 2.2.2.2; Sec. 2.2.5.3, para. 2): Based on the more detailed information provided in the EA/EISPN, the Planning Department revises its comments of July 18, 1995, to include the following:

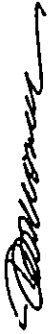
"In addition to the Use, Special and Class IV Zoning Permits required, a Variance Permit may be required from limits on height, lot coverage or other county codes related to the project, which would be determined at the time of zoning permit application.

5. Sec. 2.2.1.1.1, Advanced Cheng Cycle Combustion Turbines (ACC-CT): Although reference is made to Fig. 2-3 as a photograph of an ACC-CT, the figure is not a photo. Reference is also made to the need to raise ACC-CT stack heights, when additional units and buildings are added to the facility, in order to assure air quality standards continue to be met. The visual impact of the stack is a concern.
6. Sec. 2.2.1.2, Dual-Train Combined-Cycle Combustion Turbines (DTCC): The DTCC is a feature of Alternative #1, yet the final sentence refers to construction of a coal-fired unit, a feature of Alternative #2. Is a combination of both alternatives being suggested? Also, para. 3: Since the same engines are used in the DTCC as in the ACC-CT, would the DTCC also have flexibility in choice of diesel or naphtha?
7. Sec. 2.2.2.3, Diesel Engines, para. 2 (top of p. 2-13): This paragraph belongs with Sec. 2.2.2.2, 25 MW Coal-Fired Fluidized-Bed Generating Unit. The Draft EIS discussion of off-loading, transport, on-site and off-site storage and pulverizing facilities for coal and limestone should address possible effects of rainwater runoff and airborne dust, and proposed containment and mitigating measures.
8. Sec. 2.2.4.1, Water Sources, para. 1 & 2: The Draft EIS should discuss the timeline of water well development with respect to the proposed phasing of the power plant and effects on County water supply.
9. Sec. 2.2.4.2, Wastewater Disposal: This section suggests two wastewater streams: one which needs sanitary treatment and one which doesn't. The Draft EIS should explore the possibility of separation of the streams at the site, and diverting the clean one to agricultural reuse in the vicinity of the site. This would reserve the capacity of local wastewater treatment plants for urban uses. Also, why would there be a differential in wastewater quantity between the first phases of Alternatives #1 and #2, which are the same (ACC-CT followed by a diesel unit)?

(24)

Mr. Denny Polosky
Vice President & General Manager
Page 3
September 4, 1997

10. Sec. 2.2.5, Fuel Delivery and Storage: The Draft EIS should examine and discuss impacts of increased truck traffic on proposed routes, and any roadway improvements which would be required for fuel delivery from both the Naviliwill Harbor and Port Allen Harbor areas, with respect to the phasing of the power plant. Also, could the twenty-one day supply be stored on-site? If so, please discuss mitigation of hazards related to possible spills or fires of that volume.
11. Sec. 3.2.2, Land Use Controls: The County zoning is Open District, not Agriculture District.
12. Sec. 4.1, Potential Adverse Effects of the Proposed Project: In addition to the more complete review of the effects mentioned, the Draft EIS should also examine the possible health effects of all combustion byproducts of the proposed fuels and generator technologies; the possible impacts on the local water supply; and the possible impact on existing and future land development in the surrounding area.
13. Chapter 5, Alternatives to the Proposed Action: Alternatives of a significantly Different Nature, such as wind or solar thermal, should be examined. Alternatives of different designs or details of the proposed action should also be examined. Finally, alternative locations should be examined in significantly different areas of the island.
14. Chapter 7, Parties to Be Consulted: Please consult with the local DOT Harbors and DOT Airports offices, DBEDT Office of Planning, and the Sierra Club Kauai Chapter. More community meetings would be appropriate early on in the Draft EIS process to ensure local concerns are examined thoroughly.


DEE M. CROWELL
Planning Director

cc: Perry White, President, Planning Solutions



**P L A N N I N G
S O L U T I O N S**

1110 ARABIAN STREET, SUITE 201
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PHONE 808 531-1211
FAX 808 531-1515

Mr. Dee Crowell, Director
Planning Department
County of Kauai
Suite 473 Kapule Building
4444 Rice Street
Lihue, Kauai, Hawaii 96766

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Crowell:

Thank you for your September 4, 1997 letter concerning the *Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISP/N)* for the Lihue Energy Service Center. You and your staff have been very cooperative throughout the permitting process, and we appreciate the time you spent reviewing the document.

As you know, Kauai Electric has expanded the scope of the EIS to include locations not covered in the *EISP/N*. These additional locations are covered in the *Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center* that is enclosed for your review and comment. Specific responses to the points noted in your letter are provided below.

1. **Parcel Number.** The *DEIS* contains the correct parcel number. Thank you for calling this typographical error to our attention.
2. **Location Map.** Because it contains geographic information not readily available elsewhere, the U.S. Geological Survey 7.5-minute quadrangle sheets (scale of 1:24,000) used as the basis for this map is the best for the purposes of the *DEIS*. We agree that a version more current than the 1983 maps used in the report would be preferable. Unfortunately, they are not available.
3. **Lot Consolidation.** AMFAC/JMB have moved to consolidate the parcels as you suggested.
4. **Confirmation of Approval Process.** The Draft EIS notes that based on the more detailed information it has reviewed since the *EISP/N* was issued, the Planning Department has informed KE that a Variance Permit may be required from limits on height, lot coverage, or other county codes relating to the project. It states that this determination will be made when final plans for the facilities are available.
5. **Advanced Steam Injected Combustion Turbines.** The reference in the *DEIS* is to an illustration instead of a photo. Section 4.12 of the *DEIS* addresses the visual impact of the stack at its full height, not just at the height that would be needed for the first unit.
6. **Section 2.2.1.2.** The reference to the steam turbine building being expanded when the coal-fired unit is constructed was an error. As you correctly noted, it is part of Generating Alternative 2. The *DEIS* correctly states this. DTCC units are able to burn naphtha.
7. **Section 2.2.2.3. Diesel Engines.** This paragraph was mis-located when the *EISP/N* was being formatted. The *DEIS* has the correct placement of the description.
8. **Water Sources.** Section 2.2.4 of the *DEIS* discusses the water sources that would be used. The region's water resources and the project's potential effects on them are discussed in Sections 3.3 and 4.5, respectively.

Page 2
Mr. Dee Crowell, Director
December 11, 1998

9. **Section 2.2.4.2. Wastewater Disposal.** As a result of further investigations conducted during preparation of the *DEIS*, KE now plans to use surface water sources to provide water to the Preferred Site, and most excess water would be reused as you suggested. Only the small quantity of sanitary wastewater that would be generated on site would be disposed of through local percolation.

10. **Section 2.2.5. Fuel Delivery and Storage.** Section 4.10 of the *DEIS* discusses fuel delivery to the various sites. The conceptual plans for all three sites provide space for all of the fuel needed to meet the 21-day minimum requirement to be stored on-site. However, KE may decide to use off-site storage for a portion of this if combined on- and off-site storage appears to be more appropriate at the time it is preparing final plans for each generating unit.

11. **County Zoning.** The *DEIS* contains a revised discussion of the zoning for the Preferred Site.

12. **Potential Adverse Effects.** The *EISP/N* was intended to identify the kinds of impacts that might be anticipated. Chapter 4 of the *DEIS* a thorough discussion of the impact that are likely to result from development at each of the three locations under consideration.

13. **Alternatives.** Chapter 4 of the *DEIS* contains in-depth analyses of technology and locational alternatives in the Lihue area. Chapter 5 discusses other alternatives. Some of the broader issues mentioned in your letter have been dealt with through the PUC-mandated Integrated Resource Planning process discussed in Chapter 1; these are not analyzed in detail in the *DEIS*.

14. **Parties to be Consulted.** We have consulted the parties you mentioned. In addition, KE held open public meetings to discuss the project.

Thank you again for your comments and for your cooperation over the past year. The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is January 22, 1999. If you have any questions concerning the report or would like additional information or clarifications before commenting, please call me at 593-1288.

Sincerely,

Perry J. White

Enclosure

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PO BOX 421
LIHUE, HAWAII 96766

THE KAUAI OUTDOOR CIRCLE

September 5, 1997

Mr. Perry J. White
Planning Solutions Inc.
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Re: Request for Comments
Lihue Energy Service Center

Dear Mr. White,

The Kauai Outdoor Circle appreciates receiving the EIS for the Lihue Energy Service Center and it's accompanying letter. In addition, the telephone call from the Kauai County Planning Department on September 4 confirming receipt of the EIS was very considerate.

It is evident that a thoughtful preliminary study has been made. The concerns which have been voiced from members of the Kauai Outdoor Circle are as follows:

- (1) the great amount of fuel hauling causing traffic density, congestion and possible hazards;
- (2) the fact that it is upwind of three (3) schools;
- (3) the preference for enlarging the Port Allen site where the tradewinds blow emissions out to sea, and where visibility is less likely to affect the tourist industry;
- (4) the desire to have some provision for increasing the dependence on alternative and cleaner sources of electricity;
- (5) the wasteful consumption of electricity for excessive air conditioning in public buildings, and whether this can somehow be addressed;
- (6) further impact on the "compromised" stream which leads into Kalapaki Bay;
- (7) the height of the tower and it's visual impact;
- (8) the continual increase of residents in the Puhi area, the same vicinity of the planned Lihue Energy Service Center.

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PO BOX 421
LIHUE, HAWAII 96766

THE KAUAI OUTDOOR CIRCLE

The members of the Kauai Outdoor Circle would greatly appreciate your constant concern with the possible problems this energy center may cause. Please continue to keep this organization updated on any changes or further decisions made concerning environmental issues. Our organization's goal is the beautification of the island of Kauai...and we try to make every effort to accomplish our goal.

Sincerely,

Judy Dalton
Judy Dalton
Environmental Issues Chairman

Katherine Peroff
Katherine Peroff
Vice President

25



**P L A S M A E N V I R O N M E N T A L
S O L U T I O N S**

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FAX 808 592-1555

Ms. Judy Dalton
Environmental Issues Chairwoman
The Kauai Outdoor Circle
P.O. Box 921
Lihue, Hawaii 96766

December 11, 1998

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Ms. Dalton:

Thank you for your September 5, 1997 letter concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the Lihue Energy Service Center. We appreciate the time you, Katherine Pethoff, and other members of The Kauai Outdoor Circle spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISP/N. KE reviewed the responses to its written request for comments that it received from you and other members of the community. It also considered concerns expressed at the voluntary town meeting that KE held on August 21, 1997. Based on that input, the company decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapapa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the Lihue Energy Service Center is enclosed for your review. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes the following topics mentioned in your letter:

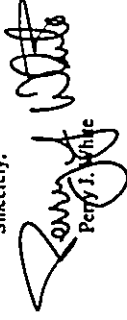
- (1) Section 4.10 of the *DEIS* discusses fuel truck traffic.
- (2) As discussed in Section 3.4 of the *DEIS*, the northeast tradewinds are the dominant wind in Lihue, and most of Lihue is actually "upwind" of KE's Preferred Site with respect to the tradewinds. However, since the proposed facility must meet ambient air quality standards all of the time, not just under "typical" tradewind conditions, that is not the essential point. KE's air quality consultants have conducted extensive modeling to insure that State and Federal standards can be met under all conditions, and the results of this modeling have influenced the design and proposed operational characteristics of the facilities. You will find an extensive discussion of these issues in Section 4.4 of the *DEIS*.
- (3) The objectives of the proposed Lihue Energy Service Center are listed in Section 1.6 of the *DEIS*. These would not be achieved if the same facilities were constructed at Port Allen. Moreover, while emissions from the Port Allen facility are carried out to sea under tradewind conditions, on-shore winds are present a significant amount of the time at that location. While KE's modeling results indicate that its existing facilities at Port Allen are able to meet ambient air quality standards, it would be extremely difficult (and perhaps impossible) to comply with those standards if KE installed the same amount of additional capacity at Port Allen as it plans for the Lihue Energy Service Center.
- (4) As discussed in Section 1.2.5.1 of the *DEIS*, KE has an aggressive Demand-Side Management (DSM) program. This program includes company financial support for solar water heater installations, heat pumps, and other alternate energy technologies. It also has a power purchase agreement with Plasma Environmental Technologies, which proposed a small garbage-to-energy facility near KE's Port Allen Generating Station.

Page 2
The Kauai Outdoor Circle
December 11, 1998

- (5) KE's DSM program addresses energy conservation in existing structures.
- (6) The proposed facility would not discharge any process or sanitary wastewater to nearby streams. Stormwater runoff would be collected and treated in accordance with best management practices before discharge. It would not measurably degrade stream or ocean water quality.
- (7) The visual impacts of the proposed facilities are discussed in Section 4.12 of the *DEIS*.
- (8) The *DEIS* considers three possible locations for the proposed facilities, only one of which is in the Puhi area. It discusses potential impacts on the areas surrounding all sites. It also notes that development of the facilities as proposed does have implications for future development (see, for example, Section 4.11.4.1).

Thank you again for taking the time to comment on the *EISP/N*. The issues you raised helped us to focus the analyses we conducted. The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications before commenting, please call me at 593-1288.

Sincerely,


Perry J. White

Enclosure

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Division of Aquatic Resources
Department of Land & Natural Resources
3060 Ewa Street, Room 306
Lihue, Kauai, Hawaii (USA) 96766-1875
Phone: (808) 274-3344; FAX: (808) 274-3448
EMAIL: don@dar.gsemail.com

5 September 1997

Mr. Perry J. White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, HI 96814
Subject: EA/EIS Preparation Notice for Kauai Electric Lihue Energy Service Center, July 1997

Dear Mr. White:

I have reviewed the above referenced notice and offer the following comments:

Potential Impacts to Nawiliwili Stream:

Because the stream borders the proposed site there is great potential for impacts related to increased stormwater runoff and both nonpoint and point source pollution, particularly related to petrochemical spills, there is potential for water pollution and impacts to stream biota. If the proposed project is approved, prior to any construction baseline data should be collected on the physical, chemical, and biological conditions of Nawiliwili Stream bordering the proposed site. A stormwater quality protection plan should be developed including the design of stormwater detention basins, biofiltration channels, and other BMPs that will assure that no aquatic resources are polluted or degraded.

Potential Impacts to Groundwater Aquifer:

Because Lihue's potable drinking water source and water transmission tunnels lie almost directly under the proposed site it is critical to explain the protective and mitigative steps that will be taken to protect this aquifer, particularly since Lihue is already having trouble meeting its drinking water needs, with a moratorium on new water meters already in place.

Need for Project Not Demonstrated:

Considering that Kauai is now in the "Low Economic Growth Scenario" (P.1-7), then the peak use in the year 2016 will only be about 30% greater than the peak experienced in 1996. With this in mind, energy conservation, education and economic incentive programs that will allow existing (and new) home and business owners to convert to energy efficient compact fluorescent lighting, energy efficient refrigerators, and other electrical conservation measures would be the most prudent option in the long-run because the energy (and fossil fuel) savings could be much greater than 30%, and there would be no additional risks of petrochemical spills contaminating nearby streams.

groundwater, or Nawiliwili Bay. Similarly, with a significant amount of conversion to energy-efficient household/office systems island-wide, when Lihue Plantation stops producing sugar and therefore terminates its purchase power agreement there will not be a significant discrepancy between power supply and demand. Kauai Electric Lihue Energy Service Center should adopt as one of its main goals that of producing all, or at least most, of its energy from renewable resources (e.g., biofuels) grown on Kauai. With Lihue Plantation (and others) discontinuing the production of sugar, there are great opportunities to sustainably produce biofuels and energy on Kauai, which will diversify our economy, increase employment, and help protect our natural resource base, our most important long-term economic asset. It would also follow the policy of the state constitution, article 11, which states that that State of Hawaii must strive to be self-sufficient.

Finally, in order to minimize or eliminate possible contamination of the groundwater aquifer or Nawiliwili Stream, an alternative site approximately 1 mile north of the proposed site (shown on your Figure 1 next to the word "hydro-separator") may be more appropriate because it is adjacent to Lihue Plantation's cane haul loading and fueling baseyard (which has underground fuel storage), is within 200 feet of a high voltage transfer station, and it is further from both the groundwater aquifer and Nawiliwili Stream.

If I may be of further assistance to you please contact me.

Sincerely,

Donald E. Heacock
Kauai District Aquatic Biologist

cc. William Devick, DAR Administrator

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**P L A N I M O
S O L U T I O N S**

1210 AVANI STREET, SUITE 211
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Mr. Donald E. Heacock
Kauai District Aquatic Biologist
Division of Aquatic Resources
Department of Land and Natural Resources
3060 Eiwa Street, Room 306
Lihue, Kauai 96766-1875

December 11, 1998

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Heacock:

Thank you for your September 5, 1997 letter concerning the *Environmental Assessment/Environmental Impact Statement Preparation Notice (EISPN)* for the Lihue Energy Service Center. We appreciate the time you spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISPN. KE reviewed the responses that it received to its written request for comments. It also considered concerns area residents expressed at the voluntary town meeting that KE held on August 21, 1997. Based on that input, the company decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapapa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the Lihue Energy Service Center is enclosed for your review and comment. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). Discussions of the specific issues mentioned in your letter may be found in the following parts of the document.

- **Potential Impacts to Nawiliwili Stream.** Water supply and wastewater disposal facilities associated with the proposed facilities are discussed in Section 2.2.4 of the DEIS. Hydrologic conditions near the sites under consideration are discussed in Section 3.3 of the report. Potential hydrologic impacts are discussed in Section 4.5. Aquatic biota, and potential effects on them, are discussed in Sections 3.7 and 4.8. Once a site has been selected, KE will develop a stormwater protection plan that will incorporate appropriate Best Management Practices.
- **Potential Impacts to Groundwater Aquifer.** Potential effects on groundwater sources are discussed in Section 4.5 of the DEIS. Concern over potential adverse effects on the Garfinghouse Tunnel water source led KE to undertake an extensive review of the control technologies that could be incorporated in the design in order to satisfy itself that its plans are compatible with the continued use of the Garfinghouse Tunnel source.
- **Need for the Project.** Section 1.2.5 of the DEIS discusses the need for the proposed project. KE's experience and the analyses it has conducted as part of the State Public Utilities Commission-mandated Integrated Resource Planning (IRP) process have led it to a different conclusion than the opinion expressed in your letter. It believes that the combination of load growth and the likely cessation of sugar operations at Lihue Plantation make it essential that it plan for additional generating capacity at this time. It has reached this conclusion only after taking into account the

Page 2
Mr. Donald E. Heacock
December 11, 1998

reductions in energy use that are likely to be garnered through its Demand-Side Management (DSM) program.

- **Alternate Location to the North.** As mentioned above and discussed in the DEIS, KE is considering alternate sites for the proposed facilities.

Thank you again for your comments. The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications before commenting, I encourage you to call me at 593-1288. I would be more than happy to discuss these with you over the telephone or to meet with you on Kauai.

Sincerely,

Peter J. White

Enclosure
cc: William Devick, DAR Administrator

(76)

27

Raymond L. Chuan

P.O. Box 1183, Hanalei, HI 96714
808-826-6814; fax 826-1115
rchuan@aol.com

Mr. Perry J. White
Planning Solutions
1210 Auahi St., Suite 221
Honolulu, HI 96814

Dear Mr. White:

The following are my comments on the EIS Preparation Notice for the Kaula Electric Lihue Energy Service Center.

1. The role of Kaula Power Partners (KPP). Since this is essentially to be a programmatic EIS, it seems reasonable to consider KPP an integral part of the EIS process. However, it is not clear in the present EISPN whether KPP is such an integral part. This confusion is particularly evident in the matter of site selection, wherein there is apparently provision for locating KPP at a site other than the Lihue Energy Service Center. I realize there is the matter of time constraint - trying to get KPP on line regardless of the fate of the approval of the Lihue site for the Service Center. On the other hand, to launch a separate EIS for the KPP plant would constitute segmentation of what is clearly the case for a programmatic EIS. Please clarify.
2. Site selection. The present Port Allen site of Kaula Electric is not considered at all, without giving any reason for it. It seems from many aspects this is possibly the best location: Fuel delivery; air pollution; noise pollution; proximity to existing KE facilities and phasing of the new facilities. Please explain why Port Allen is not considered.
3. Particulate pollution problems. Recovery and disposal of particulates from the cyclone and baghouse can be a major fugitive dust problem, especially in view of the small size of the particles. Similar problems attend the transport and processing of coal and lime. What provision is made for the case wherein the coal is to be pulverized? What provisions are made to meet the state's standards for emission of particulates from a coal-fired powerplant? While short duration fugitive dust releases probably could meet state standards, the cumulative effects on the surrounding area can be substantial over periods of months and years. The damage to property in the neighborhood can be cause for litigation. Please address these issues in detail.
4. Noise. The proximity to Kaula Community College and, across the highway, the Puhi residential area, can be a problem with respect to the use of LM-2500, or similar, combustion turbines. In other instances where jet engines are in use for electric power generation their location is considerably further from residential or school areas than the less than 4,000 feet between the proposed site and KCC and Puhi residences (per Fig 1-1, EISPN). The frequency of truck passages to and from the site would be orders of magnitude higher than the historic frequency related to cane operations. Can KE assure that the limit of 45 db from 10 pm to 7 am in a residential area (HAR 11-46-4) will not be exceeded?

Overall, this is a good EISPN, and, in fact, goes into more detail than the usual PN. Both this and the extension of the deadline for comments are appreciated by this reviewer.

Sincerely yours,

27

Raymond L. Chuan, PhD

cc: OEQC
Kaula County Planning Department
KE
Kaula County Council
Kaula Chapter Sierra Club
Kaula Community College
The Garden Island
Environment Hawaii

September 7, 1997

27



**P L A N N I N G
D E P A R T M E N T**

December 11, 1998

1111 KUAUAI STREET SUITE 2271
HONOLULU HAWAII 96813
PHONE 808 593 1318
FAX 808 513 1556

Dr. Raymond L. Chuan, Ph.D.
P.O. Box 1183
Hanalei, HI 96714

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Dr. Chuan:

Thank you for your September 7, 1997 letter concerning the *Environmental Impact Statement Preparation Notice (EISP/N) for the Lihue Energy Service Center*. We appreciate the time you spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISP/N. KE reviewed the responses that it received to its written request for comments. It also considered concerns area residents expressed at the voluntary town meeting that KE held on August 21, 1997. Based on that input, the company decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). To assist you in your review, we are also providing the following information relative to the four specific issues mentioned in your letter.

1. **Role of Kauai Power Partners.** The *DEIS* is, in fact, a kind of "programmatic" EIS. The best analogy is to think of KE as a master developer of the Lihue Energy Center Site. It would own the property and would manage development on it. In some cases it might elect to construct and operate its own facilities on the property. In others, it might determine that it would be best for its customers if an independent party developed and operated one or more of the facilities that is eventually located there. The kind of steam-injected combustion turbine that Kauai Power Partners (KPP) has proposed are one of the technologies evaluated in the *DEIS*. KPP has informed KE that the location and site layouts for the Advanced Steam-Injected Cycle unit depicted in Chapter 2 of the *DEIS* are satisfactory to it. KPP has further stated that it will consider locating its unit at one of the three KE sites if a KE site can be approved in time to meet KPP's contract obligations, water is available, and KPP development costs at that site are not substantially higher than at one of its own site options. In the meantime, KPP is continuing to secure options on the alternate sites to insure that it has a viable location for its facility if KE is unable to obtain the needed approvals for its proposed site in a timely fashion.
2. **Site Selection.** The Port Allen Generating Station site is largely developed. While it may be feasible to add a small amount of additional generating capacity on land near the existing facilities, air quality issues prevent it from developing more than a fraction of the facilities that are envisioned for the Lihue Energy Service Center at Port Allen. Consequently, this alternative would not meet KE's objectives as described in Section 1.6 of the *DEIS*.

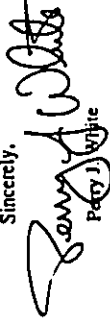
Page 2
Dr. Raymond L. Chuan
December 11, 1998

3. **Particulate Pollution Problems:** Air quality effects of the proposed facilities, including those related to coal handling mentioned in your letter, are discussed in Section 4.4 of the *DEIS*.

4. **Noise.** Potential noise impacts are discussed in Section 4.11 of the *DEIS*. KE is aware of the need to meet the 45 dBA noise limit in residences, and the *DEIS* discusses issues related to this for each of the sites under consideration.

Your comments were thoughtful and helped focus our attention on important issues. We hope you will find the analyses satisfactory. The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications before commenting, please call me at 593-1288.

Sincerely,


Perry J. Whyte

Enclosure

(17)



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 821
HONOLULU, HAWAII 96809

SEP - 9 1997

28

AGRICULTURE DEVELOPMENT
PROGRAMS
AGRICULTURAL RESOURCES
PLANNING AND SOILS RECONSTRUCTION
CONSERVATION AND
COMPLETION OF
RESOURCES DEVELOPMENT
PROJECTS
PLANNING AND SOILS RECONSTRUCTION
LAND MANAGEMENT
STATE MAPS
WATER AND LAND DEVELOPMENT
WATER RESOURCES MANAGEMENT



PLANNING
SOLUTIONS

1210 AUAHI STREET, SUITE 221
HONOLULU, HAWAII 96813
PHONE: 808 532-1322
FAX: 808 532-1333

Mr. Michael D. Wilson
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

December 11, 1998

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Wilson:

Thank you for your September 9, 1997 letter (File No. PM-97-057) concerning the *Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISP/N)* for the *Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the *EISP/N*. After reviewing the responses it received to its written request for comments on the *EISP/N* and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. The company held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses the environmental issues associated with each of the three sites that are under consideration. The two additional sites resemble the original site in having been used for sugar cane cultivation for many decades. The consulting archaeologist who surveyed the area concluded that the proposed electrical generating facilities would not adversely affect archaeological or historical resources. This finding is discussed in Sections 3.8 and 4.9 of the *DEIS*, and we hope you will concur with it.

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications before commenting, please call me at 593-1288.

Sincerely,

Perry J. White

Enclosure

File No. PM-97-057

Ref.:LD-PEM

Mr. Perry J. White
Planning Solution
1210 Auaahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

SUBJECT: Request for Comments - Environmental Assessment/Environmental Impact Statement Preparation Notice, Lihue Energy Service Center, Nawiliwili, Lihue, Kauai, Tax Map Key: 3-8-5:Por 3

We have reviewed the Environmental Assessment/Environmental Impact Statement Preparation Notice for the subject project, and would like to offer the following additional comments:

Historic Preservation Division

The project area has been developed extensively for agricultural purposes. It is highly unlikely that the historic sites are present in this disturbed area because of this previous development and existing location features (water tank and culvert). Thus, we believe that this project will have a "no effect" on significant historic sites.

Thank you for the opportunity to review and provide additional comments on the subject Environmental Assessment/Environmental Impact Statement Preparation Notice. Should you have any questions, please contact Patti Miyashiro of our Honolulu Land Division Office at (808) 587-0430.

HAWAII: Earth's Best!

Aloha.

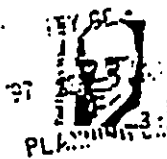
MICHAEL D. WILSON

c: Maui Land Board Member
Maui District Land Office

28

RECEIVED AS FOLLOWS

Robert N. Nishik
PO Box 1056
Kapaa, HI. 96746



Historic Preservation, USA 14
Attn: Barbara Pendragon
County of Kauai Planning Dept.
4444 Rice Street
Suite 473
Lihue 96766



I am concerned about the close
of schools to the new power plant. Also,
don't think the Lihue area has enough water to
supply a power plant.

Sincerely,
Robert Nishik

29



PLANNING
SOLUTIONS

December 11, 1998

1210 ARBON STREET, 19th FLOOR
HONOLULU, HAWAII 96813
PHONE 808 591-1288
FAX 808 591-1288

Mr. Robert Nishik
P.O. Box 1056
Kapaa, Kauai, Hawaii 96746

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Nishik:

Thank you for your September 1997 postcard concerning the Environmental Impact Statement Preparation Notice (EISP/N) for the Lihue Energy Service Center. We appreciate the time you spent reviewing the document.

As you know, Kauai Electric's (KE) initial plan focused on the single 17-acre parcel identified in the EISP/N. After reviewing the responses it received to its written request for comments on the EISP/N and considering concerns area residents expressed at the voluntary town meeting that it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two more sites, one west of Kapala and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

The Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center has just been completed. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §§11-200). Potential effects on public facilities, including schools, are part of the overall analysis (e.g., air quality, water quality, etc.) and are discussed in Section 4.14.7 of the DEIS. Water use issues are discussed principally in Sections 2.2.4, 3.3, and 4.5.

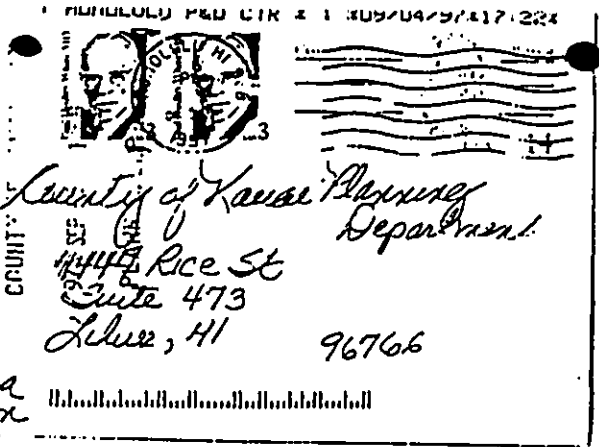
We have mailed copies of the document to the Lihue Public Library, where they are available for public review. The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 591-1288.

Sincerely,

Barbara Pendragon
Barbara Pendragon

2

RECEIVED AS FOLLOWS



County of Kauai Planning Department
 4444 Rice St
 Suite 473
 Lihue, HI 96766

ATTN: *Suzanne
 Bridgton*

01/29/97
 This is response to the location of the KE Service Center. I am concerned of the environmental impact and continuing elevation/escalation of costs. Am not convinced this is a need. There is waste of money, conservation is important rather than spending to pay for waste.
 Virginia Newell
 P.O. Box 70
 Kekaha, HI 96752

#30



PLANNING
 SOLUTIONS

1110 SUVAHI STREET, SUITE 211
 HONOLULU, HAWAII 96813
 PHONE: 808 551-1700
 FAX: 808 551-1555

December 11, 1998

Ms. Virginia Newell
 P.O. Box 70
 Kekaha, Kauai, Hawaii 96752

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Ms Newell:

Thank you for your August 29, 1997 postcard concerning the Lihue Energy Service Center. We appreciate the time you spent formulating your comments.

As you know, Kauai Electric's (KE) initial plan focused on a single 17-acre parcel. After reviewing the responses it received to its written request for comments on the Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISP/N) for the project and considering concerns expressed by area residents such as yourself, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two more sites, one west of Kapaha and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on these additional sites.

The Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center has just been completed. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). KE proposed additional generating facilities only after it concluded that its Demand-Side Management Program could not prevent the demand for electrical energy from exceeding the capacity of its existing facilities. Its filing for its next unit addition was reviewed and approved by the State of Hawaii Public Utilities Commission after a thorough consideration of the need for the facilities and the effect that their construction would have on the costs to KE's customers.

We have mailed copies of the document to the Lihue Public Library, where they are available for public review. The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288.

Sincerely,

Perry L. White
 Perry L. White

RECEIVED AS FOLLOWS

8/29/97

The newspapers had an article about Kawai Electric building a power plant in Puhii. The location does not seem appropriate. It is too close to residential areas of Puhii, and existing daycare & island school. There certainly are other places to put a power plant.
G. Woodgard
#31

WOODGARD
P.O. Box 1986
Kapaa, HI 96746
COUNTY OF KAWAII
HONOLULU P&D CTR # 1 *09/04/97*17.23*
COUNTY OF KAWAII
PLANNING DEPT.
4444 RICE ST. #473



PLAN NING
SOLUTIONS

1212 AVANI STREET SUITE 221
HONOLULU, HAWAII 96813
PHONE: 808-933-1288
FAX: 808-933-1288

December 11, 1998

Mr. G. Woodgard
P.O. Box 1986
Kapaa, Hawaii 96746

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Woodgard:

Thank you for your August 29, 1997 postcard concerning the Lihue Energy Service Center project. We appreciate the time you spent formulating your comments and understand that you believe a site in Puhii is too close to existing residential areas and schools.

Kawai Electric's (KE) initial plan focused on the 17-acre parcel discussed in the newspaper article to which your postcard referred. After reviewing the responses it received to its written request for comments on the Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISP/N) for the project and considering concerns expressed by area residents such as yourself, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

The Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center has just been completed. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

We have mailed copies of the document to the Lihue Public Library, where they are available for public review. The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 933-1288.

Sincerely,

Perry J. White
Perry J. White

(31)

RECEIVED AS FOLLOWS

Connie Copenhaver
PO 3417
Princetonville, HI
C 1111
97 SEP 5
PLAN



County of Kauai - Planning Dept
4444 Puka #473
Lihue, HI 96766

Attn



The placement of the new Kauai
Electric plant seems very poor.
Chow. Schedules, water, transport
of fuel on public roads and
destruction of a pristine vista
and all factors which hopefully
will dissuade the county from
placement near KCC.
Connie Copenhaver - Princetonville
#32



PLANNING
SOLUTIONS

2110 ANANI STREET, SUITE 211
HONOLULU, HAWAII 96815
PHONE: 808 593-1288
FAX: 808 593-1333

December 11, 1998

Ms. Connie Copenhaver
P.O. Box 3417
Princetonville, Hawaii 96714

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Ms. Copenhaver:

Thank you for your September 4, 1997 postcard concerning the Lihue Energy Service Center project. We appreciate the time you spent formulating your comments and understand that you do not support a site near Kauai Community College.

Kauai Electric's (KE) initial plan focused on the 17-acre parcel discussed in the newspaper article to which your postcard referred. After reviewing the responses it received to its written request for comments on the Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISP/N) for the project and considering concerns expressed by area residents such as yourself, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapapa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

The Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center has just been completed. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

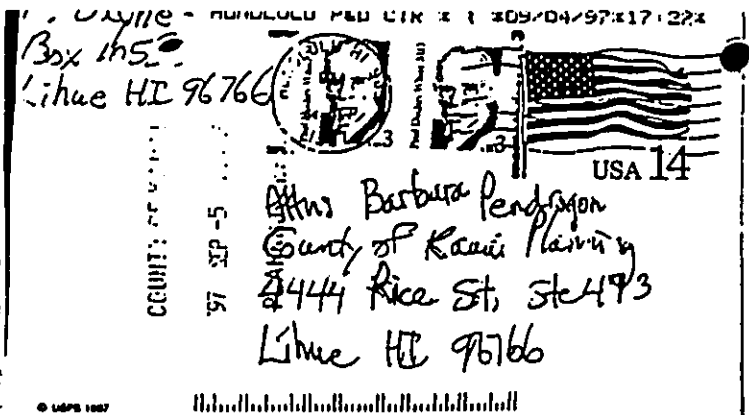
We have mailed copies of the document to the Lihue Public Library, where they are available for public review. The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288.

Sincerely,

Randy J. White
Randy J. White

RECEIVED AS FOLLOWS

#23



I am concerned about
location of the new KE power
plant. I'm a teacher at Hawaii High
& Intermediate School and feel pollution
and noise are two concerns that
would make the public site unviable.
Please reconsider.
Sincerely,
Barbara Layne



PLANNING
SOLUTIONS

December 11, 1998

1115 KUAHI STREET, SUITE 201
HONOLULU, HAWAII 96813
PHONE: 808 537-7228
FAX: 808 537-1318

Ms. Pamela Layne
P.O. Box 3417
Princeville, Hawaii 96714

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Ms. Layne:

Thank you for your September 4, 1997 postcard concerning the Lihue Energy Service Center project. We appreciate the time you spent formulating your comments and understand that you do not support a site near the Kauai Community College in Puhi.

Kauai Electric's (KE) initial plan focused on the 17-acre parcel discussed in the newspaper article to which your postcard referred. After reviewing the responses it received to its written request for comments on the *Environmental Assessment (EA)/Environmental Impact Statement Preparation Notice (EISP/N)* for the project and considering concerns expressed by area residents such as yourself, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapapa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

The *Draft Environmental Impact Statement (DEIS)* for the Lihue Energy Service Center has just been completed. The DEIS addresses environmental issues associated with each of the three sites KE is considering. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

We have mailed copies of the document to the Lihue Public Library, where they are available for public review. The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications before commenting, please call me at 593-1288.

Sincerely,

Pamela Layne
Pamela Layne

33

Kauai Electric
4463 Pabec St
Lihue, HI 96766-2032

September 4, 1997

RE: Kauai Electric Energy Service Center Proposal

Having read Kauai Electric's preparation notice and attended the public meeting that formally kicked off their proposal to build a new power station near Puhi we observe that many citizens are anxious to understand more about the assumptions that have given rise to this proposal. Knowing that this report is preliminary to a more detailed and thorough analysis of the project, we appreciate Kauai Electric's invitation to have the public pose questions and air their concerns in time to have them addressed through the formal public process.

Fundamental questions do arise when any forecast of Kauai's future is presented and a lively debate has been on-going which questions the plausibility of either positive or negative growth rates for our population and all manner of subsequent economic factors since Hurricane Iniki. To date no consensus has emerged and we wonder what indicators are being used in KE's forecasts. Indeed, one possible trend in their report supposes a slow growth rate which would not begin to surpass current supply until the year 2016.

Time is on the side of renewable technologies and the future is especially friendly to reducing our energy needs overall as new technologies continuously substitute more energy efficiencies into all new products. This expectation should be accounted for and represents a negative trend that will naturally offset somewhat the current projections based on many soon to become obsolete technologies. A variety of choices among commonplace appliances such as refrigerators, televisions and smarter control devices will afford consumers almost customized choices about individualized energy savings.

This subject naturally brings to mind the most complicated and uncontrollable human factors. And perhaps it is understandable that KE might be reluctant to try to quantify our own social behavior with regard to energy. But in no way can our current habits be dressed up in any fashion other than to say that they are generally wasteful. Yet here is where there is, paradoxically, the most room for improvement. As other utility districts are demonstrating, monetary incentives for energy conservation can do a world of good, sometimes accounting for 10 to 20 % overall reductions without significantly altering current lifestyles. We simply need to begin paying attention instead of paying

for waste. Local government leadership could be a big help in this department. Examples do exist of communities that took such tasks to heart and reaped big dividends simply by doing all the small things. Some of those folks live in a town called Osage, Iowa and their story is truly impressive. It could also be our story in the future to come.

KE properly places cost containment as a top priority in its future plans and seems to link it with the construction of this brand new facility. They also plan to partner up with various so-called independent power producers. Generally, we agree that it is a good thing to diversify energy sources but we are wondering if it makes economic sense to engage another company such as "Kauai Power Partners" to do on Kauai Electric's newly purchased property what Kauai Electric is already supposed to be doing. This relationship, unlike that with Lihue Plantation whose energy production is only incidental to its main enterprise, seems ripe for administrative redundancies, not real cost savings. What is the cost advantage of dealing Kauai Power Partners an additional hand to play?

Very importantly, we will be most interested in seeing to what extent an environmental impact statement will assess (quantify?) the external costs to the community in terms of new infrastructural demands (water, roads, port facilities), environmental degradation (air and water pollution), and social costs (increased traffic, noise and visual blight). Are any potential cost savings in the narrow accounting of energy production going to justify the wider hidden costs being shifted to the island as a whole? Even assuming there may be such hoped for savings, will they go to the island's rate payers or off island to the majority of share holders?

One reason cited for creating a new power station in a place other than the existing site at Port Allen is to reduce the risk from another natural calamity like Hurricane Iniki to such a vital resource; the so-called "eggs in one basket" theory. Ironically, the damage to the power plant itself from Iniki was insignificant as compared to the distribution system over most of the island. Meanwhile, folks have been clamoring for years to get our wires buried; at least the main trunk lines could and still should be buried to minimize such long term financial risk.

There are some additional concerns that we feel need to be addressed and were either not found or not adequately addressed in any discussions of the proposal so far. Certainly, the whole component of "Demand Side Management"

programs are critical to the equations, affecting assumptions about need and as a practical substitute for more hardware. To date little about these programs has been made available and we wonder if that situation awaits itself to the time table now being urged on by this proposal's planners. Supposedly, these programs will be ready to share with the public sometime in early 1998. By that time this project hopes to have sold itself on its presented merits alone. We are keen to know why this entire subject only earned five sentences in this 29 page report.

Again we have to say that we believe that provisions for Demand Side Management programs are critical to a proper assessment of the proposed project. This part of the equation cuts to the most important role that we as customers of KE have in exercising some semblance of control. Our aggregate demand for an energy future cannot solely be interpreted by raw data. Rather, we may and indeed should insist that we have a hand in shaping the quality and diversity of inputs which will reflect a range of healthy expectations and lifestyles for our island community.

Finally, a consideration must be made for the modernization and or expansion of the existing facility at Port Allen. One of the reasons given for not wanting to expand there has to do with current poor air quality already due to the emissions from the plant. Rather than leave those unsavory conditions intact why not improve the situation with the newer cleaner technology proposed for use at the Puhi site? We think this "opportunity" to rectify an ongoing degradation instead of inflicting further environmental insults on a virgin area merits further attention.

In sum, we look forward to a fully involved community decision making process that can address some of these questions and others that people will have. We believe everyone on this island has an important stake in the outcome of these decisions. We are looking forward to a bright energy future; one that employs the most appropriate technologies available; is built upon reliable and relevant information; and encourages the community to relate its values into the process.

Sincerely,
Kauai Group Sierra Club
Conservation Committee (Robert Culbertson)
P.O. Box 3412
Lihue, HI 96766

cc: The Garden Island

21



**P L A N N I N G
S O L U T I O N S**

1110 AVANT STREET SUITE 201
HONOLULU, HAWAII 96811
PHONE 808 533-1200
FAX 808 533-1330

Mr. Robert Culbertson
Conservation Committee
Kauai Group of the Sierra Club
P.O. Box 3412
Lihue, HI 96766

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Culbertson:

Thank you for your September 4, 1997 letter to Kauai Electric concerning the *Environmental Impact Statement Preparation Notice (EISPN)* for the *Lihue Energy Service Center*. We are preparing the *EIS* for the project, and we appreciate the time you and other members of the Kauai Group of the Sierra Club spent reviewing the document, attending the public meeting that KE held on August 21, 1997, and preparing your comments. It is very helpful to have thoughtful comments at the outset of the *EIS* process.

KE reviewed the responses that it received to its written request for comments on the *EISPN* and considered the concerns that area residents expressed at the town meeting. Based on that input, it decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State *EIS* law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). We believe you will find that it provides most of the information requested in your letter. To assist you with your review, I would like to direct your attention towards the sections of the report that may be most helpful to you. I have also noted a few additional sources for information on topics that are not discussed in detail here.

- **KE's Electrical Energy Use Forecasts.** The forecasts on which the need for the project is based are discussed in Chapter 1 of the *DEIS* (see especially Sections 1.2.4 and 1.2.5). As you probably know, the State of Hawaii Public Utilities Commission (PUC) reviews all proposed capital expenditures by utilities such as KE, thereby providing a check on unnecessary additions of generating capacity. It also requires that utilities develop and implement Demand-Side Management (DSM) programs that can postpone the need for additional generating capacity. KE is in the process of implementing its approved DSM programs. However, with the present rate of growth in the Kauai economy and the possible loss of the 14 MW of capacity from Lihue Plantation, KE must be prepared to develop its next generating unit so that it can be sure of meeting its customers' electrical needs. It is worth noting that KE plans to develop the Lihue Energy Service Center incrementally, adding only enough capacity in each increment to stay abreast of demand. If electrical energy use increases more slowly than forecast (whether from the success of the DSM programs or less-than-anticipated growth in Kauai's economy), KE can delay additions subsequent to the Kauai Power Partners (KPP) unit that the PUC has already authorized.

December 11, 1998

Page 2
Mr. Robert Culbertson
December 11, 1998

- KE agrees with your observation that time is on the side of energy efficiency and the economic feasibility of renewable resources. Kauai Electric's DSM program (see Chapter 1 of the *DEIS*, especially Sections 1.2.4 and 1.2.5) is designed to increase the average efficiency of its customers' lighting and electrical equipment. The forecasts presented in the report already assume that these efforts will be successful in reducing the use of electricity. Thus far they have met with slightly less success than anticipated; if that trend continues, electricity use may be slightly higher than shown in the *DEIS*. KE also agrees with your observations concerning the importance (and complicated and uncontrollable nature) of human factors. KE, through its DSM and public education programs, is attempting to promote responsible use of energy. At the same time, it must plan prudently for the possibility that people will continue to treat electrical and other forms of energy as they have in the recent past. This means that KE must have sufficient generating capacity available to meet its customers' needs even if they do not become more conservation-minded.

- KE decided to negotiate a contract with KPP only after it determined that this approach would be more beneficial for KE's customers than constructing and operating the facilities on its own. KE's proposal-solicitation and contractor-selection process was reviewed and approved by the State of Hawaii Public Utilities Commission, which found the contract to be in the best interests of KE's customers.

- We understand your concern with the possible externalities of a project such as the Lihue Energy Service Center. We believe that the *DEIS* accurately identifies the effects that construction and operation of the proposed facilities would have on the environment and that it presents these in a readily understandable and quantitative fashion. These effects include changes in air and water quality, implications for other land uses, required public facilities, increased traffic and noise, etc. We have not attempted to convert these costs into dollar values that could be compared against the financial benefits that the facilities would yield for KE's customers. With respect to the question of who would benefit from the anticipated efficiencies of the proposed project, the answer is that KE's customers would be the principal beneficiaries. The extent to which the company's shareholders stand to benefit depends upon the manner in which the site is developed. For example, KE shareholders will not benefit financially from the construction and operation of the 26.4 MW unit that KPP is developing under contract to KE. The costs associated with that unit will simply be passed on to KE's customers, with no benefit to KE shareholders. You may wish to review the PUC files for the next unit addition for additional detail (PUC Docket No. 97-0213). If KE constructs subsequent units for the Lihue Energy Service Center site, the PUC will determine the rate of return that KE may earn.

- You are correct that hurricane Iniki damaged KE's transmission system much more than it hurt the Port Allen Generating Station. Developing additional generating capacity closer to the center of KE's load will reduce the island's dependence on the segments of the system in and around Port Allen. With respect to your suggestion that the lines be buried, KE is amenable to undergrounding facilities where the community desires that this be done. However, when faced with the additional cost that undergrounding transmission lines entails, the PUC (which is ultimately responsible for approving KE's decision) has always favored overhead lines. In view of the fact that it would further increase the cost of the electricity they use, KE's customers have generally favored overhead lines as well.

- As noted above, KE's DSM program is discussed in the *DEIS*. If you would like additional information concerning the specific provisions of that program, please feel free to contact Mr. Tim Blume on KE's staff. He can be reached at 246-8274.

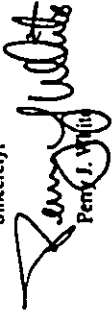
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Page 3
Mr. Robert Calbertson
December 11, 1998

Finally, KE has asked me to respond briefly to your suggestion that it consider "...modernization and expansion of the existing facility at Port Allen." rather than "...imposing further environmental limits on a virgin area...." First, you have misconstrued the statements that were made about existing air quality at Port Allen. It does not have "...current poor air quality already due to the emissions from the plant...." Conditions there are not "unusually", as you characterized them. KE's facilities are in full compliance with all applicable emission and ambient air quality standards, and it intends to maintain them in compliance. Second, as evidenced by the number of generating units that it has developed there over the past 34 years, KE has always given Port Allen due consideration when examining its options. Nonetheless, just as there are some occasions when it makes more sense to build a new road rather than to widen ("improve") an existing one, there are times when it is more appropriate from both an operational and an environmental viewpoint to install new generating units away from existing ones. For reasons explained in the DEIS, KE believes that the proposed Lithue Energy Service Center is one of those times.

We hope you find that the DEIS adequately addresses your concerns. The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288 and I will do all that I can to see that you receive what you need.

Sincerely,



Peter J. White

Enclosure

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Hawaii Electric
4633 Palms Dr.
Honolulu, HI 96766

September 5, 1977
4930 Kamehameha Dr. F
Honolulu, HI 96766

Ken Kamei Electric,
COUNTY OF HAWAII

The Preparation Notice of Proposed Rules for KE Lihue Energy Source
Under airtight conditions of the Hawaii Planning Commission air quality impacts
at Keeler Hotel, Kaula Point Harbor, Kapaemahu, Kapaemahu Hill, Kapaemahu Hill,
Old Mc Bryde Hill, and Lihue Plantation. Air quality problems caused
by emissions from the power plant is clear possible, air quality impacts
impact to consider them unacceptable. For the air in Pahi was chosen
in proximity to Island School, and the proposed Lihue Elementary, and
immediate schools would have the potential of putting a high density
of children at risk.

The visual impact on some of the other sites eliminated them from
consideration; however, the visual impact in the Lihue Pahi area even
though it would detract from the view plane of Mount Waialeale and
Kauai Point was not thought to be as substantial as other areas.
I can understand the need to want power to be covered to the Lihue
area in the event of hurricanes, and yet the potential negative health
impact and the visual impact need to be given more weight in the decision
to build the plant in Lihue. Have other alternatives been investigated to
cover Lihue's and Kapaemahu energy needs, such as underground wires
from the present Pal Allen site to Lihue and on to Kapaemahu? Since the
infrastructure is already in place at the Pal Allen site, what is the
feasibility of expanding that site for greater power needs since it
has already found so well during Hurricane Duki?

Lastly, and yet primary to the issue is conservation efforts to
increase the supply of energy available. People can become producers
of energy by installing solar panels. We can take example from
Singapore, where the energy consumption capital of the world. The power plant
in Singapore had contemplated expanding its facility but decided to reduce its
dependence on wire energy use and efficiency. Electrical use was cut to the
cost that expansion of the power plant was unnecessary. Both the power
cost and the customer saved money while saving the environment.

Thank you,
Judy Boston
Bertram Bendrym, Planning Dept.
CEOC, Honolulu



**P L A N N I N G
S O L U T I O N S**

1215 ADAMI STREET SUITE 200
HONOLULU, HAWAII 96813
PHONE 808 583 1288
FAX 808 583 1955

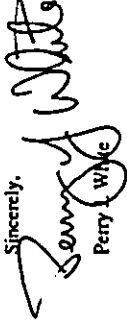
Ms. Judy Dalton
4330 Kauai Beach Drive, F
Lihue, Hawaii 96766

December 11, 1998

Page 2
Ms. Judy Dalton
December 11, 1998

The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications before commenting, I encourage you to call me at 593-1288.

Sincerely,



Perry White

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Ms. Dalton:

Thank you for your September 5, 1997 letter concerning the *Environmental Impact Statement Preparation Notice (EISPN)* for the Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments.

As you know, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISPN. KE reviewed the responses that it received to its written request for comments. It also considered concerns area residents expressed at the voluntary town meeting that KE held on August 21, 1997. Based on that input, the company decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the Lihue Energy Service Center is enclosed for your review. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200). Topics specifically mentioned in your letter are discussed in the sections noted below:

- Air quality issues are discussed in Sections 3.4 and 4.4. Results of the analyses indicate that the proposed facilities can comply with emission and ambient air quality standards at all three of the sites under consideration. KE conducted screening-level analyses of the other locations mentioned in your letter before deciding upon the three principal siting alternatives described in the DEIS. The results indicated that it would be difficult to meet these standards at many of those sites.
- Visual impacts are discussed in Section 4.12 of the DEIS.
- Air quality and other limitations would make it extremely difficult (and perhaps impossible) to install the 120 to 150 megawatts of additional generating capacity that are planned in the vicinity of the existing facilities at Port Allen. In addition, placing these generating units in Port Allen would not meet many of KE's objectives as described in Section 1.6 of the DEIS.
- KE has proposed the Lihue Energy Service Center only after it concluded that the Demand-Side Management (DSM) programs it has proposed will not eliminate the need to add generating capacity. This conclusion is discussed in Sections 1.2.4 and 1.2.5 of the report.

Enclosure

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September 11, 1997

Citizen Utilities
DBA Kauai Electric
4633 Pahae St.
Lihue, HI 96766

Subject: Concerns re: Lihue Energy Service Center

Dear Mr. Morgan and Mr. Danny Polosky:

I thank Mr. Perry White of Planning Solutions for extending the deadline for public comment to September 15, 1997. I am writing this letter for the same reason as the project's objectives, to promote the health and welfare of Kauai's people who are Kauai Electric's customers. My main concern is pollution control. The disposing of effluvia from your Service Center and the preferred method of UIC line not being used due to location are specific concerns. Your actual plan for the disposal of wastewater, is not clear to me. The chance of a major fuel spill or other contaminate spill was not addressed. The air quality due to pollutant emissions which could be trapped by the mountain range when the wind changes. What happens when it's a no burn day "brudda"? How will our municipal water supply be affected since the site is located where our wells are? At this time it looks like K.E. is doing its part to provide electricity for the future but at what cost? More knowledgeable and healthier alternatives need to be considered. Let's work together to bring a beautiful and healthy Kauai into the twentieth century.

Sincerely,

Linda Shigeta

Linda Shigeta
2105 Ehu Pl.
Lihue, HI 96766

CC: Planning Solutions Inc.
Office Of Environmental Quality Control
Kauai County Planning Department



**P L A N N I N G
S O L U T I O N S**

1710 AVANI STREET, SUITE 221
HONOLULU, HAWAII 96813
PHONE 508 531 1200
FAX 508 531 1111

Ms. Linda Shigeta
2105 Ehu Place
Lihue, Hawaii 96766

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Ms. Shigeta:

Thank you for your September 11, 1997 letter concerning the Lihue Energy Service Center. We appreciate the time you spent preparing your comments.

As you know from the *Environmental Impact Statement Preparation Notice (EISPN) for the Lihue Energy Service Center* and from Kauai Electric's (KE) presentation at the public meeting it held on August 21, 1997, the company's initial plan focused on a single 17-acre parcel. After reviewing the written comments it received and considering concerns area residents expressed at the public meeting, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center* is enclosed for your review. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

We believe the *DEIS* addresses all of the issues noted in your letter. For example, the Lihue Energy Service Center's potential effects on water resources (including the Department of Water's Garlinghouse source) are discussed in Sections 2.2.4, 3.3, and 4.5. Sections 3.4 and 4.4 discuss the effects that the proposed facilities would have on air quality.

I believe you may also be interested to know that KE proposed the new facilities only after it determined that feasible measures to increase energy efficiency and conservation would not eliminate the need for additional capacity. Sections 1.2.4 and 1.2.5 of the *DEIS* present a summary discussion of KE's Demand-Side Management program and the effect that it has on the need to add generating capacity. More detailed information is contained in KE's *1997 Integrated Resource Plan*. If you would like to review any of the information that the company has concerning this topic, please call Mr. Tim Bloom of KE's engineering staff at 246-8274.

We hope the *DEIS* addresses your concerns. If you have any questions concerning the report or would like additional information or clarifications before commenting, please call me at 593-1288. As a reminder, the State Office of Environmental Quality Control's official deadline for mailing comments on the report is February 8, 1999.

Sincerely,

Perry White
Perry White

Enclosure

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December 11, 1998



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

BENJAMIN J. CAYETANO
GOVERNOR
SHEILA MATA
DIRECTOR
BRADLEY J. MOSBACH
DEPUTY DIRECTOR
RICK EGGED
DIRECTOR, OFFICE OF PLANNING

OFFICE OF PLANNING
235 South Beretania Street, 6th Fl., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Tel.: (808) 597-2846
Fax: (808) 597-2824

Ref. No. P-6930

September 8, 1997

Mr. Perry J. White
Planning Solutions, Inc.
1210 Aieahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Environmental Impact Statement Preparation Notice (EISPN) for Lihue Energy Service Center, Kauai

We support Kauai Electric's intent to expand its generation facilities. The Lihue Energy Service Center should help preclude situations where the reserve margin of Kauai's electric system is reduced due to permit delays.

However, Kauai Electric's plans for the Lihue Energy Service Center imply a continued dependence on fossil fuels to meet Kauai's electricity needs. We urge Kauai Electric to similarly identify and seek permits for appropriate facilities for renewable energy generation facilities. Actual deployment of fossil fuel generators at the Lihue Energy Service Center should only be to meet needs which cannot be avoided through the use of cost-effective demand-side management programs or renewable resources.

According to the EISPN, the proposed Lihue Energy Service Center is situated adjacent to Nawiliwili Stream which flows into Nawiliwili Bay. As a result, there are questions about whether coastal water quality will degrade from polluted runoff and whether appropriate mitigation measures can be implemented. A primary objective of the Coastal Zone Management (CZM) law, Chapter 205A, is to protect coastal ecosystems and minimize adverse impacts to water quality. As such, this issue and the project's conformance with the objectives and policies of Chapter 205A should be thoroughly discussed in the EIS, in accordance with the Office of Environmental Quality Control's administrative rules.

If there are any questions, please contact Maurice H. Kaya of the Energy, Resources, and Technology Division of our department at 587-3812 or Charles Carole of our CZM Program at 587-2804.

Sincerely,


Rick Egged
Director
Office of Planning

cc: Maurice H. Kaya

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**P L A N N I N G
S O L U T I O N S**

1115 AVAHI STREET, SUITE 211
HONOLULU HAWAII 96814
PHONE 595 593-1228
FAX 595 593 1950

Mr. Bradley Mossman, Director
Office of Planning
Department of Business, Economic Development, and Tourism
State of Hawaii
P.O. Box 2359
Honolulu, Hawaii 96804

December 11, 1998

Page 2
Mr. Bradley Mossman, Director
December 11, 1998

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Mr. Mossman:

Thank you for your office's September 8, 1997 letter (Reference No. P-6930) concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the *Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document. Kauai Electric (KE) is pleased to know that you support its proposal to expand its generating facilities in order to maintain adequate generating reserve margins.

As you know, Kauai Electric's (KE) initial plan focused on the single 17-acre parcel identified in the *EWEISP/N* for the project. After reviewing written comments on the *EWEISP/N* and considering concerns expressed by area residents at the town meeting it held on August 21, 1997, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapapa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

Chapter 1 of the *DEIS* discusses the need for the project. Sections 1.2.4 and 1.2.5 of the *DEIS* discuss KE's Demand-Side Management (DSM) program. The DSM program includes measures designed to increase the use of renewable resources (e.g., solar water heating). The discussion in the *DEIS* notes that KE has proposed new generating facilities only after its analyses showed that increased energy efficiency and conservation measures could not eliminate the need for additional capacity. The State of Hawaii Public Utilities Commission recognized this need in its recent decision and order authorizing Kauai Power Partner's 26.4 MW generating facility.

The effect that the Lihue Energy Service Center would have on water quality is discussed in 4.5 of the *DEIS*. Effects on aquatic biota are discussed in Sections 3.7 and 4.8. Finally, while the project does not appear to trigger the need for a Coastal Zone Management Program consistency determination, its consistency with the goals and objectives of that program are discussed in Section 6.7 of the report.

The State Office of Environmental Quality Control's official deadline for mailing comments on the *DEIS* is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288.

Sincerely,

Perry J. Wind

Enclosure

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

September 11, 1997

97-160/epo

Mr. Perry J. White
Planning Solutions
1210 Aiea Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: ENVIRONMENTAL ASSESSMENT (EA)/ENVIRONMENTAL IMPACT
STATEMENT PREPARATION NOTICE (EISP/N)
Project: Kauai Electric Lihue Energy Service Center
Location: Lihue, Kauai, Hawaii
TRK: (4) 3-8-05: Por. 3

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer:

Solid & Hazardous Waste Branch

Underground Storage Tank (UST) Section

Installation of a 5,000-gallon gasoline UST and a 5,000-gallon diesel UST is proposed in the vehicle maintenance area for the storage of motor fuel. Kauai Electric should be aware that UST installations are subject to federal and state requirements covering: design, construction, installation, and notification; general operation; release detection; release reporting, investigation, and confirmation; release response and corrective action; changes-in-service and closure; and financial responsibility. Owners of newly installed USTs must notify our Underground Storage Tank Section of the existence of such USTs within 30 days of installation. Also, permits must be obtained from the applicable building and fire safety authorities before installation of any USTs.

The large fuel oil storage tanks may be regulated by the U.S. Environmental Protection Agency (EPA) under the Clean Water Act as amended by the Oil Pollution Act of 1990. We suggest that Kauai Electric contact Ms. Michelle Rogov of the U.S. EPA at (415) 744-2335 for more details.

LAWRENCE BIRD
DIRECTOR OF HEALTH

In reply, please refer to

Mr. Perry J. White
September 11, 1997
Page 2

97-160/epo

Hazardous Waste Section

Heavy metals produced from periodic chemical cleaning of the inside of boiler tubes may be regulated as hazardous wastes as defined in Hawaii Administrative Rules, Title 11, Chapter 261. These metals are considered hazardous if the extract from a representative sample of the waste exhibits toxicity characteristics and concentrations.

The subject project plan includes a production equipment and vehicle maintenance building. Typical maintenance waste streams attributable to this type of facility include: spent cleaning solvents, filters, leftover paints, dirty lubricant oils, spent lead acid batteries, dirty hydraulic fluids, and other maintenance wastes. These wastes may be subject to State and Federal hazardous waste regulations.

The vehicle/parts wash area is designed such that any solvents used in the parts-cleaning operations are directed into a holding tank. The spent solvent and the other cleaners and associated sludge that collects in the bottom of the tank should be disposed of or treated properly in accordance with applicable State and Federal regulations.

Should you have any questions regarding these comments, please contact Mr. Eric Sadoyama of the Underground Storage Tank Section or Mr. Edgar Salira of the Hazardous Waste Section, Solid and Hazardous Waste Branch at 586-4226.

Clean Air Branch

In preparing the Draft Environmental Impact Statement (DEIS), please include an assessment or discussion on the following issues:

1. The current ambient air quality levels in addition to the local meteorology and dispersion conditions in the area of the proposed project.
2. The air pollution and permitting requirements for the project's potential annual emissions for all regulated and hazardous air pollutants. Overall project impacts will need to be evaluated with state and national ambient air quality standards and air quality increments. The project's emissions should also be assessed against the newly adopted PM₁₀ national ambient air standard.

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3. All sources of air emissions, including sources of fugitive emissions, should be identified along with the type of pollutants emitted. The DEIS should cover emissions from the flyash and limestone handling operation, coal storage piles, and possible emissions from the acid and caustic storage tanks.
4. The assessment and employment of Best Available Control Technology (BACT) for all applicable air pollutants. Summarize the types of air pollution controls that will be employed to control point source emissions (e.g. steam generating units) as well as fugitive emissions (e.g. coal stockpiles).
5. Applicability to any New Source Performance Standards (NSPS) and Maximum Achievable Control Technology (MACT) standards.

If you have any questions regarding these comments, please contact Mr. Scott Takamoto of the Clean Air Branch at 586-4200.

Safe Drinking Water

1. Federal and state regulations define a public water system as a system that serves 25 or more individuals at least 60 days per year or has at least 15 service connections. All public water system owners and operators are required to comply with Hawaii Administrative Rules (HAR), Title 11, Chapter 20, "Rules Relating to Potable Water Systems."
2. The EISPN stated that there are five wells of production-size to be drilled. HAR, Section 11-20-30 requires that new or substantially modified distribution systems for public water systems be approved by the Director of Health. However, if the water system is under the jurisdiction of the County of Kauai, the Kauai Department of Water Supply will be responsible for the review and approval of the plans.
3. HAR, Section 11-20-29 requires that all new sources of potable water serving a public water system be approved by the Director of Health prior to its use. Such an approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set in Section 11-20-29.
4. The engineering report must identify all potential sources of contamination and evaluate alternative control measures which could be implemented to reduce or eliminate the potential for contamination, including treatment of the

water source. In addition, water quality analyses, performed by a laboratory certified in the State of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional tests may be required by the Director of Health upon his review of the information submitted.

If you should have any questions on this matter, please contact Ms. Queenie Komori of the Safe Drinking Water Branch, Engineering Section, at 586-4258.

Underground Injection Control (UIC)

1. The EA/EISPN accurately states that the project site is inland (mauka) of the UIC line and that injection wells cannot be located on the power plant site.
2. Off-site injection well use or injection well alternatives may be discussed with the UIC program to facilitate the project planning.

If you have any interest or questions about this subject, please contact Mr. Chauncey Hev of the Safe Drinking Water Branch, Underground Injection Control Program at 586-4258.

Water Pollution

1. The applicant should contact the Army Corps of Engineers to identify whether a federal permit (including a Department of Army permit) is required for this project. If a federal permit is required, then a Section 401 Water Quality Certification is required from the State Department of Health, Clean Water Branch.
2. A National Pollutant Discharge Elimination System (NPDES) general permit is required for the following discharges to waters of the State:
 - a. Storm water discharges relating to construction activities, such as clearing, grading, and excavation, for projects equal to or greater than five acres;
 - b. Storm water discharges from industrial activities;
 - c. Construction dewatering activities;
 - d. Noncontact cooling water discharges less than one million gallons per day;

Mr. Perry J. White
September 11, 1997
Page 5

97-160/epo

- e. Treated groundwater from underground storage tank remedial activities; and
 - f. Hydrotesting water.
- Any person requesting to be covered by a NPDES general permit for any of the above activities should file a Notice of Intent with the Department's Clean Water Branch at least 30 days prior to commencement of any discharge to waters of the State.
3. After construction of the proposed facility is completed, an NPDES individual permit will be required if the operation of the facility involves any wastewater discharge into State waters.

Any questions regarding these comments should be directed to Mr. Denis Lau, Branch Chief, Clean Water Branch at 586-4309.

Sincerely,



BRUCE S. ANDERSON, Ph.D.
Deputy Director for Environmental Health

cc: SIRWB
CAB
SDWB
CWB



**P L A N N I N G
S O L U T I O N S**

1110 KUAKA STREET, SUITE 211
HONOLULU HAWAII 96811
PHONE: 508-593-1288
FAX: 508-593-1558

Dr. Bruce Anderson, Ph.D.
Deputy Director for Environmental Health
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Dear Dr. Anderson:

Thank you for your September 11, 1997 letter (reference 97-160/epo) concerning the *Environmental Impact Statement Preparation Notice (EISPN) for the Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document.

As you know from the EISPN, Kauai Electric's (KE) initial plan focused on the 17-acre parcel identified in the EISPN. KE reviewed the responses that it received to its written request for comments. It also considered concerns area residents expressed at the voluntary town meeting that KE held on August 21, 1997. Based on that input, the company decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaa and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

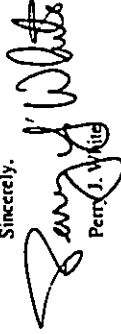
Three (3) copies of the *Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center* are enclosed for your review and comment. The DEIS addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

We found your specific comments concerning the environmental permits needed for the proposed facility to be very helpful. KE is aware of the applicability of regulations noted in the comments from the Solid and Hazardous Waste Branch, the Clean Air Branch, the Safe Drinking Water Branch, and the Clean Water Branch and will adhere to them. The following sections of the DEIS address the issues noted in your comments:

- Water supply and wastewater disposal aspects of the proposed design are described in Section 2.2.4 of the DEIS.
- Water quality and related effects are discussed in Sections 3.3 and 4.5. Those sections also discuss stormwater runoff.
- Existing air quality and potential air quality impacts are described in Sections 3.4 and 4.4, respectively.

If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288.

Sincerely,



Perry J. White

Enclosure

38



DEPARTMENT OF THE NAVY
 COMMANDER
 NAVAL BASE PEAK, HARBOR
 BOX 110
 PEAK HARBOR, HAWAII 96814

39

5090P.1
 Ser H40(23)/4484
 18 Sep 97

IN REPLY REFER TO
 5090P.1
 Ser H40(23)/4484
 18 Sep 97

Mr. Perry J. White
 Planning Solutions
 1210 Auahi Street, Suite 221
 Honolulu, HI 96814

Copy to:
 The Environmental Notice
 Office of Environmental Quality Control
 Central Pacific Plaza
 220 South King Street, Fourth Floor
 Honolulu, HI 96813

Mr. Dave Horgan
 Kauai Electric
 4463 Pahoe Street
 Lihue, HI 96766

Dear Mr. White

Subj: ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE FOR LIHUE ENERGY SERVICE CENTER

Thank you for the opportunity to review the EIS preparation notice for the proposed Lihue Energy Service Center project. The Navy offers the following comments:

- a. The Kauai Integrated Resources Plan should adequately address distributed resources and demand-side management options to minimize new generation needs and capital costs.
- b. Kauai Electric has the highest purchased electricity rates (unit costs) among the Hawaiian islands and throughout the Pacific for the Navy. At the Pacific Missile Range Facility at Barking Sands, our unit costs for purchased electricity are reaching and will likely exceed \$0.20/kwh. The economic and financial impacts of this project on the island's rate payers (industrial, commercial & residential) should be thoroughly evaluated and the trade-offs should be acceptable to the rate payers.
- c. The air emissions of the generating plants and their impacts on air quality should be thoroughly evaluated in the EIS. Sufficient consideration should be given to emissionless power generation technologies.

The Navy's point of contact is Mr. Stanford Yuen at 474-0439.

Sincerely,

Stanford B. Yuen
 STANFORD B. YUEN, P.E.
 Facilities Engineer
 By direction of
 Commander, Naval Base, Pearl Harbor

Copy to: (See next page)

39



**P L A N N I N G
S O L U T I O N S**

1115 ADAMI STREET, SUITE 217
HONOLULU, HAWAII 96813
PHONE 808 553 1151
FAX 808 553 1556

December 11, 1998

Page 2
Mr. Stanford B. C. Yuen, P.E.
December 11, 1998

Thank you again for your letter. The State Office of Environmental Quality Control's official deadline for mailing comments on the DEIS is February 8, 1999. If you have any questions concerning the report or would like additional information or clarifications, please call me at 593-1288.

Sincerely,

Perry J. White

Subject: Draft Environmental Impact Statement for the Lihue Energy Service Center

Enclosure

Dear Mr. Yuen

Thank you for your September 18, 1997 letter [reference 5090.1, Ser N40(23)/4484] concerning the *Environmental Impact Statement Preparation Notice (EISP/N)* for the *Lihue Energy Service Center*. We appreciate the time you and your staff spent reviewing the document.

As you know, Kaula Electric's (KE) initial plan focused on the single 17-acre parcel identified in the *EISP/N*. After reviewing the responses it received to its written request for comments on the project and considering concerns expressed by area residents, KE decided to investigate additional locations for the proposed facilities. At the conclusion of its investigation, it added two additional sites, one west of Kapaia and the other northwest of Lihue Airport. KE held a second informal town meeting on May 6, 1998, to allow the public to comment on the additional sites.

A copy of the *Draft Environmental Impact Statement (DEIS)* for the *Lihue Energy Service Center* is enclosed for your review and comment. The *DEIS* addresses environmental issues associated with each of the three sites that are under consideration. This includes all of the topics required by the State EIS law (Chapter 343, Hawaii Revised Statutes) and its implementing regulations (Hawaii Administrative Regulations, §11-200).

Sections 1.2.4 and 1.2.5 specifically address KE's Demand-Side Management (DSM) program, as requested in paragraph "a." of your letter. They note that the program is expected to reduce the amount of additional capacity that is needed, but will not eliminate the need to construct new facilities. This need is particularly critical in view of the uncertainty concerning the continuation of Lihue Plantation Company's sugar operations. As you know, the plantation currently supplies 14 megawatts of firm power to KE's system, and the loss of that capacity that would accompany a shutdown would accelerate the need for the utility to have a new source of electrical power.

KE appreciates the effect that high electricity costs have on all its customers, including the Navy. While it endeavors to minimize these costs, the small size of the service area, the cost of repairing the damage done by hurricane Iniki, the cost of shipping fuel to the island, and other factors make it difficult to lower costs below their current level. As you know, the State of Hawaii Public Utilities Commission (PUC) approves KE's rates based on an independent analyses of costs and revenues. Consequently, the company's filings with the PUC are the appropriate venue for the discussion of the rate issues mentioned in your letter.

Sections 3.4 and 4.4 of the *DEIS* discuss air quality issues related to the proposed project. KE's 1997 *Integrated Resource Plan* recommended fossil-fuel fired technologies to meet needs that could not be satisfied by the company's DSM program (which includes "emissionless" solar systems) after it concluded that the DSM program alone could not allow it to meet its customers need for electricity.

(39)

Final Environmental Impact Statement

**KAUAI ELECTRIC
LIHUE ENERGY SERVICE CENTER**

APPENDIX D

Draft EIS Comment and Response Letters



LIST OF DEIS COMMENT AND RESPONSE LETTERS

<i>Letter No.</i>	<i>Individual/Organization</i>
1	Fire Department, County of Kauai
2	Land Use Commission, State of Hawaii
3	Department of Accounting & General Services, State of Hawaii
4	Department of Education, State of Hawaii
5	Department of Business, Economic Development, & Tourism
6	Kaua'i Group of the Hawai'i Chapter of the Sierra Club
7	Office of Civil Defense, Department of Defense, State of Hawaii
8	Federal Aviation Administration, Western-Pacific Region, Airports District Office
9	Department of Transportation, State of Hawaii
10	Department of Hawaiian Home Lands, State of Hawaii
11	Amfac Sugar Kauai
12	Linda Shigeta
13	Princeville Resort
14	Janet Ashkenazy
15	Planning Department, County of Kauai
16	Gaylord & Carol Wilcox
17	Land Management Div., Department of Land & Natural Resources, State of Hawaii
18	Life of the Land
19	Public Utilities Commission, State of Hawaii
20	Department of Water, County of Kauai
21	Ventura Development Corporation
22	A & B Properties
23	Pacific Missile Range Facility, Department of the Navy
24	Chevron
25	Contractors Association of Kauai
26	Barnes & Ba Riznik
27	Raymond L. Chuan
28	Mary M. Cooke
29	Airports Division, Department of Transportation, State of Hawaii
30	Kilohana
31	International Brotherhood of Electrical Workers
32	Kauai Coffee
33	Office of Environmental Quality Control, State of Hawaii
34	Historic Preservation Div., Department of Land & Natural Resources, State of Hawaii
35	Environmental Health Division, Department of Health, State of Hawaii
36	Richard Jasper
37	Dean K. McRaine and Malone B. McRaine
38	Tim Brause
39	Robert O. Ferris
40	Larry Heller

LIST OF DEIS COMMENT AND RESPONSE LETTERS

<i>Letter No.</i>	<i>Individual/Organization</i>
41	Arnold B. Nurock, M.D.
42	Margery H. Freeman
43	Frances N. Frazier
44	Gabriela Taylor
45	Danie McReynolds
46	Keith Hutchens
47	Nancy L. Bunyan
48	Carol Bain
49	U.S. Department of Agriculture
50	Gaye & Robinson

MARYANNE W. KUSAKA
MAYOR



COUNTY OF KAUA'I
FIRE DEPARTMENT
MOIKIHA BUILDING
4444 RICE STREET, SUITE 205
LIHUE, KAUA'I, HAWAII

DAVID K. SPROAT
FIRE CHIEF



P L A N N I N G
S O L U T I O N S

1210 AWAHI STREET, SUITE 221
HONOLULU, HAWAII 96813
PHONE: 808-593-1288
FAX: 808-593-1938

January 15, 1999

Captain Mike Kanno
Fire Prevention Bureau
Fire Department
County of Kauai
Moikeha Building
4444 Rice Street, Suite 205
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Captain Kanno:

Thank you for your December 24, 1998 letter regarding the *Draft Environmental Impact Statement* for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your response.

Kauai Electric looks forward to working with you once a final decision has been made concerning the location of the proposed facilities. If you have any further questions, please call me at (808) 593-1288 and I will try to answer them.

Dear Mr. White:

RE: Draft EIS for the Lihue Energy Service Center

Thank you for the constructive response in addressing our Fire Department concerns regarding this project. We anticipate working with the Applicant to resolve these issues and to provide a "safer" first class facility to serve the future electrical needs of Kauai in the 21st Century.

These considerations might not erase every possibility for a "worst-case scenario" to develop, but current codes and standards minimize the potential for such hazard and provides safeguards for mitigating incidents.

We wish you success in your quest to determine where the Energy Service Center will be (finally) located and again look forward to working with the Applicant on this Project.

Happy Holidays!

Mike Kanno, Captain
Fire Prevention Bureau
TEL: 808-241-6511
FAX: 808-241-6508

Sincerely,
Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Prudragon, Kauai County Planning Department



STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION

P.O. Box 2159
Honolulu, HI 96804-2159
Telephone: 808-587-3822
Fax: 808-587-3827

January 6, 1999

Mr. Dee Crowell, Director
Planning Department
County of Kauai,
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Crowell:

Subject: Draft Environmental Impact Statement (DEIS) for
the Lihue Energy Service Center

We have reviewed the subject DEIS and have the following
comments:

- 1) We confirm that the Preferred Site and the Field 390 Site, as represented on Figure 6-1 of the DEIS, are designated within the State Land Use Agricultural District. We also confirm that the Airport Industrial Site, as represented on said figure, is designated within the State Land Use Urban District.
We note that the legend on Figure 6-1 incorrectly refers to the Agricultural District as "Agriculture." Also, the legend refers to an "Open" District; there is no such district under the State land use district classification. The "O" on the map (near Kalepa) should be amended to a "C" to identify the Conservation District.

- 2) As noted on page 6-4 of the DEIS, the Airport Industrial Area Site is situated on lands that were the subject of LUC Docket No. A94-703/The Lihue Plantation Co., Ltd., which involved the reclassification of approximately 541.769 and 12.873 acres of land from the Agricultural and Conservation District, respectively, to the Urban District for the development of residential uses, public and quasi-public facilities, village mixed-uses, industrial uses, parks, infrastructure, and open space as proposed in the

Mr. Dee Crowell, Director
January 6, 1999
Page 2

Lihue-Hanamaulu Master Plan. The reclassification was subject to 24 conditions.

We would like to clarify that pursuant to §15-15-91, Hawaii Administrative Rules, these conditions run with the land and are binding upon the petitioner and each and every subsequent owner, lessee, sub-lessee, transferee, grantee, assignee, or developer.

- 3) We note that under the Lihue-Hanamaulu Master Plan filed in the above docket, the Airport Industrial Area Site was originally proposed for a debris recycling station. At about the same time the petition in the docket was filed (1994), the County of Kauai Department of Public Works, Solid Waste Section, had applied for a special permit to establish the station so that construction could begin before the end of 1994, and not wait for the site to be urbanized. The County subsequently withdrew its request for a special permit because of a lack of funding to proceed with the station. As a result, the station was no longer a component of the project envisioned in the Master Plan.

We have no further comments to offer at this time. We appreciate the opportunity to comment on the subject DEIS.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

ESTHER UEDA
Executive Officer

EU:th

cc: OEQC
/Perry J. White



ESTHER UEDA
EXECUTIVE OFFICER



**P L A N N I N G
S O L U T I O N S**

1110 KANANI STREET SUITE 100
HONOLULU HAWAII 96813
PHONE 808 533-1288
FAX 808 533-1310

January 22, 1999

Ms. Esther Ueda, Executive Officer
P.O. Box 2359
Honolulu, Hawaii 96804-2359

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Ms. Ueda:

Thank you for your January 6, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your comments. Our responses follow below.

- (1) Thank you for confirming the State Land Use District designations of the three sites. We will correct the typographical errors in Figure 6-1 and include a revised version of it in the *Final Environmental Impact Statement (FEIS)*.
- (2) We understand that the conditions that were attached to the redistricting granted under LUC Docket No. A94-703 run with the land. Kauai Electric is aware that it must comply with applicable portions of these conditions if it decides to locate its facilities at the Airport Industrial Area Site.
- (3) Thank you for the information you provided concerning the status of the special permit application that the Kauai Department of Public Works, Solid Waste Section had submitted for a debris recycling station. We understand that the debris recycling station is no longer a component of the project envisioned in the Lihue-Hanalei Master Plan.
Should Kauai Electric decide to attempt to move forward with development on the Airport Industrial Area Site, it will arrange to meet with you to discuss the applicable conditions stemming from the redistricting. In the meantime, if you have any questions, please call me at 593-1288.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pradrogan, Kauai County Planning Department

3



**P L A N N I N G
S O L U T I O N S**

January 22, 1999

1210 AUAAHI STREET, SUITE 221
HONOLULU, HAWAII 96814
PHONE: 808 593-1199
FAX: 808 593-1930

LETTERS (P) 11022-9



STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 111, HONOLULU, HAWAII 96810

DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES

JAN 15 1999

Mr. Perry J. White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Draft Environmental Impact Statement (EIS)
for the Lihue Energy Service Center

Thank you for the opportunity to review the subject Draft EIS sent by your December 11, 1998 letter.

The project will not impact on any of our existing or proposed facilities. Therefore, we have no comments.

In the future, when actions described by Environmental Assessments, Environmental Impact Statement Preparation Notices, Environmental Impact Statements, Plan Review Use, etc., do not impact on specific State plans or facilities, we for work reasons will not provide a "no comments" or a "good planning principles evaluation" type of response. But, since we are still interested in knowing what is going on planning-wise in our State, we would still appreciate the opportunity to review all such documents.

If you should have any questions, please contact Mr. Ronald Ching of the Planning Branch at 586-0490.

Sincerely,

GORDON MATSUOKA
Public Works Administrator

RC/ET:jj
c: OBOC
Kauai County Planning Department
Mr. Dave Morgan, Kauai Electric

Mr. Gordon Matsuoka
Public Works Administrator
Department of Accounting and General Services
State of Hawaii
P.O. Box 119
Honolulu, Hawaii 96810

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Matsuoka

Thank you for your January 15, 1999 letter regarding the Draft Environmental Impact Statement for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your response.

It was helpful of you to confirm that construction and operation of the Lihue Energy Service Center project will not affect any of your Department's existing or proposed facilities. We understand your Department's reasons for deciding it will no longer provide a "no comments" response when projects will not affect your areas of responsibility.

If you desire any further information concerning the proposed project, please feel free to call me at 593-1288.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

DE JAMES J. CAFFREY
DIRECTOR



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 3398
HONOLULU, HAWAII 96864

OFFICE OF THE SUPERINTENDENT

January 14, 1999

(4)

Planning Solutions
1110 AVARD STREET, SUITE 201
HONOLULU, HAWAII 96813
PHONE: 808 593-1288
FAX: 808 593-1958



PLANNING
SOLUTIONS

January 22, 1999

Dr. Paul G. LeMahieu, Superintendent
Department of Education
State of Hawaii
P.O. Box 2360
Honolulu, Hawaii 96804

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Dr. LeMahieu:

Thank you for sending me a copy of your January 14, 1999 memorandum to the Office of Environmental Quality Control regarding the *Draft Environmental Impact Statement* for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your response.

We understand that the Department of Education has no additional comments on the proposed facility. If you or your staff should desire further information about the project, please call me at 593-1288.

MEMO TO: Mr. Gary Gill, Director
Office of Environmental Quality Control

F R O M: Paul G. LeMahieu, Ph.D., Superintendent
Department of Education

SUBJECT: Lihue Energy Service Center Draft EIS

The Department of Education has no additional comment on the proposed facility.

If you have any questions, please call Mr. Sanford Beppu at 733-4862.

PLeM:SB:hy

cc: L. Chuck, OBS
A. Maeda, KDO
P. White, Planning Solutions

Sincerely,

Percy J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pedregon, Kauai County Planning Department

5



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

BENJAMIN J. CAJETANO
GOVERNOR
SELF MATA
DIRECTOR
BRADLEY J. BLANC
DEPUTY DIRECTOR
DAVID W. BLANC
DIRECTOR OFFICE OF PLANNING

OFFICE OF PLANNING
235 South Beretania Street, 6th Fl., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359 Honolulu, Hawaii 96804

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

Ref. No. P-7899

January 15, 1999

Mr. Perry J. White
Planning Solutions, Inc.
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Draft Environmental Impact Statement (EIS)
Kauai Electric Lihue Energy Service Center

We have reviewed the draft EIS for the three alternative sites for the Kauai Electric Lihue Energy Center. The Department of Business, Economic Development & Tourism's Energy Division participated in the Kauai Electric Integrated Resource Planning Advisory Group discussion that determined increased energy demand on Kauai for the next two decades. We believe the project ensures timely availability of new fossil fuel generation that is cost-effective and reliable on Kauai. We have the following comments on the project.

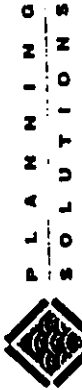
While we support the project, we do not have any suggestions for a preferred site. Our only recommendation is that the site selected should have minimal environmental and social impacts. In the future, we urge Kauai Electric to meet some of the generation requirements using renewable energy. Kauai Electric should also review sites recommended in the Hawaii Energy Strategy program for renewable energy options.

Our concerns on coastal water quality were addressed but a few questions remain. The storm water containment on the two agricultural sites relies on the existing earthen berms presently used for sugar cane cultivation. Will the two agricultural sites continue to farm sugar or a replacement crop? Can the earthen berms accommodate the additional storm water runoff?

If there are any questions, please contact Maurice H. Kaya of the Energy Resources and Technology Division of our department at 587-3812 or Christina Meller of our Coastal Zone Management Program at 587-2804.

Sincerely,

David W. Blanc
Director
Office of Planning



March 18, 1999

Mr. David W. Blane, Director
Office of Planning
Department of Business, Economic
Development, & Tourism
P.O. Box 2359
Honolulu, Hawaii 96804

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Blane:

Thank you for your January 15, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your response.

Kauai Electric has also asked me to extend its appreciation to you for DBEDT's participation in the Advisory Group that helped prepare its current *Integrated Resource Plan*. As discussed in the *DEIS*, the energy use forecasts that were developed as part of the *Integrated Resource Planning Process* are a fundamental part of KE's decision to develop the Lihue Energy Service Center project. As you stated in your letter, the proposed facilities will insure timely availability of new fossil fuel generation capacity that is cost-effective and reliable.

We understand that the Office of Planning does not have any preference with respect to the choice of sites. We agree that the decision as to the site should be based on the minimizing adverse environmental and social effects and maximizing community benefits.

KE currently purchases power from several renewable energy sources. These are discussed in Section 1.2.1 of the *DEIS*. As you know, KE also continues to consider the use of renewable energy sources as part of its overall *Integrated Resource Planning Process*. This is discussed in Section 5.6 of the *DEIS*. During preparation of the most recent (1997) *Integrated Resource Plan (IRP)*, KE evaluated several renewable energy sources. These included biomass, wind, photovoltaic, solar dish, and hydroelectric generation technologies. It considered these technologies both individually and as part of the "Energy Sufficiency/Environmental Scenario" that is discussed in Section 8.5 of the *1997 IRP*. KE concluded that while some of the renewable technologies show promise, these technologies would be considerably more costly to its customers than the Demand Side Management/Conventional Generating Technologies combination it has proposed. Finally, as noted on page 5-5 of the *DEIS*, KE will continue to explore renewable energy options whenever it updates its *IRP*. It will also be receptive to proposals from independent power producers who wish to provide electrical power generated using renewable resources.

Your letter posed two questions relating to storm water runoff. Answers to these are as follows:

- KE will develop the proposed facilities in phases as they are needed to meet the electrical energy needs of its customers. It will allow continued agricultural operations on the portions of the property it does not need until it proceeds with subsequent phases. Lihue Plantation

Page 2
Mr. David W. Blane, Director
March 18, 1999

and AMFAC/JMB will determine whether it is practical to continue its present use of the areas that the utility does not yet need. It is possible that agricultural use of portions of the sites will continue for many years. Either sugar or other crops may be cultivated at their discretion.

- As indicated in the *DEIS*, the existing low earthen berms are designed to retard runoff from the sites; they are already overtopped during heavier rainfall, with the water flowing into the adjacent gulches. The storm drainage pattern will be reconfigured during development of the power generation and transmission and distribution facilities. The new facilities will be designed to accommodate the anticipated flows.

Thank you again for your comments. If you have any questions or would like to discuss the project further, please call me at 593-1288.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pedregon, Kauai County Planning Department



Kauai Group of the Hawai'i Chapter
Post Office Box 3412
Lihue, Kauai, Hawai'i 96766

6

Mr. Perry J. White
Planning Solutions Inc.
1210 Auhai St., Suite 221
Honolulu, HI 96814

January 25, 1999

Subject: Draft EIS for Kauai Electric Service Center - Comments

Acting on behalf of the Kauai Group of the Hawaii Chapter Sierra Club, we wish to thank the staff of Kauai Electric for their cooperation in providing supplemental information and explanations of the many charts and technical details in both the Draft Environmental Impact Statement (DEIS) and the underlying 1997 Integrated Resource Plan (IRP).

Upon first review of the Draft Environmental Impact Statement it was abundantly apparent that many of the assertions and assumptions were based on information such as load forecasts, supply-side options, demand-side management options, and the analysis approach binding these elements together that could only be found in the 1997 Integrated Resource Plan. Ultimately, they rendered some conclusions about Kauai's energy needs that would culminate in the current proposal to site a new service and generating station.

These comments then, although primarily referring to statements from the DEIS, must occasionally also refer to the data generated from the 1997 IRP document.

Our main concern is centered around the expressed need for a large generating station at KE's preferred site in the Lihue area at this time.

FORECAST RELIABILITY

We have had about two additional years from when the forecasts in the IRP were made to judge their reliability and believe the present historical facts require rethinking KE's original conclusion. For instance, in that report the data used for forecasting demand was tabled (see Appendix A - 1997 IRP) to compare the various HIGH, LOW, and BASELINE scenarios. We also note (quite importantly) that in all cases the contributed savings - positive impact - of a fully effective demand-side management program calculated to have begun in

the forecast period was factored in to these projections.

Interestingly, we note that for the first two years of that forecast period - 1997 and 1998 the figures for the critical peak demand (see the month of November for each year) trail the projected baseline figures significantly. In 1998 for instance, the actual figure given for November was 72 MW while the projected figure was 74.12. If one considers the fact that the demand-side management programs, rather than being even partially effective, were in reality non-existent at the time due to unforeseen delays, then the assumption of that factor could account for a further reduction of perhaps another megawatt which would then begin to approach the figure (70.13) representing the low demand growth trend.

One aspect that KE repeatedly asserts is driving the need to develop this new energy service center is the uncertainty about the firm-demand now contributed by Lihue Plantation which is listed at 14 MW. On page 1-10 the DEIS illustrates KE's predicament with regard to this supplier. There it cites the need to maintain a certain reserve capacity from within its total capacity of about 110.45 MW to meet the peak demand (typically November of any given year). Citing their illustration, it says that... "Since the peak demand during 1998 is forecast to be about 74 MW, the company has approximately 13 MW more installed capacity than it needs to satisfy its capacity criteria during the present year."

Now with the benefit of hindsight we can adjust this illustration since the actual peak usage in November of 1998 we know came in at about 72MW. The difference remaining under the same criteria used would yield a little more than 15 MW excess capacity at present. Now we observe that this capacity is more than enough to offset the potential immediate loss of LP's 14 MW.

If we consider the time trends of the various components we are led away from the heightened urgency which seems to characterize KE's development plans. These trends are: the actual demand forecast coming in lower than expected, the positive impact that demand-side programs have yet to contribute, and the lead time (three years) that Lihue Plantation is contracted to give in the case of their demise.

This is not to say that we disagree with KE's planning strategy to incrementally apply new supply options in a timely, cost effective manner. We heartily agree and support the role of so-called independent power partners to provide the many strategic advantages KE is now seeking. We support the notion of

decentralizing generating facilities for hazard mitigation sake. Likewise, we support the notion of moving to a greater mix of generating technologies to diversify in the face of economic risks associated with dependencies on a single energy source. And we support such diversity in light of community standards such as our state and county policies to move toward greater energy self-sufficiency. For these reasons then, we look forward to the other options we expect to be forthcoming, most notably the development plans of Kaua'i Power Partners and the increment of capacity generation that they may provide in a more low scale manner.

DEMAND-SIDE PROGRAMS

We must take issue within the area of the DEIS that discusses the alternative of "Additional Demand-side Management Programs/Enhanced Conservation." In section 5.3 of the DEIS the arguments presented ostensibly in favor of further demand-side/conservation measures seem cynically framed to undermine their importance. For example, their discussion of additional measures such as "banning air-conditioning, prohibiting the use of second refrigerators" come off as unwarranted extremes. Elsewhere, they say that .. "If customers were simply to lower electrical consumption by reducing their use of lights, water heating units, kitchen appliances, and other equipment, then the *only effect would be foregoing the enjoyment they presently receive from their use of these items.*"

In the first instance, a discussion of more modest measures would be more constructive. Rather than banning air-conditioning, exploring the potential incentives to conserve and better regulate air-conditioning would be more meaningful. (Many people feel that air-conditioning is abused in a manner that is both wasteful and unhealthy. There seems to be much room for improvement short of banning the use.)

In the second instance, implying that reduction in any use automatically precludes the benefits or enjoyment of the use completely ignores the all too prevalent component of mere waste that is the real target of conservation. Rational usage that takes advantage of more efficient technology should be the focus of the discussion. Therefore, we find this section severely deficient and look for the Final EIS to include a more constructive discussion of additional demand-side and enhanced conservation measures. (Incidentally, we have reason to hope that the staff at KE are now more seriously engaged and supportive in this area than the DEIS seems to reflect. We are heartened by the creative analytical applications KE appears to be bringing through the target marketing

of DSM programs now in the offing. It is hoped that this capability can further be refined to help identify and, along with appropriate incentives, eliminate greater amounts of energy waste in the future).

SUPPLY SIDE OPTIONS

In section 5.6 of the DEIS various generating technologies are discussed and reference is often made to studies undertaken in the 1997 IRP document. KE states.. "Even with the additional weighting given to environmental and energy self-sufficiency factors (which in Kaua'i's situation means renewable energy), KE found this scenario to be more costly than the DSM/conventional generating facility program it has proposed."

After reviewing the analysis made of the various options in the IRP document we can largely agree with KE's conclusion with one glaring exception. It appears to us that in section 9-9 of that document according to figure 9.1 the results for KE's dominant base line scenario indicate that a renewable source by windpower was rated at least equal to or greater than the conventional supply sources. At the bottom of the same chart was coal. Also, from page 8-9 of the IRP, the decision analysis results say, "The least preferred plans are those with relatively high capital costs such as coal and biomass."

It is quite surprising therefore to see the DEIS list a fluidized coal unit as one of its proposed components and no reference to wind made. We think this apparent deviation from the IRP analysis needs to be addressed further in the final document.

LIHUE AREA SITES

It will come as no surprise that KE's preferred Energy Center site behind the community college is from a community standpoint the least preferred! We would again point out that the proximity (elevation as well as horizontal distance) to a major fresh water supply for Lihue is a major concern that remains objectionable despite the proposed mitigations of physical buffers and best management practices.

The economic effect of siting the plant in this area needs greater scrutiny. We note that L.P.'s conceptual master plan for the areas surrounding the plant site and future state traffic plans admit the prospect for intensified urbanization. We wonder whether or not the plant siting would create an economic "dead zone" in

the midst of these plans.

Apart from the 17 acre parcel described as the preferred site, we want to see what form and size of parcelization applies to the "Maalo Rd." and "Airport" sites. Despite the fact that KE has secured by the County Planning Department an agreement that relieves it from state Land Use Commission authority, never the less, we ask that in the final EIS a consideration be made as to whether or not a precedent is being established by which the area of use rather than the size of the parcel determines the jurisdiction for permitting on Agriculture zoned land.

It is also noted that a variance would be sought to exceed height limitations due to the smokestacks. More particularly, the coal facility which necessitates a building height of 110 feet and stacks as high as 165 feet would interpose particularly obtrusive elements into the visual landscape at all sites. Those stacks would also pose a more prominent air navigation hazard around the current airport/heliport site. Again, the need to resort to a variance to legitimize other customarily excluded features only further weakens the integrity of our land policies and regulatory tools. Therefore, the Final EIS should address the cumulative impact of such connecting loopholes and the extent to which taken together they defeat the intent of land use regulation in the Agriculture zone.

The Draft EIS understates the impacts of utilizing all fuel sources, but coal most importantly, when it discusses the transportation and handling of these materials through Nawiliwili to serve the Lihue area sites. Certainly, the increased truck traffic, safety, noise and wear and tear on surface roads in the Lihue area would be the most noticeable and objectionable impact to the public. But it also seems reasonable to conclude that more area of the Nawiliwili harbor would need to be developed or displaced in order to accommodate both the increased barge traffic and standby loads deposited at the pier. The Final EIS needs to discuss the type of equipment, space needs and economic impact of displacement of current facilities to accommodate bulk shipment and handling of coal and fuel oil at Nawiliwili. Also, what measures would need to be taken to prevent fugitive dust as well as accidental dumping of coal on land or in the harbor?

SUMMATION

Many other concerns not specifically referenced above have received adequate attention in the DEIS and/or will likely be addressed by other interested parties. We would conclude by setting forth our contention that based on the available

information we remain unconvinced of the need to site a new energy production and service center in the Lihue area at this time. Instead, we think it would be less costly and just as prudent to look to improving and perhaps expanding (as in the Kaua'i Power Partners proposal) the Port Allen facility in the near term. We submit that another alternate plan should exist that emphasizes the timely substitution of older generating units with some of the modern units described in the current proposal.

Additional capacity insurance in the form of another 26.4 MW unit under the management of KPP seems advisable in the short term. In the longer term, the savings from DSM programs and enhanced conservation measures should be the centerpiece of our island's energy strategy. With more dispersion and diversity of generating components such as wind and photovoltaics (in the future) KE's goals to insure security and to service their customers closer to their needs can be met.

We strongly urge the reconsideration of a coal fired unit in any case. Many of the greatest detriments and negative impacts under the current proposal can be traced back to this element of the plan. We fail to see how it even got into the current proposal after the study it was given in the 1997 IRP.

For Kaua'i Group Sierra Club,



R. Culbertson
Conservation Committee Member

cc: OEQC
Kauai County Planning Department



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S O L U T I O N S**

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March 18, 1999

Mr. Rob Culbertson
Conservation Committee
Kauai'i Group of the Hawai'i Chapter of the Sierra Club
Post Office Box 3412
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Culbertson:

Thank you for your January 25, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and other members of the Sierra Club spent reviewing both the *DEIS* and the *1997 Integrated Resource Plan (IRP)* and preparing your extensive comments.

This letter addresses the concerns you raised and the changes that we are incorporating into the *Final Environmental Impact Statement* to address them. We have referenced the headings in your letter as a means of tying the response to your comments.

Introduction

(1) Page 1, Paragraphs 1 and 2. Dave Morgan and other members of KE's staff have asked me to say that they found their conversations with you helpful. When we prepared the *DEIS*, we tried to (a) provide sufficient information for the most knowledgeable readers to be able to evaluate the various alternatives that are being considered and (b) present the material in terms comprehensible to the general public. It was our hope that individuals who wanted additional detail and related documents would contact us before preparing comments, as you did.

(2) Page 1, 4th Paragraph. This paragraph states: "Our main concern is centered around the expressed need for a large generating station at KE's preferred site in the Lihue area at this time." I would like to note several things about your summarization.

• The *DEIS* addresses the potential impacts of full build-out of the Lihue Energy Service Center. This is consistent with State environmental impact regulations that are intended to prevent related projects from being evaluated on a piecemeal basis. However, KE intends to seek permits for and construct only one generating unit at a time over the next several decades as the need for additional generating capacity arises. Consequently, while the Lihue Energy Service Center could eventually be about the same size (in megawatts of capacity) as the existing Port Allen Generating Station, the initial increment would be relatively small. In fact, as discussed in the *DEIS*, nothing more than the 26.4 MW KPP unit is likely to be there until 2012 or later.

• Creation of the Lihue Energy Service Center would give KE the ability to construct a second centralized power generation facility on the island. The company believes that preserving this option is important if it is to continue to offer reliable, cost-effective electrical service to its customers. Securing a 17-acre site at this time will give KE the

Page 2
Mr. Rob Culbertson
March 18, 1999

option of trying to develop future generating capacity at a centralized site. However, it does not commit the company or the community to full build-out of the Lihue Energy Service Center. The company and the Public Utilities Commission will evaluate the need for each additional generating unit individually, and no new units will be approved until both those parties are satisfied that they are needed and the County has issued the required land use permits. On the other hand, if KE does not secure a relatively large site suitable for long-term development of centralized facilities, it may miss the opportunity to do so. As discussed later in this letter, this could lead to the scattering of facilities that would not be in the best interest of the island community.

• KE would like to develop the proposed facilities at the location referred to in the *DEIS* as the "Preferred Site". However, it is actively considering the two other sites discussed in the *DEIS* (Field 390 and Airport Industrial Area). KE is willing to construct its facilities at either of those locations if the outcome of the land use permitting and environmental process indicates that this is desirable.

• KE must seek and obtain land use and environmental approvals for each subsequent generating unit it wishes to construct on the site. The need for recurrent review provides assurance that the company could not proceed with future development of the property without public review.

Forecast Reliability

The first four paragraphs under this heading of your letter discuss the details of the demand forecasts contained in KE's 1997 *IRP*. You conclude that the company actually has 15 MW more capacity than it presently needs (rather than the 13 MW cited in the *DEIS*) and note that this is greater than the 14 MW that KE presently obtains from Lihue Plantation. You further state that the contractual requirement that LP provide KE three years advance notification of a shutdown together with KE's contract with Kauai Power Partners (KPP) make it unnecessary to develop the Lihue Energy Service Center now.

KE's 1998 peak demand was 72 MW. As you noted, this is less than the 74.12 MW forecast in the 1997 *IRP*. It is only marginally less, however. More importantly, there are a number of reasons why the need to establish the Lihue Energy Service Center should not be determined using short-term statistics. I would like to touch briefly on the more important of these.

• Your letter indicates that you find the idea of developing a single "low-scale" unit such as KPP has proposed more attractive than the "large-scale" Lihue Energy Service Center. KE's contract with KPP for 26.4 MW of capacity insures that the utility can meet the anticipated demand over the coming decade. However, the KPP facility is not intended as a substitute for the Lihue Energy Service Center. On the contrary, if KE's site receives the needed approvals and development costs are competitive, KPP's unit would be the first constructed on the Lihue Energy Service Center site.

• If Kauai never needs additional capacity beyond the 26.4 MW KPP unit, then there would be no further development of generating facilities on the island. In this case, the ultimate size (in megawatts) of the Lihue Energy Service Center would be the same as that of the "low-scale" KPP unit.

• If, on the other hand, KE's forecasts are correct and capacity beyond that provided by the single KPP unit is eventually needed despite KE's best Demand-Side Management (DSM) efforts, then the utility would be forced to develop facilities on yet another site. Over the long-term, then, the choice is between generating power at Port Allen and at another

centralized location such as the Lihue Energy Service Center or generating power at Port Allen and at several other sites. Centralized fossil-fuel-fired power generation can: (i) be efficiently served by the electrical transmission system (minimizing the number of lines that are needed), (ii) realize economies of scale that result in more affordable electricity rates, and (iii) benefit from unified environmental protection measures. Dispersed fossil-fuel-fired generating facilities result in fuel being transported and stored in more places, generally costs more to staff and operate, and is more difficult and expensive to provide with adequate protective measures. [Please note that there is no doubt that dispersed generation powered by renewable resources is the most desirable model for any electrical system, but KE's analyses, validated by the Public Utilities Commission through its review and approval of the IRP, show that this is still not economically feasible given today's technology.]

Because of the length of time it takes to obtain permits for and construct new generating facilities, KE must initiate project development many years before the additional capacity must be on-line. Recent utility experience in Hawaii, for example, has shown that it takes a minimum of five years to bring a new generating unit on line even if it is simply an addition to an existing generating station. Much more time is needed if the unit addition involves construction on a site that is not already used for power generation. The planning and permitting process is greatly simplified if the fundamental siting decision has been made in advance of the construction of individual generating units. One of KE's objectives in proposing development of the Lihue Energy Service Center is to provide such a site.

Demand-Side Programs

As the author of Section 5.3, I must take responsibility for its wording. I was not being at all cynical when I drafted the discussion. As discussed in Chapter 1 of DEIS, energy conservation measures are an inherent part of the actions that KE proposed in its 1997 Integrated Resource Plan and in other submittals to the PUC. The Commission subsequently approved several of KE's proposed programs, and the company is now implementing these to meet customer needs. The forecasts presented in Chapter 1 assume that these conservation measures will reduce energy use significantly. If they do not, the peak demand for electrical power in 2004 is expected to be at least 5 megawatts greater than would otherwise be the case.

KE's proposal to the PUC included all of the Demand-Side Management programs it believed were likely to be cost-effective. These include most "moderate" conservation measures. Consequently, this portion of the discussion was intended to address measures that are more "extreme" than those incorporated in KE's DSM programs (although there are probably a good number of persons in the community who would not consider reliance on natural ventilation or single household refrigerator extreme). On a personal level, I agree that air-conditioning is sometimes used inappropriately and that individuals and businesses are not always conservation-minded in their use of electrical power. KE's DSM programs are directed at changing some of that. Public education efforts funded by the State and Federal governments are also intended to make people more sensitive to practices that are wasteful of energy. At the same time, an environmental impact statement for a particular project is not the most appropriate venue for formulating and discussing the policies and programs needed to achieve these worthy goals. Instead, they are best addressed in the IRP process and through other public forums designed to address overall energy policy and formulate regulations.

Supply-Side Options

KE is pleased that you largely agree with its conclusions. My response addresses the "one glaring exception", discussing windpower first, then the reason why a coal unit was included in one of the illustrative plans presented in the DEIS.

The 1997 IRP does rate windpower highly. Unfortunately, because there are periods of calm, windpower cannot be relied upon to meet peak demand. Consequently, it is not a substitute for the fossil-fuel-fired generating technologies that could be accommodated at the Lihue Energy Service Center. Nonetheless, KE continues to be anxious to purchase electricity produced from windpower, hydroelectric, and solar sources. Such purchases are provided for under Schedule Q Modified of its official rates on file with the State Public Utilities Commission.

Page 8-9 of the 1997 IRP referenced in your letter is part of the report's discussion of individual scenarios (in that case the "Baseline Scenario"). The recommended plan is discussed in Chapter 9 of that report. Chapter 9 begins with a summary of the issues that KE faced in establishing its "Preferred Integration Resource Plan". This summary (reproduced below) highlights the uncertainties that KE faced and its philosophy in dealing with these.

Kawai Electric's preferred IRP is based on the results of the individual scenario analyses. The intent of the plan is to provide KE with the flexibility to move down a short-term path with the full understanding that the longer-term future is extremely uncertain. By attempting to capture these uncertainties through its scenario development, KE has developed a plan that will minimize its risks while maintaining a high level of service to its customers. As the future unfolds while KE moves toward securing the resources established in the preferred plan, the individual scenario plans will provide KE with information for comparison on an on-going basis. Should a scenario as contemplated by this IRP begin to materialize, KE will adjust its plan accordingly.

Based on the individual scenarios, the supply-side option that offers the lowest cost and flexibility to KE's system is a purchase of capacity and energy from an Independent Power Producer's (IPP) combustion turbine plant.... The IPP contract includes the flexibility to delay or move forward the installation date based on KE's demonstrated need.... The remaining supply options fall outside the immediate decision time frame suggesting a small diesel unit followed by a coal unit.

The 1997 IRP includes coal as an option in part because it provides an alternative to the petroleum fuels that are used by the remainder of the KE-owned generating units on the island. We included a coal unit in one of the two "illustrative site plans" presented in the DEIS because that technology raises issues that we thought it important to explore. As evidenced by the AES Barbets Point 180 MW fluidized bed generating unit located at Campbell Industrial Park, this is a clean-burning technology with a history of success in Hawaii.

Lihue Area Sites

The first sentence under this heading in your comment letter states that "...KE's Preferred Energy Center site behind the community college is from a community standpoint the least preferred". You refer specifically to the site's proximity to the Gaithinghouse Tunnel water source, an issue that is thoroughly discussed in the DEIS.

In preparing the DEIS we strove to take into account the kinds of land use implications that you referred to in your letter. This occurs throughout the document, but a good example may be found in the noise impact analysis (see, for example Section 4.11.4.1). We believe that both of the mauka sites (i.e., KE's Preferred Site and the Field 390 Site) have implications for uses

identified in landowner's conceptual master plan for the area and have identified these implications in the DEIS. However, the fact remains that the possible sites were approved by the landowner with full knowledge of its other development plans for adjacent areas. This certainly implies that they believe the economic impacts (which will accrue to the present landowner in terms of altering the "developability" of its property) are acceptable. The Airport Industrial Area Site consists of land that the State and County recently rezoned for general industrial use. This recent action is evidence that they believe an industrial facility such as the Lihue Energy Service Center is compatible with existing and planned uses of the area.

State and County agencies consistently employ the "area of use" in determining the jurisdiction for permitting on land in the State Agricultural District. Consequently, no new precedent would be set by developing the proposed facilities on either the Field 390 Site or KE's Preferred Site.

KE is not seeking "loopholes". Quite the contrary, it has gone out of its way to insure that the Lihue Energy Service Center undergoes comprehensive environmental review through the Chapter 343 EIS process. The height limits in the Kauai County Comprehensive Zoning Ordinance (CZO) are such that it simply is not possible to develop energy generation facilities of the sort under consideration without a variance regardless of the zoning district in which they are located. This is because the stack height needed to insure good dispersion of the exhaust gases exceeds 50 feet, which is the highest structure permitted as a matter of course in any zoning district (see CZO §8-6.5(O)).

Some generating technologies (e.g., diesel) would require variances only for the exhaust stacks. A fluidized-bed-generating unit is inherently larger; it would require a variance for the boiler building as well. The CZO provides for the possibility of exceptions through a variance process. Variances can be granted where it can be demonstrated that (a) a greater height is essential to the functioning of the development and (b) that no reasonable alternative exists. KE believes this is the case for its proposed facilities. In this regard, it is worth noting that some of its existing facilities at Port Allen have been granted such exceptions. KE must justify its request for deviations from the CZO development standards, and the County Planning Commission will make the ultimate decision to grant or reject its request.

We do not believe that the DEIS understates the impacts of using the fuels that would be consumed by the proposed facilities. Moreover, the Harbor Division's experience with coal at the Barbers Point Deep Draft suggests that coal is a "good" fuel with respect to potential accidental spills. Nonetheless, it is true that the DEIS did not attempt a detailed analysis of the harbor use issues you raised. There are several reasons for this:

- KE would not be the developer or provider of the fuel. Instead, it would contract with an independent supplier and would take delivery of the fuel at the power plant site. Consequently, it has no control over the means that the fuel supplier uses to fulfill its contract obligations to KE. In fact, given the possibility that the generating units on the Lihue Energy Service Center Site might be operated by more than one entity (if several Independent Power Producers located facilities there), the facilities might very well be served by two or more suppliers, each using its own facilities.
- Fuel suppliers could use new and/or existing facilities to supply fuel to the Lihue Energy Service Center. The extent of the additional development this would necessitate will depend upon many factors. These include the extent to which the suppliers have existing excess capacity, on the way they manage their facilities, and on the relationship between on-site and harbor fuel storage facilities.

- The DEIS discusses the additional fuel volume that would be required to operate the proposed facilities at full build-out. Only a small fraction of this would be needed initially, however. It would be several decades before the full amount would need to be accommodated. Many other uses of the harbor areas are likely to occur over the interim, and some of these would probably free space that is currently committed to other uses (e.g., bulk sugar handling).

Following receipt of your letter, we met with Mr. Fred Pasqua of the Harbors Division of the State Department of Transportation (February 23, 1999). Based on the information collected from the various sources, we believe that the liquid fuel needed to operate the proposed facilities could be unloaded using existing facilities if the land transport of fuel from the harbor-side storage tanks to the power plant sites is optimized for that purpose. Operators may wish to construct additional facilities in order to maximize the efficiency of their operations, but that is not essential. Any expansion of these facilities would be subject to normal State and County approval process, insuring the full public review of the plans.

Nawiliwili Harbor has sufficient wharf space to accommodate the additional along-side time that the fuel delivery barges would require. However, barge and tug operators would need to coordinate their deliveries with the Harbors Division to insure that conflicts with other harbor traffic does not occur during peak periods.


Summary

The DEIS lays out the reasons why KE believes it is in the community's interest to develop the Lihue Energy Service Center. The incremental additions you refer to would allow KE to meet its short-term commitments. In fact, that is why KE signed the purchase power agreement with KPP. However, KE believes that a single unit-addition would not meet the Kauai's long-term needs and that adding single units at multiple locations would result in higher electricity rates for its customers and greater overall adverse impacts on the island's residents, visitors, and businesses.

This does not mean that KE will not aggressively pursue DSM measures and the development of renewable energy sources. It will continue to do all of these. As noted on page 5-5 of the DEIS, KE will continue to explore renewable energy options whenever it updates its IRP. It will also be receptive to proposals from independent power producers who wish to provide electrical power generated using renewable resources. At the same time, it must proceed in accordance with its approved IRP, and that plan includes additional fossil fuel-fired generating capacity such as that provided by the Lihue Energy Service Center.

I hope the foregoing adequately responds to your comments. Once again let me say how much we appreciate the time and thought you put into them and the fact that you took the time to discuss issues with Dave Morgan and others before submitting them. We would be happy to meet with you to discuss the Lihue Energy Service Center further if you would find that helpful.

Sincerely,



Dave Morgan

Office of Environmental Quality Control
Dave Morgan, Kauai Electric

Barbara Pendragon, Kauai County Planning Department



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March 18, 1999



STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE
3949 DIAMOND HEAD ROAD
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January 26, 1999

BRUCE J. CAVITT
DIRECTOR OF CIVIL DEFENSE

ROY C. PRICE, Sr.
VICE DIRECTOR OF CIVIL DEFENSE

Mr. Roy C. Price, Sr.
Vice Director of Civil Defense
Office of the Director of Civil Defense
State of Hawaii
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

TO: Mr. Perry J. White
Planning Solutions, Inc.
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

FROM: Roy C. Price, Sr.
Vice Director of Civil Defense

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS),
LIHUE ENERGY SERVICE CENTER, LIHUE, KAUAI, HAWAII

We appreciate the opportunity to comment on Kauai Electric's Lihue Energy Service Center in Lihue, Kauai, Hawaii, TMK: 3-8-05: por. 3, Nawiliwili, Kauai, Hawaii; TMK: 3-8-03: por. 1, Hanamaulu, Kauai, Hawaii; and TMK: 3-7-02: por. 1, Hanamaulu, Kauai, Hawaii.

State Civil Defense (SCD) recommends that an Emergency Alert System (EAS) receiver be placed into a 24-hour manned area such as the security office or possibly the power control room. This recommendation is for any site selected.

If the airport industrial area site is selected, a 121 dB solar powered outdoor warning siren should be provided. The location to be determined by a committee composed of a KE representative, the developer of the industrial area, Kauai Civil Defense Agency, and SCD.

Our SCD planners and technicians are available to discuss any concerns you or the developer's staff may have. Please contact Mr. Norman Ogasawara of my staff at (808) 733-4300.

Dear Mr. Price:

Thank you for your January 26, 1999 letter regarding the Draft Environmental Impact Statement (DEIS) for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your comments. Your recommendations were thoughtful and to the point. I have discussed them with Mr. Norman Ogasawara of your staff and with representatives of Kauai Electric (KE).

Based on those discussions, KE has the following responses to your recommendations:

- (1) It will place an Emergency Alert System Receiver (EAS) into a 24-hour manned area.
- (2) Mr. Ogasawara indicated that the purpose of the siren you recommended for the Airport Industrial Area Site is to provide adequate warning for densely populated areas. He agreed that the Lihue Energy Service Center alone did not qualify as such an area. Instead, the need for the siren stems from the overall development of Amfac/JMB's Airport Industrial Area property. If it selects the Airport Industrial Area Site, KE will work with your agency, the Kauai Civil Defense Agency, and the developer of the industrial area to insure that adequate outdoor warning equipment is provided.

When KE begins preparing final construction plans for the Lihue Energy Service Center, members of its staff or its design consultant will contact Civil Defense for further discussions. In the meantime, if you have any questions concerning the proposed project, please call me at 593-1288.

Sincerely,


Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department



U.S. Department
of Transportation
Federal Aviation
Administration

Western-Pacific Region
Airports District Office

300 Ala Moana Blvd., Room 7-128
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PHONE: 808 593-1200
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March 18, 1999

February 2, 1999

Mr. Perry J. White
Planning Solutions, Inc.
1210 Aushi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

We have reviewed the Draft Environmental Impact Statement (EIS) for the
Kauai Electric Lihue Energy Service Center dated December 1998.

We have no comments on the Draft EIS; however, we note that proposed
structures at the Airport Industrial Area Site would fall within the
notice criteria of Federal Aviation Regulation (FAR) Part 77.13.
Therefore, a FAA Form 7460-1, Notice of Proposed Construction or
Alteration, would be required for any construction at this site.

If you have any questions, please call David Welhouse at 541-1243.

Sincerely,

Daniel S. Matsumoto
Daniel S. Matsumoto
Civil Engineer

cc: Ben Schlapak, DOTA

Mr. Daniel S. Matsumoto, Civil Engineer
Airports District Office
Western-Pacific Region
Federal Aviation Administration
U.S. Department of Transportation
300 Ala Moana Boulevard, Room 7-128
Honolulu, Hawaii 96850-0001

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Matsumoto:

Thank you for your February 2, 1999 letter regarding the Draft Environmental Impact Statement
(DEIS) for the proposed Lihue Energy Service Center. We appreciate the time you and your staff
spent reviewing the document and preparing your response.

We understand that you have no comments on the DEIS. We have informed Kauai Electric that
the proposed structures on the Airport Industrial Area Site would fall within the notice criteria of
Federal Aviation Regulation (FAR) Part 77.13. A FAA Form 7460-1, Notice of Proposed
Construction or Alteration, will be filed for any aboveground construction at this site.

If you have any questions or would like to discuss this further, please call me at 593-1288.

Sincerely,

Perry J. White
Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

SENT BY: COUNTY OF KAUAI

2-5-99 : 8:24AM : PLANNING DEPT.

8085931658: # 3

DEPARTMENT OF TRANSPORTATION



COUNTY OF KAUAI

STATE OF HAWAII '99 FEB -4 AM '98
DEPARTMENT OF TRANSPORTATION
808 PUNCHBOWL STREET
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STP 8.1963

February 1, 1999

Mr. Dee M. Crowell
Director
Department of Planning
County of Kauai
Subs 473, Building A
4444 Rice Street
Limea, Hawaii 96766

Dear Mr. Crowell:

Subject: Limes Energy Service Center
Draft Environmental Impact Statement (DEIS)
TMK: 3-8-5; 3-8-3; 3-7-2

Thank you for your transmittal requesting our comments on the subject project.

Our comments are as follows:

1. We anticipate that some roadway and intersection improvements may be required to accommodate the various vehicles and fuel trucks accessing the proposed facility from the State roads to maintain public safety and roadway capacity. After the final selection of the site, specific requirements should be coordinated with our Kauai Highways District Office.
2. If the Field 390 Site is selected, the DEIS recognized that because of the weight restrictions on the Maalo Road Bridge, fuel trucks will have to use the cane haul road to the site. However, another option maybe to strengthen the bridge to accommodate the heavy loads.
3. The applicant should be advised that if highway improvements noted in the Kauai Long Range Plan (and assumed to be in place at full build-out in the DEIS) do not materialize, their plans and expectations for roadway improvements may have to be reexamined.
4. Our Airports Division may also be submitting additional comments under separate cover.

SENT BY: COUNTY OF KAUAI

2-5-99 : 8:24AM :

PLANNING DEPT.

8085931658: # 3

Mr. Dee M. Crowell
Page 2
February 1, 1999

STP 8.1963

We appreciate the opportunity to provide comments.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation



**P L A N N I N G
S O L U T I O N S**

1110 KAUAI SQUARE SUITE 201
DUNEDIN KAUAI 96701
PHONE 808 533 1200
FAX 808 533 1050

March 18, 1999

Mr. Kazu Hayashida, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Hayashida:

Thank you for your February 1, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your comments. Specific responses to those comments are as follows:

- (1) Kauai Electric understands that some roadway improvements may be needed. It will coordinate these specific requirements with your Kauai Highways District Office once land use approvals have been received for a specific site.
- (2) If the Field 390 Site is approved, KE will consider Maalo Road as a possible access route in accordance with your suggestion. It understands that fuel truck use of this route could necessitate strengthening the existing Maalo Road Bridge.
- (3) Kauai Electric understands the uncertainty that exists with respect to the highway improvements identified in the *Kauai Long-Range Master Plan*. It will reexamine its plans if the absence of these improvements affects traffic related to its facility.
- (4) Thank you for informing us that the Airports Division may submit comments separately.

Thank you again for your comments. If you have any questions or would like to discuss the project further, please call me at 593-1288.

Sincerely,

Peppy J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Podragon, Kauai County Planning Department

SENT BY: COUNTY OF KAUAI

8:22AM

PLANNING DEPT.

8085931856

10

RAYNARD C. SOON
HAWAIIAN HOMES COMMISSION
STATE OF HAWAII



COUNTY OF KAUAI

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOMELANDS
PLANNING DEPT.

RAYNARD C. SOON
HAWAIIAN HOMES COMMISSION
STATE OF HAWAII

February 2, 1999

Mr. Dee M. Crowell
4444 Rice Street, Suite 473
Lihue, Kauai, HI 96766

Attn: Barbara Penderagon

Dear Mr. Crowell:

Subject: Draft Environmental Impact Statement, Kauai Electric,
Division of Citizens Utilities Company,
TKM 3-8-5103 por., 3-8-3101 por., 3-7-2101 por.,
Lihue, Kauai, Dated December, 1998

Thank you for the opportunity to review the subject application.
The Department of Hawaiian Home Lands has no comment to offer.

If you have any questions, please call Daniel Ornellas at
586-3836.

Aloha,

[Signature]

RAYNARD C. SOON, Interim Chairman
Hawaiian Homes Commission



PLANNING
SOLUTIONS

RAYNARD C. SOON
HAWAIIAN HOMES COMMISSION
STATE OF HAWAII

Mr. Raynard C. Soon, Interim Chairman
Hawaiian Homes Commission
Department of Hawaiian Home Lands
State of Hawaii
P.O. Box 1879
Honolulu, Hawaii 96805

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Soon:

Thank you for your February 2, 1999 letter to the Kauai County Planning Department regarding
the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service
Center. We appreciate the time you and your staff spent reviewing the document and preparing
your response.

We understand that your Department has no comments to offer concerning the project. Should
any questions relating to the Lihue Energy Service Center arise in the future, please feel free to
call me at 593-1288. I will try to answer them

Sincerely,

[Signature]
Barbara Penderagon

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Penderagon, Kauai County Planning Department

March 18, 1999



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FEB 2 1999

AMFAC.....



Amfac Sugar Kauai

The Lihue Plantation Co., Ltd. - Koloa Sugar Company, Ltd.
3970 Kele Street
Lihue, Hawaii 96766

February 2, 1999

Mr. Dee Crowell, Director
Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Crowell:

Subject: Lihue Energy Service Center Project
Draft Environmental Impact Statement

I have reviewed the Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center Project. I appreciate the effort that Kauai Electric has put into soliciting community input into possible locations for the proposed project. The company's willingness to investigate multiple sites and to include three of these as alternatives in the DEIS is admirable. This approach insures that public decision-makers have the information they need to make the best siting decision with respect to these important facilities.

The Draft Environmental Impact Statement does a comprehensive job of describing the alternatives and the effects that each would have on the surrounding environment. It indicates that the proposed facilities may have some adverse effects regardless of the site on which they are developed. This is to be expected for a project of this type. However, assuming implementation of the mitigation measures described in the DEIS, it appears that none of these potential adverse effects is likely to be significant.

The proposed Lihue Energy Service Center project offers numerous benefits that we believe more than offset the potential adverse effects identified in the DEIS. These include the following:

- The project would provide generating facilities closer to the center of Kauai Electric's load, thereby decreasing the cost caused by the "line losses" that occur when electricity must be transmitted over long distances.
- The Lihue Energy Service Center can accommodate the additional generating units that the utility will need to construct over the next several decades, not just the next several years. By obtaining a site suitable for long-term development, KE will minimize its staffing requirements, be able to share resources (personnel and equipment) between

Mr. Dee Crowell, Director
Page 2
February 2, 1999


multiple activities, and benefit from other economies of scale.

- The facilities that would be constructed on the Lihue Energy Center site would be able to accommodate a variety of fuels. This would increase the reliability of supply and allow the company to generate the electricity it needs using the lowest-priced fuel.
- The Lihue Energy Service Center provides space for a T&D facility to be co-located on the same property as generating facilities. Consequently, it would allow the company to share personnel and equipment between different functions and simplify administration of the facilities. Again, this will eliminate costs that must otherwise be passed on the KE's customers.
- Construction of the proposed project would allow the company to disperse its generating units, thereby reducing the damage that might be done to them by a single catastrophic event.
- Constructing the new generating facilities near Lihue would have two additional benefits. First, it would allow KE to make efficient use of its existing electrical transmission facilities (thereby avoiding the need to construct a new transmission line to Lihue). Second, it would help KE improve the quality and reliability of the service it provides to customers in the central and eastern portions of the island.

For the reasons outlined above, we believe your Department should accept the environmental impact statement that Kauai Electric has prepared. Furthermore, we encourage you to forward a positive recommendation concerning the land use approvals need for the project to the County Planning Commission. We support the proposed project at any of the three locations discussed in the Draft Environmental Impact Statement.

Sincerely,

AMFAC SUGAR KAUAI


Lyle Tabata
Vice President

cc: Office of Environmental Quality Control
Mr. Dave Morgan, Kauai Electric
Mr. Perry White, Planning Solutions, Inc.
Mr. Gary Grotke



**P L A N N I N G
S O L U T I O N S**

1111 Kalia Road, Suite 1000
Honolulu, Hawaii 96813
Tel: 808-955-1111

March 18, 1999

Mr. Lyle Tabata
Amifac Sugar Kauai
2970 Kele Street
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Tabata:

Thank you for your February 2, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and others at Lihue Plantation spent reviewing the document and preparing your response.

We are pleased that you have concluded that the *DEIS* does a comprehensive job of describing the potential effects of the various alternatives. Kauai Electric has asked me to extend its appreciation for your comments concerning the suitability of the three sites it is considering. It is also pleased that you recognize the benefits that the Lihue Energy Service Center would bring to Kauai.

If you have any further questions concerning the proposed project, please feel free to call me at 593-1288. Alternatively, you may speak to Dave Morgan at Kauai Electric (335-6233).

Sincerely,

Percy J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Prodrigon, Kauai County Planning Department



RECEIVED
FEB 5 1999

Am#.....

Linda Shigeta
2105 Ehu Place
Lihue, HI 96766

February 4, 1999

Honorable Governor Benjamin J. Cayetano
State Executive Offices
Hawaii State Capitol
Honolulu, HI 96813

Subject: Our future as the "Health State" The impact of the Lihue Energy Center.

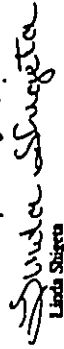
Dear Honorable Governor Benjamin J. Cayetano:

I am writing to you directly because I believe in your honest concern for the health and progress of the people of Hawaii. I was so impressed when Hawaii received the benefits of the positron emission tomography. Thank you for your involvement. I believe in your concern for our fragile ecosystem. Your concern for the Hamalei River is a prime example of your commitment to environmental issues. I believe in your concern for justice. Our Attorney General's record is impressive. I voted for you because of these qualities. In fact the majority of Kauai voters gave you their support in the fall of 1998.

I research you on behalf of the people of Kauai to take a good look at the Draft Environmental Impact Statement for the Lihue Energy Service Center prepared for Kauai Electric, a division of Citizens Utilities, Inc.

What we need to use on Kauai is a progressive state-of-the-art energy center, not one that is dependent on coal and petroleum and is situated almost directly on our municipal water source and tunnels. Our new middle school, now being constructed thanks to your efforts, Kauai Community College and the community of Puhi are down wind from the preferred site. The mountain range, depending on the wind, will hold this pollution over our children's lungs. I have asthma and also live and work in this area. The rationale for proceeding despite unavoidable adverse effects is not practical due to the location of our water sources and the air quality impacts. The proposed project will increase the release of greenhouse gases. The following is a quote from the Draft Environmental Impact Statement page 4-40: "The project-related emissions and changes in ambient air quality are expected to exceed the significance thresholds for some criteria pollutants and averaging periods for all site/generating technology combinations." There are other energy producing alternatives. Use our resources for technologies at U.H. to develop better energy efficient alternatives. Hawaii should become a leader in environmental technologies for the Asian Pacific region. Do not let this monopoly of our citizens utilities have its way. Please Honorable Benjamin Cayetano: moves Kauai into the twenty-first century with a healthy and clean environment. I believe in your ability and wisdom.

With warmest personal regards,


Linda Shigeta

cc: Planning Solutions (Attn: Perry White)
State Office of Environmental Quality Control
Honorable Mayor Maryanne W. Keolala
Honorable U.S Representative Patsy Mink



P L A N N I N G
S O L U T I O N S

.....
.....
.....

Ms. Linda Shigeta
2105 Ehu Place
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Ms. Shigeta:

Thank you for sending me a copy of your February 4, 1999 letter to Governor Cayetano regarding the Draft Environmental Impact Statement (DEIS) for the proposed Lihue Energy Service Center. I appreciate the time you spent reviewing the document and writing the letter.

Your letter clearly expresses your belief that Kauai Electric's proposed Lihue Energy Service Center does not constitute the kind of additional generating capacity you believe it should add. You also cite information contained in the DEIS as reason why KE should not develop facilities of this sort on its "Preferred Site".

The DEIS was not intended to argue for or against the proposed facilities or to favor one or another of the three sites KE is considering. Instead, it was intended to describe the alternatives KE is considering and the effects they are likely to produce. Where possible, it compares the forecast effects against established criteria to determine their significance and reports these findings. We believe it represents an accurate and comprehensive basis for decision-making.

As you know from your reading of the DEIS, KE is developing additional generating capacity only because it does not believe that Demand Side Management (DSM) programs can limit energy use sufficiently for it to forego new construction. While the Lihue Energy Service Center is a master-planned site that would have the ability to accommodate multiple generating units, these would be developed only when the State Public Utilities Commission confirms that they are needed. In the meantime, KE will continue to evaluate renewable resource alternatives and to be open to proposals from Independent Power Producers that wish to use such resources to supply the electrical energy needs of the island.

I would be happy to meet with you at your convenience to discuss your concerns. Please call me at 593-1288 if you would like to arrange this. Dave Morgan of Kauai Electric has asked me to reiterate his invitation for you to meet with him at your convenience to discuss KE's plans in more detail. You may reach him at 335-6233.

Sincerely,


Perry J. White

cc: Governor Benjamin J. Cayetano
Mayor Maryanne W. Keolala
Representative Patsy Mink
Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

March 18, 1999



Princeville Resort
K A U A I

COUNTY OF KAUAI

99 FEB -4 AM '96

February 2, 1999

PLANNING DEPT.

Mr. Dee Crowell, Director
Department of Planning, County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Re: Lihue Energy Service Center Draft Environmental Impact Statement
Kauai Electric

Dear Mr. Crowell:

We are writing to express our support for the referenced project, and to request your approval of one of the proposed locations specified in the Draft Environmental Impact Statement.

Location of the generating facilities closer to the north shore will reduce line losses that occur when transmitting electricity over long distances, which should result in cost savings to Kauai Electric and to its customers - especially large scale users such as Princeville Corporation. Minimizing transmission distances should also improve the quality of the power provided to north shore customers.

A location in Lihue will also avail the proposed generating facilities of already existing transmission lines, and provide improved accessibility to a variety of fuels, and other Lihue-based services. A second power generating facility in a different location will also provide some redundancy in the event of a natural disaster.

Overall, the proposal presents an opportunity to improve quality of service, reliability of service, and in the long run, to realize cost savings. We request that the Planning Commission grant the necessary land use approvals to construct the proposed facilities.

Very truly yours,

Michael Fallick
Director
Real Estate & Development

ms\dm\pcc\ccm

Princeville Corporation

P.O. Box 3040 • Princeville, Kauai, Hawaii 96722 • Telephone: 808 / 824-3040 • Fax: 808 / 825-7972



PLANNING
SOLUTIONS

March 18, 1999

Mr. Michael Y.M. Loo, Director
Princeville Resort
P.O. Box 3040
Princeville, Hawaii 96722

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Loo:

Thank you for your February 2, 1999 letter to the Kauai County Planning Department regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and others at the Princeville Resort spent reviewing the document and preparing your comments.

Kauai Electric has asked me to say that it is pleased that you support its efforts to establish the Lihue Energy Service Center. For reasons discussed in the *DEIS*, it strongly believes that it is in the best interest of its customers to have a second, centrally located generating station and to establish a centralized transmission and distribution facilities baseyard.

If you have any further questions concerning the proposed project, please feel free to call me at 593-1288. Alternatively, you may speak to Dave Morgan at Kauai Electric (335-6233).

Sincerely,
Popy Morgan

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

14

ATTN: Terry T. Mink

3134 KUHIO HIGHWAY, #23
LIHUE, HI 96766

February 4, 1999

Governor Ben Cayetano
Honolulu, HI

Dear Governor Cayetano:

I am most concerned over plans by Kauai Electric to build a huge power plant in Lihue, a.k.a. Lihue Energy Service Center Project. The power plant would be dependent on petroleum and coal fuel. According to the Environmental Impact Statement for this project, there would be polluting emissions coming from the plant, dirtying the air and harming our health. Already, Kauai is known as the asthma capital.

Further, the power plant will be built in Lihue, on top of large wells currently providing county water to the populace. The plant will require this water to generate electricity. This water is needed by the people and should be conserved for this sole purpose. Future water supplies cannot be guaranteed in this world of rapidly changing weather conditions.

One of the electric companies in Hawaii has pushed for the development of solar electricity (photovoltaic power) and has even asked customers to contribute to its development. Of course, this has not happened on Kauai.

Solar electricity should be encouraged in a much greater way because it works and is already proven practical. I myself am fortunate enough to have a solar electric setup for my own home. I am in no way dependent on Kauai Electric to furnish my electricity. I do not pay any electric bills because all my needs for electricity are met on my own home premises. I am also acquainted with other Kauai residents who rely solely on the sun for their electricity, with some living in photovoltaic luxury.

This means I am not contributing to any fossil fuel emissions which dirty our air and damage our health. It also means I am not contributing to any increased heavy truck traffic due to the daily shipments of fuel from Nawiliwili Port to the proposed Lihue power plant.

Plans for this new power plant notwithstanding, I have noticed increasing dirty air in the environment of our beautiful island. Once upon a time, it was possible to see Oahu from Kealia, Kauai. This is no longer possible, obviously due to air pollution. The ever increasing industrialization of first and third world countries as well as growing air traffic certainly seem to have their effects on Hawaiian air quality which is becoming more and more noticeable. Once the reds and oranges of our sunrises and sunsets were brilliantly bright and pure in color, but now have a

dirty brown caste, so very similar to that of Los Angeles. This new power plant will only add to the filth.

Solar electricity requires far great consideration in increasing our energy needs. Perhaps in the beginning, it could supplement established power sources. Other power sources need to be investigated such as hydrogen fuel cells, wind power and emerging developments of non-fossil fuel energy. The world is changing rapidly with many new wonderful developments looming on the horizon which must not be overlooked before we make regrettable decisions.

Governor Cayetano, I voted for you because you were instrumental in declaring our Hanalei River as an American Heritage River. I saw you take an interest in preserving our wonderful environment. Please take all necessary steps to maintain environmental quality by stopping this terrible power plant. Thank you.

Sincerely,

Janet Ashkenazy

Janet Ashkenazy

cc: Senator Daniel K. Akaka
Senator Daniel K. Inouye
Congressman Neil Abercrombie
Congresswoman Patsy T. Mink
Congressman Terry Nui Yeshinaga
Congressman Dwight Y. Takamine
Mayor Maryanne W. Kusaka
Councilman Bill Kaipo Asing
✓ Planning Solutions
State Office of Environmental Quality Control

RECEIVED AS FOLLOWS



PLANNING
SOLUTIONS

March 18, 1999

Ms. Janet Ashkenazy
3134 Kuhio Highway, #23
2105 Ehu Place
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Ms. Ashkenazy:

Thank you for sending me a copy of your February 4, 1999 correspondence to Governor Cayetano regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. I appreciate your concern for Kauai's environment and the time you spent reviewing the document and writing the letter.

Your comments are far ranging and are directed principally at the desirability of constructing additional fossil-fuel-fired generating capacity on Kauai rather than at the *DEIS*' assessment of potential impacts. However, some do address environmental impact issues, and we would like to address these below. The references are to the location in your letter to Governor Cayetano.

(1) Page 1, Paragraph 1.3rd Sentence. The proposed generating facilities would emit air pollutants. The nature of these emissions and the resulting ambient concentrations are described in Section 4.4 of the *DEIS*. While the emissions (which are in accordance with Federal and State air emissions standards) would increase ambient concentrations, the concentrations would remain below ambient air quality standards. Since these standards are designed to protect the health of sensitive individuals in the community, they would not "harm health" as you have stated.

(2) Page 1, Paragraph 2.1st Sentence. I presume that your statement that "...the power plant will be built in Lihue, on top of large wells currently providing county water to the populace..." refers to KE's preferred Puhi Site. If this is true, the statement is not completely accurate. KE's Preferred Site in Puhi is adjacent to the tunnels that comprise the Garlinghouse Tunnel complex; the site does not overlie those wells. This relationship is shown in Figure 3-1 of the *DEIS*. Moreover, the two other sites discussed in the *DEIS* are not over potable water wells.

(3) Page 1, Paragraph 2.2nd and 3rd Sentences. KE's plans for the Puhi Site do not involve the use of groundwater. Consequently, it would not affect the amount of water available to Lihue residents. Instead, development at the Puhi site would depend upon surface water that is not suitable for potable use. Consequently, the proposed project would not compete with the people as you have suggested.

(4) Page 1, Paragraph 2.4th Sentence. KE's plans call for the use of water sources that have been proven highly reliable. While it is true that no water supply comes with a guarantee, there is no evidence that climatic change or other factors will reduce the available water to the point where it would be impossible to operate the proposed facilities. This is not to say that KE has ignored the implications of its proposed water use. On the contrary, it has selected equipment (e.g., air-cooled condensers) that is not highly consumptive of water.

Page 2
Janet Ashkenazy
March 18, 1999

(5) Page 1, Paragraph 3. I am not sure which electric company in Hawaii you are referring to or the nature of its request for customers to provide financial support for the development of photovoltaic energy sources. However, there is no doubt that technology has evolved rapidly over the past two decades. Photovoltaic cells generate electricity only during the daytime. Consequently, they could not forestall the need for the kind of generating capacity planned for the Lihue Energy Service Center unless they were combined with an energy storage system (e.g., batteries, pumped hydro, etc.) that would make the power available during KE's peak use period (which occurs in the evening). The cost of such a hybrid system is presently prohibitively high. The cost of photovoltaic systems is continuing to decline, however, and economics may change in its favor in the future. KE's phased approach to the development of generating capacity provides the utility the option of taking advantage of such a system should this occur.

(6) Page 1, Paragraph 4. KE's Demand Side Management (DSM) program includes measures intended to promote the use of solar energy. Photovoltaic systems are not presently part of that program because they are not cost-effective. However, KE reevaluates the programs annually and reviews its entire DSM Program every three years as part of its Integrated Resource Planning (IRP). It has included photovoltaics in that evaluation in the past and will continue to do so in the future.

(7) Page 2, First Full Paragraph. There is no doubt that solar energy can play a substantial role in meeting the energy needs of Hawaii's people. As noted above, KE's existing DSM programs already include measures designed to encourage its customers to use it more extensively than they have done in the past. Nonetheless, solar energy sources are not presently capable of replacing the generating capacity that would be provided by the Lihue Energy Service Center.

I would be happy to meet with you at your convenience to discuss your concerns more fully. Please call me at 593-1288 if you would like to arrange this. Dave Morgan of Kauai Electric (335-6233) has asked me to reiterate his invitation for you to meet with him at your convenience to discuss KE's plans in more detail.

Sincerely,

Perry J. White

cc: Senator Daniel K. Akaka
Senator Daniel K. Inouye
Representative Neil Abercrombie
Congresswoman Patsy T. Mink
Governor Benjamin J. Cayetano
State Representative Dwight Y. Takamine
State Representative Terry Nui Yoshinaga
Mayor Maryanne W. Kusaka
Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

MARYANNE W. KUSAKA
VICE



DEE M. CROWELL
PLANNING DIRECTOR
SHEILAH N. MIYAKE
PLANNING DIRECTOR
1110 PHONE (808) 215-2111
FAX (808) 211-2111

PLANNING DEPARTMENT

15

MR. DENNY POLOSKY
VICE PRESIDENT & GENERAL MANAGER
Page 2
February 8, 1999

February 8, 1999

MR. DENNY POLOSKY
VICE PRESIDENT & GENERAL MANAGER
KAUAI ELECTRIC
4463 PAHA'E STREET
LIHUE, HI 96766-2032

SUBJECT: Draft Environmental Impact Statement (DEIS)
Kauai Electric Lihue Energy Service Center
THK 3-8-05: por. 3 Hanaliwili, Lihue, Kauai
THK 3-8-03: por. 1 Hanamaulu, Lihue, Kauai
THK 3-7-02: por. 1 Hanamaulu, Lihue, Kauai

We have reviewed the Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center. It is evident that extensive research and effort were expended in the development of the document. We thank Kauai Electric for agreeing to process this project pursuant to Hawaii Revised Statutes Chapter 343, which has allowed full public review of the project from the outset.

Thank you for addressing our comments regarding the Environmental Assessment/Environmental Impact Statement Preparation Notice (EA/EISP/N) within the DEIS. We have the following additional comments regarding the DEIS:

1. The subject Tax Map Keys for the three sites should be identified within the document as noted above.
2. Permits or approvals under Planning Commission jurisdiction required for all three sites may include a Use Permit, Variance Permit, Class IV Zoning Permit and Final Subdivision. A Special Permit is required for the Preferred Site and the Field 390 Site if the project area is under 15 acres. Please note that the Use Permit for the Airport Industrial Site would be required pursuant to Section 8-6.4 (b)(3) for inflammable chemical storage in the General Industrial District.

Kapole Building • 4444 Rice Street, Suite 473 • Lihue, Kauai, Hawaii 96766
AN EQUAL OPPORTUNITY EMPLOYER

COPY

3. Within the Impacts Evaluation Section, please clarify that a total of seventy-five employees for the project site is proposed and any effects anticipated.
 4. Please identify the volume and impact of the solid waste generated by the proposed facility (i.e. ash, limestone, etc.) on Kauai's landfill.
 5. Please evaluate the impacts of possible disruption to the proposed surface water supply for the Preferred and Field 390 Sites.
 6. Please discuss any impacts which may be associated with runoff from uncovered coal storage areas.
 7. Please be advised that further evaluation of impacts may be required for the proposed transmission line routes north toward Waialua and Kapa'a for the full build out scenarios.
 8. In comparing the relative impacts of the two generating scenarios, consideration should also be given to the difference in the generating capacity (150 MW vs. 119 MW).
 9. Possible effects of runoff or possible spills channelled to Kalapaki Bay or Hanamaulu Bay should be addressed in the document.
 10. Effects of noise from trucks on surrounding communities should be addressed.
 11. Several Resource Options identified in Table 5.6-1 appear to be competitive with the selected generating options. Re-evaluation of options prior to installation of Phase II generating capacity may be requested.
 12. Please note that tentative subdivision approval for the preferred site does not constitute approval for the proposed power plant use at that site.
- We commend Kauai Electric for their thorough effort in addressing the three potential sites for the proposed facility. Although Chapter 343 review is not required for this project, per mutual agreement, the permit application process will continue once a Final Environmental Impact Statement is accepted by the Department.

Mr. Denny Polosky
Vice President & General Manager
Page 3
February 8, 1999

Should you have any question regarding the above comments, please do not hesitate to contact myself or staff planner Barbara Pendragon.



DEE M. CROWELL
Planning Director

cc: Perry White, President, Planning Solutions
Gary Gill, Interim Director, Office of Environmental Quality Control



**P L A N N I N G
S O L U T I O N S**

March 18, 1999

Mr. Dee M. Crowell, Director
Planning Department
County of Kauai
Suite 473 Kapule Building
4444 Rice Street
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Crowell:

Thank you for your February 8, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your response. Responses to the twelve points listed in your letter follows below.

(1) This is an excellent suggestion. We will include the TMK numbers of all of the sites in Section 1.1 of the *Final Environmental Impact Statement (FEIS)*.

(2) We have included the information you provided concerning required permits in Section ES-7 of the *FEIS*.

(3) Section 4.13.2 of the *DEIS* describes the employment that would be generated by the proposed project. It states: "KE estimates that up to 30 persons could be employed at the generating component of the Lihue Energy Service Center at full build-out." The following paragraph of that section goes on to say: "As many as 45 persons could ultimately staff the T&D facilities. While some of these may represent additional employees, many would be transferred from existing locations. Consequently, they do not represent a net gain in employment." Hence, while it is anticipated that as many as 75 employees might eventually be based at the site, KE already employs the 45 workers who would work at the T&D Baseyard. We will clarify the discussion by revising it to read as follows:

KE estimates that up to 30 persons could be employed at the generating component of the Lihue Energy Service Center at full build-out. Far fewer persons, probably 6 to 10, would be needed for the first generating unit. More staff would be hired as additional units are brought on line. In some cases, an individual might split his or her time between the Company's Port Allen facilities and the new site, particularly in the early years when only a small number of the planned units are operating.

As many as 45 persons could ultimately staff the T&D facilities. While some of these may represent additional employees, many would be transferred from existing locations. Consequently, they do not represent a net gain in employment. Combining these, KE estimates that up to 75 workers may eventually be based at the facility.

Page 2
Mr. Dee M. Crowell, Director
March 18, 1999

(4) In accordance with your request, we have included a discussion of solid waste in the *FEIS*. The text of the discussion is reproduced in Attachment 1.

(5) **Physical Factors.** The surface water sources that would be used for KE's Preferred Site and for the Field 390 Site have minimum flows approaching 20 million gallons per day. This is an order-of-magnitude more than is needed for the proposed facilities. Consequently, there is little likelihood of an interruption stemming from inadequate source capacity. The surface water supply systems for these two sites include reservoirs, storage tanks, ditches, and underground pipelines. None of these is typically subject to catastrophic failure. Approximately 3 days of water storage would be provided on-site, assuring that short-term interruptions in the supply would not prevent the facility from generating power as planned. In addition, there are two different routes available to bring water from Kapaia Reservoir to the Field 390 Site. In an extreme emergency, it would also be possible to supply the site from DeMello Reservoir. Consequently, there seems little likelihood that a failure in the water supply system would significantly disrupt facility operations.

Legal Factors. KE's purchase agreement with Amfac/Lihue Plantation (LPCO) obligates the landowner to provide a source of water sufficient for the proposed facilities and easements for roads, electric lines, water lines, and other utility services needed to serve KE's facilities. A memorandum that the two parties are negotiating provides details concerning these rights. The agreement is intended to provide KE the first rights to any water in Kapaia Reservoir up to 1.5 million gallons per day (based on a twelve-month moving average). The right to this water (and other rights described below) would endure as long as the Field 390 Site is used for electric utility purposes.

The proposed agreement between Amfac/LPCO and KE grants KE non-exclusive rights to use the Lower Lihue Ditch (between Kapaia Reservoir and DeMello Reservoir). It also gives KE the non-exclusive right to use the flumes and ditch system connecting Kapaia Reservoir with the Field 390 Site. It stipulates that LPCO may not impair the naturally occurring flow of surface water into Kapaia Reservoir from the lands surrounding the reservoir. This restriction would be recorded either as a covenant running with the land or as an easement to protect KE's long-term use of the Field 390 Site for electric utility purposes.

The terms of the proposed agreement call for LPCO to continue to maintain Kapaia Reservoir, DeMello Reservoir, and the connecting ditches for as long as LPCO or its successors use the water in any of those reservoirs or ditches. However, it gives KE the right to have reasonable access to the lands on which the reservoirs and ditches are situated in order to repair and maintain the water system infrastructure in the event that LPCO is unable to keep them in usable condition. The proposed agreement allows KE to place cooling water and process discharge water from the Field 390 Site operations into DeMello Reservoir, and it prohibits Amfac/LPCO from taking any action that would jeopardize this use of DeMello Reservoir. LPCO would grant KE the easements required along with the right to install pipelines to connect the Field 390 Site to LPCO's reservoir/ditch system for the supply and disposal of water. Finally, the agreement provides that if LPCO no longer needs the Kapaia and DeMello reservoirs and/or ditches, KE will assume primary responsibility for maintaining and repairing the affected reservoirs and ditches.

6) Generating Alternative 2 includes a 25 MW coal-fired generating unit. In accordance with usual industry practice, the coal (approximately 10,000 tons) would be stored outdoors in a coal-pile area that allows the coal to be fed into the generating unit as needed. Coal pile

discharge consists of runoff from the surface of the pile and leachate that percolates through the coal. It is considered a wastewater and is handled accordingly.

Coal consists primarily of carbon, mostly in a complex organic matrix that is nearly insoluble in water. It also contains traces of numerous inorganic minerals, each with its own individual solubility characteristics. The runoff from coal storage piles can range from acidic to neutral to basic depending upon the specific makeup of the coal. Federal effluent regulations for coal pile runoff currently require that the pH and solids content be controlled or treated until the runoff volume reaches the equivalent of a 10-year, 24-hour storm. The pH of the treated coal pile runoff must be in the range of 6 to 9 pH units. The total suspended solids concentration in the runoff may not exceed 50 mg/l. KE would comply with this requirement, eliminating the potential for significant adverse effect.

The control of coal pile runoff would be among the measures implemented as part of an overall storm water pollution control plan (SWPCC) for the site. The plan, which would identify the "Best Management Practices" (BMPs) that would be followed, would be designed to minimize the discharge of pollutants in the stormwater. The BMPs consists of schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of State waters. BMPs also include treatment provisions, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

(7) KE understands that additional environmental documentation may be required before it undertakes the construction of electrical transmission lines to the north toward Waialua and Kapa'a.

(8) As discussed in Section 2.1 of the DEIS, the two generating alternatives were intended to illustrate the combinations of generating units that KE considers to be most appropriate for its system. You correctly note that the generating capacity of the two scenarios is not identical and request that consideration be given to the difference between these in the discussion of impacts.

In response to your comments, we have added the following paragraph to the end of Section 2.1. "Note: Because the electrical generating capacities of the two alternatives differ (150 MW for Alternative 1 versus 119 MW for Alternative 2), they are not directly comparable. In general, the differences are not substantial, and we felt that it would overly complicate the discussion if we were to attempt the comparison throughout the document."

(9) Existing State Department of Health regulations govern the control of runoff from industrial facilities such as the proposed Lihue Energy Service Center. Compliance with these regulations will require implementation of the measures developed as part of KE's overall storm water pollution control plan (SWPCC) for the site. These would prevent adverse effects on Kalapaki or Hanamaulu Bays because of normal operations.

Section 4.5.5 of the DEIS discusses the potential for leaks or spills because of operation of the proposed facilities. It describes the primary and secondary containment measures incorporated into the design. It also discusses the Spill Prevention Control and Countermeasures Plan (SPCC) that KE will prepare. Together, these measures are intended to minimize the likelihood of a spill and to maximize the probability that a spill would be adequately dealt with should it occur. If all of these measures were to fail, petroleum product would move down-slope toward the ocean. Both the Field 390 Site and Puhī Site (referred to as KE's Preferred Site in the DEIS) drain into stream valleys some distance

above the respective bays. Thus, there would be time to establish barriers above them to intercept petroleum products should a spill occur and escape the on-site controls. The fact that the petroleum fuels that would be used are at the lighter range of the spectrum means two things. First, they are lighter than water and would tend remain on the surface of the water, simplifying the containment and cleanup. Secondly, their volatility means that they will disperse relatively quickly into the atmosphere.

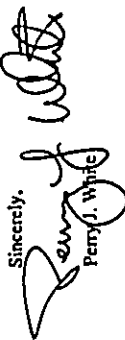
(10) Section 4.11.6 of the DEIS discusses noise from project-related traffic, including trucks.

(11) As discussed in the DEIS, KE constantly reevaluates the need for additional generating capacity and the kinds of capacity that are most appropriate. This is done independently and as part of the State PUC-mandated Integrated Resource Planning process. KE will submit the most current information from this process at the time it seeks approvals for later phases of the facility.

(12) KE understands that the preliminary subdivision approval for its Preferred Site does not constitute approval for the proposed power plant use.

We appreciate your comments concerning the thorough effort that has been made to address potential impacts associated with power plant development at each of the three sites that KE is considering. Your staff planners were extremely helpful to us as we prepared the report and deserve credit for their assistance. If you have any questions, please call me at 593-1288.

Sincerely,



Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric

Attachments:

(1) Solid Waste Impact Discussion

4.1.1 SOLID WASTE

4.1.1.1 Solid Waste from T&D Baseyard

As previously discussed, the T&D Baseyard facilities proposed for the Lihue Energy Service Center would accommodate activities that KE now conducts elsewhere on the island. Consequently, their operation would generate no additional solid waste and would not affect County landfill operations. The generating units do represent an additional use. Consequently, their operation does have the potential to increase the load at County landfills.

4.1.1.2 Solid Waste from Electrical Generating Facilities

Oil-Fired Generating Units. On the basis of its experience at the Port Allen Generating Station, KE anticipates that the 150 MW of oil-fired capacity and T&D Facilities included in Generating Alternative 1 would produce 1-2 cubic yards of municipal solid waste per day (approximately 10 cubic yards per week) at full build-out. KE estimates that Generating Alternative 2's oil-fired generating units would produce slightly less solid waste, but the difference would probably be no more than a few cubic yards per week. In accordance with its practice at Port Allen, KE would contract with a private solid waste management company for the collection and disposal of this refuse. The contractor would pick up the refuse once each week and haul it to the Kekaha Landfill for disposal. No hazardous material is present in this waste stream.

Coal-Fired Generating Unit. The coal-fired unit that is part of Generating Alternative 2 would produce substantially more solid waste, principally in the form of ash from the combustion process. The majority of the solid waste generated by a coal-fired generating unit of the sort KE is consists of ash and limestone from the fluidized-bed combustion process. The exact amount will depend upon the specific character of the coal that is available. Based on the probable coal consumption rate, between 10 and 15% of the fuel input is likely to wind up as ash. Based on estimates of the heat rate of the coal, the usage pattern of the unit, and other factors, it is likely that the 25-megawatt coal unit would generate approximately 1-2 tons per day of waste. This waste has not been classified as hazardous and generally can be land-filled so long as state leachate control regulations are met (Black & Veatch, 1996: 343). The properties of the ash are such that it is often suitable for use as an aggregate, and some facilities have even marketed the ash as a soil conditioner.



February 5, 1999

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RE: **Kauai Electric Lihue Energy Service Center
Draft Environmental Impact Statement December 1998**

Comments by: **Gaylord & Carol Wilcox, P.O. Box 19558, Honolulu, HI 96816
February 4, 1999**

Applicant: **Kauai Electric Division, Citizens Utilities Company**
Approving Authority: **County of Kauai, Planning Department**
Consultant: **Planning Solutions, Inc**
State Agency: **OEQC**

Dear County of Kauai and Citizens Utilities Company

As landowners of TMK 3-4-5-1, herein referred to as Kilohana, we wish to officially notify you that in the matter of the "Preferred" site for the proposed Lihue Energy Service Center we are "...directly and immediately affected by the proposed project..." as set out in Planning Commission Rules of Practice and Procedure 1-4-1(b) and wish to be considered an interested party. Please let us know if you need further information to verify that we qualify as an interested party.

We further respectfully notify you that if this project proceeds as presently stated at the "Preferred" site we will ask for a contested case and the highest level of review and compliance, as required under Chapter 343, Hawaii's Environmental Law and all other pertinent laws and rules. We ask that you avoid involving us all in costly and time consuming confrontation and possibly litigation. Certainly there can be few decisions more important than this one, which proposes to provide energy for all of Kauai well into the next century. This project warrants the highest level of planning and public participation, yet the applicant has not even consulted with the General Plan Update currently underway.

We urge the authority to not accept the Draft EIS. It appears to be deficient under the law.

It would appear from the DEIS that of the three sites considered site the Airport Industrial Site is by far the best. However, it would also appear that not enough attention was given to developing alternatives near Port Allen and Nawiliwili Harbor.

Kilohana is a historic homestead adapted to providing commercial, retail, agricultural, restaurant, group facilities and historic tour services for locals and visitors alike. We are within 2000 feet and directly down wind of the "Preferred" site. Our shops are all open air, in compliance with historic preservation standards. This gracious attraction depends on qualities of peace and quiet and tranquility. There is no question in our mind that the significant negative impact of this project (e.g. air and noise pollution, the real and perceived safety hazards, the visual impact) could cause Kilohana to go out of business. Despite this clear nexus, we could find no mention of Kilohana in the Draft EIS, nor were we consulted during the preparation process.

Besides affecting Kilohana, the project at the "Preferred" site will have significant negative impact on existing and approved commercial, residential and public purpose developments. These include Grove Farm Shopping Center, Grove Farm developments at Puhii, proposed and approved Puhii Public School and Park, Kauai Community College, Island School, German Hill, Lihue Plantation manager's house development, and the land immediately surrounding the "Preferred" site. Some of the existing uses are very old, such as at Kilohana, German Hill and the

Lihue plantation managers site, and those locations chosen by earlier settlers suggest the high value of these lands for urban development, incompatible with industrial development.

Siting at the "Preferred" site would not serve Kauai well in terms of attracting future investors. The significant negative impacts of this proposed industrial development ---safety, noise, air pollution, water pollution, traffic, and infrastructure ---would be in direct conflict with existing and planned developments in this area. We, and many others, have invested in Kilohana with the understanding that Kauai County, when it allowed the adaptive commercial use of this homestead, would maintain a safe and reasonable climate in which to conduct business. Surely those many others who have invested in the Puhii area have done so with the same assumption, be they homebuyer, private developers, or the State (e.g. new school at Puhii, Kauai Community College). Siting of the Energy Center at the "Preferred" site would signal to potential investors that Kauai County can not be relied on to maintain a healthy business and residential environment after the investor has committed their resources.

It is our recommendation that the authority direct the applicant, Kauai Electric, to amend the DEIS to:

- Include appropriate site selection criteria, which we assume would include siting near the port of fuel entry and minimizing impact on urban areas. Consequently, it would make sense for the authority to specifically require the applicant to develop in detail at least two additional alternative sites, one near Nawiliwili and one near Port Allen. Even the cursory treatment of these sites in the DEIS suggests they have strong advantages over the "Preferred" site (Justification based on the need for Lihue Plantation, Amfac/JMB to raise operating capital is irrelevant and inappropriate.)
- Communications: Coordinate and cooperate with the General Plan Update currently in progress. Require a process that includes and fully involves adjacent property owners such as ourselves in the ongoing discussion.
- Fuel delivery and storage: The DEIS describes 312 trips per day by tanker to the site and 21 days worth of fuel storage. The DEIS proposes routes to each site from Nawiliwili. However, the fuel arrives from Port Allen. The DEIS should disclose fully and in detail the method, safety, and cost of fuel delivery by tanker, cost to the state to maintain the highways, and impact on traffic and roadside developments relative to the transportation of fuel from both of the ports to each site. Disclose fully the safety hazards and proposed mitigation measures.

- Water: Disclose fully the potential negative impact at the "Preferred" site on Nawiliwili Stream, Kalapaki Beach and surrounding hotel and commercial facilities and proposed mitigation measures. Disclose fully the potential for ground water contamination.

The Draft EIS does not meet the intent or content requirements of as listed in HRS Chapter 343. The law is clear that an EIS should not be simply a self-serving recitation of the projects beneficial aspects. This DEIS is not an objective disclosure document; it does not include a rigorous exploration and objective evaluation of the environmental, social and economic impacts of the project; it is not written in a manner easily understood by the layman. In addition, it does not meet the specific requirements set forth in the "Draft & Final EIS checklist" which we attach herein, having circled those areas which we consider the DEIS to be deficient.

Again, we urge you to not accept this Draft EIS.

Gaylord & Carol Wilcox
Veronica DeStefano

**P L A N N I N G
S O L U T I O N S**

Page 2
Mr. Gaylord & Ms. Carol Wilcox
March 18, 1999

March 18, 1999

Mr. Gaylord Wilcox & Ms. Carol Wilcox
P.O. Box 19558
Honolulu, Hawaii 96816

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. & Ms. Wilcox:

Mr. Dave Morgan of Kauai Electric forwarded a copy of your February 4, 1999 letter commenting on the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. Dave and I both appreciate the time you spent reviewing the document, preparing your comments, and meeting with us on Wednesday, March 3, 1999 to discuss the issues you had raised. This letter addresses your concerns and is consistent with the approach we discussed in our meeting.

General

In both your letter and in our conversations, you indicated that your principal concerns were related to what the *DEIS* identified as "Kauai Electric's Preferred Site". (The *Final Environmental Impact Statement* will refer to this as the "Puhii Site".) As you know from our discussion and from your review of Section 1.3 of the *DEIS*, KE selected that site in the early 1990's following a comprehensive review of its siting options. In order to promote the broadest possible public review of the project, KE asked the County to request preparation of a Chapter 343 EIS even though one was not required. When the public raised concerns about the Puhii Site, KE expanded the *DEIS* to include the Field 390 and Airport Industrial Area Sites. The Field 390 Site was chosen as an alternative because it is not subject to several of the concerns raised about the original site (e.g., proximity to the Garlinghouse Tunnel water source). KE selected the Airport Industrial Area Site as an alternate because it is in an area that already has heavy industrial facilities, is in an area already impacted by airport-related noise, and is zoned for general industrial uses.

Based on the feedback it has received during public review of the *DEIS*, KE has decided to pursue land use and other permit approvals only at the Field 390 Site. KE will indicate its choice when it submits the *Final Environmental Impact Statement (FEIS)*. If the County accepts the *FEIS*, KE will initiate permit applications for the Field 390 Site and ask the County to suspend processing of its application for approval at the 17-acre "Puhii Site". KE does not intend to submit development applications for the Airport Industrial Area Site.

Response to Specific Comments

While it is our understanding that KE's selection of the Field 390 Site removes the most important of your concerns, I would like to address the issues you have raised with respect to the adequacy of the *DEIS*.

(1) Page 1, Paragraph 4. You indicate your belief that the Airport Industrial Area Site is by far the best, but you suggest that not enough attention was given to alternative locations near Port Allen or Nawiliwili Harbor. In fact, KE considered both these locations and found them wanting. It concluded that a location near the existing generating facilities at Port Allen would not address several of the objectives outlined in Section 1.6 of the report. Specifically: (i) it would not provide the geographic separation needed to reduce the damage that could be caused by a single catastrophic event, and (ii) it would not provide an opportunity to co-locate generation and transmission and distribution facilities. As discussed in Section 1.3.2.1 of the *DEIS*, the high terrain that lies close to Nawiliwili Harbor would make it difficult or impossible for generating facilities located there to meet ambient air quality standards.

(2) Page 1, Paragraph 5. Your statement concerning the absence of consultation with Kilohana during preparation of the *DEIS* is incorrect. Mr. Wilcox submitted a letter dated August 20, 1997 registering his opposition to the 17-acre Puhii site. A copy of that letter is included in the *DEIS*. In addition, Mr. Dave Morgan, KE's production manager discussed the project on several occasions with Mr. Fred Atkins, manager of Kilohana. We were aware of your concerns with respect to this wonderful homestead, and we made no attempt to minimize the effect that the proposed project would have on it. Discussions of visual, noise, transportation, and other effects all address the effect that construction and operation of the Lihue Energy Service Center would have on the areas and uses you mentioned.

(3) Page 2, First Full Paragraph. This paragraph of your letter attributes a multitude of adverse impacts to use of the 17-acre Puhii Site for the Lihue Energy Service Center, basing its argument on the information contained in the *DEIS*. The *DEIS* was not intended to justify the choice of a particular location for the proposed facilities. Instead, it attempts to present an objective discussion of the effects that likely to result from development of each of three sites. The fact that you cite freely from it in arguing against the use of the Puhii Site indicates that it has served its intended purpose well.

(4) Page 2, First Bulleted Item. The *DEIS* contains a detailed discussion of the site selection process that KE followed. This letter has already noted KE's reasons for rejecting Port Allen and Nawiliwili Harbor as practical locations for the Lihue Energy Service Center. Since both these locations are adjacent to existing urban development, neither would be consistent with your suggestion that the location minimize impact on urban areas.

(5) Page 2, Second Bulleted Item. As described in the *DEIS*, KE voluntarily held two public meetings to describe its proposed project and to solicit public comment on it. The State Office of Environmental Quality Control published a description of the project when the *EIS Preparation Notice* was issued and again following KE's decision to add the Field 390 and Airport Industrial Area Sites. KE has regularly provided information concerning the project to the Kauai County Planning Department for use in the General Plan Update. It has also volunteered to participate in the General Plan Update process in any manner the County desired. As previously noted, it has communicated regularly with Fred Atkins, Kilohana's manager.

(6) Page 2, Third Bulleted Item. The *DEIS* does not "... describe 312 trips per day by tanker to the site..." Table 4.10-3 and Table 4.10-4 provide detailed tabulations of the number of fuel truck trips that the facility would generate each day if it were fully developed (i.e., full build-

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Mr. Gaylord & Ms. Carol Wilcox
March 18, 1999

out) and operating at 100 percent capacity. They show that the facility would generate between 32 and 35 fuel truck round-trips per day at full build-out, not 312.

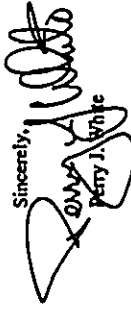
(7) Page 2, Third Bullet Item. KE presently obtains fuel from its Port Allen Generating through Port Allen. It would not use that same port-of-entry for generating facilities located in Lihue. Consequently, your statement that the fuel would arrive from Port Allen is incorrect. The petroleum-fired generating units that are described in the DEIS would burn diesel oil or naphtha (which has characteristics between those of diesel fuel and gasoline). Both gasoline and diesel fuels are used on Kauai now, and tanker trucks routinely transport those fuels throughout the island. The 35 tanker truck round-trips that the facility would generate when it is full built-out and operating at 100 percent of its design capacity would not impose significant wear and tear on the roadways of the island or measurably affect road maintenance costs.

(8) Page 2, Fourth Bullet Item. Section 4.5 of the DEIS discusses the effect that the Lihue Energy Service Center would have on ground and surface water resources. Section 4.5.5 discusses the potential for leaks or spills and the measures that are incorporated in the design to prevent them. While there is a remote possibility that a catastrophic failure could occur that might affect Kalapaki Beach, trying to describe the chain of events required to allow this is so conjectural that it cannot be done in an objective fashion.

(9) Page 2, Next-to-Last Paragraph. We do not agree with the assertion, which lacks specific documentation, that the DEIS does not meet the intent or content requirements listed in Chapter 343, HRS. It is most certainly not a "...self-serving recitation of the projects (sic) beneficial aspects." On the contrary, the document discusses all of the adverse effects that operation of the facilities would have on such things as noise levels, air emissions/quality, runoff, etc.

Thank you again for the effort you put into your review of the DEIS and preparation of your comments. I particularly appreciate your willingness to meet with Dave and me to discuss the concerns you outlined. If you would like to discuss any of these issues further, please call me at 593-1288.

Sincerely,



Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department
Mr. Ken Kupchak

LAND MANAGEMENT DIV.

ID:808-587-0455

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17



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AGRICULTURE, FORESTRY, RANGELANDS, AND WILDLIFE
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SOLUTIONS

Mr. Dean Uchida, Administrator
Land Division
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

March 18, 1999

Ref: PS:EH

FEB 6 1999

Mr. Perry J. White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center

We have reviewed the subject DEIS and offer the following comments:

1. The Preferred Site, according to FEMA Community Panel Map No. 150002 0201 C is located in Zone X. This is an area determined to be outside the 500-year flood plain.
2. The proposed Field 390 Alternate Site and Airport Industrial Area site, according to FEMA Community Map No. 150002 0140 D, are both located in Zone X. This is an area outside the 500-year flood plain.

Thank you for the opportunity to comment on the subject.

Very truly yours,

Dean Uchida
Dean Uchida,
Administrator

c.c. KDLO
Engineering Branch

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Uchida:

Thank you for your February 8, 1999 letter regarding the Draft Environmental Impact Statement for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your comments.

Your letter confirms that the three sites Kauai Electric is considering lie outside the 500-year flood plain. This information will be added to Section 3.3.1 of the report.

If you or your staff would like further information about the project, please call me at 593-1288.

Sincerely,
Perry J. White
Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department



LIFE OF THE LAND

Me Hana Ke Eo O Ke 'Aiea I Ke Aiea
Hawai'i's own Community Action Group
Protecting our Fragile Environment through
Research, Education, Advocacy and Litigation

February 8, 1999

Mr. Dave Morgan
Kauai Electric Division
Citizens Utility Company
4463 Pele'e Street
Lihue, Kauai 1 96766

Re: Lihue Energy Services Center
Draft Environmental Impact Statement

Aloha!

Life of the Land has reviewed the Draft Environmental Impact Statement for your proposed power plant. Mahalo for this opportunity to comment on it.

Our concerns are as follows:

1. The proposal to build yet another fossil-fueled burning power plant is, in our view, short sighted. Hawai'i needs to look toward more renewable and clean energy-producing resources. Kauai has the chance to lead the state in this technology with an innovative approach to power generation and transmission, and delivery. Making Kauai more dependent on foreign-oil will not help the economy grow or the self-sufficiency of the island be realized.
2. The planned expansion from the current 70-80 megawatt use to 120-150 megawatts is a matter of great concern to Life of the Land. What sources is such projected growth based upon? Can Kauai handle that growth sustainably?
3. We encourage a full airing of all the community concerns with proper, visible notice in the Oahu like News and community bulletin boards so the entire community understands the project and has input regarding the impacts of it.
4. The proposed trucking of fuel oil is a concern because of the traffic problems that Kauai is experiencing. How many trucks would it take per day, per week? What is your safety plan in case of an accident or oil spill? Please outline in detail your safety plan and contingency plans.
5. Please describe the plans for off-loading the fuel and the storage activities which would be involved in the anticipated off-site fuel unloading. What is the time line for these proposed facilities? Do you know what the safety plan is for the residents and the environment should an accident occur? Please describe.
6. Please describe more fully how you comply with the Office of Environmental Quality Control's Cultural Impact Guidelines. In particular, have you consulted Hawaiian practitioners?
7. How does this plan fit in with the distributed power system scenarios being advanced by energy planning theorists?

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8. How does this plan fit in with electric industry deregulation assuming that full wholesale and retail deregulation is ordered by the PUC? That is, assuming that this one very possible outcome does occur, how will your plan mesh with in the new multi-volter areas?

9. Will harbor expansion be needed to handle additional oil tankers at full build-out? How much will this cost? When these east coasts are added in, will this plan provide cheaper energy that relying on greater use of photovoltaics?

10. How much money is spent on foreign fuel sources to power Kauai Electric plants each year? The multiplier effect shows the total loss to the Kauai economy. How much is that? Factoring in those losses, are oil and coal still a better deal than solar?

11. What is the difference (pounds per chemical) between this proposal and equivalent photovoltaic systems over the lifespan of this facility?

Sincerely,

Henry Curtis

Henry Curtis
Executive Director



**P L A N N I N G
S O L U T I O N S**

March 18, 1999

Mr. Henry Curtis, Executive Director
Life of the Land
1111 Bishop Street, Suite 303
Honolulu, Hawaii 96813

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Curtis:

Thank you for your February 8, 1999 letter to Kauai Electric (KE) regarding the Draft Environmental Impact Statement (DEIS) for the proposed Lihue Energy Service Center. We appreciate the time you and other Life of the Land members spent reviewing the document and preparing your comments. Responses to the concerns expressed in your letter follow below. The numbering corresponds to that used in your letter.

1. KE understands your desire to reduce Kauai's dependence upon imported fossil fuels. It would prefer to meet all of the island's energy needs using renewable sources. It presently contracts with Lihue Plantation for 14 megawatts of generating capacity, and most of the energy that it obtains from that source is produced using bagasse, a by-product of sugar cane processing. In 1998, approximately 10 percent of all of the electricity that KE delivered to its customers, came from that source. In fact, because of the KE/Lihue Plantation collaboration and the availability of hydroelectric power, approximately 15 percent of the electrical energy used by KE's customers comes from renewable sources.

As discussed in the DEIS, KE has begun implementing an aggressive Demand Side Management (DSM) program. That program is designed to minimize the use of electricity and, therefore, to reduce the need to construct new generating capacity. KE adds capacity only when it cannot balance supply and demand by reducing the amount that its customers need to maintain their homes and businesses through DSM. When it does add capacity, it follows the Integrated Resource Planning (IRP) process mandated by the State Public Utilities Commission (PUC). That process includes strong consideration of renewable energy sources, but balances this against the cost to consumers.

2. In proposing to establish the Lihue Energy Service Center, KE is beginning a process that will secure a site on which additional generating capacity can be constructed as it is needed. The basis of the immediate need is discussed in Section 1.2 of the DEIS. Full build-out of the facilities will occur only if growth on the island necessitates it. That growth, which is regulated by State and County authorities, is driven by economic and social factors that are beyond KE's control. As the regulated public utility serving Kauai, KE is mandated by the PUC to meet its customers' needs. Thus, KE is not free to restrict the increase in generating capacity as a means of controlling growth.

3. KE has provided advance notices of the two voluntary public meetings it has held to both the print and electronic media. The *Garden Isle* newspaper has published several articles about the proposed project. The State of Hawaii Office of Environmental Quality Control (OEQC) has published formal notices of KE's intent to prepare an environmental impact statement

Page 2
Mr. Henry Curtis
March 18, 1999

and of the availability of the DEIS. It also published a separate announcement when KE decided to include the Field 390 Site and the Airport Industrial Area Site in the DEIS. KE received 37 letters in response to the EISP and 51 letters commenting on the DEIS, including many from members of the general public. Consequently, we believe that a "...fall airing of all the community concerns..." has already occurred.

4. Section 4.10 of the DEIS describes the number of truck-trips it would require to transport fuel from the harbor to the Lihue Energy Service Center at full build-out when it is operating at 100 percent of its design capacity. The fuel used by the proposed generating facilities would be delivered to the Lihue Energy Service Center site by the fuel supplier. The detailed safety and contingency plans are the responsibility of the fuel supplier. The activities needed to transport fuel from the harbor to the project site or similar to the activities in which the fuel suppliers are currently engaged. Consequently, it is likely that their contingency plans will be similar as well.

5. Fuel for the facilities would be purchased from a fuel supplier. The supplier would be responsible for delivering the fuel to the harbor and transshipping it from the harbor to the power plant site. KE anticipates that barges similar to those presently in use would be used to bring fuel to Kauai. Existing harbor unloading and temporary storage facilities have sufficient capacity to handle the fuel as it is off-loaded until it is transhipped to the site. Consequently, there is no need to construct additional harbor facilities to accommodate the project.

6. All three of the sites KE is considering have been intensively cultivated in sugar cane and other crops for most of the 20th century. They do not sit astride known or otherwise documented trails, and the biological surveys conducted for the project suggest there are no indigenous resources that might be used by native Hawaiian practitioners. In order to clarify this, the following is being added to Section 3.8.1 of the Final Environmental Impact Statement. "Results of the archaeological survey and review of historical documents did not indicate any existing use of the area by native Hawaiian practitioners. Moreover, no correspondence was received from any individual or group claiming such rights during the extensive consultation that accompanied planning and report preparation for the project. Consequently, no native Hawaiian gathering rights are believed to be exercised on the sites under consideration for the Lihue Energy Service Center."

7. The Lihue Energy Service Center is intended to accommodate phased development. Individual generating units would be installed only when they are needed and when the PUC and other approving bodies deem them appropriate. If the distributed generating systems being advanced by futurists prove practical, they can be developed instead of further development at this centralized site. Consequently, there is a good fit between the proposed project and such systems.

8. The Lihue Energy Service Center would fit very well with electric energy deregulation. In fact, the availability of sites suitable for future generating units would actually facilitate an effective response to such deregulation by providing third parties with reasonably assured and permitted sites for their facilities. This is evidenced by the fact that Kauai Power Partners (KPP), an independent power producer (IPP) under contract with KE to provide the next 26.4 MW of generating capacity, has made the Lihue Energy Service Center one of its principal siting options.

Page 3
Mr. Henry Curtis
March 18, 1999

9. No expansion of public harbor facilities will be needed solely to accommodate the proposed project.

10. In 1998, KE spent approximately \$15 million on fuel for its existing units. Most of the crude oil originated from foreign (i.e., non-U.S.) sources but was refined on Oahu. Information on that topic is proprietary, and so it is impossible to determine the precise split between domestic and foreign sources. Nonetheless, it is evident that considerable sums leave Kauai and the State in return for the fuel that is used.

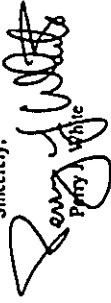
Calculating the effect that this has on the Kauai economy is not so simple as applying an economic multiplier. It is true that the money that industries spend locally has a multiplier effect as it ripples through the economy. Hence, other things being equal it is better to depend upon on-island/in-state resources than to import those resources. However, it is also true that the ability of Kauai's businesses to compete with producers (be they agricultural, tourism, hi-technology, or others) located elsewhere in the world depends upon the cost of doing business on Kauai and that expenditures for electrical energy constitute a substantial portion of those costs. Consequently, it is quite possible, even likely, that a policy that attempted to increase the use of "local" energy sources at the expense of a higher energy costs to KE customers who are in turn producers could make them uncompetitive. To the extent that this is true it would reduce, rather than increase, the amount of economic activity on the island.

The determination of the most appropriate mix of demand-side management and generating units (including the fuels that power them) takes place as part of the PUC-mandated Integrated Resources Planning (IRP) process. The first unit that would be constructed at the Lihue Energy Service Center will be KPP's 26.4 MW advanced steam-injected combustion turbine. The contract between KE and KPP for the purchase of power from that unit was approved by the PUC in 1998. In view of the fact that present forecasts indicate that subsequent capacity additions will not be needed until 2012 or later, there will be several opportunities for the PUC to review solar/fossil-fuel tradeoffs before subsequent generating units are developed on the site. KE is constantly reviewing its renewable options and will make them a priority consideration in its on-going planning. If energy technologies continue to evolve as energy planning futurists have suggested it might, renewable energy sources may be economically viable by the time KE needs additional capacity.

11. Fuel consumption by the generating technologies that KE considers most appropriate for the Lihue Energy Service Center are shown in Table 4.10-3 of the DEIS. This constitutes the vast majority of the chemicals that would be consumed by the project. The other chemicals that would be consumed on the site will depend upon the exact mix of generating units that are developed there. There are numerous different solar technologies. Each involves a unique mix of chemicals in the fabrication, operational, and deactivation/demolition phases of its life cycle. Moreover, because the materials and fabrication techniques that are used in the production of photovoltaic cells are evolving rapidly, it is not possible to provide information on those. Nonetheless, it is clear that both solar hot water heating and photovoltaic systems involve less on-island chemical handling than does fossil fuel-fired generation.

Page 4
Mr. Henry Curtis
March 18, 1999

Thank you again for the time you and other Life of the Land members spent commenting on the DEIS. If you have any further questions, please call me at 593.1288.

Sincerely,

Perry White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

19

PLANNING
SOLUTIONS



DEBRA B. YAMADA
Chairman

PAUL B. LORA
Commissioner

GEORGE S. PAL, Ph.D.
Commissioner



STATE OF HAWAII
PUBLIC UTILITIES COMMISSION
DEPARTMENT OF BUDGET AND FINANCE
465 S. KING STREET, #103
HONOLULU, HAWAII 96813

February 4, 1999

RECEIVED / CERTIFIED
DATE

March 18, 1999

Perry J. White
Planning Solutions, Inc.
1210 Aushi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Draft Environmental Impact Statement:
Lihue Energy Service Center

This letter is to acknowledge receipt of the subject draft. We have reviewed the report and have no comments. If you have any questions on this matter, please call me at 586-2020.

Very truly yours,

Paul Shigenaga
Administrative Director

PS:eh

c: Honorable Earl I. Anzel
Director, Department of Budget & Finance

Mr. Paul Shigenaga, Administrative Director
Public Utilities Commission
Department of Budget and Finance
State of Hawaii
465 South Beretania Street
Honolulu, Hawaii 96814

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Shigenaga:

Thank you for your February 4, 1999 letter regarding the Draft Environmental Impact Statement for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document.

We understand that the Public Utilities Commission has no comments at this time. If you desire any further information concerning the proposed project, please feel free to call me at 593-1288.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

DEPARTMENT OF WATER

County of Kauai

Water Use and Subsidies - Concern of COUNTY OF KAUAI

February 8, 1999

99 FEB -8 P3:08

PLANNING DEPT.

Mr. Dee Crowell, Planning Director
Planning Department, County of Kauai
4444 Rice Street, Suite 473
Lihue, HI 96766

Dear Mr. Crowell:

Subject: Draft Environmental Impact Statement for the Kauai Electric Lihue Energy Service Center, Lihue, Kauai, Hawaii

The County of Kauai, Department of Water (DOW) has reviewed the Draft Environmental Impact Statement (EIS) for the Kauai Electric Lihue Energy Service Center, dated December 1998. The main focus of our review has been directed toward the potential impacts of the project on water quality in general, and specifically with respect to potential impacts on existing and potential sources of potable water for the Lihue, Hanalei, and Pali water systems. Based on the information presented in the EIS, it is clear to the DOW that the Airport Industrial Area Site is the most appropriate of the three sites with respect to minimizing the potential for negative water resources impacts. The least desirable site, from a water resources protection perspective, is the so-called Preferred Site.

This conclusion is based on the following observations:

- The Airport Industrial Area Site is situated hydrologically down-gradient of, and at considerable distance from, all current or anticipated potable groundwater source areas. Therefore, water supply, wastewater disposal, and the project's potential for releases from fuel storage would not impact current or potential potable surface or groundwater sources.
- The Field 390 Site does overlie a potable water supply aquifer, and is in the vicinity of DOW water wells. Those wells are not presently in use; however, the DOW is currently proceeding with development plans for our Hanalei No. 3 and Pukaki wells, and is considering development of our Hanalei No. 2 well. Additional wells in the Hanalei area are planned; however, new facilities could likely be situated up-gradient of the Field 390 Site to minimize potential impacts. At this site, the potential for negative impacts to existing DOW facilities would be significantly lower than at the "Preferred Site", but there would continue to be potential for negative impacts from the project to potable groundwater resources.
- The so-called "Preferred Site" is in close proximity to, and up-gradient of, the Garlinghouse Tunnel, a critical existing major potable water source for the Lihue Water System. The DOW has major concerns regarding disposal of both process and sanitary wastewater at this site, and considers the potential for undetected releases from fuel storage facilities to constitute a significant long term threat to the future viability of the Garlinghouse Tunnel water source.

Mr. Dee Crowell

Subject: Draft Environmental Impact Statement for the Kauai Electric Lihue Energy Service Center, Lihue, Kauai, Hawaii
February 8, 1999
Page 2

We have the following comments on the content of the draft EIS, and offer the following information regarding existing and planned DOW facilities:

- In the executive summary of the draft EIS, a table of Expected Impacts is presented. The proximity of the Garlinghouse Tunnel to the Preferred Site is indicated; however, the table appears to minimize the potential for significant impacts to this critical public facility. Perhaps contamination of this potable water source is not an "expected" impact, but if this site is selected, a fuel storage tank farm would be constructed in near proximity and up-gradient of the Garlinghouse Tunnel. We believe that this potential hydrologic and public facility impact should not be minimized. We acknowledge that current construction methods and comprehensive performance monitoring may mitigate potential releases from fuel storage tanks; however, it is our understanding that the vast majority of fuel tank farms in the State of Hawaii, and the United States in general, are sources of subsurface contamination.
- The chemicals and solvents expected in the process wastewater and reliance on the discharge of effluent to irrigation water is of concern at both the Preferred Site and Field 390 Site. Such irrigation water is a component of groundwater recharge, and reliance on this method of disposal may create the potential for groundwater contamination and loss of existing and future drinking water sources for the Lihue and Hanalei areas.
- The DOW is highly critical of the potential hydrological impacts to the Garlinghouse Tunnel potable groundwater source that is located down-slope and approximately 400 feet from the Preferred Site. The Garlinghouse Tunnel water source is equipped with two 800 gallon per minute pumping units and provides at least 34% of the current Lihue water system source capacity. The Garlinghouse Tunnel produces from a high-level ground water aquifer, as opposed to deep wells that pump water from hundreds of feet below the ground surface. The ground water surface at the Garlinghouse Tunnel (196 feet msl elevation) is approximately 100 feet beneath the Preferred Site. The Department's concern for potential contamination and loss of this nearby potable ground water source is paramount.
- Beside the Garlinghouse Tunnel source, the Department currently operates six other ground water well sources within one-half mile from the Preferred Site. Pump capacity from these wells represent 53% of the total pump capacity for the Lihue-Hanalei water systems.
- There are two ground water well sources located within 0.6 mile from the Field 390 Site. Hanalei Well No. 1 is located approximately 800 feet north of the Field 390 Site and Hanalei Well No. 2 is located approximately 3,000 feet west of the Field 390 Site. The DOW is currently considering development of Hanalei Well No. 2 as a production well. At present, there are no plans to put Hanalei Well No. 1 into production, but development is proceeding for the recently completed Pukaki Well and Hanalei Well No. 3. The DOW is considering future

Mr. Dee Crowell
Subject: Draft Environmental Impact Statement for the Kaula Electric Lihue Energy Service Center,
Lihue, Kauai, Hawaii
February 8, 1999
Page 3

ground water well development in the area north of Hanalei. Future groundwater well fields may include lower capacity, shallower and closer spaced wells (100 gpm - 200 gpm).

6. The DOW recommends that prior to the final subdivision approval and building permit approvals for either the Preferred Site, or the Field 390 Site by the Department of Water, the applicant must submit a detailed hydrogeologic study conducted by a reputable geologist for Department of Water approval. This report shall be based on actual test borings, sufficient in number to determine the hydrogeologic characteristics of the site. It has been our experience that hydrogeologic reports are often highly subjective. The DOW will not accept any highly subjective report.

We appreciate the opportunity to submit our comments on this phase of the project. The Department of Water anticipates that as detailed plans are prepared and submitted for building permit approval, further comments and conditions may be established. Should you have any questions, please feel free to call me at (808) 245-5408 or Gregg Fujikawa of my staff at (808) 245-5416.

Sincerely,



Ernest Y. W. Lan
Manager and Chief Engineer

GH/ET:rm
c: Planning Solutions, Inc., 1210 Auahi Street, Suite 221, Honolulu, HI 96814
Kaula Electric Division, 4463 Palae Street, Lihue, HI 96766-2032
Office of Environmental Quality Control, 236 S. Beretania Street, Honolulu, HI 96813.
Letters12/EIS:rm



PLANNING
SOLUTIONS

March 18, 1999

Mr. Ernest Y.W. Lau, Manager & Chief Engineer
Department of Water
4398 Pua Loke Street
Lihue, Hawaii 96766-5706

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Lau:

Thank you for your February 8, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your comments. Let me begin by saying that Kauai Electric (KE) has taken your concerns about water resources very seriously. They are one of the principal reasons why we have decided to suspend its efforts to obtain approvals for the Puhii Site. Instead, it will concentrate its efforts on the Field 390 Site.

Responses to the numbered points in your letter follow below.

1. The *DEIS* does not minimize the seriousness of concerns related to the Garlinghouse Tunnel water source. Section 4.5.4.1 discusses issues related to the disposal of sanitary wastewater. Section 4.5.5 discusses potential leaks or spills. It states that fuel oil will be trucked to, stored within, and piped around the site to the various generating units. It notes that effective fuel containment measures will be required to avoid contaminating groundwater or surface water. It stipulates that double-liner systems with alarms would be employed at whichever site is ultimately chosen. It discusses the Spill Prevention Control and Countermeasure (SPCC) that KE would prepare in accordance with Federal and State rules and regulations. The *DEIS* concludes that the proposed facilities and procedures would make fuel leakage from the facility highly unlikely, but not impossible. It also states that the Puhii Site has the greatest potential to affect Lihue's water supply adversely.

You do not indicate the source of your statement that the "...vast majority of fuel tank farms in the State of Hawaii and the United States in general are sources of subsurface contamination." This is not consistent with electric utility experience in Hawaii. Moreover, it is inappropriate to base judgments about facilities being constructed to today's very stringent standards with experience from facilities constructed decades ago.

2. As described in Chapter 2 and 4 of the *DEIS*, chemicals used in periodic cleaning and for other purposes would not be discharged into the irrigation system. Instead, they would be collected and transported off-site for appropriate treatment and disposal. Only materials that the State Department of Health considers safe for agricultural reuse would be released back into the irrigation system.

3. As indicated above and as stated in the *DEIS*, potential adverse effects on the Garlinghouse Tunnel water source are of concern to KE as well. It expended considerable effort

Page 2
Mr. Ernest Y.W. Lau
March 18, 1999

assembling information on the kinds of leak detection and containment measures that would be used. It provided this information to you in December 1997.

4. The *DEIS* lists water sources near the three sites that KE is considering.

5. Thank you for confirming the names and locations of the wells that are located within 0.6 miles of the Field 390 Site. These facilities are described in Sections 3.3 and 4.5 of the *DEIS*. We appreciate your confirmation of the DOW's water development plans near the Field 390 Site.

6. KE will provide an objective hydrogeologic report before seeking final subdivision approval or building permits.

If you have any further questions, please call me at 593-1288 or speak with Dave Morgan, Kauai Electric's Production Manager, at 335-6233.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

SENT BY: COUNTY OF KAUAI

: 2-8-99 : 9:41AM : PLANNING DEPT. ~

005971858:RA



Ventura Development Corporation
COUNTY OF KAUAI

99 FEB -8 P2:38

PLANNING DEPT.

February 8, 1999

Mr. Dee Crowell, Director
Department of Planning
County of Kauai
4444 Rice Street, Suite 473
Lihue, Kauai, Hawaii 96766

Subject: Lihue Energy Service Center Draft Environmental Impact Statement

Dear Mr. Crowell:

As a developer on Kauai for the past 20 years, my company is most interested in the availability, cost, and quality of electric power required for the planned growth of the Island of Kauai. A review of subject Impact Statement indicates a clear need for the Lihue Energy Service Center not only to meet future demand, but also to manage cost, power quality and emergency preparedness. We recommend that the County Planning Department accept Subject Impact Statement on the site referred to as Field 390 and the County Planning Commission grant the land use approvals needed to construct the proposed facilities.

Your consideration of our comments is appreciated.

Sincerely,

M.C. Ventura
M.C. Ventura
President

PLANNING
SOLUTIONS



Mr. M.C. Ventura, President
Ventura Development Corporation
4463 Pahe'e Street
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Ventura:

Thank you for your February 8, 1999 letter to the Kauai County Planning Department regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments.

Kauai Electric (KE) has asked me to say that it is pleased that you support its efforts to establish the Lihue Energy Service Center. For reasons discussed in the *DEIS*, it strongly believes that it is in the best interest of its customers to have a second, centrally located generating station and transmission and distribution facilities baseyard.


Your letter stated a preference for the Field 390 Site identified in the *DEIS*. Consequently, I am sure that you will be pleased to know that KE has decided to pursue land use approvals for that alternate site that if the County accepts the *Final Environmental Impact Statement*. It will ask the County to suspend processing of its application for the original site near Puhi.


If you have any further questions concerning the proposed project, please feel free to call me at 593-1288. Alternately, you may speak to Dave Morgan at Kauai Electric (335-6233).

Sincerely,
Perry J. White
Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

March 18, 1999

SENT BY: COUNTY OF KAUAI : 2- 8-99 : 9:42AM : PLANNING DEPT. - 8065931958: # 5
02-08-99 01:43PM FROM ASB PROPERTIES INC. TO PLANNING DEPT. 700: 


P L A N N I N G
S O L U T I O N S

March 18, 1999

A & B PROPERTIES, INC.

February 8, 1999

Mr. Dee Crowell, Director
County of Kauai
Planning Department
4444 Rife Street, Suite 473
Lihue, HI. 96766

Subject: Lihue Energy Service Center
Draft Environmental Impact Statement

Dear Mr. Crowell:

I am writing to you to urge the acceptance of the DEIS for the subject project which has been submitted to your department.

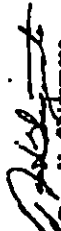
Hurricane Iniki proved how vulnerable we are and how crippling an effect such devastation can cause on businesses and the lives of residents of Kauai. Without power, everything virtually comes to a halt and no matter how resilient we try to be, it just creates so much burden to everyone living and working here.

From the business perspective, a reliable power generating source is a must to prevent disruption to our operations. The new service center aims to provide this continuity. ASB Properties, Inc. understands and appreciates the efforts of Kauai Electric to enhance its serviceability to its customers.

As a lifelong resident of Kauai, it behooves me to implore your Department's consideration for the various permits necessary to effacinate the center. I know that issues related to health and safety concerns will and have been raised. However, in my experiences with the establishment of a generating power plant, it is important to understand that federal and state standards need to be complied with before such a facility is approved. If these standards cannot be met then the facility in all likelihood cannot be built.

For the foregoing, I ask that the Planning Department accept the DEIS and approve whatever land use permits are necessary for the new service center. Thank you for your consideration.

Sincerely,


Tom H. Shigemoto
Vice President

cc: Mr. Dennis K. Polcaky, Kauai Electric

Mr. Tom H. Shigemoto
A & B Properties, Inc.
P.O. Box 430
Koloa, Hawaii 96756

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

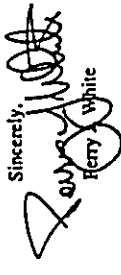
Dear Mr. Shigemoto:

Thank you for your February 8, 1999 letter to the Kauai County Planning Department regarding the Draft Environmental Impact Statement (DEIS) for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments.

Kauai Electric (KE) has asked me to say that it is pleased that you support its efforts to establish the Lihue Energy Service Center. For reasons discussed in the DEIS, it strongly believes that it is in the best interest of its customers to have a second, centrally located generating station and transmission and distribution facilities baseyard.

If you have any further questions concerning the proposed project, please feel free to call me at 593-1288. Alternately, you may speak to Dave Morgan at Kauai Electric (335-6233).

Sincerely,


Dave Morgan
Barbara Pendragon, Kauai County Planning Department

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

P.O. Box 4, Hilo, Hawaii 96721 • (808) 935-2500 • FAX (808) 935-2501
A member of the Hawaiian Telephone System

RECEIVED AS FOLLOWS

SENT BY: COUNTY OF KAUAI : 2-9-99 : 9:42AM : PLANNING DEPT. : 808593195518
PUBLIC WORKS OFFICE : 335-4683 : FEB 11 15:01 No. 006 P. 02



PLANNING SOLUTIONS



DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. BOX 128
KAKAHA, HAWAII 96757-0128

11390
601 7031 0097
88 FEB 11 15:01

March 18, 1999

County of Kauai
Department of Planning
Attn: Mr. Des Crowley
4644 Rice Street, Suite 473
Lihue, Kauai, HI 96766

RE: KAUAI ELECTRIC'S LIHUE ENERGY SERVICE CENTER PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Dear Mr. Crowley:

The Draft Environmental Impact Statement for the Lihue Energy Service Center Project was made available to the Pacific Missile Range Facility for comments. The alternative and effects of the project were described. It appears that upon accomplishment of the mitigating measures there will be no significant effects at the Pacific Missile Range Facility.

Construction of the project would result in more efficient use of equipment and personnel, lower the cost of fuel, and thus generate cost savings to the customer. The additional generating units will also assist in a faster recovery from emergencies due to events such as hurricanes. As a major power user, we support Kauai Electric's proposed project and encourage you to grant the land use approvals necessary for the construction.

If there are any questions, please contact Mr. Christine Monaka of my staff at (808) 335-4630.

Sincerely,
J. S. Fitzgerald
Lieutenant, USN, U.S. Navy
Public Works Officer
By direction of the
Commanding Officer

Lieutenant J.S. Fitzgerald
Public Works Officer
Pacific Missile Range Facility
P.O. Box 128
Kakaha, Hawaii 96757-0128

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Lt. Fitzgerald:

Thank you for your February 8, 1999 letter [your reference 11300/Ser 7031.2/0097] to the Kauai County Planning Department regarding the Draft Environmental Impact Statement (DEIS) for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments.

Kauai Electric (KE) has asked me to say that it is pleased that PMRF supports its efforts to establish the Lihue Energy Service Center. For reasons discussed in the DEIS, it strongly believes that it is in the best interest of its customers to have a second, centrally located generating station and transmission and distribution facilities baseyard.

If you have any further questions concerning the proposed project, please feel free to call me at 593-1288. Alternately, you may speak to Dave Morgan at Kauai Electric (335-6233).

Sincerely,
Dave Morgan
Dave Morgan

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

PLANNING DEPT.
99 FEB-8 P3:22
COUNTY OF KAUAI

SENT BY: COUNTY OF KAUAI

PLANNING DEPT. -

808593195918

2-9-99 : 8:43AM :



PLANNING
SOLUTIONS

FEB-09-99 10 53 FROM: CHEV HAWAII

ID: 89-1212410

March 18, 1999



February 8, 1999

Chevron Products Company
1271 Kalia Street
P.O. Box 1000, Suite 1000
Honolulu, HI 96813

Brant Fish
Marketing Manager
Phone No. 808 527 2714
Fax No. 808 527 2410

Mr. Don Conwell, Director
Department of Planning - Kauai County
4444 Rice Street, Suite 473
Lihue, Kauai, HI 96766

Dear Mr. Conwell:

This letter in regards to Kauai Electric's proposed Lihue Energy Service Center. We would like to recommend that the County Planning Department accept the Draft Environmental Impact Statement prepared by Kauai Electric. Our company supports Kauai Electric in their efforts to better serve their customers. The proposed Lihue Energy Service Center would provide numerous benefits to the people on Kauai.

- There would be less likelihood of "line loss" as the Center would be closer to areas with higher electrical demands.
- Transportation of fuels could be more easily secured, thereby increasing reliability of the fuel supply and enabling Kauai Electric to acquire the lowest priced fuel to generate electricity.
- The proposed new facilities would be able to accommodate Kauai's power needs in the long term. Personnel and equipment could be shared on the same property. More efficient use of the existing transmission facilities could be made. All of these are benefits to the customers in terms of cost savings.
- Generating units in Lihue would disperse power generation, which would be extremely important should a hurricane or other catastrophe occur.

We hope you, too, will agree with the need for the Lihue Energy Service Center. We and the you grant the land use approvals necessary for the construction of the proposed facilities. Should you have need to contact me, I can be reached at 527-2714.

Sincerely,
Brant Fish
Brant Fish

COUNTY OF KAUAI
FEB -8 P3 22
PLANNING DEPT.

RECEIVED AS FOLLOWS

Mr. Brant Fish
Chevron Products Company
Pauahi Tower, Suite 1000
1001 Bishop Street
Honolulu, Hawaii 96813

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Fish:

Thank you for your February 8, 1999 letter to the Kauai County Planning Department regarding the Draft Environmental Impact Statement (DEIS) for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments.

Kauai Electric (KE) has asked me to say that it is pleased that Chevron supports its efforts to establish the Lihue Energy Service Center. For reasons discussed in the DEIS, it strongly believes that it is in the best interest of its customers to have a second, centrally located generating station and transmission and distribution facilities baseyard.

If you have any further questions concerning the proposed project, please feel free to call me at 593-1288. Alternately, you may speak to Dave Morgan at Kauai Electric (335-6233).

Sincerely,
Percy J. White
Percy J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

SENT BY: COUNTY OF KAUAI

: 2- 9-99 : 9:43AM : PLANNING DEPT. *

805931858: # 8

CONTRACTORS ASSOCIATION OF KAUAI

4231 Ahukini, Lihue, Kauai, Hawaii 96766
Phone (808) 248-0842 (FAX) (808) 248-8642



P L A N N I N G
S O L U T I O N S

March 18, 1999

'99 FEB -8 P2:46

PLANNING DEPT.

February 5, 1999

- Presidents:
Michael Pankras
Grove Farms Co.
- 1st Vice-President:
Andy Riggs
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Constructors

- Roy Takemaki
Roy Takemaki
Construction

- Steve Rogers
GTB Hawaiian Tel

Mr. Dee Crowell, Planning Director
County of Kauai
4444 Rice Street, Suite 473
Lihue, HI 96766

Dear Mr. Crowell:

RE: Lihue Energy Service Center, Draft EIS

The Contractors Association of Kauai's Board of Directors are in support of the Draft Environmental Impact Statement for the Lihue Energy Service Center being sought by Citizens Utilities Company, Kauai Electric Division.

There needs to be a new generation facility closer to Lihue and Kapa'a, Kauai's largest consumption districts. The Draft EIS adequately discusses three locations that are close to urban areas.

Our association likes the mitigation aspect of the proposal so that Port Allen does not have to be relied on so heavily. Having two major generation centers will add to system reliability and public safety.

We believe this project is vital to the residents and businesses of Kauai and we ask for your support in approving the Draft Environmental Impact Statement. Further, we would like to encourage the Planning Commission to expedite land use approvals so timely construction can begin. This kind of construction project will help stimulate the industry and Kauai economy.

Sincerely,
CONTRACTORS ASSOCIATION OF KAUAI

Michael H. Furukawa
President

Mr. Michael H. Furukawa, President
Contractors Association of Kauai
4231 Ahukini
Lihue, Kauai 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Furukawa:

Thank you for your February 5, 1999 letter to the Kauai County Planning Department regarding the Draft Environmental Impact Statement (DEIS) for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments. Kauai Electric (KE) has asked me to say that it is pleased that the Contractors Association of Kauai supports its efforts to establish the Lihue Energy Service Center. For reasons discussed in the DEIS, it strongly believes that it is in the best interest of its customers to have a second, centrally located generating station and transmission and distribution facilities baseyard.

If you have any further questions concerning the proposed project, please feel free to call me at 593-1288. Alternately, you may speak to Dave Morgan at Kauai Electric (335-6233).

Sincerely,

Dave Morgan

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pedregon, Kauai County Planning Department

RECEIVED AS FOLLOWS

RECEIVED AS FOLLOWS



PLANNING
SOLUTIONS

4767 Hoomana Road
Lihue, Hawaii 96766
February 7, 1999

Perry J. White
Planning Solutions, Inc.
1210 Awahi Street, Suite 221
Honolulu, Hawaii, 96814

Dear Mr. Barnes:

Thanks for your letter of December and the copy of the DEIS for the proposed Lihue Energy Service Center.

We are residents and property owners on Hoomana Road and have lived here for 23 years. From this personal perspective, we have serious reservations about the industrial location of the "preferred site" and probable negative impacts of the proposed action on several parts of Lihue.

We are not engineers and do not feel qualified to comment about noise levels, air pollution and impacts on Lihue's water supply. However, we think we can comment on the traffic impacts of the project described in the DEIS.

In its General Plan, Lihue Development Plan and zoning over the past 20 years, the County has designated land along Nawiliwili Road and Kaunualii Highway for new residential subdivisions, a new middle school as well as Kauai High School and Kauai Community College. It has been the planning policy of the County to encourage industrial development, but to put that development in land zoned for industrial development, either in Lihue or elsewhere. We think that you have minimized the impacts that fuel truck trip generation rates will have on traffic and safety in these areas along Nawiliwili Road and Kaunualii Highway west of Lihue town. In the four-lane road improvements that you list, it should be noted that the DEIS does not include Nawiliwili Road, a major truck traffic corridor for fuel trucks from the harbor to the "preferred site." It will remain two-lane, won't it?

For many reasons, including our personal concerns as residents of German Hill, we are not in favor of the "preferred site" location in your plan.

Thank you again for the report,

Sincerely,
Barnes and Ba Riznik

cc: Mayor Marianne Kusaka

March 18, 1999

Mr. and Mrs. Barnes Riznik
4767 Hoomana Road
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. & Mrs. Riznik:

Thank you for your February 7, 1999 letter regarding the Draft Environmental Impact Statement (DEIS) for the proposed Lihue Energy Service Center. We appreciate the time you both spent reviewing the document and preparing your comment letter. We understand the concerns expressed in your letter and have tried to address them below.

(1) The 17-acre parcel the DEIS refers to as KE's "Preferred Site" is one of three discussed in the report. It was given that name because it is the site that KE originally selected and purchased from Amfac/Lihue Plantation. In response to public concerns expressed during preparation of the DEIS, KE expanded the search to include the Field 390 and Airport Industrial Area Sites described in the report. Based on the information contained in the DEIS and a review of the comments that were received concerning each of the three sites, KE has decided to pursue land use approvals only for the Field 390 Site. The application process will continue following submission of the Final Environmental Impact Statement (FEIS). At that time KE will ask the County to suspend processing of its application for approvals at KE's "Preferred Site" (which the FEIS calls the "Puhi Site" in order to avoid confusion).

(2) Section 4.10 of the DEIS contains a detailed discussion of the number of vehicle-trips that the Lihue Energy Service Center would generate. The discussion addresses both the number of fuel truck trips and the routes that would be followed by vehicles moving to and from each of the sites. Nawiliwili Road is one of the two principal access routes to and from Nawiliwili Harbor, and the fuel trucks that operate out of the existing fuel tank farms located there currently use it.

You ask if Nawiliwili Road will remain two lanes. The mauka segment of that road (i.e., the portion between Kaunualii Highway and Pikeake Street along the makai side of the Kukui Grove Shopping Center) already has four through-lanes plus turning lanes. The makai portion of the road presently has two lanes plus turning lanes. Because the existing roadway is considered adequate to meet the forecast demand (see the *Kauai Long-Range Land Transportation Plan*), no widening is called for within the next 20 years.

Thank you again for your comments. If you have any additional questions or would like to talk further about issues related to the Lihue Energy Service Center, please call me at 593-1288.

Sincerely,
Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

27

Raymond L. Chuan
P.O. Box 1113, Hanalei, HI 96714
808-826-4814, fax 826-1113
chuan@ralpha.net

February 7, 1999

Mr. Perry J White
Planning Solutions
1210 Auahi Street, Suite 221
Honolulu, HI 96814

Subject: Comments on DEIS, Kauai Electric Lihue Energy Service Center

Dear Mr. White:

My comments are primarily related to the choice of site for the future power plants.

In studying Table ES-1, Summary of Expected Impacts, Page ES-9 of the DEIS one can discern no particular advantage to the choice of the Preferred Site, since the impacts for all three sites are essentially the same, with the possible exception that the Preferred Site may have some impact on water supply (of the Department of Water, County of Kauai) in that it is located over the Garlinghouse Tunnel. Such being the case, one should look at the comparative advantages of the sites. There should also be consideration given to the relationship of the propose energy center to the Kauai County General Plan Update the preparation of which is currently underway.

When viewed from such a perspective one can identify numerous advantages in the Airport Industrial Area Site, despite the fact that this area may be impacted by the expansion plans of the Lihue Airport. In addition to the existing Solid Waste Transfer Station the County also is in the process of developing a Materials Exchange Facility in this area. As the County proceeds with the implementation of its Integrated Solid Waste Management Plan some additional solid waste treatment facilities may well be located in this area. Kauai Power Partners has indicated it can accept this site as well for its facilities. The picture emerges then that the whole area between the Lihue Airport and Kapule Highway is evolving into the county's basic infrastructure facilities location area. This seems to be an appropriate use of the former cane field. As a site for power generation this site has distinct advantages over all the other alternative sites considered by KE.

One, the site imposes no impacts as shown in Table ES-1. Two, the area is already served by major roadways, with possibly some realignment of Ahukini Road by the Airport expansion. A corollary advantage to this is that there is no nearby residential area to be impacted by frequent vehicle movements from these infrastructure activities. Three, and this is a very significant advantage, by restoring Ahukini Landing as a port facility fuel for the power plants can be pumped directly from the fuel barge, eliminating a serious problem with the Preferred Site (wherein fuel trucks must transport fuel from Port Allen to the site). A restored Ahukini Landing would also serve the needs of the County's solid waste management activities. Four, from the standpoint of having a centrally located power generating center with respect to the demand centers, this location is definitely superior to the Preferred Site and is geographically as good as, if

not superior to the Field 390 Site. Since it is highly unlikely that a coal-fired generating plant would ever be seriously considered, there is no need for a tall stack, and the short stack of the diesel or turbine type generators would not pose any problem to the expansion of the Lihue Airport. As a matter of fact, the Airport Site would allow KPP to proceed more expeditiously with its goal of having 26.4 MW on line by 2002 (even without the immediate availability of Ahukini Landing, by fueling, in the interim, from Nawiliwili which is nearer than Port Allen)

While this reviewer has not investigated the implications of restoring Ahukini Landing, there appears to be no obvious obstacle to a serious review of this possibility. I believe it is incumbent upon KE to undertake such a review before proceeding further with the course of the current planning process. It will, of course, be necessary for the three entities - KE, Hawaii Dept of Transportation/FAA and Kauai County - to coordinate closely their ongoing planning activities. The pace and current status of their respective planning activities seem to be none too disparate, so that one sees no obstacle to conducting an all-encompassing Super Master Plan for the Airport Industrial Area, a plan that will inure to the benefit of all three entities, thus best serving the needs of the entire Kauai community.

Thank you for your attention to these comments. Again, as I alluded to in my comments on the EISPN, this is generally a very good draft EIS, the only shortcoming being a vision constrained by the traditional practice of only following the assigned parameters of the customer by the consultants. I have always been philosophically inclined to advocate that the consultant's role should be more expansive, so as better to serve both the customer and the greater public.

Sincerely yours,

Raymond L. Chuan
Raymond L. Chuan, PhD

cc: OEQC
Kauai County Planning Department
Kauai Electric
Kauai County Council
Kauai Chapter Sierra Club
Environment Hawaii



**P L A N N I N G
S O L U T I O N S**

March 18, 1999

Dr. Raymond L. Chuan, Ph.D.
P.O. Box 1183
Hanalei, Hawaii 96714

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Dr. Chuan:

Thank you for your February 7, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your thoughtful comments concerning the choice of sites. Our responses to those comments follow below.

(1) Page 1, Paragraph 2, Summary Table. As noted in your letter, none of the sites has an overwhelming advantage over the others with respect to potential adverse effects. All could be developed in compliance with existing environmental regulations. While the risk of fuel spill is small, KE's Preferred Site (which the *Final Environmental Impact Statement (FEIS)* refers to as the "Puhi Site") is the closest to the County's Garinhouse Tunnel water source and there is real concern over possible adverse effects on it in the event of a major accident.

(2) Page 1, Paragraph 2, Last Sentences. The Kauai County General Plan update process is ongoing. During preparation of the *DEIS*, KE has made all of the information concerning its plans available to the Kauai County Planning Department. In addition, we provided a copy of the *DEIS* to the consultant that is assisting the County with the update. It is our understanding that KE's proposal is being considered during preparation of the updated General Plan.

(3) Page 1, Paragraphs 3 and 4. As you indicated, the Airport Industrial Area Site has some advantages as a possible location for the generating facilities. It also has some disadvantages. For example, it is the most difficult of the three to serve from a power transmission viewpoint and its proximity to the Lihue Airport Gateway project and its high visibility from aircraft bringing visitors to Kauai has raised substantial concerns from those responsible for that sector of the economy. Finally, a couple of the points made in this part of your letter are not completely accurate. First, neither the summary table nor the detailed discussions contained in the main body of the *DEIS* indicate that "...the [Airport Industrial Area] site imposes no impacts". Second, the Airport Industrial Area Site is not presently served by "major roadways". Access is via a particularly circuitous portion of Ahukini Road and a paved field road. While the prospect is good that this will change in the future, the development schedule for the improvements is not set.

The idea of restoring Ahukini Landing is an interesting one. However, given the exposed nature of the shoreline, the fact that quite substantial infrastructure development would be required to accommodate fuel barges, and the heavy recreational use of the nearby areas, it seems unlikely that such a use would be acceptable from either an economic or environmental standpoint. Also, please note that KE expects that the fuel delivery would be

Page 2
Dr. Raymond L. Chuan, Ph.D.
March 18, 1999

from Nawiliwili Harbor as shown in the *DEIS* rather than from Port Allen as stated in your letter.

The Airport Industrial Area Site is not more centrally located than the Puhi Site is. The Puhi Site could be connected to KE's existing transmission system with a single, short run of wire across Nawiliwili Stream. As described in the *DEIS*, the Airport Industrial Area Site would require a much longer run with greater cost and more visual impacts.

4) Page 2, Paragraph 1. One of KE's goals in establishing the Lihue Energy Service Center is to maximize its flexibility with respect to generating technologies and fuels. Hence, one of the generating alternatives includes a coal-fired generating unit. While you dismiss this as "highly unlikely", the evidence suggests otherwise. A coal-fired unit is included in KE's proposed mix of generating units in its *1997 Integrated Resources Plan*. Moreover, a coal-fired unit using this technology is in operation at Barbers Point on Oahu, and a project using this technology was nearly constructed on Maui near the existing Pu'unene Sugar Mill. As evidenced by the AES Barbers Point 180 MW fluidized bed generating unit located at Campbell Industrial Park, this is a clean-burning technology with a history of success in Hawaii. Because of the size of the equipment needed for coal-fired combustion, the buildings are necessarily tall. To avoid stack exhaust downwash that can cause violations in ambient air quality standards, the stack must be high (estimated at 165 feet). Even the stacks for the diesel and combustion turbine units must be at least 90 feet high at full build-out. While this is consistent with FAA standards, it is of concern to helicopter operators based at the Lihue Airport. Consequently, this issue cannot be readily dismissed.

We are pleased that you found the *DEIS* to be generally very good. I share your belief that it is good for consultants to "think outside the box", and we endeavor to do that. If you have any further questions, please call me at 593-1288.

Sincerely,

Perry J. Wolff

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

28

Kauai Electric Division
Citizens Utility Company
4463 Pahee Street
Lihue, Kauai 96766
Contact: Dave Morgan (335-6233)

February 8, 1999

Dear Citizens Utility Company:

I was born and raised on Kauai and although I live in Honolulu now, I am still an owner of two pieces of property on Kauai and I care deeply about the future of Kauai. I know you have tried very hard to work well with the Kauai community on the proposed plans.

I have many questions concerning the proposed Lihue Power Plant: Why, as we approach the 21st Century, are you proposing to build an out of date, outmoded, expensive fossil fuel powered system? Have you considered thoroughly, how you could use clean renewable energy for the proposed plant? Before it is accepted by the Kauai Planning Department, a thorough investigation of alternate energy systems must be made. The proposed system is out of step with systems being used by mainland companies and Kauai will be saddled with an old outmoded expensive system instead of taking advantage of the latest technology.

Are all the Kauai residents fully aware of what is being proposed and its consequences? They will be paying for it, both financially and in terms of environmental degradation and loss of natural beauty which Kauai is so dependent upon as far as its economy is concerned. Have articles discussed the proposal thoroughly in the newspaper, notices appeared on TV, community meetings been held to give adequate notice about this project before it is decided upon? Have you allowed the public to give adequate testimony on this issue which will affect them for generations to come? When the Haupu Tower project was approved, no one knew about it. I hope the same mistake is not about to be made.

According to the notice in the OEQC Bulletin, fuel oil would be delivered to the selected site by tanker trucks from existing or expanded fuel oil facilities in Port Allen or from facilities that a fuel supplier might construct at Nawiliwili Harbor. Before approval is given, shouldn't the exact location and route for the tanker trucks be decided? Isn't the traffic already heavy between the proposed areas? Isn't the highway already inadequate and wouldn't additional fuel trucks make traffic worse?

The DEIS is inadequate, doesn't consider new technologies thoroughly, the plans for transport are too vague, and the proposed Lihue Energy Service Center's present plan should be deferred until all the public concerns have been thoroughly addressed.

Sincerely,

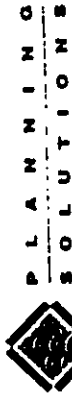
Mary M. Cooke

Mary M. Cooke
2859 Manoa Road
Honolulu, HI 96822
phone 988-6016

cc: County of Kauai, Planning Department
444 Rice Street, Suite 473
Lihue, Kauai 96755
Contact: Dee M. Crowell (241-6677)

Planning Solutions, Inc.
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814
Contact: Perry White (593-1288)

OEQC
235 S. Beretania St.
State Office Tower, Suite 702
Honolulu, HI 96813
phone 586-4185 fax 586-4186



Page 2
Ms. Mary M. Cooke
March 18, 1999


planning process. KE's 1997 IRP contains a more detailed discussion of the technologies it has evaluated and the reasoning that had led it to its current program. Customers are involved in the IRP process, and KE is committed to doing all it can to reduce electrical power use through Demand Side Management and to foster the use of cost-effective renewable energy technologies.

(4) **Public Awareness.** With respect to public awareness, KE has held voluntary public meetings to discuss the project, newspapers have published numerous articles and announcements, radio and TV stations have carried stories about the proposal, and the State Office of Environmental Quality Control has published formal notices in its twice-monthly bulletin. KE received 51 letters commenting on the DEIS. Further public discussion will take place as the County Planning Commission reviews KE's request for land use approvals.

(5) **Fuel Delivery.** The fuel used by generating units at the Lihue Energy Service Center would be delivered by independent fuel suppliers to the site. Consequently, the generating unit owners/operators do not have complete control over this. Nonetheless, the economics of fuel transport are such that the port-of-entry for this fuel is almost certain to be Nawiliwili Harbor. Section 4.10 of the DEIS describes the number of trips and routes associated with this activity. Chapter 3 of the DEIS describes existing traffic patterns and volumes. Traffic on the roads immediately fronting the sites is tight at the present time. As Kauai residents know all too well, and as the DEIS makes clear, traffic on Kaunualii and Kuhio Highways is heavy during peak hours. However, the proposed project generates few trips during these periods. Section 4.10 discusses the ability of area roadways to accommodate the forecast traffic volumes, including project-related vehicle-trips.

The State Public Utilities Commission approved KE's contract for the purchase of power from KPP, in June 1998. That contract stipulates that the next generating unit will be a 26.4-megawatt fossil fuel-fired, steam-injected combustion turbine; KE is not able to reverse that decision. However, it is expected to be at least a decade before subsequent generating capacity is needed, and KE will continue to evaluate alternative technologies during this period. Technological advances and/or other factors may make renewables more cost-effective in the future. In the meantime, the high thermal efficiency of the KPP unit will decrease the amount of fuel that the utility burns to serve its present customers, a positive step.

I hope the foregoing provides you a better understanding of the proposal and the energy planning process within which it has evolved. If you would like to discuss the Lihue Energy Service Center further, please call me at 593-1288.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

March 18, 1999

Ms. Mary M. Cooke
2859 Manoa Road
Honolulu, Hawaii 96822

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Ms. Cooke:

Thank you for your February 8, 1999 letter to the Kauai Electric Division of Citizens Utilities Company (KE) regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments. Because we prepared the document on behalf of KE, Dave Morgan asked us to respond to the points in your letter.

Your letter asks a number of questions about KE's reasons for proposing development of the Lihue Energy Service Center. The questions are very broadly stated, but I will do my best to respond to them.

(1) **Need for Fossil-Fired Generating Capacity.** KE continuously evaluates the available generating technologies, including those using renewable energy sources, as part of its regular Integrated Resource Planning (IRP) process. It submits formal reports to the Public Utilities Commission (PUC) describing these evaluations every three years. The most recent is its *1997 Integrated Resource Plan*. Results of the analysis described in the 1997 IRP indicated that the 26.4 MW advanced steam-injected cycle combustion turbine that Kauai Power Partners, L.P. (KPP) is developing for KE is the most appropriate next unit for KE's system. Among other things, the analysis submitted to the PUC showed that it was the "least-cost option" available to the utility. In approving KE's contract with KPP, the PUC acknowledged that the unit is a state-of-the-art technology that is in the best interest of KE's customers. It would not have done this if it had concluded that the project was out of date, outmoded, or more expensive than the available alternatives.

(2) **Efforts to Use Renewable Energy Sources.** KE continues to look for ways to use renewable energy sources as part of its IRP process. This involves thoroughly investigating the available technologies and seeking proposals from third parties for the construction and operation of generating units relying on renewable resources. At present, approximately 15 percent of the energy used by KE's customers comes from renewable sources. KE also has a contract with the developer of the waste-to-energy project that has been proposed for Port Allen; it will dispatch that energy to its customers if and when it becomes available.

(3) **Appropriateness of Generating Technology.** The 26.4 MW advanced steam-injected cycle combustion turbine that KPP is developing for KE is one of the most advanced technologies available for electrical systems of KE's size. Similar systems are being installed throughout the U.S. and the rest of the world. Chapters 1 and 5 of the DEIS discuss the process that KE went through in developing its plans for the proposed facilities. As indicated in those discussions, alternate technologies were thoroughly investigated as part of the utility's

STANLEY J. CATTANO
Governor



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
AIRPORTS DIVISION
400 ROBERTS BOULEVARD, SUITE 700
HONOLULU, HAWAII 96819-1800



DAVID L. BROWN
DIRECTOR
DEPUTY DIRECTOR
BRUCE K. BERNAI
GENERAL COUNSEL

BY REPLY REFER TO:
AIR-EP
99.0066

Mr. Perry J. White
Page 2
February 8, 1999
AIR-EP
99.0066

February 8, 1999

Mr. Perry J. White
Planning Solutions, Inc.
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Lihue Energy Service Center
Draft Environmental Impact Statement

Thank you for the opportunity to review and comment on the subject above. We offer the following comments:

1. Page ES-15, Table ES-2

In the "Comments" box for the Federal Aviation Administration (FAA), insert the following: "Need to file FAA Form 7460-1 prior to construction."

2. Page 1-6, Figure 1-5

The portion of the Lihue Airport boundary to the east of the Solid Waste Transfer Station should be revised. The airport boundary is east along Ahukini Road, south of the Transfer Station and the adjacent Tropical Fruit Disinfestation Facility and continues north along the eastern boundary of the Disinfestation Facility to the shoreline.

3. Page 1-10, last paragraph, third line:

Insert "the rate of growth" before "will remain well below."

4. Page 4-73, second paragraph, second line

Revise "SDOT" to "HDOT."

5. Page 4-79, first paragraph, third line

Revise "air space" to "airspace."

Last paragraph, third line, revise "500" feet to "250" feet.

6. Page 4-81, Section 4.10.9.1, second paragraph, last line:

Change "transitional" to "conical."

7. Page 4-82, Section 4.10.9.3:

Need to clarify whether the ground elevation at the Airport Industrial Area Site is 120 feet or 100 feet.

8. Page 4-82, Section 4.10.9.3, last paragraph

Need to clarify whether the structures along the outer edge of the transitional surface are 220, 202 or 182 feet in height.

Change "less" to "more" on the last line.

Please have your staff contact Stephen Takashima, Senior Planner, at 838-8810 to clarify any questions you may have.

Sincerely,

JERRY M. MATSUDA, P.E.
Airports Administrator

c: Wilson Okamoto and Associates, Inc. (E. Matsukawa)



**P L A N N I N G
S O L U T I O N S**

March 18, 1999

Mr. Jerry M. Matsuda, P.E.
Airports Administrator
400 Rodgers Boulevard, Suite 700
Honolulu, Hawaii 96819-1880

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Matsuda:

Thank you for your February 8, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your comments. Item-by-item responses follow below.

1. Page ES-18, Table ES-2. We have inserted the phrase "Need to file FAA Form 7460-1 prior to construction." in the table as requested.
2. Page 1-6, Figure 1-5. We have revised the airport boundary shown in the drawing as requested. The revision is based on the information that Wilson Okamoto & Associates provided to us on March 10, 1999.
3. Page 1-10, Last Paragraph. We have revised the sentence as requested. It now reads: "This scenario anticipates that visitor activity will continue to recover but the rate of growth will remain well below the pace experienced in the 1980s."
4. Page 4-73, Second Paragraph, Second Line. We have changed "SDOT" to "HDOT" as you requested.
5. Page 4-72. We have changed "air space" to "airspace" and revised "500" feet to "250" feet as you requested.
6. Page 4-81. We have changed "transitional" to "conical" as you suggested.
7. Page 4-82, Section 4.10.2.3. The first sentence in the second paragraph of this section has been revised to read: "As shown in Figure 1-5, this site ranges from 95 to 120 feet above sea level."
8. Page 4-82, Section 4.10.2.3, Last Paragraph. The discussion has been revised to read as follows in order to clarify the relationship of the project to the various controlling surfaces.
Of the three locations that are being considered, the Airport Industrial Area Site is by far the closest to the airport. Consequently, its potential impacts on air navigation are of greatest concern.

As shown in Figure 1-5, this site ranges from 95 to 120 feet above sea level. This places it below the airport elevation of 152 feet above sea level, but above the existing 80 and 88-foot elevations of the nearest runway ends. As shown in Figure 4.10-5, the portion of the Airport Industrial Area Site closest to the airport is within the

Page 2
Mr. Jerry Matsuda
March 18, 1999

transitional surface. The remainder of the site is within the area controlled by the horizontal surface elevation of 302 feet above sea level.

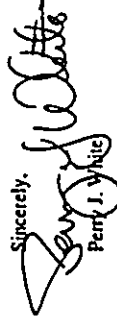
Subtracting the highest ground elevation at the Airport Industrial Area Site (120 feet) from the height of the horizontal surface (302 feet) indicates that structures less than 182 feet high would not penetrate the horizontal surface regardless of where on the site they were constructed. None of the structures that would be constructed as part of the Lihue Energy Service Center project would exceed that limit.

The following facts are relevant to a determination of the extent to which structures constructed on the Airport Industrial Area Site might penetrate the transitional surfaces:

- The north end of Runway 17 (the portion of the primary surface closest to this site) is 80 feet above sea level.
- The transitional surface extends outward and upward from the edge of the primary surface at a 7:1 slope (i.e., 1 foot upward for each 7 feet outward).
- The ground elevation on the portion of the site that lies within the transitional surface is approximately 95 to 100 feet above sea level.
- The closest point on the portion of the site that lies within the transitional surface is approximately 1,200 to 1,300 feet from the edge of the primary surface. At that point the transitional surface is approximately 170 to 185 feet above the elevation of the primary surface (i.e., 250 to 265 feet above sea level).
- The part of the site located along the outer boundary of the transitional surface is approximately 1,550 feet from the edge of the primary surface. At that point the transitional surface is at an elevation of 302 feet above sea level.

Subtracting the elevation (approximately 100 feet above sea level) of the ground in the area where the tallest of the proposed structures would be located from the elevation of the horizontal surface (302 feet above sea level) indicates that structures on the Airport Industrial Area Site that are along the outer edge of the transitional surface could be up to 220 feet high without penetrating it. Structures on the portion of this site that are closest to the runway could be up to 170 feet high without penetrating the surface. The latter is 5 feet more than the anticipated 165-foot height of the tallest structure (the exhaust stack for the coal-fired generating unit in Generating Alternative 2).

Thank you very much for the helpful comments. If you have any further questions, please call me at 593-1288.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

K. E. POWER PLANT

ID: 808-335-5674

FEB 10 '99

6:50 No. 001 P. 01



PLANNING
SOLUTIONS

March 18, 1999



February 5, 1998

David L. Morgan
Manager, Production
Kauai Electric
4463 Pahoa Street
Lihue, Hawaii 96766

Dear Mr. Morgan:

Thank you for dropping of the booklet on the Draft Environmental Impact Statement on the Kauai Electric Lihue Energy Service Center. Also, it was nice talking to you very briefly.

In the short time that I had to review the booklet, I am not in favor of the Preferred Site but would be in favor of the Field 390 Site. I would be happy to give further testimony in your next scheduled public hearing.

Sincerely,

Fred Atkins
Fred Atkins
Managing Director

F/aa

Mr. Fred Atkins, Managing Director
Kilohana
P.O. Box 3121
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Atkins:

Thank you for your February 5, 1999 letter to Dave Morgan of Kauai Electric regarding the Draft Environmental Impact Statement (DEIS) for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your comments.

KE understands that you are not in favor of KE's "Preferred Site" as identified in the DEIS.

Based on your letter, we understand that you do find the Field 390 Site acceptable. Consequently, you may be pleased to know that KE has decided to ask the County to suspend processing of its application for land use approvals at the original location and to pursue approvals at the Field 390 Site.

If you have any questions, please call me at 593-1288. Alternately, you may speak to Dave Morgan, KE's Production Manager, at 335-6233.

Sincerely,
Perce J. Morgan
Perce J. Morgan

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department



Local Union 1260
International Brotherhood of Electrical Workers
2202 So. Beretania St. • Honolulu, Hawaii 96826 (USA)
Telephone: 943-9443
Fax No. 943-1390



P L A N N I N G
S O L U T I O N S

March 18, 1999

HARRY H.K. KAMEENUI
Business Manager

WILFRED ANDRADE
President

February 8, 1999

Mr. Harry H.K. Kameenui, Business Manager
International Brotherhood of Electrical Workers, Local 1260
2205 South Beretania Street
Honolulu, Hawaii 96826-1494

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Mr. Dee Crowell
Director
Department of Planning, County of Kauai
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Crowell:

International Brotherhood of Electrical Workers, Local 1260, supports the proposed construction of the Lihue Energy Service Center.

The facility, we believe, would benefit the people of Kauai by centralizing the generation of electricity closer to the customer loads and by reducing the cost of transmitting electricity over a long distance.

The Draft Environmental Impact Statement (DEIS) proposed by Kauai Electric, we believe, would be in the best interest of its customers and ask that the County Planning Commission grant land use approvals needed to construct the proposed facilities.

Dear Mr. Kameenui:
Thank you for your February 8, 1999 letter to the Kauai County Planning Department regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments. Kauai Electric (KE) has asked me to say that it is pleased that the International Brotherhood of Electrical Workers supports its efforts to establish the Lihue Energy Service Center. For reasons discussed in the *DEIS*, it strongly believes that it is in the best interest of its customers to have a second, centrally located generating station and transmission and distribution facilities baseyard. If you have any further questions concerning the proposed project, please feel free to call me at 593-1288. Alternately, you may speak to Dave Morgan at Kauai Electric (335-6233).

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

Sincerely,

Harry H. K. Kameenui
Business Manager -
Financial Secretary

HKK:cliam

SENT BY: COUNTY OF KAUAI

2-9-99 1:50PM PLANNING DEPT. 8085931858

32



COUNTY OF KAUAI

February 5, 1999

99 FEB -9 12:43

PLANNING DEPT.

Mr. Dee Crowell
Dept. of Planning, County of Kauai
4444 Rice Street, Suite 473
Lihue, HI 96766

Dear Mr. Crowell,

I support Kauai Electric's plan to build the Lihue Energy Service Center at their preferred site. This site is far away from the existing Point Allen site and closer to the center of Kauai's electrical load. The separation between power generation points will provide Kauai with better protection from catastrophic interruptions and decrease the power grid's "line losses." The proposed site has room for expansion without intruding on the landscape, and is close to fuel terminals. The second and third potential sites could work, but seem less ideal than the first site.

Kauai Coffee Company has a power agreement with Kauai Electric and is interested in maintaining its connections with a stable power grid. Kauai Coffee Company depends on its grid connections as both a supplier and user of electric power. I feel that Kauai Electric's expansion plan is best for the long-term stability of the Kauai electric power grid.

Aloha,

Lyle Wilkinson

Lyle Wilkinson

Copy: Dennis K. Polosky

KAUAI COFFEE COMPANY
PO BOX 4, LIHUE, HI 96766 PHONE 808.334.0200 FAX 808.334.8180

www.kauaicoffee.com

PLANNING SOLUTIONS



Mr. Lyle Wilkinson
Kauai Coffee Company
P.O. Box 8,
Eleele, Hawaii 96705

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Wilkinson:

Thank you for your February 5, 1999 letter to the Kauai County Planning Department regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments. Kauai Electric (KE) has asked me to say that it is pleased that the Kauai Coffee Company supports its efforts to establish the Lihue Energy Service Center. For reasons discussed in the *DEIS*, it strongly believes that it is in the best interest of its customers to have a second, centrally located generating station and transmission and distribution facilities baseyard.

If you have any further questions concerning the proposed project, please feel free to call me at 593-1288. Alternatively, you may speak to Dave Morgan at Kauai Electric (335-6233).

Sincerely,

Dave Morgan
Dave Morgan
Perry, White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

March 18, 1999



GARY OLL
DIRECTOR



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

228 SOUTH KALANIANA'OLE STREET
SUITE 1018
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4188
FACSIMILE (808) 586-4188

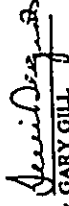
February 8, 1999

DELOUANE J. CAVETAKO
SECRETARY

Mr. Dave Morgan
Kauai Electric Division
Citizens Utilities Company
February 8, 1999
Page 2 of 2

If you have any questions, please call Leslie Segundo at 586-4188. Thank you for the opportunity to comment.

Sincerely,


for GARY GILL
Interim Director

cc Mr. Perry White, Planning Solutions
County of Kauai, Planning Department

Mr. Dave Morgan
Kauai Electric Division
Citizens Utilities Company
4633 Palaeo Street
Lihue, Hawaii 96766

Dear Mr. Morgan:

Thank you for the opportunity to review the draft environmental impact statement (DEIS) for the Kauai Electric Lihue Energy Service Center. Because we are concerned that the construction of an energy plant will likely have the following indirect and/or cumulative impacts, we submit the following comments for your response.

A. UNLOADING/STORAGE FACILITIES AT NAWILIWILI OR PORT ALLEN:

A reasonably foreseeable indirect effect (impacts caused by the action but later in time or farther removed in distance) will likely be the need for unloading and storage facilities at Nawiliwili Harbor/Port Allen. Page 2-22 notes that "fuel oil would be delivered to the sites by tanker trucks. These could arrive from existing or expanded fuel oil handling facilities in Port Allen or from existing or expanded facilities that a fuel supplier might construct at Nawiliwili Harbor." Page 2-24 of the DEIS also notes that "coal ... will be delivered to the site by trucks." Please consult with the State Department of Transportation and discuss in the final environmental impact statement possible plans for unloading and storage facilities at Port Allen and Nawiliwili Harbor, along with possible indirect effects of these facilities on things such as nearshore water quality and general traffic.

B. DISPOSAL OF PROCESS WASTEWATER

Page 4-44 notes that "[p]rocess wastewater, in the range of 0.23 to 0.36 MGD, would be returned from either the Preferred Site or Field 390 Site to the Lower Lihue Ditch. A short distance downstream, the ditch empties into DeMello Reservoir which has a 10 to 15 million gallon - storage capacity. Wastewater, diluted by mixing with the normal flow of surface water in the Lower Lihue Ditch, would then be used at LPCO's mill or for irrigation."

The process equipment used at the power plant will require maintenance to control corrosion (e.g., the use of antiscalants). During periodic cleanings of equipment such as boilers, etc., the equipment usually has oxidized and the cleaning process will generate wastes which may meet the characteristics of hazardous waste (e.g., chromium, lead, etc.). The process waste streams may contain such constituents. Please consult with the Department of Health's Solid and Hazardous Waste Branch (Grace Simmons, telephone 586-4726) and discuss in the final environmental impact statement the management of power plant wastes as hazardous/solid wastes, and indirect effects on surface and ground water quality of discharge of process wastewater via irrigation.



**P L A N N I N G
S O L U T I O N S**

March 18, 1999

Mr. Leslie Segundo, Interim Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Segundo:

Thank you for your February 8, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and others at OEQC spent reviewing the document and preparing your comments. Our responses follow below.

A. Unloading/Storage Facilities at Nawiliwili or Port Allen

Fuel for the proposed facilities will be purchased from an independent fuel supplier. Consequently, KE is unable to stipulate the facilities that would be used to handle (unload, transport, and store) the fuel before it reaches the power plant site. Accordingly, the *DEIS* discussed the volume of fuel that would be needed and the routes that tanker trucks were likely to follow in transporting fuel from Nawiliwili Harbor to each of the three sites, but it did not attempt to specify the exact manner in which the fuel would be handled at the harbor itself.

No amount of additional research will increase KE's control over the fuel supplier activities. Because of this, we do not believe it would be appropriate to include a discussion of these issues in the body of the document. However, in an effort to comply as fully as possible with your request we have had further contacts with parties familiar with fuel handling at Nawiliwili Harbor. More specifically, we met with Mr. Fred Pasqua of the Harbors Division of the State Department of Transportation on February 23, 1999. Following the meeting, we reviewed information that he had provided. We also reviewed information that Kauai Petroleum and others had provided to Mr. John Burns of Kauai Power Partners, LLP. Finally, we met with Harbors Division representatives on Kauai. The information from these sources indicates the following:

- The existing pipelines that carry fuel from the berths used by fuel barges have sufficient capacity to accommodate the transfer of fuel from the barges to existing fuel storage tanks in the harbor area. Consequently, no new construction on the piers is required.
- The existing fuel storage tanks at Nawiliwili Harbor have sufficient capacity to handle fuel off-loading for the proposed facilities if the land transport of fuel from the harbor-side storage tanks to the power plant sites is optimized for that purpose. Operators may wish to construct additional facilities in order to maximize the efficiency of their operations, but that is not essential. Any expansion of these facilities would be subject to normal State and County approval process, insuring the full public review of the plans.
- Nawiliwili Harbor has sufficient wharf space to accommodate the additional along-side time that the fuel delivery barges would require. However, barge and tug operators would need to coordinate their deliveries with the Harbors Division to insure that conflicts with other harbor traffic does not occur during peak periods.

Page 2
Mr. Leslie Segundo
March 18, 1999

- At present, there are no special coal handling facilities at Nawiliwili Harbor. However, assuming typical delivery schedules of once per month, space is available in the general bulk material handling section of the harbor to accommodate the coal that would be required for a 25 megawatt unit of the sort that KE is considering. If the coal were delivered using barges equipped with their own unloading equipment, no new harbor facilities would be required for that purpose. If shore-side equipment were to be used for the unloading, the fuel supplier would need to provide these and would be responsible for obtaining the needed approvals.

Section 4.10 of the *DEIS* already discusses the effect that construction and operation of the proposed facilities would have on general traffic. Section 4.5 of the report discusses water quality effects. In view of the absence of new in-water construction at Nawiliwili Harbor or elsewhere, the only other potential for the project to affect nearshore water quality is through an ocean transportation accident leading to a spill.

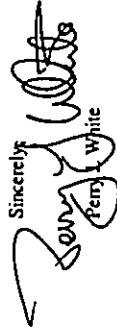
The U.S. Coast Guard maintains records of oil spills in Hawaii. Its most recent compilation of these statistics, *Hawaii Oil Spill Statistics: 1993-1996*, was prepared to help the Coast Guard and Hawaii maritime community make risk management decisions. During the four-year period covered in the report just over a quarter of the oil spills involved vessels; this is true whether the measurement is by number of spills or by the volume of oil spilled. Regulated facilities (such as the harbor fuel handling facilities used to import oil to Kauai) and vessels carrying over 250 barrels of oil (such as the interisland barges used to transport oil to Kauai) accounted for only 14 percent of the oil spilled. During the period of record, there were a total of 12 oil spills at Nawiliwili Harbor; all were quite small, however, averaging less than 10 gallons per event (<100 gallons total). The generally good performance during this period cannot guarantee that interisland fuel transportation will not lead to a larger spill in the future, but it is evidence that the probability is small.

B. Disposal of Process Wastewater

Periodic cleaning of equipment such as boilers does generate small quantities of hazardous materials. As indicated in Tables 2-2 through 2-5, the cleaning activities that produce wastes that may be classified as hazardous are batch processes rather than continuous. These potentially hazardous materials would not be released into the wastewater stream destined for eventual agricultural reuse. Instead, it would be collected separately and discharged in accordance with State and Federal regulations governing the handling of such wastes.

Following receipt of your letter, I met with Ms. Grace Simmons at the Department of Health's Hazardous Wastes Branch as you requested. At the conclusion of the meeting Ms. Simmons agreed that, in the kinds of concentrations that are anticipated, the chemicals normally used to condition the boiler water would not constitute a hazard if disposed of into the irrigation system in accordance with State Department of Health regulations. She indicated that so long as the wastewater that results from periodic equipment cleaning is handled in accordance with hazardous waste regulations as described in the *DEIS*, it should pose no undue environmental threat. It is my understanding that she would discuss the matter with you and that she would call me if this was not satisfactory.

If you wish any further information concerning the proposed project, please call me at 993-1288.

Sincerely,

Barbara Pendragon

cc: Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

DEANARD J. CASTLEMAN
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION
Kamohiwa Building, Room 515
601 Kamohiwa Boulevard
Honolulu, Hawaii 96817



MICHAEL B. WILSON, CHIEF
DIVISION OF LAND AND NATURAL RESOURCES
DEPUTY COMMISSIONER
THOMAS L. JONES

AQUATIC RESOURCES
SOILS AND OCEAN RECLAMATION
CONSERVATION AND RESOURCES
DEPARTMENT
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

P L A N N I N G
S O L U T I O N S

March 18, 1999

Mr. Don Hibbard, Administrator
Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii, Kakuhihewa Building, Room 555
601 Kamohiwa Boulevard
Kapolei, Hawaii 96707

February 4, 1999

Mr. Perry White
Planning Solutions
1210 Auahi St. Suite 221
Honolulu, Hawaii 96814

LOG NO: 22809 ✓
DOC NO: 9901NN07

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Hibbard

Thank you for your February 4, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your comment.

Your letter confirms that the project would have no impact on significant historic sites regardless of the site that is selected. If you have any questions, please call me at 593-1288.

SUBJECT: Chapter 6E-42, Historic Preservation Review -
Draft EIS for the Lihue Energy Service Center (Kauai Electric)
TMK: 3-8-05-03: 4, Nawiliwili, Lihue, Kauai

As our letter of August 6, 1997 stated. The project area and additional areas has been developed extensively for agricultural purposes. It is highly unlikely that historic sites are present in this disturbed area. Thus, we believe that this project will have a "no effect" on significant historic sites.

If you have any questions, please call Nancy McMahon at 742-7033.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

NM:amk

c. Gary Gill, Director, Office of Environmental Quality Control 235 South Beretania St.,
Honolulu, HI 96813
Dee Crowell, County of Kaula Planning

Sincerely,

Perry White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

35



COUNTY OF KAUAI

99 FEB 24 1999
STATE OF HAWAII
DEPARTMENT OF HEALTH
HONOLULU, HAWAII 96801

STATE OF HAWAII, DEPARTMENT OF HEALTH

IN REPLY, PLEASE REFER TO

Mr. Dee M. Crowell
February 18, 1999
Page 2

97-160A/epo

February 18, 1999 97-160A/epo

Mr. Dee M. Crowell
Planning Director
Planning Department
Kapule Building
4444 Rice Street, Suite 473
Lihue, Hawaii 96766

Dear Mr. Crowell:

Subject: Draft Environmental Impact Statement (DEIS)
Lihue Energy Service Center
Lihue, Kauai

Thank you for allowing us to review and comment on the subject document. We have the following comments to offer:

Kauai Electric proposes to develop a master-planned energy service center in Lihue, Kauai, Hawaii. The complex would include 120 to 150 megawatts of new electrical generating capacity, and a Transmission and Distribution (T&D) facility proposed facility with the existing transmission system on the island. Three sites are being considered for the facility. The "Preferred site" is situated northwest of Grove Farm's Kukui Grove Shopping Center. Field 190 Site is located just south of Maalo Road, and the Airport Industrial Area Site is located just north of the Lihue Airport. Proposed actions affecting air quality includes removing vegetation, grading, excavation, and other construction activities.

Control of Fugitive Dust:

Due to the nature of the project, there is a significant potential for fugitive dust to be generated during the removal of debris and during the grading, excavating, and construction activities that would impact nearby residential and business establishments, and thoroughfares. It is suggested that a dust control management plan be developed which identifies and addresses activities that have a significant potential for

Two separate paragraphs should be added to Section 4.4.4 to address:

- a. Particulate emission (fugitive dust) from vehicles such as fuel delivery trucks traveling on cane haul roads.
- b. Emissions impacting nearby residences and schools especially during night and early morning hours when mountain/land breeze and surface temperature inversions prevail.

The Department would also like to note that the proposed emissions, air quality impacts, and control technology may change as a result of the air permit review process and requirements. The final determination on such parameters is made only after the Department has completed its review of the application and an air permit has been issued.

If you have questions regarding fugitive dust and the air permit review process, please contact Mr. Calen Miyahara of the Clean Air Branch at 586-4200.

The applicable requires of Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control," shall pertain to construction activities, industrial activities, and stationary sources.

Sincerely,

GARY GILL
Deputy Director for
Environmental Health

c: CAB
KDHO



**P L A N N I N G
S O L U T I O N S**

March 18, 1999

Mr. Gary Gill
Deputy Director for Environmental Health
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Gill:

Thank you for your February 18, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and your staff spent reviewing the document and preparing your comments. Our responses follow below.

Control of Fugitive Dust

The potential impacts of fugitive dust emissions from construction are discussed in Section 4.4.5 of the *DEIS*. The discussion includes a summary of the dust control measures that would be used during construction of the proposed facilities.

As described in the Chapter 1 of the *DEIS*, all of the sites under consideration are on land that is presently cultivated in sugarcane and are far from sensitive receptors. This is clearly depicted in Figure 1-2 and in the aerial photographs reproduced in Figures 1-3, 1-4, 1-5, and Appendix B of the *DEIS*. All of the sites being considered are more than a half-mile from the nearest residential areas. The Puhii Site and Airport Industrial Area Site are slightly closer (approximately 0.4 mile) to the nearest institutional and commercial uses. All of the sites are also removed from major public thoroughfares.

The existing agricultural use of the sites involves repetitive activities similar to, but on a larger scale than, the activities needed to construct the Lihue Energy Service Center. These are described in Section 4.4.5.5 of the *DEIS*:

This activity also involves exhaust emissions from tractors and harvest vehicles, and fugitive dust during planting and harvesting activities. Sugar cane grows on a two-year cycle, so approximately every 18 months the cane is burned and then the area is stripped bare. A harvested field will lie barren for several months before being replanted, during which time the unprotected soil has a high potential for generating fugitive dust.

In contrast, construction emissions will occur for a relatively short period of time and will be minimized by the use of good operating practices. Unpaved areas on which construction vehicles travel will be watered frequently to minimize dust generation. Storage piles will also be treated with water or dust palliatives as necessary, to reduce windblown dust. As a result of the temporary nature of the construction activities and the mitigation KE will employ to minimize emissions, air emissions from construction activities are not expected to be significant.

Page 2
Mr. Gary Gill
March 18, 1999

Your letter asks that paragraphs be added to Section 4.4.4 to address "a. Particulate emission (fugitive dust) from vehicles such as fuel delivery trucks travelling on cane haul roads." Fuel would be brought to the sites using existing public and private roads. All of the public roadways are paved. The small private roadways serving the Airport Industrial Area Site have an asphaltic concrete surface. The main cane haul roads that trucks would use to access the Puhii Site and the Field 390 Site also have an asphaltic concrete surface. Thus, fuel trucks and other vehicles will not be moving over unpaved roads. As discussed in Section 4.10 of the *DEIS*, the State Department of Transportation's *Kauai Long-Range Land Transportation Plan* (Austin, Tsutsumi & Associates, Inc., May 1997; Figure 17) calls for the eventual construction of a 4-lane divided highway past the two inland sites as part of the Lihue-Hanalei Bypass Road project. The roads serving the Airport Industrial Area Site are slated for upgrading as part of the overall industrial development planned and approved for the area *makai* of Kapule Highway. From a dust-control perspective, these roads will be even better than the existing pavement.

Impacts on Nearby Residences and Schools

Your letter asks that we add paragraphs to Section 4.4.4 to address: "b. Emissions impacting nearby residences and schools especially during night and early morning hours when mountainland breeze and surface temperature inversions prevail."

Sections 4.4.7, 4.4.8, and 4.4.9 of the *DEIS* discuss all aspects of potential air quality impacts of the proposed project. The modeling analyses performed to evaluate these air quality impacts used meteorological data collected at or near the project sites specifically for the purpose of accounting for mountainland breezes and surface temperature inversions that occur in these locations. Even when these meteorological conditions are considered, the modeled ambient concentrations of pollutants are well below the limits State and Federal ambient air quality standards establish to protect the public health.

Air Permit

Thank you for your closing note explaining that the actual air quality impacts are a function of the emission rates and control technologies that the Department of Health establishes as a result of the air permit review process. The *DEIS* describes the probable impacts of the proposed action using the best information that is currently available and the air quality consultant's judgement as to currently available emissions control technology. KE understands that these factors will ultimately be established on a unit-by-unit basis as part of the air permitting process before your agency.

If you have any further questions, please call me at 593-1288.

Sincerely,

Dave Morgan
Permitting

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

36
SEND COPIES TO 756
APPROPRIATE OFFICES



P L A N N I N G
S O L U T I O N S

March 18, 1999

TO: Office of Environmental Quality Control
235 South Beretania Street
Honolulu, HI 96813

99 FEB 11 AM 6:1

FROM: Richard Jasper
3416 Rice Street
Lihue, HI 96766
Phone: 808/246-4422
Fax: 808/245-7019

U.F. DU...

DATE: February 8, 1999

RE: Location of New "Energy Service Center"

To Whom It May Concern:

The new power plant location should be located at "Port Allen". Expansion of an existing facility would, "bottom line", be better for Kauai, then impacting a 2nd area with all the environmental baggage that comes with developing a new and pristine area.

Port Allen has the area to expand, and Port Allen is already irreversibly committed to energy delivery and the industrial impact that is already on-going in the industry.

Sincerely,

Richard Jasper

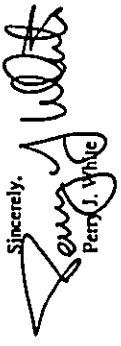
Mr. Richard Jasper
3416 Rice Street
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Jasper

Thank you for your February 8, 1999 letter to the Office of Environmental Quality Control regarding the proposed Lihue Energy Service Center. Kauai Electric (KE) understands that you believe it would be better to expand its existing facilities at Port Allen than to establish a new power generation facility in the Lihue area.

Chapters 1 and 5 of the *Draft Environmental Impact Statement* for the Lihue Energy Service Center explain KE's reasons for preferring a location in the Lihue area and the alternatives it considered. If you have any questions, please call me at 593-1288 and I will try to answer them.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

SEND COPIES TO
APPROPRIATE PARTIES

37
POSTED
7/8/99

Aloha:

I am writing to comment on the proposed 23MW electric generator planned for Kauai. No doubt you have received a copy of Carol Bain's column in the Sunday Garden Island discussing the future of electric energy here on Kauai. I agree with Ms. Bain. I would very much like to see the development of alternative sources of power that would make Kauai more self-sufficient. Hawaii and particularly Kauai has abundant sources of sustainable energy. Biomass, hydroelectric, solar and wind are all available. Oil supplies are vulnerable to a variety of problems outside our control such as technological breakdowns like Y2K and political conflicts in middle eastern oil supplying countries. Also oil is a highly polluting and non-renewable source. If we continue to rely on fossil fuel, a time will come when our refineries and power plants stand idle because we have run out of oil. Our money will be better spent if you plan for renewable energy sources now. Developing renewable energy resources ultimately will keep a lot of money here in Hawaii that is currently being spent to bring in fossil fuel from distant sources, thereby strengthening the state's economy.

Please consider developing plans for sustainable power sources for Kauai and delay the building of this power plant.

Yours Truly,


Dean K. McRaine
Malone B. McRaine

FEB 11 AM '99



P L A N N I N G
S O L U T I O N S

March 18, 1999

Mr. Dean K. McRaine &
Mr. Malone B. McRaine
4430 Kaihii Makai
Kihaea, Hawaii 96754

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Sirs:

Thank you for your February 8, 1999 letter to the Office of Environmental Quality Control concerning the proposed Lihue Energy Service Center. We appreciate the time you both spent preparing your letter. Because we prepared the *Draft Environmental Impact Statement for the Lihue Energy Service Center*, Kauai Electric (KE) has asked us to respond to your comments.

Your letter refers to "...the 23 MW electric generator planned for Kauai." I presume that this is the 26.4 MW advanced steam-injection combustion turbine that Kauai Power Partners, L.P. (KPP) is developing in order to fulfill the terms of its power purchase agreement with KE. The State of Hawaii Public Utilities Commission approved the contract between KPP and KE in June 1998. While the terms of the contract allow some flexibility in the date on which the KPP generating unit enters service, it does not allow for the cancellation of the project. Moreover, at present none of the available renewable technologies is a cost-effective substitute for KPP's oil/naphtha-fired generating unit. KE entered the contract only after determining that it could not forestall the need to install additional generating capacity through its *Energy Wise Demand-Side Management (DSM)* programs.

KE continuously evaluates available generating technologies, including those using renewable energy sources, as part of its regular Integrated Resource Planning (IRP) process. This involves thoroughly investigating the available technologies and seeking proposals from third parties for the construction and operation of generating units powered by renewable resources. At present, approximately 15 percent of the energy used by its customers comes from renewable sources. KE also has a contract with the developer of the waste-to-energy project that has been proposed for Port Allen and will dispatch that energy to its customers if and when it becomes available.

While the Lihue Energy Service Center is a master-planned development with the capability of accommodating a number of generating units, those units will be constructed only if the PUC concurs that that they are needed. Moreover, each will be subject to permitting by State and County agencies through processes that involve comprehensive public review and approval. If more cost-effective renewable energy alternatives are available, subsequent fossil fuel-fired units will not be installed.

If you have any further questions or comments, please call me at 593-1288.

Sincerely,


Perry W. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

SEND COPIES TO
APPROPRIATE PARTIES

P.O. Box 52 (36)
Kalaheo, HI 96741



PLANNING
SOLUTIONS

March 18, 1999

Office of Environmental Quality Control

235 S. Antoinette St.

Kalaheo, HI 96741

2/18/99

99 FEB 11 AM 05:55

(P)

Dear Utility Regulators, etc.,

✓ agree completely with the article
Carol Bain wrote in the Kalaheo Herald-Sunday of
February 7, 1999. The use of additional alternative
energy sources definitely needs to be explored.

Thank you,

Tim Brause

Tim Brause

Mr. Tim Brause
P.O. Box 521
Kalaheo, Hawaii 96741

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Brause:

Thank you for your February 8, 1999 letter to the Office of Environmental Quality Control (OEQC) concerning the proposed Lihue Energy Service Center. Because we prepared the Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center, OEQC forwarded your letter to Kauai Electric and us (KE) has asked us to respond to your comments.

Your letter states that you agree completely with Carol Bain's February 7, 1999 article in The Garden Isle newspaper. Her official comment letter on the DEIS is virtually identical to the article, and so I would like to respond to your observations by providing you a copy of our response to Ms. Bain's letter.

If you have any further questions or comments, please call me at 593-1288.

Sincerely,

Barbara Pendragon
Barbara Pendragon

Attachment:
Letter to Ms. Carol Bain

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

2-8-99

APPROPRIATE AGENCIES



Office of Environmental Quality Control
235 South Beretania Street
Honolulu, HI. 96813

Subject: *Kaunoi Electric Expanded Generating Plan.*

I find it hard to believe that Kaunoi Electric is proposing a fossil fueled generating facility. British Petroleum has recently announced that it takes climate change seriously and is stepping up its investments in solar energy. All the current trends in energy planning acknowledge that renewable, sustainable and non-polluting sources are the only viable choices. Kaunoi has excellent potential in wind, hydraulic and solar sources, so we should look ahead and use our natural resources. Oil is NOT renewable and chemists have long decried our wanton destruction of the wonderful hydrocarbon molecules just to get the energy out.

An expansion is NOT immediately needed, there is enough time so that no proposal of expansion should be considered until a complete analysis and comparison of sustainable, non-polluting sources is made and reviewed for accuracy, competence and attention to the latest developments in science and economics.

I am a retired Architect who has known Kaunoi as my home, and to find this KE proposal has left me dumbfounded. We must insist on a careful, comprehensive look at all of our alternatives, and remember that climate change will cause more hurricane activity.

Sincerely,

Robert D. Ferris F.A.I.A.

Box 1197 KILAUEA HI. 96754



**P L A N N I N G
S O L U T I O N S**

Mr. Robert T. Ferris, F.A.I.A.
Box 1197
Kilauea, Hawaii 96754

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Ferris:

Thank you for your February 8, 1999 letter to the Office of Environmental Quality Control (OEQC) concerning the proposed Lihue Energy Service Center. Because we prepared the *Draft Environmental Impact Statement (DEIS) for the Lihue Energy Service Center*, OEQC forwarded your letter to us, and Kauai Electric (KE) has asked us to respond to your comments.

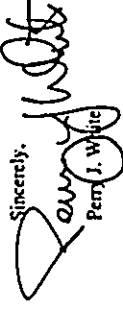
Before addressing your comments concerning the kinds of generating facilities that are most appropriate for Kauai, I would like to note that KE shares your concerns about the environmental effects of its activities. While your comments were limited to the generation side of the equation, KE begins from the conservation side. As discussed in the *DEIS* for the Lihue Energy Service Center project, KE considers Demand Side Management (DSM) programs before it decides to build any type of additional generating capacity, conventional or renewable. It is presently implementing DSM programs that it hopes will shave 5 MW off of the peak demand that would otherwise occur by the year 2004. While this is an important contribution, it will not eliminate the need to construct additional generating capacity.

Energy planners (including those at KE) are continuously evaluating renewable energy sources for use in its system. Approximately 15 percent of the energy that KE presently sells to its customers already comes from such sources (bagasse and hydropower). KE would very much like to see the proportion rise. However, it is also cognizant of the burden that high electrical energy rates place on its customers and the renewable energy technologies that are presently available are more costly than the fossil fuel-fired technology that KE has proposed as its next unit addition.

For reasons outlined in the *DEIS*, both KE and the State Public Utilities Commission (PUC) have independently concluded that additional generating capacity is needed. In June 1998, following review by its staff, the State Consumer Advocate, and the public, the PUC approved the contract between KE and Kauai Power Partners, L.L.P. for the next generating unit. The PUC's review and approval process is thorough, open, careful, and comprehensive. The process that KE used to select the unit was open to bidders using renewable resources and, in fact, one of the five finalists did propose a renewable energy system. This biomass proposal was rejected because a) the bidder was unable to secure a source of biomass fuel on Kauai, and b) the cost was unattractive. KE also met with representatives from the Danish wind turbine maker Micon A/S during the bid selection; however, they did not submit an official response to KE's Request for Proposals. Finally, while HITECH, L.L.C.'s proposal for a waste-to-energy project did not qualify as a firm power resource, KE did sign an energy purchase agreement with that company.

Page 2
Mr. Robert T. Ferris
March 18, 1999

If you have any further questions, please call Dave Morgan, KE's Production Manager, at 335-6233.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

March 18, 1999



**P L A N N I N G
S O L U T I O N S**

March 18, 1999

Mr. Larry Heller
P.O. Box 387
Lawai, Hawaii 96765

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Heller:

Thank you for your February 7, 1999 letter to the Office of Environmental Quality Control (OEQC) regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments. Because we prepared the *DEIS*, the OEQC forwarded a copy to us. We have discussed the issues you raised with Kauai Electric (KE), and have the following responses.

(1) **Paragraph 1.** Your letter refers to "...the *EIS Draft report for the proposed 26.4 MW (meriwah) power plant being planned (sic) by Kauai Power Partners for Kauai Electric...*" I believe the report you referred to is the *DEIS* for the Lihue Energy Service Center. Kauai Power Partners (KPP) is considering locating its unit on the Lihue Energy Service Center site, if the site approvals can be obtained in time. However, the *DEIS* covers a much larger undertaking that would provide KE space for a transmission and distribution facilities baseyard and for a series of generating units to be developed over several decades. Consequently, it is incorrect to equate the two. As discussed in Chapter 1 of the *DEIS*, both KE and the State Public Utilities Commission (PUC), which has approved KE's expenditures for a new site and its purchase power agreement with KPP, have concluded that additional generating facilities are needed.

(2) **Paragraph 2.** KE is a regulated public utility, and its planning and decision-making take place within the framework of PUC rules. These rules dictate that its activities be the most economically advantageous for its customers and/or directed at a non-economic objective established by the PUC.

- **Project Economics.** KE already obtains approximately 15 percent of the power it sells to customers from renewable sources (bagasse and hydro). KE would like to increase the percentage that is obtained from renewable sources. However, as demonstrated by the response it received to its 1996 Request for Proposals (RFP) for additional generating capacity, renewable sources are not presently competitive with efficient fossil fuel-fired units such as the one KPP is developing.

- **Non-Economic Objectives.** The State could influence the growth of renewable energy by changing the regulations governing the Hawaii's electric utilities. One approach (being applied in California's newly deregulated electric industry, for example) allows for retail customers to purchase (at a premium based on their higher cost) their electricity from renewable energy sources which transmit or "wheel" the energy across utility power lines. Consumer freedom to choose electric providers is one of several complicated and controversial issues that the Hawaii PUC is studying today. Another approach is for the

Page 2
Mr. Larry Heller
March 18, 1999

State Legislature or the PUC to set specific goals for the use of renewable sources of energy. The Minnesota PUC recently made such a ruling when it ordered Northern States Power to develop 400 megawatts of additional wind power by the year 2010 even if it is not the "least cost" option. Absent a regulatory mandate that utilities either install or transmit renewable energy, the success of renewables will depend on cost. KE will buy electric energy (renewable or otherwise) from any independent power producer (IPP) that can provide energy at a price below its avoided energy cost (i.e., Kauai Electric's cost of fuel to generate electricity).

(3) **Paragraph 3.** As described in the Chapters 1 and 5 of the *DEIS*, KE considered many alternatives, including those involving the use of renewable energy sources, in developing its proposal for the Lihue Energy Service Center. It undertakes a comprehensive review of its options every three years of part of the Integrated Resource Planning process. Its Demand-Side Management (DSM) program (see Section 1.2.5.1 of the *DEIS*) is aimed at increasing energy conservation and, therefore, avoiding the need to construct additional generating units. Public opposition has blocked several efforts to increase the amount of electrical energy that is produced using the hydro resources of the island. KE has repeatedly evaluated potential windpower projects. However, because one cannot rely on the wind to blow when the electricity is needed, such generating capacity is not a substitute, in-and-of-itself, for fossil fuel-fired generators. Moreover, neither KE nor independent power producers have been able to assemble an economically feasible windpower project. Solar photovoltaic power (without suitable storage) is like windpower in that it is not always available when needed. In addition, photovoltaic conversion efficiencies are low (but growing) and manufacturing costs are high. Until economic, utility grade, electric storage technologies (batteries, etc.) are available, KE cannot use it to meet the needs to be served by the Lihue Energy Service Center. Solar thermal systems (such as solar panel hot water heaters) can store energy and do help lower peak demand; such systems are included in KE's DSM programs.

I hope the foregoing addresses your specific comments relating to the *DEIS* for the Lihue Energy Service Center. If you have any questions, please call Dave Morgan, KE's Production Manager at me at 335-6233.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

SEND COPIES TO
APPROPRIATE PARTIES

411

POSTED
2/8/99

Arnold B. Nurock, M.D.
P.O. Box 705
Kilauea, Hawaii 96754-0705
Telephone (808) 828-1207
Email: anurock@aloha.net

Monday February 8, 1999

99 FEB 11 AM 7

QUAL...

OEQC
235 South Beretania Street
Honolulu, HI 96813

Dear Persons:

I wish strenuously to object to any expansion of Kawai Electric's facilities on Kauai. We already pay the highest rates in the US, and no longer have any options for energy suppliers but Citizens Utilities since they also own the Gas Company now.

There is no need for increased electric capacity now. There is no way to predict what the need might be in the future. As more and more residents opt for solar power, because it has become economically feasible due to the high rates of Kawai Electric, there will be less and less demand, not more.

Certainly, additional fossil fuel generation can only degrade the environment. If Citizens Utilities wants to do something positive, it could explore solar, wind power, and biomass options.

What is evident, however, is that the company's concern is to enrich it's shareholders at our expense. They can get away with it because they have a monopoly unless our government agencies, such as your own, protect us. I do understand that it is a company's duty to increase value for shareholders, but the Department of Justice seems clear on the issue that it is not legal to use a monopoly position to do so at unreasonable expense to consumers.

This proposal is inappropriate at this time. Please deny it.

Sincerely,





**P L A N N I N G
S O L U T I O N S**

March 18, 1999

Dr. Arnold D. Nurock, M.D.
P.O. Box 705
Kilauea, Hawaii 96754-0705

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Dr. Nurock:

Thank you for your February 8, 1999 letter to the Office of Environmental Quality Control (OEQC) regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your comments. Because we prepared the *DEIS*, the OEQC forwarded a copy to us. We have discussed the issues you raised with Kauai Electric (KE), and have the following responses.

- (1) **Paragraph 1.** Your letter registers your objections to any expansion of KE's facilities on Kauai. It cites the existing high rates for electricity and Citizens Utilities ownership of both companies as the basis for your objection. This comment did not pertain specifically to the *DEIS*.
- (2) **Paragraph 2.** As discussed in Chapter 1 of the *DEIS*, both KE and the State Public Utilities Commission (PUC) have concluded that additional generating facilities are needed now. This determination considered all factors that affect the use of electricity, including the implementation of demand-side management (DSM) measures such as rooftop solar power. Because of the time needed to obtain needed permits and to construct generating facilities, it is essential that the decision to proceed with projects be made well before the time they must be in service.

(3) **Paragraph 3.** As described in the *DEIS*, KE's generating system planning takes place within the context of the PUC's Integrated Resource Planning (IRP) process. KE begins its evaluation of the need for additional generating capacity by first evaluating the extent to which DSM measures can eliminate the need. Only after it has concluded that DSM cannot allow the company to meet its customers needs does it consider adding generating capacity. Both the magnitude of the need and the generating technology most appropriate for providing it are updated every three years as part of the IRP process. Finally, as explained in the *DEIS*, KE does consider solar, wind power, and biomass options. More specifically:

- KE already obtains approximately 15 percent of the power it sells to customers from renewable sources (bagasse and hydropower), and it would like to increase this.
- Public opposition has blocked several efforts to increase the amount of electrical energy that is produced using the hydropower resources of the island.
- KE has repeatedly evaluated potential windpower projects. However, because one cannot rely on the wind to blow when the electricity is needed, such generating capacity cannot substitute in-and-of-itself with fossil fuel-fired generators. Moreover, neither KE nor

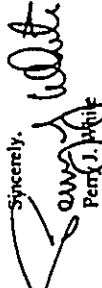
Page 2
Dr. Arnold B. Nurock, M.D.
March 18, 1999

independent power producers have been able to assemble an economically feasible windpower project.

- Solar photovoltaic power (without suitable storage) is like windpower in that it is not always available when it is needed. Moreover, conversion efficiencies are low (but rising) and manufacturing costs are high. Until economic, utility grade, electric storage technologies (batteries, etc.) are available, KE cannot use it to meet the needs served by the Lihue Energy Service Center. Solar thermal systems such as solar hot water heaters can store energy and do help lower peak demand; such systems are included in KE's DSM programs.

(4) **Paragraph 4.** The State PUC exists to insure that public utilities do not misuse their monopolistic power. It controls the rate of return that KE shareholders may earn on their investments. KE will not earn any return on the next unit addition to KE's system (the 26.4 MW advanced steam-injected combustion turbine that Kauai Power Partners, LLP, is developing under contract to KE). It will simply purchase the power from the unit, passing on these direct costs to its customers. KE negotiated the contract with KPP principally because it felt that this would result in the lowest cost to its customers.

I hope the foregoing addresses your specific comments relating to the *DEIS* for the Lihue Energy Service Center. If you have any questions, please call me at 593-1288.

Sincerely,

 Perry J. White

cc: Office of Environmental Quality Control
 Dave Morgan, Kauai Electric
 Barbara Pendragon, Kauai County Planning Department

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APPROPRIATE PARTIES

42

POSTER
2/2/99

MARGERY B FREEMAN
6448 KAAHELE ST.
Kapaa, Hawaii 96746
Phone: 808-822-4605
Feb. 7, 1999

Office of Environmental Quality Control
235 S. Beretania St.
Honolulu, HI 96813

Dear Sirs/Madam:

I would like to go on record as opposing Kauai Electric's planned new generating plant.

1. First of all there is no proven need for an expansion of electricity at this time. Kauai's General Plan calls for only modest increases in tourists over the next 20 years and very little increase in population. We already have almost 3 times as much power capacity as we need.
2. Building a new power plant will greatly increase our costs of electricity even though we now have one of the highest rates in the country.
3. KE is doing nothing to:
 1. Conserve energy and decrease our dependence on fossil fuels
 2. To look at alternative ways to decrease energy use such as encouraging houses to install solar panels
 3. Look into use of biomass in the form of bamboo growing, etc.
4. All the sites chosen by KE for the new power plant are not good. They are too near schools, require crossing of population areas with gas and are in areas where they will be unsightly.

Please refuse KE request for a new generation plant on Kauai.

Thank you.

Sincerely,

Margery Freeman



PLANNING
SOLUTIONS

March 18, 1999

Ms. Margery H. Freeman
6448 Kaabele Street
Kapaa, Hawaii 96746

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Ms. Freeman:

Thank you for your February 7, 1999 letter to the Office of Environmental Quality Control (OEQC) regarding the proposed Lihue Energy Service Center. Because we prepared the *Draft Environmental Impact Statement (DEIS)* for the project, the OEQC forwarded a copy to us. Your letter does not refer specifically to the *DEIS*. Moreover, its date and content are such that it appears to have been a reaction to the information contained in Ms. Carol Bain's commentary in the February 7, 1999 edition of the *Garden Isle* newspaper rather than to the content of the *DEIS*. Nonetheless, we have discussed the issues you raised with Kauai Electric (KE), and have the following responses.

KE understands that you are opposed to its planned new generating plant. Its reasons for believing the facility should be approved are described in the *DEIS*.

(1) Need for Additional Generating Capacity. You do not indicate the basis for your conclusion that there is no need for additional generating capacity at this time. As discussed in Chapter 1 of the *DEIS*, both KE and the State Public Utilities Commission (PUC), have concluded that additional generating facilities are needed now. The PUC has authorized construction of 26.4 MW of additional capacity to be on-line in mid-2002. You state that: "We already have almost 3 times as much power capacity as we need." I presume that you arrived at this multiple by dividing 110 MW (the present installed capacity, including Lihue Plantation) by 40 MW (the "average" use cited in Ms. Bain's commentary). The 40 MW figure is incorrect, with the actual figure for 1998 being about 47 MW. More importantly, the need for capacity is a function of peak demand, not average use, and it must take into account the fact that some generating units are always out of service for routine maintenance. Chapter 1 of the *DEIS* discusses these factors at some length.

(2) Effect on Electricity Costs to Consumers. KE is acutely aware of the burden that high electricity costs place on consumers. Working within the constraints of Kauai's geographic situation, the company and its employees do their utmost to work efficiently. It has not added a generating unit since 1991, and its regular maintenance program is designed to keep its existing units on-line for as long as practical (no retirements are planned through 2017). In 1995 and 1996, KE's rates increased approximately 22 percent; this was due in large part to the rebuild after Hurricane Iniki. If it were not for the effects of that natural disaster, KE's customers would actually be paying much less for their current electric bills.

(3) KE's Conservation and Alternative Energy Efforts. This comment is incorrect. Chapter 1 of the *DEIS* describes KE's efforts to foster conservation through its Demand-Side Management (DSM) program. That program contains economic incentives and educational

Page 2
Ms. Margery H. Freeman
March 18, 1999

materials designed to help KE's customers install solar hot water heating panels, use more efficient lighting, upgrade their air-conditioning units, and select energy-efficient motors. KE presently obtains approximately 15 percent of the energy it sells to customers from renewable energy sources (biomass and hydro). Although bamboo may have some profitable uses, as an energy crop it is inferior to sugar cane.

(4) Site Qualities. We understand that you do not approve of any of the sites being considered for the Lihue Energy Service Center. The *DEIS* analyzes each of the three sites KE is considering with respect to the factors mentioned in your letter (proximity to schools, fuel transport through urbanized areas, and visual impacts). The analyses do not support the conclusion that none are acceptable.

I hope the foregoing addresses your specific comments relating to the *DEIS* for the Lihue Energy Service Center. If you have any questions, please call me at 593-1288.

Sincerely,

Perry J. Whiting

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

43

Environmental Quality Control

3-3400 Kubio Hwy. #B410
Lihue, Hawaii 96766

February 7, 1999

Office of Environmental Quality Control
235 South Beretania Street
Honolulu, HI 9813

99 FEB 11 A 2:44d

Dear Sirs:

CC: [unclear]

I enclose an interesting article published in the Garden Island newspaper on Kauai. I am in agreement with Ms. Bain's views, and wish to add a comment on the subject of biomass.

Since the closure of some sugar plantations on Kauai and the reduction of the planting areas of Lihue Plantation, hundreds of acres of abandoned cane land have blossomed into fields of more than four-foot high grass which I believe is called "guinea grass". It is not a particularly good fodder grass and when the dry season arrives these grassy fields constitute a real fire hazard.

I understand from my husband, an engineer who worked at the Waihiua Plantation on Oahu many, many years ago, that the plantation had special rollers which removed the juice from the sugar cane they harvested to the point that on the final crushing the fibers could be immediately used to fuel the generators, to the extent that they did not need electricity from outside sources to run the mill.

Besides the guinea grass, there are other types of tall grasses, which offer even more fiber and could be cultivated for biomass, as well as the bamboo suggested by Ms. Bain. One of these is so-called "elephant grass", which is very fibrous and grows six or seven feet tall.

In our former home we had solar panels which supplied all the hot water we needed for domestic purposes, and use of these panels, especially on the dry side of the island would cut down considerably on the need for electric power.

Amfco/JMB has repeatedly threatened to close down their sugar operation, which would leave only the West side plantations. The Lihue Sugar Mill and the Koloa Sugar Mill, might be planned as future power generating sources, rather than just allowing them to crumble. The McBride mill was rehabilitated for the coffee industry, so there is a precedent for re-use of these sites which are already in place. Some re-thinking needs to be done before any new ventures are begun.

Very truly yours,

Frances N. Frazier
Frances N. Frazier

44
POSTED
4/2/99

CC 235 (2)
AFFIDAVIT

Office of Environmental Quality Control
235 So Beretania St. Honolulu, HI. 96813

Feb. 7, 1999

To whom it may concern,

As a resident of the island of Kauai I am offering public testimony on the subject of the new power plant proposed by Kauai Electric on this island.

I am extremely disappointed with the current proposal to build a power plant that will use non sustainable energy sources. I am against the burning of naphtha or alternately, coal as the energy source. We should not be setting up a dependency on fossil fuel which is imported to Hawaii. Oil tankers have a nasty record of leakage and accidents which have soiled our pristine beaches in the past. Coal would also have to be imported and is known to emit toxic substances when burned to produce energy. People have pointed out in the public hearings that the proposed location near a community college and private school is at best an unhealthy and at worst, a dangerous location for emissions from either of those energy sources.

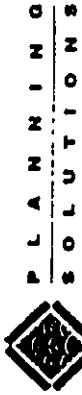
Denny Polosky, VP and manager of KE, attended an Economic Renewal Conference at Waimea Plantation Gardens last fall. He was a speaker on a panel in the energy segment and, in turn, was exposed to the other innovative speakers who are visionaries and pioneers in that field. It did seem peculiar to me at the time that he was emphasizing the above mentioned non sustainable fuel sources for the proposed power plant when there were several other alternatives available to us on Kauai. However, I gave him credit for attending the conference and hoped that this exposure would enlighten his thinking on how we could meet our energy needs in the future. Not true. According to the recent draft Environmental Impact Statement (EIS) Denny and the other planners have not changed course on their neolithic approach about how to provide energy to Kauai in the future.

I implore you to get up to speed with the current thinking. Get creative and maybe you will receive recognition as well as revenues. Carol Bain Garden Isle Feb. 7, 1999) outlined some possibilities; namely, greatly expanded solar collection, biomass, and wind production as a significant part of the future energy plan for Kauai. In her editorial, Carol wrote about increased rates to the consumer with the construction of the proposed plant.

I challenge KE and the powers that be in the State of Hawaii who determine the future of Kauai to consider the cost to our environmental heal and personal health as it will be affected by their decisions. Please get these renewable energy sources in gear and make them the basis of our energy expansion for Kauai.

Sincerely,
Gabriela Taylor
5620 Keapana Rd. Kapaa, Hi. 96746

Gabriela Taylor



PLANNING
SOLUTIONS

March 18, 1999

Ms. Gabriella Taylor
5670 Keapana Road
Kapaa, Hawaii 96746

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Ms. Taylor:

Thank you for your February 7, 1999 letter to the Office of Environmental Quality Control (OEQC) regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. Because we prepared the *DEIS*, the OEQC forwarded a copy to us.

Your letter's only reference to the *DEIS* is in the context of it showing that Kauai Electric (KE) still wishes to develop additional fossil fuel-fired generating capacity on Kauai. You register your opposition to the construction of such facilities. The issues mentioned in the second paragraph of your letter are discussed in the impact sections of the *DEIS*. In general, the results of the scientific and engineering analyses do not support your assertions with respect to such things as health risks of forecast project-related emissions.

At the bottom of the first page of your letter you direct KE's attention to the possibilities outlined in Carol Bain's February 7, 1999 article in the *Garden Isle*. Because Ms. Bain's comments on the *DEIS* were virtually identical to those expressed in the article, we have enclosed a copy of our response to her with this letter.

I hope the foregoing addresses your specific comments relating to the *DEIS* for the Lihue Energy Service Center. If you have any questions, please call me at 593-1288.

Sincerely,

Peggy J. White

Attachment: Copy of Carol Bain Response Letter

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

RECEIVED
PLANNING DEPARTMENT

45
FEB 11 1999



PLANNING
SOLUTIONS

February 8, 1999

Kauai Electric
Public Utilities Commission
Office of Environmental Quality Control
235 South Beretania Street
Honolulu, Hawaii 96813

March 18, 1999

Ms. Danie McReynolds
P.O. Box 767
Kilauea, Hawaii 96754

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Ladies and Gentlemen:

Please do not build a new Kauai Electric Power Plant. Alternate means of power such as biomass, solar and wind generation need to be addressed more closely before this new power plant is built. There is no urgency to this proposed power plant. Let's try conservation and research and development of these other power solutions first.

Please support Hawaii's sustainability mandate, "For the benefit of future and present generations, the State...shall conserve and protect Hawaii's natural beauty and all natural resources, including...energy sources, and shall promote the development and utilization in a manner consistent with their conservation and furtherance of the self-sufficiency of the State." Dependence on imported fossil fuel is not self-sufficient, even if oil happens to be glutting the world market right now. (And this brings to mind that Hawaii is paying more for gas and oil than any other state in the nation at a time when prices have never been lower since the Sixties!!!. Explain that!)

Thank you for considering the quality of life here on Kauai.

Sincerely,

Danie McReynolds
PO Box 767
Kilauea HI 06754

Dear Ms. McReynolds:

Thank you for your February 8, 1999 letter to Kauai Electric (KE), the Public Utilities Commission (PUC), and the Office of Environmental Quality Control (OEQC) regarding the Draft Environmental Impact Statement (DEIS) for the proposed Lihue Energy Service Center. Because we prepared the DEIS, the OEQC forwarded a copy to us.

We understand that you do not wish KE to construct the Lihue Energy Service Center until alternate means of power generation such as biomass, solar, and wind have been evaluated more closely. You state that it is not urgent that KE proceed at the present time and that KE should try conservation and research and development of the other alternatives before moving forward with its proposal.

As discussed in Chapter 1 of the DEIS, KE does consider conservation first. Its decisions concerning the need to construct additional generating capacity are made within the context of the PUC's Integrated Resource Planning (IRP) process. KE begins by determining if the need to construct additional units can be avoided through Demand-Side Management (DSM). KE's approved DSM programs include economic incentives and educational materials designed to help KE's customers install solar hot water heating panels, use more efficient lighting, upgrade their air-conditioning units, and select energy-efficient motors.

KE's reasons for believing that it must add additional generating capacity now are also described in Chapter 1 of the DEIS. If the next generating unit is to be located at the Lihue Energy Service Center, it is essential that KE move expeditiously to obtain the required approvals and environmental permits. If it does not do this, the next unit will not be available when it is needed to meet its customers needs.

Finally, KE has asked me to say that it understands your desire for greater use of renewable energy sources. The IRP process is intended to balance this with other goals in arriving at an acceptable generation mix for Kauai. The IRP analysis shows that fossil fuel-fired generation makes the most sense at present.

If you have any questions, please call me at 593-1288.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

To: OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

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U.S. DEPARTMENT OF
ENERGY

POSTED
7/18/89

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U.S. DEPARTMENT OF ENERGY

Kaui Electric's plan to build a new fossil fuel burning power plant seems somewhat premature, and to use oil or coal is just not very creative in this day and age.

Power demands are based on peak use requirements. Peak demands normally occur in the morning and early evening. How about installing some smaller turbine generators that could use clean burning propane gas, now that they own the gas company. These peak demand generators could be used until such time as, say, trash to energy systems are practical.

The other way to help delay building a major oil/coal burner at this time is to shave the peak demand.

If electric water heaters were all converted to solar power it would surely reduce the peak demand by quite a bit. Investing in Kauai Electric owned individual solar water heaters might hold off the need to build a power plant of the type they are planning. By Kauai Electric owning the solar heaters they would be able to put that cost into rate base in order to protect the investment. Electric water heaters are major contributors to peak demand. The greatest need for hot water occurs morning and evening contributing greatly to the peak requirements. Yes it would be a new concept for them to own the water heating systems in individual homes and businesses, but isn't it time for a new approach rather than the same old concept tied to fossil fuel use, a commodity we don't have, that has to be imported at great cost, and then burned at a major cost to the local and world wide environment.

Trash to energy may have a lot of problems, and is not yet ready for commercial use, but shouldn't we find a way to meet our energy needs for the time it takes to develop safe efficient trash to energy use. We have the fuel (trash) in amounts that are overwhelming, and very expensive to deal with. Shouldn't we put our efforts toward a method that relieves both of these costly problems - what to do with trash, and an increasing need for electric energy. Let's take some interim steps to give us the time to develop the technology to use the trash to energy option. We will all pay for this oil/coal burning plant with higher electric rates for the next 30 years, and with adverse environmental effects. That is just not very creative, it's the same old way of making electricity that has been going on for over a hundred years. A no brainer method that is far too costly, (we have one of the highest electric rates in the country), and damaging to the island/world environment. The ever increasing high cost of electricity is a major contributor to the high cost of living on Kauai.

The cost of electricity is passed on to all of us in the form of increased costs of everything we buy: food, clothing, etc. The visitors we try so hard to get must pay more at hotels, restaurants, etc. than other places they may go.

Is it any wonder our economy is in so much trouble?

Let's find a better way, our future depends on it.

Keith Hutchens
Keith Hutchens
Kilauea
925-1725



**P L A N N I N G
S O L U T I O N S**

March 18, 1999

Mr. Keith Hutchens
2180A Iola Street
Kilauea, Hawaii 96754

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Hutchens:

Thank you for your undated letter to the Office of Environmental Quality Control (OEQC) regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. Because we prepared the *DEIS*, the OEQC forwarded a copy to us. Y

our letter does not directly reference the *DEIS*. However, it does question the need for the project and suggests alternative approaches that you believe Kauai Electric (KE) should investigate. It suggests that the Lihue Energy Service Center would not be needed if the demand for electrical power could be met through the use of smaller turbines, increased use of solar energy, or by shaving demand. We have addressed each of these possibilities below.

Smaller Turbines. KE has considered "distributed generation" using small turbines such as you suggest. However, even preliminary analyses of this option have shown that it would be substantially more expensive than the centralized generation that KE has proposed. In Hawaii, propane, which is the only practical fuel for such an application, is considerably more expensive (in terms of dollars per kilowatt-hour) than the liquid fuels used by the kinds of units that KE is considering. This is different from many locales on the Mainland where propane has cost advantages over liquid fuels.

Increased Use of Solar Power. KE recognizes that increased use of solar water heating can reduce the consumption of fossil fuel and delay the need to add new generating capacity. As discussed in Chapter 1 of the *DEIS*, solar thermal systems are included in KE's Demand-Side Management (DSM) program. That program does not include KE ownership of the solar systems.

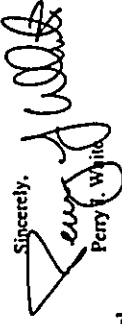
Trash-to-Energy Systems. Trash-to-energy systems are in operation in a number of locales. Honolulu, for example, obtains approximately 50 megawatts from the HPOWER trash-to-energy facility located in Campbell Industrial Park. However, the amount of trash that is available on Kauai is a small fraction of the volume available to the HPOWER facility. Assuming roughly equivalent heat content and conversion efficiency, trash-to-energy conversion on Kauai could probably not generate more than 5 MW on a sustained basis.

Moreover, given today's energy prices, trash-to-energy systems are much more expensive to operate than comparable fossil-fuel-fired facilities. The higher cost would have to be passed on in the form of higher refuse disposal costs or higher electricity costs. Advances in technology may reduce the cost of these systems in the future. However, the energy content of municipal waste is so low and the work required to process it into suitable fuel so substantial that it will be an economic fuel only if waste disposal fees are set high so that these fees pay most of the cost of operating the facility.

Page 2
Mr. Keith Hutchens
March 18, 1999

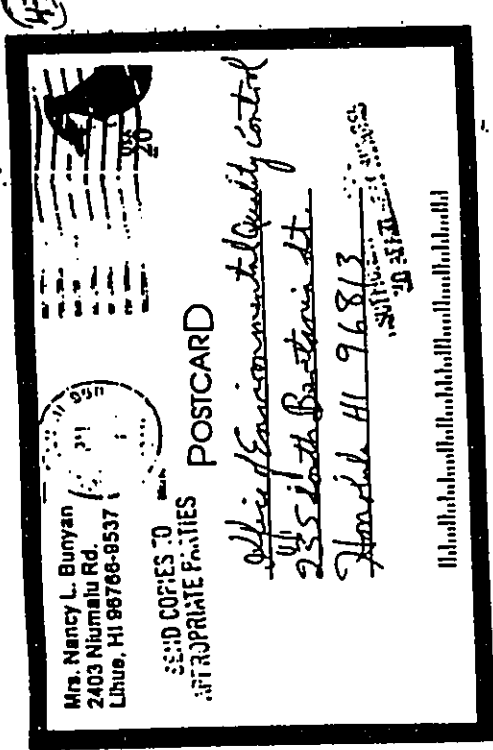
Conclusion. At the conclusion of your letter, you point to the high cost of electricity as being a major contributor to the cost-of-living on Kauai. KE is acutely aware of the burden that high electricity costs place on consumers. It believes this is one of the reasons why it would be imprudent for it to propose technologies which are substantially more expensive than the ones it has proposed. Working within the constraints of Kauai's geographic situation, the company and its employees do their utmost to work efficiently. It has not added a generating unit since 1991, and its regular maintenance program is designed to keep its existing units on-line for as long as practical (no retirements are planned through 2017). In 1995 and 1996, KE's rates increased approximately 22 percent; this was due in large part to the rebuild after Hurricane Iniki. If it were not for the effects of that natural disaster, KE's customers would actually be paying much less for their current electric bills.

Again, we appreciate your interest in the proposed changes to KE's system. If you have any questions, please call me at 593-1288.

Sincerely,

Perry F. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

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P L A N N I N G
 S O L U T I O N S

March 18, 1999

Mrs. Nancy L. Bunyan
 2403 Niimalu Road
 Lihue, Hawaii 96766-9537

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Ms. Bunyan:

Thank you for your undated postcard to the Office of Environmental Quality Control (OEQC) regarding the proposed Lihue Energy Service Center. Because we prepared the *Draft Environmental Impact Statement (DEIS)* for the project, OEQC forwarded a copy of the postcard to us.

Your postcard does not directly reference the *DEIS*. However, it does make it clear that you are opposed to Kauai Electric (KE) constructing additional generating units. Instead, you suggest that KE explore alternative approaches such as windmills and subsidies for solar panels.

Chapters 1 and 5 of the *DEIS* describe the Integrated Resource Planning (IRP) process that KE follows in planning additions to its system. The IRP process includes Demand-Side Management (DSM) measures intended to reduce energy use and, therefore, forestall the need to add capacity. These measures include subsidies that are intended to increase the use of solar panels.

The IRP process also includes consideration of generating technologies that rely on renewable resources (e.g., biomass, wind mills, photovoltaic cells, etc.). KE's consideration of these technologies is discussed in Chapter 5 of the *DEIS*.

Thank you for your interest in the project. If you have any questions, please call me at 593-1288.

Sincerely,

 Perry J. White

cc: Office of Environmental Quality Control
 Dave Morgan, Kauai Electric
 Barbara Pendragon, Kauai County Planning Department

Please do not approve plans for a
 new Kauai Electric power plant.
 Explore other means of providing
 electricity such as wind mills,
 subsidies for solar panels, etc.
 Thank you Nancy L. Bunyan

Handwritten: 2/10/99



February 8, 1999

-1-

February 8, 1999

Kaui Electric, ATT: Mr. Perry White
4463 Palae St., Lihue, HI 96766

Dear Sir:

Last month the draft environmental impact statement for the Energy Service Center arrived in my mailbox. It makes a nice companion piece to the July 1997 Environment Assessment (EIS) preparation notice. Both refer a lot to the Integrated Resource Plan (IRP), a big thick book submitted to the Public Utilities Commission (PUC) in 1992 that is now being updated.

There is a lot of information in these documents. I understand KE can deliver 110 megawatts (MW) total, including electrical generation from hydro and bigas combined with its Port Allen fossil fuel generation capabilities. The entire island uses only around 40 MW on average, so it seems like we don't need new 26.4 MW advanced steam-injected turbines that are planned.

At least not now, but I realize these documents are looking ahead and planning for the future, like we all should do before we invest in some big ticket item.

No one knows if the demand for electric power will grow as fast as projected. Kaui should look for alternative sources of energy and conserve. The longer we avoid building a new plant, the longer we avoid paying for it.

I understand KE must also be able to have its 23 MW generator down for maintenance and still meet peak demand to make the government regulators happy.

Fortunately, Kaui has capacity of offering diverse energy sources. Bigas from Lihue Plantation (LP) combined with hydro generates 20% of our energy, and we could increase this percentage.

What is worrisome is that LP may close down, and its 14 MW won't be there as a cushion. If Kaui can find a way to keep the biomass going and perhaps expand, then we can forestall the need for a new energy plant.

It may be time for our PUC and utility company to demonstrate leadership in finding and encouraging alternative energy sources. Perhaps you may not think it is the role of business to demonstrate community leadership, but this can happen with joint business and government partnerships. The same leadership that seeks out new visitors to our island can be applied to seeking out sustainable and diverse agro-business opportunities.

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- 2 -

February 8, 1999

Not your role, you say? It is everyone's role to take responsibility for our future energy needs.

There is no doubt that burning asphalt may be cheaper right now, but burning any fossil fuel does not support Hawaii's sustainability mandate which states: "For the benefit of future and present generations, the State...shall conserve and protect Hawaii's natural beauty and all natural resources, including...energy sources, and shall promote the development and utilization in a manner consistent with their conservation and in furtherance of the self-sufficiency of the State."

Because oil is refined within the state and asphalt is a by-product, technically the KE plan uses in-state energy resources. However, we all know that dependence on imported fossil fuel is not self-sufficient, even if oil happens to be glutting the world market right now.

KE must get the PUC to approve of its planning, but the only alternate plan in the draft EIS describes a coal-burning option. Where are the wind, solar and biomass options? I recommend an alternative from renewable sources be considered and planned for.

To KE's credit, the company solicited RFP's and 37 companies put in proposals as independent power producers. At least two of them offered biomass options. Biomass may cost more initially to develop as a fuel source, but it would provide hundreds of jobs and achieve sustainability goals so the next generation can have affordable energy. That might have been the option to include in the plan instead of coal. Too bad the public did not see these plans.

If the community had been allowed to review some of the more innovative plans that were submitted, ratepayers may even agree to pay a higher rate to get the project off the ground if it supported sustainability and hundreds of jobs.

I am sure if KE asked "Do you want higher rates for electricity?" the answer was "no". However, if ratepayers knew that higher rates today would mean lower rates tomorrow, then maybe they would agree. I recommend the public be allowed to view these alternatives. Then take the survey to find out if ratepayers would be willing to pay more now on their rates if they knew that the next generation would pay less.

The KE forecast for electric energy consumption on Kaui contains variables beyond our control, and makes for an unpredictable future.

One way is to reduce the "demand" for electricity by conserving it. KE went to the PUC for permission to charge ratepayers for its "Demand Side Management" plan. Beginning in 1998, ratepayers are now spending \$2 million educating ourselves to conserve electricity, primarily through solar hot water use and reduction.

For our \$2 million, we could have some real conservation. Our \$2 million can buy about 2000 solar panels that put electricity back into the grid, not just heat water. What if we started in sunny Kekaha putting 2000 solar panels on the roofs there? The next year we buy \$2 million more electric generating panels to install on Waimea rooftops. Every roof on the

2

February 8, 1999

island is a power supplier within 10 years. We all would become "power partners". This would tremendously reduce our dependence on fossil fuel, and we could become more sustainable by generating power right here on Kauai.

Are there barriers to the concept above? Yes, but rather than only list the reasons why not to pursue this why not work to find solutions? The above project is a far more ambitious plan than the Energy-Wise KE goal to get the island's energy use down by only 1 MW. The solar panel idea would, after the first 5 years, allow us to reduce so we might not need a new asphalt power plant at all, or at least one instead of multiple generators.

I recommend the island conserve and delay the building of the plant as long as we can, at least until we develop diverse energy sources and develop innovative biomass projects like bamboo or another resource. If we practice thoughtful conservation and supplement the grid with biomass, solar and wind generation we will reduce fossil fuel consumption and pollution. It will cost more to invest in expanded biomass, solar and wind generation initially but we would increase sustainability, self-sufficiency and decrease dependence on imported fossil fuel.

I will close with some specific recommendations:

- a. allow the ratepayers input on the alternative responses to alternative proposals such as biomass, wind and solar options (some of which may create hundreds of jobs to replace the demise of sugar related jobs)
- b. take a survey to see if ratepayers, after reviewing the options above, would allow a small rate increase with a projected lowering of rates over ten years.
- c. Include one or more alternative, renewable (biomass/solar/wind) energy source options in the plan and allow ratepayers to fund part of this project with innovative matching funds from government funds
- d. The location for a new fossil fuel plant, when it must occur, should be at the airport industrial site. Reasons include: to reduce the amount of air/noise pollution and truck traffic in Lihue

Finally, allow me to say I commend KE for its planning efforts. I do believe that KE is a good management company worthy of retaining its role as energy provider and director for this island. I also realize the PUC is following procedure. I hope citizen input is taken seriously. I am asking the PUC to delay the building of any new fossil fuel plant on Kauai until all the conservation and alternative energy resource development concepts have been exhausted.

Sincerely,



Carol D. Bain
P.O. Box 2320, Lihue, HI 96766

CC: Greg Gal, OEQC



**P L A N N I N G
S O L U T I O N S**

March 18, 1999

Ms. Carol D. Bain
P.O. Box 2320
Lihue, Hawaii 96766

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Ms. Bain:

Thank you very much for your February 8, 1999 letter regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you spent reviewing the document and preparing your letter. Because we prepared the *DEIS*, Kauai Electric (KE) has asked us to respond to your comments.

Your letter raises broad issues, offers recommendations, and makes specific comments about the *DEIS*. With the exception of its closing paragraph, it appears to be identical to your commentary published in the *Garden Isle* newspaper on February 7, 1999. This letter addresses the broad issues and recommendations you present. Attachment 1 responds point-by-point to specific comments about the *DEIS*.

The broad issues you raise relate to: (i) the need for additional capacity, (ii) alternate energy sources, and (iii) Demand Side Management (DSM) programs. Each of these is discussed below.

Need for Additional Capacity

KE does not add capacity until it is needed. It installed its last new units (two 7.85 MW diesel-electric generators at Port Allen) in 1991. The generating unit the State Public Utilities Commission (PUC) recently approved will not go into service until mid-2002 at the earliest. For reasons presented in Chapter 1 of the *DEIS*, the company believes that it must add generating capacity now if it is to be assured of meeting its customers' needs. When it is first placed in service, Kauai Power Partners' (KPP) recently approved 26.4 MW advanced steam-injected combustion turbine unit will actually reduce the amount of fossil fuel that is consumed on Kauai in its first year of operation by approximately 3,000,000 gallons. This is because it is more thermally efficient than the units whose output it will replace.

Renewable Energy Sources

First, let me make some general comments regarding renewable energy sources:

- If utility-scale renewable energy projects are to be successful, they must be justified either on the basis of economics (i.e., ability to return a reasonable return on investment) or be undertaken in response to a regulatory mandate. The State can foster the growth of renewable energy use by changing the regulations governing Hawaii's electric utilities. California's newly deregulated electric industry, for example, allows for retail customers to purchase - at a premium - their electricity from renewable energy sources which transmit or "wheel" the energy across utility power lines. [Note that consumer freedom to choose electric providers is one of several complicated and controversial issues that the Hawaii PUC is studying today.] Another approach would be for the State Legislature or the PUC to set specific goals for the

use of renewable sources of energy. The Minnesota PUC made such a ruling recently when it ordered Northern States Power to develop 400 megawatts of additional wind power by the year 2010 even if the electricity from wind power is more expensive than that generated using conventional means.

- Absent a regulatory requirement that utilities install renewable energy, the success of renewables in Hawaii will depend on project economics. Kauai Electric will buy electric energy - renewable or otherwise - from any Independent Power Producer (IPP) that can provide energy at a price below its avoided energy cost (i.e., Kauai Electric's cost of fuel to generate electricity).
- Wind Power. From a utility perspective, wind power is considered surplus or non-firm power because the wind does not blow all of the time. Thus, economics aside, KE can neither build nor contract for wind power to satisfy its obligation to serve. Kauai's energy needs reliably and to maintain an adequate capacity reserve. In other words, KE can pay for the energy produced by a wind project (based on its avoided cost), but it cannot pay for the capacity of a wind farm because energy from wind-powered sources may not be there when KE's customers need it. From the financial perspective of an IPP, potential wind energy projects face: (i) the absence of capacity revenue from the utilities; (ii) low energy revenues (because they are tied to today's relatively low fuel costs); and (iii) the pending expiry of the federal production tax credit. Further, a Kauai wind project would be a relatively small project, thus denying the developer the economy of scale found in mainland projects. The Hawaii alternative energy tax is a plus, but it is not enough to offset the negative factors that exist today.
- Solar Photovoltaic Power. Solar photovoltaic power is also considered non-firm power because the sun does not always shine when electricity is needed. In twelve of the last thirteen years, the annual peak demand for electricity on KE's system has occurred on an October, November, or December weekday after 6:30 PM (i.e., after sunset). Because economic, utility-grade electric storage technologies (batteries, etc.) do not exist, KE cannot count on solar energy to help meet its peak demands. Solar thermal systems (such as solar hot water heaters) can store energy and do help lower KE's peak demand. These systems are included in its DSM (*Energy Wise*) conservation programs. From both a utility and IPP economic point of view, solar photovoltaic energy's near-term prospects are dim. Conversion efficiencies are relatively low (albeit rising) and manufacturing costs are high. On both a gross and net basis, solar energy projects require more land area than wind projects (the "footprint" of a wind energy project is typically 2% of the land area, leaving large spaces available for agriculture or livestock).
- Biomass Energy. Roughly 10% of the electric energy KE delivers to its customers comes from bagasse, a biomass fuel. KE purchases this bagasse-derived energy from Lihue Plantation, Ketchikan Sugar, and Gay & Robinson. You suggested that KE consider bamboo. Although bamboo may have some profitable uses, as an energy crop it is inferior to sugar cane. The combustion temperature comparison you offered is irrelevant in the evaluation of energy crops: the key indicator is energy density. This is the product of the crop's heat content (measured in BTUs per pound) times the crop density (pounds per acre). Neither bamboo nor bana grass nor several other frequently mentioned crops measure up to sugar cane in this regard. Evidence of this can be seen in the fact that the Waiulua Sugar Company on Oahu was not able to survive on bana grass.

- Hydroelectric Power. Approximately 5% of the electrical energy that KE sells to its customers is produced by the island's small, run-of-the-river hydroelectric power plants. Efforts to increase this have met strong public opposition.

DSM Programs

KE's DSM effort is aimed at reducing the need to add generating capacity by decreasing the amount of energy its customers use. DSM does include a public education component because studies have shown that electrical energy use decreases as users become more aware of their energy use habits and of the steps that they can take individually to change those. However, KE's DSM program also includes subsidies designed to increase energy efficiency. These subsidies, which are described in Chapter I of the *DEIS*, are designed to increase the use of energy-efficient lighting, improved heating, ventilating, and air-conditioning (HVAC) systems, and better electrical motors and control systems. They also target water-heating conservation.

Your Recommendations

In closing, let me address the four specific recommendations you made at the end of your letter:

- (a) *allow the ratepayers' input on the alternative responses to alternative proposals such as biomass, wind and solar options, some of which may create hundreds of jobs to replace the demise of sugar related jobs.*

Ratepayers have a number of existing venues for providing input into KE's alternate energy efforts. The most important of these is the Integrated Resource Planning (IRP) process, which KE conducts in accordance with the Public Utility Commission's mandate. The company does listen to the advisory bodies and to those who would like to see a greater role for renewable energy. It will encourage even greater participation in its future efforts to develop viable renewable energy supplies. As a point of fact, only one of the renewable energy sources you mentioned (biomass) generates substantial employment. Wind and solar are capital-intensive technologies that generate few jobs in the areas where they are used.

- (b) *Take a survey to see if ratepayers, after reviewing the options above, would allow a small rate increase with a projected lowering of rates over ten years.*

KE has indicated that it is willing to poll its customers concerning the extent of their willingness to pay higher rates in order to allow KE to use renewable resources. This poll will be conducted as part of KE's update of its IRP. However, please note that the question you have suggested for a survey contains an imbedded assumption (that higher rates now will lead to lower rates later); that assumption is probably incorrect. Consequently, the survey question will need to be worded differently if it is to produce useful results.

- (c) *Include one or more alternative, renewable (biomass, solar/wind) energy source options in the plan and allow ratepayers to fund part of this project with innovative matching funds from government funds.*

As explained in the *DEIS*, KE's IRP does consider the use of renewable resources. Biomass and hydro already provide 15 percent of the electrical energy used by KE's customers, and the company is always on the lookout for outside sources of funds that can be used to lower costs to the consumer. It will continue to pursue this open policy in the future.

- (d) *The location of a new fossil fuel plant, when it must occur, should be at the airport industrial site. Reasons include: to reduce the amount of air/noise pollution and truck traffic in Lihue.*

Page 4
Ms. Carol D. Bain
March 18, 1999

As indicated in the DEIS, some of the impacts associated with fossil fuel-fired electrical power generation are lower at the Airport Industrial Area Site than they are at the other two sites KE evaluated in the DEIS. However, some of the issues associated with this site, particularly visual impacts on the Lihue Gateway and the need to install a new electrical transmission line across Hanalei Gulch, make it less desirable.

In closing, I would like to thank you again for the thorough effort you made to review the DEIS and to question the appropriateness of planning for additional fossil fuel-fired generating capacity. I hope this letter clarifies issues about which you expressed concern.

If you have further questions or would like to discuss the project and/or KE's overall energy planning strategy further, please call me at 593-1288. Alternatively, you may speak to Mr. David Morgan, KE's Production Manager. His telephone number is 1-808-335-6233.

Sincerely,



Perry J. White

Attachment
cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Peadarogon, Kauai County Planning Department

ATTACHMENT 1: POINT-BY-POINT RESPONSES

- (1) Page 1, Paragraph 1. As indicated on page 14 of the DEIS, Kauai Electric's (KE) most recent *Integrated Resource Plan (IRP)* was published in 1997, not in 1992. KE expects to complete its next IRP in 2000. Much of the analytical work that underlies the IRP goes on continuously.
- (2) Page 1, Paragraph 2. As stated in Section 1.2.1 of the DEIS, the installed firm capacity available to KE is presently slightly over 110 megawatts. Because some of the units are already out of service for maintenance, KE cannot "...deliver 110 megawatts (MW) total in its customers." Moreover, as you recognize in your subsequent discussion, it is not appropriate to compare "installed capacity" with "average demand" in determining whether additional generating capacity is needed. The State Public Utilities Commission (PUC) recognized this when it approved KE's contract with Kauai Power Partners, L.P. (KPP) for its 26.4 MW advanced steam-injected generating unit. While the statistic is not meaningful with respect to determining the need for additional capacity, you may wish to know that the average demand in 1998 was approximately 47 MW, not the 40 MW cited in your letter.
- (3) Page 1, Paragraphs 6 and 7. You recognize that Kauai already obtains a relatively large percentage of its electrical energy from a renewable resource (bagasse and hydro) and state that this percentage could be increased. You do not say how such an increase could be accomplished. In fact, in your next paragraph you acknowledge the uncertain future of Lihue Plantation's bagasse-fired generator, whose closure would drastically reduce the percentage of the Island's energy that comes from renewable sources. Lihue Plantation Company's contract with KE is an important reason why the plantation has remained viable as long as it has, and the two companies are cooperating to insure that the capacity it provides continues to be available. Please note, however, that the analysis that demonstrated the need for the 26.4 MW KPP unit already assumes that 14 MW will continue to be available from Lihue Plantation. Thus, "...finding a way to keep the biomass going" will not forestall the need for a new energy plant.
- (4) Page 1, Paragraph 8. The DEIS does not state that it is not the role of business to demonstrate community leadership. KE is, and has been, an integral part of the Kauai community. Its management and employees constantly seek to work for the benefit of the people of Kauai. However, the fact remains that the company exists and functions within a regulated environment, and it must follow procedures established by the PUC in arriving at decisions concerning its regulated activities. The process that KE voluntarily used to solicit bids for additional generating capacity opened the competition to bidders proposing renewable resources. The bids they submitted were not competitive with that submitted by KPP as evaluated under existing rules.
- (5) Page 2, Paragraph 4. The statement that a coal-burning unit is the only alternative discussed in the DEIS is incorrect. Chapter 1 describes the process that KE went through in arriving at its proposal. Chapter 5 contains an extensive discussion of the generating technologies that KE considered during preparation of its 1997 IRP. They include the following renewables: biomass; wind; photovoltaics; solar dish; hydro; fuel cell; battery energy storage; and plasma arc.
- (6) Page 2, Paragraph 5. You praise KE for having solicited proposals from a large number of independent power producers, including organizations using biomass. You then imply that biomass would provide the next generation with "affordable energy". Finally, you say that it

is too bad that the public did not see these plans. While I share your bias toward renewable energy sources, the facts are at odds with some of your statements and conclusions. First, you do not offer evidence supporting the assertion that choosing a more expensive renewable source now would make energy more affordable in the future. KE's choice of its next unit considered anticipated costs over the 25-year contract period. Thus, it did consider a reasonably long time period in arriving at a decision. Second, because renewable energy technology is evolving relatively rapidly, the renewable energy systems likely to be available in the future will almost certainly be more efficient than those available today. Moving prematurely into renewables would prevent KE from taking advantage of these technological advances. Finally, the public did have an opportunity to see the other plans. KE's 1997 IRP (which KE developed with extensive public review and input) evaluated a range of generating technologies, including renewables. KE submitted summaries of all of the proposals it received from IPPs to the PUC when it sought approval for its contract with KPP, and these are a part of the public record on which the PUC's decision was based. We did not include them as specific alternatives within the DEIS because they were not capable of meeting the objectives of the Lihue Energy Service Center.

(7) Page 2, Paragraph 6. As indicated above, the public has had an opportunity to review the "more innovative plans that were submitted." The record of the hearings does not indicate that the bulk of KE's customers would willingly choose to pay higher rates for electrical energy. In fact, KE has often been criticized as having excessively high rates (brought on in part by the cost of recovering from the damage done by hurricane Iniki).

(8) Page 2, Paragraph 7. I am sure that if some customers were asked if they were willing to pay higher rates today in return for lower rates tomorrow, they might say "yes". None of us knows what proportion of its total customer base this might be. More importantly, paying higher rates today does not necessarily mean paying lower rates tomorrow. In fact, making a wise economic choice using the best information available when deciding upon each unit addition is the approach most likely to have the lowest long-term costs. That is what KE and the PUC have done.

(9) Page 2, Paragraphs 9 and 10. While KE does spend funds budgeted for DSM programs to raise the community's awareness of the need to conserve energy, the expenditures for that purpose are a fraction of the amount cited in your letter. The program is also being used to fund numerous physical improvements as described in Section 1.2.5.1 of the DEIS. These include such things as rooftop solar (but not photovoltaic) hot water heating, energy-efficient lighting, improved heating, ventilating, and air-conditioning (HVAC) systems, and better electrical motors and control systems. During 1999, KE has budgeted \$1,167,000 as incentive payments for customers who participate in its Energy-Wise conservation programs. If KE were to spend the same amount of money on the type of photovoltaic systems that you suggest, it would have far less impact on long-term energy consumption. Direct solar hot water heating systems, for example, are at least four times more efficient than systems that convert solar energy into electrical energy and then use that energy to heat water. Moreover, without accompanying storage systems, photovoltaic systems do little if anything to reduce peak demand and, therefore the need to add capacity.

(10) Page 3, First Full Paragraph. As stated in the DEIS, KE's DSM goal is to reduce peak electrical demand by 5 MW below the level it would otherwise be, not by the 1 MW stated in your letter. The 1 MW reduction is an annual target that would compound over a period of 5 years, for a total of 5 MW. As indicated previously, the photovoltaic panels that you

advocate would not decrease peak electrical energy use and would not, therefore, eliminate the need for planned additions to generating capacity. (They would decrease total fossil fuel consumption.) Finally, let me reemphasize that while the Lihue Energy Service Center concept provides for the possibility of multiple generating units, selection of the site and construction of the first generating unit and T&D facilities there does not commit the utility to install subsequent generating units at that location unless and until they are needed. The presence of a master-planned site will eliminate the need for last-minute ad hoc siting decisions about generating units by providing an appropriate location where units may be installed if needed. KE will continue to search for opportunities to increase the share of its power that is produced from renewable sources without unduly increasing the rate impact on its customers. Each generating unit will still need to be permitted individually. Each successive unit addition will be installed only if analyses prove that it is needed (i.e., that KE cannot balance the supply and demand for electrical power through DSM programs) and that it is most appropriate to install that unit at the Lihue Energy Service Center.

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 20004
Honolulu, HI
96820



Our People...Our Islands...In Harmony

February 22, 1999

Mr. Perry J. White
Planning Solutions, Inc.
1210 Auahi Street, Suite 221
Honolulu, Hawaii 96814

Dear Mr. White:

Subject: Draft Environmental Impact Statement (DEIS) - Lihue Energy Service Center,
Lihue, Hawaii

We have reviewed the above mentioned document and offer the following comments:

The environmental, social, and cultural considerations that we normally address in our
Conservation Planning efforts are adequately addressed in this study.

Soils on the three sites mentioned in the study are mainly Puhi silty clay loam and Lihue Silty
clay which are classified as Prime Ag soils and the area has been historically farmed to
sugarcane. However during the past 10 years, there has been a drastic reduction in acres of
sugarcane production on Kauai. The loss of Prime Agricultural Lands would be minimal at any of
the three sites; however, NRCS always discourages conversion of Prime Agricultural Lands to
non-agricultural uses.

The success of possible future conversion from sugarcane lands to diversified agricultural
operations will depend on continuing the operations and management of the existing surface
irrigation water delivery systems. Having Kauai Electric as a partner in advocating the
preservation of these existing irrigation systems would be beneficial to the future of agriculture
on Kauai.

The preferred site appears to be the best location for several reasons:

1. It would be less intrusive into the view plain.
2. It has ready access to gravity flow surface water for cooling operations.
3. It would be close to existing power distribution lines.
4. It would have access to domestic water for site services.

Based on the project description in this report, there appears to be limited potential for adverse
impacts to soil or water resources.

Thank you for the opportunity to review this document.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

The Natural Resources Conservation Service works hand-in-hand with
the American people to conserve natural resources on private lands

AN EQUAL OPPORTUNITY EMPLOYER

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P L A N N I N G
S O L U T I O N S

March 18, 1999

Mr. Kenneth R. Kaneshiro, State Conservationist
Natural Resource Conservation Service
U.S. Department of Agriculture
P.O. Box 50004
Honolulu, Hawaii 96850

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Kaneshiro:

Thank you for your February 28, 1999 letter regarding the *Draft Environmental Impact
Statement (DEIS)* for the proposed Lihue Energy Service Center. We appreciate the time you and
your staff spent reviewing the document and preparing your comments. We are pleased that you
found that the *DEIS* adequately examines the environmental, social, and cultural considerations
that the Natural Resource Conservation Service normally addresses in its conservation planning.

Thank you for expressing your opinion that the Preferred Site (which the *Final Environmental
Impact Statement* refers to as the "Puhi Site") is the best of the three under consideration. Kauai
Electric (KE) also believes that this site offers many advantages. However, based on the
comments it received as a result of public review of the *DEIS*, KE has decided that it will ask the
County to suspend its original application and will seek County land use approvals for the Field
390 Site.

If you have any further questions or would like to discuss the project further, please call me at
593-1288.

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

SENT BY: COUNTY OF KAUAI

: 2-12-99 : 1:43PM : PLANNING DEPT. -

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COUNTY OF KAUAI
99 FEB 12 12:57
PLANNING DEPT.

GAY & ROBINSON, INC.

P.O. BOX 156 KAUMAKANI, HAWAII 96747-0156
PHONE: (808) 335-3133 FAX: (808) 335-6424

February 8, 1999

Mr. Dee Crowell, Director
Department of Planning, County of Kauai
4444 Blue Street, Suite 473
Lihue, HI 96766

Re: Kauai Electric Lihue Energy Service Center Draft EIS

Dear Mr. Crowell:

Gay & Robinson, Inc. (G&R) would like to provide comments on the draft EIS dated December 1998 regarding the Kauai Electric Lihue Energy Center. G&R commends Kauai Electric (KE) for its long-range planning for meeting the future energy needs of the island.

G&R supports the EIS and believes all three sites are acceptable and has no preference on sites.

G&R supports KE's plan to consider coal as an alternate fuel source. Although fuel sources other than fossil fuels were evaluated in the EIS, G&R preferred more diversification from biomass fuel power generation. The EIS addressed the possibility that the Lihue Plantation Company (LPCO) may curtail operations in the foreseeable future, thereby eliminating KE's largest source of biomass power generation. G&R is concerned with this possible loss of biomass produced energy as this would further increase the island's dependency on imported fossil fuels. Should LPCO indeed curtail its operations, G&R would like the opportunity to be considered as a replacement supplier for this alternate energy source.

Sincerely,

E. Alan Kennett
President & General Manager



P L A N N I N G
S O L U T I O N S

March 18, 1999

Mr. E. Alan Kennett, President & General Manager
Gay & Robinson, Inc.
P.O. Box 156
Kaumakani, Hawaii 96747-0156

Subject: Lihue Energy Service Center: Draft Environmental Impact Statement

Dear Mr. Kennett:

Thank you for your February 8, 1999 letter to the Kauai County Planning Department regarding the *Draft Environmental Impact Statement (DEIS)* for the proposed Lihue Energy Service Center. Because we prepared the *DEIS*, the Department forwarded a copy to us for a response.

We appreciate the time you and others at Gay & Robinson, Inc. spent reviewing the document and preparing your comments. We understand that you believe the *DEIS* adequately describes the effects of developing and operating the Lihue Energy Service Center and that you have no preference as to which of the three sites are used.

Based on your letter and Dave Morgan's March 8, 1999 telephone conversation with you, it is our understanding that Gay & Robinson is not in a position to generate the 26.4 MW of firm power called for in KE's contract with Kauai Power Partners, L.L.P. Consequently, Gay & Robinson is not an alternative to the first unit slated for development at the Lihue Energy Service Center. Mr. Morgan informed me that should the Lihue Plantation Company (LPCO) curtail its operations to the point where it is no longer able to meet its contractual obligations under its existing purchase power agreement with KE, then the utility would be pleased to offer you the opportunity to be considered as a replacement supplier. He further indicated that KE would be happy to purchase additional surplus power from Gay & Robinson as provided for in the existing contract between the two companies.

If you have any further questions concerning the proposed project, please feel free to call me at 593-1288. Alternately, you may speak to Dave Morgan at Kauai Electric (335-6233).

Sincerely,

Perry J. White

cc: Office of Environmental Quality Control
Dave Morgan, Kauai Electric
Barbara Pendragon, Kauai County Planning Department

Reduced
to be
placed later

Table ES- 1. Summary of Expected Impacts.

Area of Impact	Puhi Site		Field 390 Site	
	Generating Alt. 1	Generating Alt. 2	Generating Alt. 1	Generating Alt. 2
Physiographic	Minor grade changes, no significant drainage pattern changes.	Same as Generating Alternative 1	Same as Puhi Site	Same as Puhi Site
Soils/Geology	Soils are well-suited for agriculture. Withdrawal represents less than 1/10 th percent of LPCO lands under cultivation. Soils are suitable for construction.	Same as Generating Alternative 1	Same as Puhi Site	Same as Puhi Site
Air Quality	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly higher than Generating Alternative 2. Site has lowest modeled ambient pollutant concentrations.	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly lower than Generating Alternative 1. Site has lowest modeled ambient pollutant concentrations.	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly higher than Generating Alternative 2.	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly higher than Generating Alternative 2.
Hydrological	Permanent commitment of water to the proposed project. Surface water supply available. Requirement offset by reduction in irrigation. Increased stormwater runoff. Reuse of process wastewater possible. Site located near Garlinghouse Tunnel (DOW Water source).	Surface water supply available. Uses about 9% more water than Generating Alt 1. Some offset due to reduction in irrigation. Increased stormwater runoff. Reuse of process wastewater possible. Site located near Garlinghouse Tunnel (DOW water source).	Permanent commitment of water to the proposed project. Surface water supply available. Requirement offset by reduction in irrigation. Increased stormwater runoff. Reuse of process wastewater possible.	Permanent commitment of water to the proposed project. Surface water supply available. Requirement offset by reduction in irrigation. Increased stormwater runoff. Reuse of process wastewater possible.
Vegetation	Site previously disturbed/ cultivated. No endangered species. Therefore no impact anticipated.	Same as Generating Alternative 1.	Site previously disturbed/ cultivated. No endangered species. Therefore no impact anticipated.	Same as Generating Alternative 1.
Fauna	No endangered species on site. No impact anticipated	Same as Generating Alternative 1.	No endangered species on site. No impact anticipated	Same as Generating Alternative 1.
Aquatic Biota	No discharge of process water to streams. Stormwater runoff to be handled in accordance with Best Management Practices. No effect on aquatic habitat anticipated.	Same as Generating Alternative 1.	No discharge of process water to streams. Stormwater runoff to be handled in accordance with Best Management Practices. No effect on aquatic habitat anticipated.	Same as Generating Alternative 1.
Archaeological/ Cultural Resources	Site previously disturbed/ cultivated. "No effect" on archaeological or cultural resources	Same as Generating Alternative 1.	Site previously disturbed/ cultivated. "No effect" on archaeological or cultural resources	Same as Generating Alternative 1.

	Field 390 Site	Airport Industrial Area Site	
	Generating Alt. 2	Generating Alt. 1	Generating Alt.2
	Same as Puhi Site	Same as Puhi Site	Same as Puhi Site
	Same as Puhi Site	Withdrawal from agricultural production same as Puhi Site; re-routing of existing irrigation needed.	Same as Generating Alternative 1
tan- e ian	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly lower than Generating Alternative 1.	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly higher than Generating Alternative 2.	Federal and State Air Quality Standards will be met. Emissions are expected to be slightly lower than Generating Alternative 1.
or to water off- i- use of	Permanent commitment of water to the proposed project. Surface water supply available. Uses about 9% more water than Generating Alt 1. Some offset due to reduction in irrigation. Increased stormwater runoff. Reuse of process wastewater possible.	Groundwater source required (existing or new). Some offset due to reduction in irrigation. Increased stormwater runoff. Disposal of wastewater through Disposal Wells.	Same as Generating Alternative 1 except slightly more water needed.
vated. fore	Same as Generating Alternative 1.	Site previously disturbed/ cultivated. No endangered species. Therefore no impact anticipated.	Same as Generating Alternative 1.
No	Same as Generating Alternative 1.	No endangered species on site. No impact anticipated.	Same as Generating Alternative 1.
to e st ect	Same as Generating Alternative 1.	No discharge of process water to streams. Stormwater runoff to be handled in accordance with Best Management Practices. No effect on aquatic habitat anticipated.	Same as Generating Alternative 1.
vated. or	Same as Generating Alternative 1.	Site previously disturbed/ cultivated. "No effect" on archaeological or cultural resources	Same as Generating Alternative 1.

Table ES- 1. Summary of Expected Impacts.

Area of Impact	Puhi Site		Field 390 Site	
	Generating Alt. 1	Generating Alt. 2	Generating Alt. 1	Generating Alt. 2
Transportation Facilities	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways.	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways. Coal delivery would involve different vehicles and delivery timing.	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways.	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways. Coal delivery would involve different vehicles and delivery timing.
Noise	Noise in excess of 50 dB at the parcel boundaries. One existing home may be exposed to noise greater than 45 dBA nighttime standard. Would constrain type of future development appropriate on nearby land now used for agriculture.	Noise in excess of 50 dB at the parcel boundaries. 2-3 dB quieter than Alternative 1. Would not expose existing residences to noise greater than 45 dBA. Would constrain type of future development appropriate on nearby land now used for agriculture.	Noise in excess of 50 dB at the parcel boundaries. Would not expose existing residences to noise greater than 45 dBA. Would constrain type of future development appropriate on nearby land now used for agriculture.	Noise in excess of 50 dB at the parcel boundaries. Would not expose existing residences to noise greater than 45 dBA. Would constrain type of future development appropriate on nearby land now used for agriculture.
Scenic/Aesthetic	Facilities would be most visible from area <i>mauka</i> of Kaunualii and Kuhio Highways. Existing vegetation and proposed landscaping would screen all structures except stacks, which would protrude above the tree line. The presence of these facilities may influence future land uses on adjacent land. If the Lihue-Hanamaulu Bypass Road is constructed as planned, occupants of vehicles will be able to view the site, increasing the importance of vegetative screening.	The boiler building (up to 110 feet high) and the stack (165 feet high) for the coal-fired generator would be visible from many additional viewpoints. Otherwise, generally the same as Generating Alternative 1.	The greatest potential for visual impacts would occur on the existing residences along Kanakelu and Noi Streets and the rim lots in Kapaia. Views from most of these areas are blocked by existing structures and vegetation. Proposed landscaping along the perimeter of the power plant site would screen most structures from view, but the portions of the stacks taller than approximately 50 feet would be visible from some vantage points. Landscaping needed to screen the facilities from view from cars that are <i>makai</i> -bound on Maalo Road.	The boiler building (up to 110 feet high) and the stack (165 feet high) for the coal-fired generator would be visible from many additional viewpoints. Otherwise, generally the same as Generating Alternative 1.

	Field 390 Site	Airport Industrial Area Site	
	Generating Alt. 2	Generating Alt. 1	Generating Alt.2
Importing fuel	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways. Coal delivery would involve different vehicles and delivery timing.	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways.	Increase in harbor activity importing needed fuel. Increase in fuel delivery trucks on highways. Coal delivery would involve different vehicles and delivery timing.
Parcel noise character type category	Noise in excess of 50 dB at the parcel boundaries. 2-3 dB quieter than Alternative 1. Would not expose existing residences to noise greater than 45 dBA. Would constrain type of future development appropriate on nearby land now used for agriculture.	Noise in excess of 50 dB at the parcel boundaries. Would not expose existing residences to noise greater than 45 dBA. Noise from airport operations is more restrictive than power plant noise.	Noise in excess of 50 dB at the parcel boundaries. Would not expose existing residences to noise greater than 45 dBA. Noise from airport operations is more restrictive than power plant noise.
Timing Noise visibility are and ing or uc- is of itely ome eeded w on	The boiler building (up to 110 feet high) and the stack (165 feet high) for the coal-fired generator would be visible from many additional viewpoints. Otherwise, generally the same as Generating Alternative 1.	Existing vegetation along the edge of Hanamaulu Gulch and planned landscaping around the perimeter of the site would screen lower structures at this location from all directions. In time, the industrial structures that AMFAC/JMB expects to develop within its Airport Industrial Park will provide some additional screening. However, the highest structures will be visible above the tree line. If aboveground transmission lines are used to connect the site to the Hardwoods substation north of Hanamaulu Stream, they will be visible as well. Finally, development on this site will be much more visible to passengers on aircraft arriving or departing Lihue Airport to/from the north.	The boiler building (up to 110 feet high) and the stack (165 feet high) for the coal-fired generator would be visible from many additional viewpoints. Otherwise, generally the same as Generating Alternative 1.

Table ES- 1. Summary of Expected Impacts.

Area of Impact	Puhi Site		Field 390 Site	
	Generating Alt. 1	Generating Alt. 2	Generating Alt. 1	Generating Alt. 2
Economic	The anticipated construction cost for the generation portion of the project is estimated at \$170 million (approximately \$30 million on the first phase). The T&D facilities are estimated to cost up to \$3 million. Up to 30 persons could be employed at the generating component of the Lihue Energy Service Center at full build-out (6-10 for the first increment). Anticipated Operation & Maintenance expenditures at full build-out are (in 1998 \$): Salaries & Wages-\$4.6 million Materials & Services-\$3 million Fuel -\$28 million	Same as Alternative 1 except total construction cost would be approximately \$135 million.	Same as Puhi Site.	Same as Puhi Site.
Public Facilities/ Services	The project would rely almost entirely on itself for needed utility systems and services. Consequently, it would place little burden on other public utility systems or services.	Same as Generating Alternative 1.	Generally the same as Alternative 1 on the Puhi Site.	Generally the same as Alternative 2 on the Puhi Site.

Field 390 Site	Airport Industrial Area Site		
	Generating Alt. 2	Generating Alt. 1	Generating Alt.2
	Same as Generating Alternative 2.	Same as Puhi Site.	Same as Generating Alternative 2.
Alternative 1	Generally the same as Alternative 2 on the Puhi Site.	Generally the same as Alternative 1 on the Puhi Site.	Generally the same as Alternative 2 on the Puhi Site.



LEGEND

- 1 Preferred Site
- 2 Field 390 Site
- 3 Airport Site

CORRECTION

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



(Cont'd)

- 1 Preferred Site
- 2 Field 390 Site
- 3 Airport Site

