

BEFORE THE LAND USE COMMISSION
OF THE STATE OF HAWAI'I

In the Matter of the Petition of)
)
MAUI ELECTRIC COMPANY, LIMITED, a)
Hawai'i corporation)
)
To Amend the Agricultural Land Use)
District Boundary into the Urban)
Land Use District for Approximately)
65.7 Acres of Land at Wailuku and)
Makawao Districts, Island of Maui,)
State of Hawai'i, Tax Map Key No.)
3-8-03: 23 and 24)
_____)

DOCKET NO. A97-722
FINDINGS OF FACT,
CONCLUSIONS OF LAW, AND
DECISION AND ORDER

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LAND USE COMMISSION
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FINDINGS OF FACT,
CONCLUSIONS OF LAW, AND DECISION AND ORDER

Maui Electric Company, Limited, a Hawai'i corporation ("Petitioner"), filed a Petition for Land Use District Boundary Amendment on October 24, 1997, pursuant to chapter 205, Hawai'i Revised Statutes ("HRS"), and chapter 15-15, Hawai'i Administrative Rules ("HAR"), to amend the State land use district boundary by reclassifying approximately 65.7 acres of land situated in the Wailuku and Makawao Districts, island of Maui, State of Hawai'i, Tax Map Key No. 3-8-03: 23 and 24 ("Property"), from the State Land Use Agricultural District to the State Land Use Urban District to permit the construction of the Waena Generating Station.

The Land Use Commission ("Commission"), having heard and examined the testimony and evidence presented during the hearing; the Proposed Findings of Fact, Conclusions of Law, and Decision and Order of Petitioner, the Office of Planning ("OP"),

and Maui Tomorrow ("Intervenor"); and the responses filed by Petitioner, the County of Maui Planning Department ("Planning Department"), and Intervenor, hereby makes the following findings of fact, conclusions of law, and decision and order:

FINDINGS OF FACT

PROCEDURAL MATTERS

1. On October 24, 1997, Petitioner filed a Petition for Land Use District Boundary Amendment ("Petition").

2. Petitioner Maui Electric Company, Limited, is a Hawai'i corporation whose business and mailing address is P.O. Box 398, Kahului, Maui, Hawai'i, 96733-6898.

3. By letter dated November 3, 1997, the Executive Officer of the Commission ("Executive Officer") deemed the Petition defective pursuant to section 15-15-50(f), HAR.

4. By letter dated November 18, 1997, the Executive Officer deemed the Petition a proper filing as of November 7, 1997, upon review of the additional information submitted by Petitioner.

5. On December 4, 1997, the County of Maui filed the Position of the Maui Planning Department in support of the Petition.

6. On December 8, 1997, OP filed a Statement of Position of the Office of Planning in Support of the Petition.

7. On December 22, 1997, Mr. Mark Sheehan, President, Maui Tomorrow, filed an application for leave to intervene ("Petition for Intervention").

8. On January 22, 1998, and by a written Order dated March 3, 1998, the Commission granted Maui Tomorrow's Petition for Intervention, provided that the scope of its intervention be limited to (i) air quality impacts of the proposed project; (ii) alternative sources, fuels, and processes; (iii) the cumulative impact of industrialization of the central valley area of Maui; and (iv) visual/aesthetic impacts of the proposed project from the surrounding roads.

9. On February 3, 1998, the Commission held a prehearing conference on the Petition which was attended by all parties.

10. On February 4, 1998, the Commission issued a Prehearing Order pursuant to section 15-15-57, HAR, which set forth the dates by which the parties were to file amended exhibit lists, exhibits, witness lists, memoranda, or other documentary information with the Commission.

11. On February 20, 1998, the Planning Department filed Objections of the Maui Planning Department to Intervenor Maui Tomorrow's Witness and Exhibit List.

12. On February 20, 1998, the parties filed a stipulation regarding Petitioner's witnesses. That stipulation set forth that all the witnesses for Petitioner listed on its witness list were accepted as expert witnesses and were deemed qualified to provide expert opinions in their respective fields.

13. On February 20, 1998, the parties filed a stipulation regarding non-contested issues. That stipulation set forth that Intervenor Maui Tomorrow did not contest the testimony

of Petitioner's following expert witnesses, and that the testimony of such experts could be submitted in written testimony/reports that would be accepted into evidence: Glen Lau on geotechnical resources, natural hazards, geology, and soils; Amy Dunn on archaeological and cultural resources; Dr. Evangeline Funk on biological resources; and J. Michael Silva on electric and magnetic field analysis. Each of the foregoing individuals was later made available by Petitioner for examination at the hearings before the Commission.

14. On February 24, 1998, Petitioner filed a Statement of Objections and Joinder in the Objections of the Maui Planning Department to Intervenor Maui Tomorrow's Witness and Exhibit List Dated February 18, 1998.

15. On February 26 and 27, 1998, the Commission conducted a hearing on the Petition pursuant to public notices published on December 5, 1997, in the Maui News and the Honolulu Star-Bulletin.

16. At the February 26, 1998, hearing, the following individuals provided written public testimonies, which were admitted into evidence: G. Stephen Holaday; Harry H.K. Kameenui; Clyde Murashige; Terryl Vencl; Michael H. Lyons, II, and Robert T. Johnson; Lynne Woods; Warren Watanabe and Kenneth Okamura; and Richard Heede. The Commission also admitted into evidence as LUC Exhibit No. 1 a memorandum dated December 10, 1997, from Rae M. Loui, Deputy Director, Commission on Water Resource Management ("CWRM"), to Richard Egged, Jr., Director, OP.

17. At the February 26, 1998, hearing, the following individuals appeared and testified as public witnesses and submitted written testimonies: Jeffrey Parker, Lucienne de Naie, and Daniel Grantham. In addition, the following individuals appeared and testified as public witnesses: Madelyn D'Enbeau, Diana Dahl, Glen Shepherd, David Patton, Tom Ulick, Scott Crawford, Marc Drehsen, and Constance Palmore.

18. On February 26, 1998, the Commission took a field trip to the Property in the afternoon.

19. On March 25, 1998, Petitioner filed a Motion to:

- (1) Preclude Intervenor Maui Tomorrow From Submitting Exhibits or Presenting Witnesses Not Identified by the Deadlines Established in the Commission's Prehearing Order (Filed February 4, 1998);
- (2) Limit the Testimony of Intervenor Maui Tomorrow's Expert Witnesses to the Subject Matter and Material Disclosed Pursuant to the Commission's Prehearing Order; and
- 3) Restrict Intervenor Maui Tomorrow From Engaging in Repetitious and Duplicative Cross-Examination ("Motion").

On April 23, 1998, the Commission denied Petitioner's Motion.

20. The Commission continued the hearing on the Petition on April 8 and 9, and 23 and 24, 1998. The hearing on the Petition was completed on April 24, 1998.

21. At the April 8, 1998, hearing, the Commission admitted into evidence as LUC Exhibit No. 2 a memorandum from Don Hibbard, Administrator, Department of Land and Natural Resources, State Historic Preservation Division ("DLNR-SHPD"), to Esther Ueda, Executive Officer, Commission, dated February 9, 1998. At

the April 9, 1998, hearing, the Commission admitted into evidence a letter from Rory Frampton, dated April 3, 1998.

22. On April 20, 1998, Petitioner filed Applicant's Motion in Limine #1: To Preclude Admission of Maui Tomorrow's Exhibits 4 & 5 ("Motion in Limine #1"). On April 23, 1998, the Commission denied Petitioner's Motion in Limine #1.

23. On April 20, 1998, Petitioner filed Applicant's Motion in Limine #2: To Preclude Testimony of Roy Smith and Erik Frye as Experts in Air Quality and Air Impacts ("Motion in Limine #2"). Petitioner orally moved to withdraw its Motion in Limine #2 on April 24, 1998, at which time the Commission granted Petitioner's oral motion.

24. On April 20, 1998, Petitioner filed Applicant's Motion in Limine #3: To Preclude Testimony of Steven Moser as an Expert in Air Quality and Air Impacts ("Motion in Limine #3"). On April 23, 1998, the Commission granted Petitioner's Motion in Limine #3.

25. On April 20, 1998, Petitioner filed Applicant's Motion in Limine #4: To Preclude Testimony of James Williamson as an Expert ("Motion in Limine #4"). Petitioner orally moved to withdraw its Motion in Limine #4 on April 24, 1998, at which time the Commission granted Petitioner's oral motion.

26. On April 20, 1998, Petitioner filed Applicant's Motion in Limine #5: To Preclude Testimony of Dick Mayer and Ian Chan-Hodges as Experts ("Motion in Limine #5"). Petitioner orally moved to withdraw its Motion in Limine #5 on April 24,

1998, at which time the Commission granted Petitioner's oral motion.

27. On April 23, 1998, Petitioner filed Applicant's Motion in Limine to Preclude Admission of Maui Tomorrow's Exhibits 2, 3 & 12 ("Motion in Limine"). On April 23, 1998, the Commission denied Petitioner's Motion in Limine.

28. At the April 23, 1998, hearing, the Commission admitted into evidence letters from Julie Higa, dated March 4, 1998; Mike Trotto, dated April 15, 1998; Tom C. Leuteneker, dated April 15, 1998; Michael J. Singlehurst, dated April 16, 1998; Fernando Ribao, Jr., dated April 16, 1998; and Tom Reed, dated April 20, 1998.

29. On April 24, 1998, Petitioner requested the Commission to strike any and all references to Mr. Paull and Mr. Schroeder's positions with the University of Hawai'i contained in the record, including Petitioner's witness lists. On April 24, 1998, the Commission granted Petitioner's request.

30. On May 1, 1998, the Commission filed:

- An Order Granting Request To Strike Any and All References To Mr. Paull and Mr. Schroeder's Positions with the University of Hawai'i Contained in the Record, Including MECO's Witness Lists;

- An Order Denying Maui Electric Company, Limited's Motion To:

- 1) Preclude Intervenor Maui Tomorrow From Submitting Exhibits or Presenting Witnesses Not Identified by the Deadlines Established

in the Commission's Prehearing Order (Filed February 4, 1998);

- 2) Limit the Testimony of Intervenor Maui Tomorrow's Expert Witnesses to the Subject Matter and Material Disclosed Pursuant to the Commission's Prehearing Order; and
- 3) Restrict Intervenor Maui Tomorrow From Engaging in Repetitious and Duplicative Cross-Examination.

- An Order Denying Applicant's Motion in Limine to Preclude Admission of Maui Tomorrow's Exhibits 2, 3 & 12;

- An Order Denying Applicant's Motion in Limine #1: To Preclude Admission of Maui Tomorrow's Exhibits 4 & 5;

- An Order Granting Oral Motion to Withdraw Applicant's Motion in Limine #2: To Preclude Testimony of Roy Smith and Erik Frye as Experts in Air Quality and Air Impacts;

- An Order Granting Applicant's Motion in Limine #3: To Preclude Testimony of Steven Moser as an Expert in Air Quality and Air Impacts;

- An Order Granting Oral Motion to Withdraw Applicant's Motion in Limine #4: To Preclude Testimony of James Williamson as an Expert; and

- An Order Granting Oral Motion to Withdraw Applicant's Motion in Limine #5: To Preclude Testimony of Dick Mayer and Ian Chan-Hodges as Experts.

DESCRIPTION OF THE PROPERTY

31. The Property encompasses lands owned in fee by Petitioner, a subsidiary of Hawaiian Electric Company ("HECO"), which in turn is a wholly owned subsidiary of Hawaiian Electric Industries ("HEI"), a holding company with publicly traded stock. Petitioner is regulated by the Public Utilities Commission ("PUC").

32. The Property is situated in the Wailuku and Makawao Districts, north of Waiko Road at its intersection with Pulehu Road, approximately one quarter mile above the Central Maui Sanitary Landfill and the Ameron HC&D Quarry on the island of Maui, State of Hawai'i.

33. The Property is identified by Tax Map Key No. 3-8-03:23 and 24, consisting of 65.7 acres, inclusive of all existing easements identified as Easements 1-11.

34. The Property encompasses two adjacent parcels totaling approximately 65.7 acres. Parcel 23 is the smaller of the two parcels with a total acreage of 15.127 acres. Parcel 24 encompasses approximately 50.573 acres.

35. The Property has 11 easements. Hawaiian Commercial & Sugar Company ("HC&S") holds 4 easements, identified as easements 1-4, within the Property for the maintenance and use of its irrigation ditch. Petitioner holds easements 5-11 for transmission line use.

36. The Property is currently leased to HC&S for sugarcane cultivation. The Property has been in sugarcane cultivation for the past 2 years.

37. According to the letter of agreement, Petitioner agreed to lease the Property to HC&S on a month-to-month basis at no rent for sugarcane cultivation until the Property is required for development by Petitioner for utility purposes or until December 31, 2004, whichever comes first, or if cultivation of crops on the premises is no longer permissible by law. HC&S must use the Property solely for crop cultivation and ancillary agricultural activities.

38. Lands immediately surrounding the site are owned by Alexander & Baldwin-Hawaii and are used for sugarcane cultivation.

39. Elevations on the Property range from approximately 335 feet above mean sea level ("MSL") on the western side nearer Pu'unene to approximately 365 feet above MSL on the eastern side near the intersection of Waiko and Pulehu Roads. The Property has a gently sloping topography, with an average slope from the southeast to northwest across the site of about one degree.

40. Surface water in the area is comprised of reservoirs, irrigation ditches, and intermittent natural streams within Kalialinui Gulch and Pulehu Gulch. Surface water runoff generated from the Property and adjacent areas is generally through a series of gulches extending from the upper slopes of Haleakala towards the central isthmus area. The Property is drained by Kalialinui Gulch, located a quarter mile to the north, and by Pulehu Gulch, located a mile to the south of the Property. The proposed Waena Generating Station will be located

approximately 1,000 feet from Kalialinui Gulch and 5,000 feet from Pulehu Gulch.

41. The mountainous topography of both East Maui (Haleakala) and West Maui tend to channel prevailing winds through the central valley area. The sloping terrain from the shoreline to the higher elevation at the Property also tends to escalate the wind speeds.

42. The Property is underlain by a thin cover of topsoil lying on top of andesitic lava flows of the Kula Volcanic Series, which in turn overlies the main shield-building, predominantly tholeiitic lavas of the Honomanu Volcanic Series. These series erupted from Haleakala Volcano.

43. Subsurface conditions along the preferred and alternative line corridors are anticipated to generally consist of clays and clayey silts underlain by hard andesitic bedrock. The corridor along most of Pulehu Road extends across the youngest lava a'a flows in the study area and hard bedrock is anticipated to be present within about 3 feet below the existing ground surface. The remainder of the corridors cross over soils consisting of alluvium derived from surrounding a'a flows and weathered volcanic ash. Hard bedrock is anticipated to be present at depths greater than 5 to 6 feet below the existing ground surface.

44. The Property is located in a dry area, with the median rainfall amounting to only 17 to 20 inches a year. Rainfall in the Central Maui isthmus is evenly distributed, averaging approximately 28 inches a year over an area of

approximately 200 square miles. The dry and windy conditions allow only a small percentage of rainfall to percolate deep enough below the ground surface to become groundwater recharge.

45. The U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii, identifies the soils within the Property as belonging to the Waiakoa Series, silty clay loam occurring on 3 to 7 percent slopes. Waiakoa Series, silty clay loam is composed of generally stony soil, grading to hard bedrock within a depth of approximately 5 feet. Lava flows over the Property are a'a. Due to the undulating nature of the surface a'a flows, the depth of a'a bedrock will vary across the site and can range from 25 to 35 feet thick and consist of clinker zones above and below a massive, highly to moderately fractured a'a core. Runoff potential of this type of soil is slow to medium and the erosion hazard is slight to medium.

46. Surface soils along the preferred and alternate transmission line corridors have been classified as the Molokai Series (M), Paia Series (Pc), Waiakoa Series (W), Ewa Series (E), Iao Series (I), Alae Series (A), Pulehu Series (Ps), and Rockland (R). The Molokai and Paia soils evolved from weathered a'a lavas and volcanic ash. At the ground surface, they consist of silty clay loam, grading to saprolite then to soft, highly weathered rock at a depth of approximately six feet. The Ewa, Iao, Alae, and Pulehu Series consist of alluvial soils derived from the weathered a'a flows. The soils reach depths of greater than 5 feet, and range from loams to clays with varying amounts of

sands, stones, and cobbles. The Alae soils also contain weathered volcanic ash.

47. The University of Hawai'i Land Study Bureau's Detailed Land Classification rates the productivity rating of soils. Productivity ratings range from "A" lands which are very productive to "E" lands which are considered unproductive for cultivated agriculture. The Land Study Bureau Detailed Land Classification (productivity rating) for the Property is "A." A rating of "A" means that the condition of the soil is very good for agricultural operations.

48. The Property contains land classified as Prime Agricultural Land according to the Agricultural Lands of Importance to the State of Hawaii map.

49. According to the Flood Insurance Rate Map, the Property has been classified as Zone C, indicating areas that experience minimal flooding, and not considered to be in a flood plain area.

PROPOSAL FOR RECLASSIFICATION

50. The proposed reclassification will allow Petitioner to construct a new power generating facility in Central Maui which will: maintain an adequate system margin-of-reserve generating capacity; increase overall system reliability; replace older generation facilities scheduled for retirement; and provide additional capacity to meet projected demand for electric service. Petitioner proposes to develop the 232-megawatt ("MW") electrical generating station in four 58-MW phases.

51. At full buildout, the major components required to operate a 232-MW electrical generating station will include:

- Four diesel oil-fired 58-MW dual-train, combined-cycle ("DTCC") units, exhausted to four two-flue 150-foot-tall stacks
- Four steam turbines ("STs")
- Four steam condensers
- Four control houses
- A control room, including control equipment, offices, file room, kitchen, restrooms, showers, lockers, and meeting room.
- Fire protection system
- Supply wells
- Water treatment facility
- Injection wells
- Water and air laboratory
- Maintenance shop
- Warehouse and storage areas
- Relay building
- Switch yard
- Fuel storage tanks
- Fuel storage tank berms
- Fuel unloading area
- Administration building
- Leach field
- Related 69-kilovolt ("kV") transmission line corridors

- Possible 12-kV distribution line corridors
- Possible gasoline storage area
- Possible transmission and distribution warehouse offices
- Possible transmission and distribution storage and parking area

52. In each of the station's four 58-MW phases, a DTCC unit would be added to the station. Each DTCC unit would consist of two 20-MW combustion turbine ("CT") generators fitted with two heat recovery steam generators ("HRSGs") and one 18-MW ST generator.

53. The first of two 20-MW CT generators is planned to be installed at the Waena Generating Station in calendar year 2004.

54. The second CT unit will be installed in 2005. The HRSGs and an 18-MW ST generator will be added to the station in calendar year 2006 to complete the Phase I installation of the first of three DTCC units. The three remaining DTCC units to be installed, each comprised of similar CT, HRSG, and ST modules, are planned to be added to the station in the calendar years 2010 (Phase II) and 2016 (Phase III), and beyond 2020 (Phase IV).

55. The existing Ma'alaea-Kealahou and Kanaha-Pukalani 69-kV transmission lines will be reconfigured through the proposed Waena Switchyard. As demand for more power increases, two new 69-kV transmission lines from the Property will be constructed to connect with the Pu'unene and Pa'ia Sugar Mill substations to support any growth in demand for additional

electricity. Pending demand requirements, two proposed 12-kV distribution lines from the Property to the Pu'unene area may also be added to these corridors.

56. In Petitioner's Application and Certificate of Service submitted to the PUC in February 1996, Petitioner requested approval to commit funds in excess of \$500,000 to purchase the Property for the construction of the proposed Waena Generating Station.

57. In its Decision and Order No. 14674, the PUC approved Petitioner's request to commit funds for the acquisition of the Property and related easements and determined that said acquisition was reasonable and in the public interest.

58. Petitioner purchased the site in November 1996, at a cost of \$1,847,648. The estimated cost for construction of the initial Phase I is approximately \$105,370,000. Construction cost for the entire Waena Generation Station is estimated at approximately \$417,559,668. Petitioner has estimated that the cost to rate payers will be an additional 1.76 cents per kilowatt-hour in 1997 dollars for the first DTCC unit.

59. The following table describes development timetable and costs for the project.

**Project Cost and Schedule
(1997 Dollars)**

Project Component	Acreage	Cost	Construction Start	Operation Date
<u>Land Costs</u>	<u>65.7</u>	<u>\$1,847,648</u>	<u>n/a</u>	<u>1997</u>
<u>DTCC 1/ Site Development</u>	<u>65.7</u>	<u>\$105,370,000</u>	<u>2002</u>	<u>2006</u>
<u>DTCC 2</u>	<u>0</u>	<u>\$96,857,000</u>	<u>2005</u>	<u>2010</u>
<u>Transmission Lines</u>	<u>n/a</u>	<u>\$10,419,000</u>	<u>2003</u>	<u>2004-2020</u>
<u>Transmission & Distribution Facility</u>	<u>0</u>	<u>\$5,900,000</u>	<u>2014</u>	<u>2016</u>
<u>DTCC 3</u>	<u>0</u>	<u>\$100,318,000</u>	<u>2009</u>	<u>2016</u>
<u>DTCC 4</u>	<u>0</u>	<u>\$96,848,000</u>	<u>2013</u>	<u>2020</u>
Total Project Cost		\$417,559,668		

60. The costs for the project do not include the costs for obtaining the diesel fuel, trucking the diesel fuel, and operating the Waena Generating Station.

PETITIONER'S FINANCIAL CAPABILITY TO UNDERTAKE THE PROPOSED DEVELOPMENT

61. As a subsidiary of HECO which itself is a subsidiary of HEI, a publicly traded company, Petitioner has access to sufficient economic resources required to develop the project. Petitioner is also able to issue bonds and stock to finance the project.

62. Petitioner's net income for the month of August 1997 was \$1,525,414, with an accumulated year to date net income of \$9,213,872. Petitioner's accumulated net income for the 12 months from August 1996 to August 1997 was \$15,016,036.

63. Petitioner must request authority from the PUC to make expenditures for construction of the proposed generating station and recapture costs through the electricity rate paid by Petitioner's customers.

64. The proposed Waena Generating Station project will be funded through Petitioner's customer base and will not require expenditures by either the State of Hawai'i or the County of Maui.

STATE AND COUNTY PLANS AND PROGRAMS

65. The Property is designated within the State Land Use Agricultural District, as reflected on the Commission's official map, M-7 (Pa'ia).

66. The Property is currently designated as "Interim" under Maui County's Zoning Code. Use of the Property for the proposed generating station project will require a change in the current County zoning classification from "Interim" to "Heavy Industrial." On November 20, 1997, Petitioner filed an application with the Planning Department for a change in zoning.

67. The Wailuku-Kahului Community Plan designation for the Property is "Agricultural." The proposal to construct and operate a generating facility will require a change in the existing Community Plan designation to "Heavy Industrial." On November 20, 1997, Petitioner filed an application with the Planning Department for a Community Plan Amendment.

68. Petitioner prepared and submitted a Final Environmental Impact Statement ("FEIS") for the proposed project

as a requirement for the Community Plan Amendment for the County of Maui.

69. The project's FEIS was accepted by the Planning Department on November 24, 1997.

70. Although the Planning Department recommended approval of Petitioner's Community Plan Amendment and Change in Zoning request, the Planning Commission on March 10, 1998, voted to make no recommendation to the Maui County Council.

71. The County Planning Commission raised the following nine concerns that they wanted the County Council to consider.

- Address greater demand-side management and make efforts to cut demand through conservation.
- Re-review growth demand estimates and projections.
- Address rate control as an incentive to diversify from dependency on fossil fuels.
- Close the Ma'alaea and Kahului generating plants.
- Adhere to lighting standards by "night skies."
- Commit to renewable fuel technology or other alternatives by a certain time frame.
- Establish emission control monitoring so public has 24-hour access to inform authorities, especially Department of Health ("DOH").
- Further investigate Best Management Practices of Ammonia, sludge, and other potentially hazardous materials and wastes.

- Get involved in a county-wide energy symposium in order to get feedback from the public on energy resources.

72. The Property is not located within the County of Maui Special Management Area.

NEED FOR THE PROPOSED DEVELOPMENT

Petitioner's Existing Service Area

73. Petitioner provides nearly all the electrical service to the residents and businesses of the County of Maui. The islands of Maui, Moloka'i, and Lana'i each have their own generation and transmission systems.

74. On the island of Maui, Petitioner serves over 91,000 residents with approximately 43,940 metered accounts. Maui County is the fastest growing County in the State.

75. From 1970 to 1980, Maui's population grew by 62.4 percent and increased by 45.4 percent during the period from 1980 to 1990.

Petitioner's Existing Generating Resources

76. Petitioner operates and maintains a diverse variety of generating units of various capacities from 2.2 MW to 28 MW on Maui. These include ST generators, diesel engine generators, and CT generators.

77. Petitioner presently owns and operates 22 generating units on Maui: 4 at Kahului and 18 at Ma'alaea.

Transmission and Distribution Resources

78. As power is generated on Maui, transformers boost the voltage to either 23 kV or 69 kV. The power is then

transmitted through the 23-kV and 69-kV transmissions grids. When the power reaches the substations, the voltage is reduced from 69 kV and 23 kV to Petitioner's 12-kV and 4-kV. The power proceeds from the substations along streets and roads through overhead, or where necessary, underground distribution feeders, to small step-down distribution transformers. These transformers are located on poles or pads near the facilities they serve and are sized for the particular load and voltage required by the customer. The 69-kV system consists of approximately 96 miles of overhead lines, and the 23-kV system consists of approximately 137 circuit miles of overhead lines.

79. The proposed Waena Generating Station is required as a facility to: maintain an adequate system margin-of-reserve generating capacity; provide a system that meets the projected electrical demand; increase system reliability; replace older generation facilities scheduled for retirement; and provide dependable electrical service to its customers.

80. The need for additional generating capacity was identified by Petitioner through the integrated resource planning ("IRP") process.

81. IRP is a PUC process, adopted in 1992, that governs all of the energy utilities in the State of Hawai'i. IRP is an ongoing process which results in a 20-year master plan for the near and long-term energy needs of all the utilities on all of the islands.

82. IRP is intended to bring together representatives from Petitioner, government agencies, public groups, and

individuals concerned with the environment, culture, businesses, and communities to participate in the energy planning process.

83. Petitioner's goal in the IRP process is to identify the resources or the mix of resources needed to meet near and long-term consumer energy needs in an efficient and reliable manner at the lowest reasonable cost.

84. IRP revolves around a three-year cycle to allow for resubmissions of the comprehensive plan with annual and updates such as status reports every year.

85. Petitioner's IRP was a very comprehensive process.

86. The IRP process evaluated the following issues:

- existing and forecasted demand for energy and capacity;
- existing and forecasted fuel prices;
- impacts of Demand-Side Management ("DSM") and conservation and energy efficiency programs on the demand for energy;
- existing firm capacity;
- maintenance and retirement schedules of generating units;
- existing Purchase Power Agreements ("PPAs") from independent power producers ("IPPs");
- proposals for future PPAs from IPPs.

87. Peak power demand by Petitioner's customers has increased an average of 5 percent per year between 1983 and 1996, from 95.4 MW to 174.8 MW. Peak power demand on the island of Maui is forecasted to increase steadily over the next 20 years at

approximately 2.6 percent per year. It is anticipated that there will be a shortfall in Petitioner's system reserve margin by the year 2004, and that additional generation will be required through the year 2016.

88. DSM programs, which are a component of the IRP, were designed to influence customer consumption of electricity in a manner that will produce changes in the utility's demand.

89. DSM is energy conservation to which Petitioner gives strong preference to energy conservation as a first resource option to meet energy needs of its customers.

90. Petitioner formed four DSM resource programs based upon the common end-uses and market segments that they address. These programs include the: Commercial and Industrial Energy Efficiency Program, Commercial and Industrial Customized Rebate Program, Commercial and Industrial New Construction Program, and Residential Efficient Water Heating Program. Potential programs include conservation, energy efficiency, load management, and fuel substitution.

91. Petitioner's total firm capacity for the island of Maui, after completion of its second 58-MW expansion at Ma'alaea in the year 2001, will be 254 MW from Petitioner-owned plants and will enable Petitioner to meet demand forecasted through 2003.

92. After completion of the three additional units at Ma'alaea, the plant will have expanded to its full land capacity. The Kahului plant is also built to land capacity.

93. Replacing or repowering existing units at the Kahului and Ma'alaea Power Plant is not feasible due to the high costs involved.

94. Petitioner considers unit retirement dates as the unit approaches the end of a normal life expectancy. For different technologies, there are different retirement life expectancies. For STs, the life expectancy is 50 years; CTs, 35 years; and depending upon the size of the unit and operating speed, the life expectancy for diesel engines is 25 to 30 years.

95. Petitioner considers three major factors when making unit retirement determinations: availability of parts for the units, service reliability, and operating and maintenance costs.

96. Petitioner's resource plan identifies the retirement of 17 older generating units producing a gross 112.64 MW of power over the next 20 years.

97. Power produced by IPP is classified as either firm capacity or as-available capacity. Petitioner's resource planning can only evaluate producers of firm capacity.

98. The power provided by HC&S is classified firm capacity. The firm power contract with HC&S expires at the end of 1999 and its renewal is uncertain. Beginning in 2000, Petitioner has removed the 16 MW provided by HC&S from Petitioner's resource plan since Petitioner needs to pursue parallel planning in the event the PPA with HC&S is not renewed.

99. The power provided by Pioneer Mill Company is classified as-available capacity. Petitioner cannot rely on this

source of power since the power is available only when the mill is producing electricity in excess of its own needs. Therefore, as-available capacity power is not included in Petitioner's resource plan.

100. Petitioner is an isolated utility; therefore planning criteria requires higher levels of reliability than would mainland utilities that have interconnected grids and can rely on their neighbors to support those contingencies.

101. The proposed Waena Generating Station is designed to meet the increasing demand for electricity on the island of Maui and to improve system reliability. Based upon Petitioner's existing generation resources, resource planning, and planned addition of generation capacity over the next 20-30 years, the Waena Generation Station can accommodate changing public demands and allow for the flexibility of future designs and technologies.

102. Resources Planning has identified the need for additional units to the system beginning in the year 2004.

103. Development of DSM energy programs will not offset the need for unit additions beginning in the year 2004.

104. The scheduled retirement of older generation equipment can be deferred for a short time in order to accommodate permitting delays; however, this action does not ensure continued operating reliability nor offset the identified need for additional units beginning in the year 2004.

Alternate Energy Resources

105. Petitioner examined and evaluated the feasibility of employing biomass conversion, geothermal, hydroelectric, solar, wind, ocean thermal energy conversion ("OTEC"), and coal as alternatives to diesel fuel, and determined that these technologies had not reached a stage in either their development or commercial availability to provide cost-efficient firm generating capacity for the island of Maui.

106. Petitioner will continue to monitor these technologies for possible use should they become cost-effective.

107. Petitioner is currently negotiating with a wind developer for a large MW-scale wind farm installation on Maui.

108. As a part of the IRP process, Petitioner fully evaluated the alternative of a 10-MW wind farm in the Central Maui region near Ma'alaea. Cost of the 10-MW system was estimated at approximately \$13.3 million.

Alternative Fuels

109. The CTs will be fueled by No. 2 diesel fuel. Petitioner, through its IRP process, also examined the feasibility of using alternative fuels other than diesel and coal for use with its conventional generation resources, such as propane, ethanol, methanol, orimulsion, coal slurries, municipal solid waste, naphtha, A-21, and landfill gas and digester gas. These alternative fuels are not feasible at this time for several reasons, including but not limited to: high costs, availability, and safety and design concerns.

110. The generating units planned for the Waena Generating Station will have the capability to burn not only diesel fuel, but other gaseous fuels as well, should the technical feasibility and economics of alternative fuels be demonstrated in the future. The planned installation of units over a 30-year span will also allow Petitioner to take advantage of new technologies for power generation at such times as they may be appropriate.

Site Selection

111. To determine the optimal location for the proposed Waena Generating Station, several siting studies and site assessments were conducted between 1989 and 1995. The first island-wide study, Site Selection Study, Maui Electric Company, Ltd. (Stone & Webster, 1989), assessed ten candidate sites and identified three viable sites out of the ten for future generation expansion. These three were the Kahului Power Plant, Pu'unene Sugar Mill, and the Ma'alaea Power Plant.

112. The second study, Candidate Sites Report and Preferred Alternative Site/Technology Report (Black & Veatch, 1991), screened the island of Maui for areas suitable for power plant development and identified the Central Maui isthmus as the most appropriate location for a new, stand-alone electrical generation facility. The assessment was based on compatible land uses, topographic slope, suitable land area, water availability, air shed availability, fuels logistics, transmission line integration, land uses, permitability, community acceptance, socioeconomics, and archaeology.

113. The Ameron Quarry, Pu'unene Airport, and Ma'alaea sites were identified as feasible locations for a power plant. After evaluating these sites with several technologies (atmospheric fluidized bed combustion (coal), coal gasification, and combined-cycle CTs) and an evaluation of 20 technical and environmental criteria, a combined-cycle CT arrangement at the quarry site was determined to be most suitable for Petitioner's future baseload power generation station, with the Pu'unene Airport site as an alternate.

114. When Petitioner further evaluated the quarry and Pu'unene Airport sites, the owner for both sites, Alexander & Baldwin-Hawaii, raised concerns which resulted in the identification of an alternate site approximately two miles southeast of Pu'unene Airport. This site was previously identified in the Candidate Sites Report and Preferred Alternative Site/Technology Report completed in 1991. Based on the findings of the environmental assessment prepared by Belt Collins (1992), the site, identified as Site C-3, was a viable candidate for further consideration as a potential site for a Maui baseload generating station.

115. Further site evaluations in 1993 found Site C-3 to be an acceptable location based on evaluations of several issues including those related to hazardous materials and groundwater issues. An air quality analysis study (Trinity Consultants, 1993) found the Central Maui area an acceptable location for a large baseload generating station. The air quality study also identified areas within the isthmus by the

level of difficulty ascertained in obtaining air quality permits. Areas north of the quarry were discovered to have the highest level of difficulty.

116. The MECO Central Maui Siting Study (Belt Collins, 1994) identified ten 50-acre candidate sites for evaluation. The identification of these sites was based on environmental and technical factors, such as air quality impacts, site soils, agricultural potential, visibility, and fuel transportation requirements.

117. Six of the ten sites were selected as "finalist" sites and analyzed further. The remaining four were rejected because they were either inferior or so similar to one of the six that individual analyses would not have been meaningful.

118. Three sites identified as Sites A-1, A-2, and D-1 ranked highest among the six "finalist" sites and were recommended for further analyses. After further evaluations and discussions with the DOH, Petitioner identified the region surrounding Sites A-1, A-2, and D-1 as primary areas of interest. The Central Maui Siting Study Air Quality Analysis by Trinity Consultants identified Site D-1 as having the best air quality.

119. The Environmental Screening and Siting Report for the Central Maui Generation Project (Dames and Moore, 1995) evaluated Sites A-1, A-2, and D-1 against several environmental factors, including: air quality, topography, soils, ground and surface water, aesthetics, noise, traffic, cultural resources, hazardous materials, botany, engineering considerations, and natural hazards. Baseline studies were conducted on each site

and reports were prepared that outlined anticipated impacts of a 232-MW baseload generating station located on each of the three sites. As a result of the analysis, Site A-2 was identified as the most preferred of the three candidate sites.

120. The MECO Generation Siting Study (Stone and Webster, 1995) conducted a final site evaluation of Sites A-2, C-3, and D-1. The evaluation was based upon more technical issues, including but not limited to: constructability, modeled impacts to air quality, proximity to wells, need for infrastructure improvements to adjacent roadways, overall project schedule, and costs. Site A-1 was eliminated from further consideration because Sites A-1 and A-2 were in the same air quality area and Site A-2 ranked higher. Site D-1 was retained as a final candidate, because although it was found to be the least environmentally desirable site in the Pulehu area, it had been found to have the best air quality in previous analyses (Trinity Consultants, 1993). Site C-3 was included as one of the final sites since it was not being used for sugarcane, and the owner said it was available.

121. As the result of this site analysis, Site A-2 was considered the preferred site for the proposed Waena Generating Station.

122. Of the three sites under consideration, Site A-2 had the least impact on: air quality, biological resources, area traffic and transportation, and infrastructure costs.

123. Air quality constituted one of the more important environmental screening factors in the site selection

process. Air quality modeling data, predicted air emissions, national ambient air quality standards, and the Federal Prevention of Significant Deterioration ("PSD") increment limits were utilized to screen the candidate sites.

124. For air quality and health base standards, the recommendations are based on protecting the most sensitive individuals. The standards are based on protecting people with bronchial asthma.

125. Other factors were also considered by Petitioner in the site selection process for the proposed generation facility, including the compatibility of the proposed use of the site with the quarry, landfill, and the surrounding agricultural uses; its distance from more sensitive urban uses; and its centralized location within Petitioner's existing generation and transmission systems.

126. The site for the proposed Waena Generating Station, Site A-2, is central for Petitioner's transmission grid and populated areas.

SOCIO-ECONOMIC IMPACTS

127. Upon full buildout of the plant, there will be approximately 20 shift personnel. In addition, there will be 26 non-operating personnel, for a total of 46 new employees.

128. Petitioner plans to move the transmission and distribution facilities to Waena, which will include approximately 195 employees working on a 7 to 3:30 shift. The grand total of employees at full buildout will be about 241 people.

129. The proposed facility will require between 80 to 100 construction workers during the initial installation.

130. The electricity provided by the proposed generating facility will support continued economic expansion for the island and provide the necessary energy to support housing developments.

131. Construction of the Waena Generating Station will not have a significant impact on property values.

132. There would be no significant impacts on the value of the property immediately surrounding the Waena Generating Station. The only discernable impact to the property immediately surrounding the project would be the minor effect on sugarcane production operations, such as crop dusting and harvesting activities caused by the physical presence of the structure on the Property and the erection of utility lines.

133. There may be a small effect on residential property values in the immediate vicinity of the facility, but the effect on property values diminishes to relatively minimal and becomes nonexistent as you proceed approximately one-half mile away from the facility. The residential development closest to the Property is located approximately 2½ miles away.

IMPACTS UPON RESOURCES OF THE AREA

Agricultural Resources

134. Maui County has approximately 360,000 acres of land classified as farmland. Of this acreage, approximately 89,000 acres of land are considered cropland, of which 36,500 acres are cultivated by HC&S and 11,000 are cultivated by Maui

Land and Pine Co., Ltd. The Property represents approximately 0.02 percent of Maui County's total farmland, 0.07 percent of Maui County's total cropland, and 0.18 percent of HC&S total acreage.

135. The proposed reclassification of the Property from the State Land Use Agricultural District to the State Land Use Urban District will remove approximately 65.7 acres of prime agricultural land from sugarcane cultivation.

136. Although the proposed Waena Generating Station will remove 65.7 acres of prime agricultural land from active production, the power generated from this facility will support further expansion and diversification of agricultural activities on Maui.

137. HC&S is undergoing expansion plans and will offset the loss of 65.7 acres of sugarcane land by expanding their acreage by 280 acres near Kuihelani Highway and adding another 1,100 acres of land formerly cultivated by Wailuku Agribusiness.

138. A study entitled Potential Ethylene and Sulfuric Acid Impacts of Proposed Waena Generating Station was prepared by Robert E. Paull ("Paull") to evaluate the potential impact of ethylene and sulfuric acid ("H₂SO₄") emissions from the proposed generating station on surrounding agricultural areas.

139. The Paull study used models from the study prepared by Dr. Thomas A. Schroeder and Jim Clary & Associates on the Maui Vortex, a cyclonic eddy that is formed by winds flowing through the Central Maui isthmus that travel along the coast and

encounter upwardly flowing winds along the slopes of Haleakala. The vortex is generally present during periods of regular tradewinds. With all four DTCC units operating, it would take 1,363 days of continuous vortex, with no loss of ethylene from the vortex, to reach a plant response threshold concentration of 0.01 microliters per liter.

140. Given ethylene's normal lifetime of only 0.4 to 4 days and the highly unlikely event of experiencing 1,363 days of uninterrupted tradewinds to produce a continuous vortex, the ethylene impacts from the proposed generating station are not expected to have any adverse impact upon the surrounding agricultural environment.

141. Sulfur dioxide ("SO₂") is commonly produced as the result of fossil fuel burning. SO₂ is the main sulfur compound emitted into the atmosphere. This is oxidized to SO₃ that forms H₂SO₄ when hydrated. A major source of SO₂ in Hawai'i is volcanism. Symptoms of adverse impacts of high concentrations of SO₂ on plants includes bleached brownish or yellowish spots or blotches with areas of dead tissue.

142. Plant sensitivity to SO₂ varies. Some plant species (beans) are very sensitive, while others (celery, corn, potatoes) are quite tolerant.

143. The SO₂ level anticipated from the proposed generating station is less than the U.S. Environmental Protection Agency ("EPA") significance level of 5 micrograms per meter cubed.

144. Exposure of plants to H_2SO_4 can cause damage with a threshold for growth reduction being 0.5 parts per million ("ppm"). Assuming 100 percent of the SO_2 is converted into H_2SO_4 , and that no H_2SO_4 decay occurs, the time required to reach an H_2SO_4 concentration of 0.01 ppm is 274 days, and that such infrequent and very low concentration is below the projected thresholds for plant chronic injury and concentrations would never reach acute plant injury concentrations. Other sources of H_2SO_4 , which include sea spray, plants, algae, and bacteria, may be expected to have a more significant impact.

145. Based on the findings of the Maui Vortex study by Schroeder and Clary Associates, a persistent vortex would not result in significant concentrations of SO_2 , nitrogen dioxide (" NO_2 "), particulate matter less than 10 microns in diameter (" PM_{10} "), H_2SO_4 , and ethylene.

146. The Maui County Farm Bureau concurs with the assessment that SO_2 and ethylene emissions from the proposed Waena Generating Station will not result in any harmful effects on new and existing crops grown commercially on Maui.

147. Haleakala National Park, approximately 12 miles southeast, is the closest area to the proposed Waena Generating Station having a Class I designation.

148. At the request of the U.S. Department of the Interior, National Park Service ("NPS"), deposition values were calculated for the amount of chemical concentrations which may be deposited on plants and in the soil thereby impacting sensitive plant species. The deposition levels for SO_2 and nitric acid

were calculated based on the procedure contained in the Interagency Workgroup on Air Quality Modeling (IWAQM) Phase I Report: Interim Recommendation for Modeling Long Range Transport and Impacts on Regional Visibility (EPA, 1993). However, the NPS does not have any data on what deposition levels would adversely affect Haleakala National Park. The NPS will need to assess the potential impact on plant species by conducting detailed threshold analyses for specific plant species and soil conditions within the park.

Flora and Fauna

149. A biological survey, prepared by Botanical Consultants, surveyed the Property and the preferred and alternative transmission line corridors. No rare or endangered species of plants or animals, or species listed as candidate for such status, were found either on the Property or within the preferred or alternative transmission line corridors.

150. Neither the Hawaiian hoary bat or the Hawaiian owl was observed during the survey. Hawaiian hoary bats are known to roost at higher elevations. Although the Hawaiian hoary bat was not observed during the survey periods, they have been recorded at elevations as low as 400 feet and within gulches, and it is likely that they utilize the air space above the Property. However, no habitat conducive to bat roosting or forging exists on the Property.

151. Three reservoirs in the area (designated by HC&S as 80, 84, and 52), in addition to being integral to sugarcane

production, also serve as wildlife habitats. Two Hawaiian stilts were observed during a site reconnaissance at reservoir 80.

152. The nearest HC&S reservoir is approximately 2,000 feet from the boundary of the Property.

153. The proposed Waena Generating Plant is not expected to have a significant negative impact on flora or fauna communities because construction and operation of the plant will occur on lands presently under sugar cultivation. Further, the Property has almost no value as native bird habitat. None of the species observed on the Property are listed as threatened or endangered, or candidates for the threatened or endangered species list.

Archaeological Resources

154. The documentary research provided no evidence of prehistoric sites or utilization of the area. An archaeological inventory survey of the Property and the proposed and alternative transmission line routes was conducted by Scientific Consultant Services, Inc., dated April 1997. No archaeological resources were identified in any of the proposed transmission line corridors or at the Property.

155. In a letter dated August 29, 1997, the DLNR-SHPD provided the following comments: "We concur with the findings that no significant historic sites are located on the subject property. Historic to modern sugarcane production and access road construction have destroyed all previous vestiges of the landscape, making it unlikely that significant historic sites survive. We therefore find the proposed construction of the

power line to have 'no effect' on known historic resources."

Groundwater Resources

156. The Property is located in the Pa'ia Aquifer System, one of four aquifer systems within the Central Maui Hydrologic Sector of the Central Maui isthmus. Rainfall in Central Maui averages approximately 28 inches per year, over an area of approximately 200 square miles. Due to dry and windy conditions, only a small percentage of rain infiltrates deep enough to become groundwater recharge. The Property is located in a dry area with the median rainfall amounting to 17 inches a year.

157. The Pa'ia Aquifer System covers an area of 61 square miles and has a sustainable yield of 8 million gallons per day ("mgd"). Significant amounts of water recharge around the Property results from excess sugarcane irrigation in the area. The sustainable yield of 8 mgd represents only natural recharge from rainfall and does not include the large amounts of artificial recharge resulting from drip irrigation of the surrounding sugarcane fields.

158. The lands surrounding the Property are irrigated with surface waters collected from various streams on the windward slopes of East Maui by an elaborate irrigation ditch system operated by HC&S. Water from this system is distributed throughout the Pa'ia Aquifer System by the Haiku, Lowrie, Kauhikoa, and Hamakua Ditches. The system extends 4 miles inland, 1 mile seaward, and more than 2 miles on either side of the Property.

159. Groundwater with chloride levels higher than 250 milligrams per liter ("mg/l") is classified as non-potable. The basal groundwater throughout the central isthmus generally contains chloride levels higher than 250 mg/l and is classified as non-potable.

160. Certain areas, such as near the Property, contain significantly lower chloride levels because the irrigation ditch system contributes to a significant amount of artificial recharge in the area, which dilutes the chloride and significantly lowers the chloride content of the groundwater. The ditch system distributes approximately 164 mgd of surface water to the Pa'ia Aquifer and contributes a significant but undetermined amount of fresh irrigation water recharge in the area, resulting in lower chloride levels.

161. The CWRM provided the following comments:

"The CWRM is currently in the process of assessing recharge from irrigation and other sources and assessing the effect on the net sustainable yield. Furthermore, while estimates of drawdown and water quality appear to be reasonable, these issues will be further addressed, and possibly validated via pump tests during the well construction and pump installation permitting phase."

162. Groundwater on the Property is developed from a dozen or more wells and shafts. Most of the water is used for sugarcane irrigation, with small amounts used for landscape irrigation and industrial purposes.

163. The Property is surrounded by five large capacity wells within a 3-mile radius. These wells produce 80.6 mgd of non-potable water for irrigation. Other wells within the 3-mile radius include 3 monitor wells in the Central Maui Landfill. These wells provided data on groundwater quality expected on the Property.

164. The wells nearest the Property are in the existing Central Maui Landfill. The nearest producing well is HC&S' Pu'unene Pump 6 located 1.5 miles downslope of the Property and has a chloride content reported at between 335 to 490 mg/l.

165. There are no existing municipal wells near the Property or elsewhere in the Central Hydrologic Sector.

Scenic/Visual Resources

166. The Property is situated within an area of gently sloping terrain which extends to the slopes of Haleakala. There are few significant topographic barriers to limit views. The area surrounding the Property is in active sugarcane production.

167. The proposed 232-MW Waena Generating Station will constitute a relatively large industrial complex. The structures housing the generating machinery, support equipment, and offices will be between 15 and 70 feet high and will cover approximately 25 acres. The four stacks will be 150 feet high and 24 feet in diameter.

168. Petitioner analyzed the visual impacts of the proposed project in terms of distance, screening (vegetation), and backdrop (mountains), and provided computer generated

photographic simulations to assess the impact of the proposed facility on surrounding scenic features. The facility would not have an adverse impact upon the area's visual resources because of the proposed facility's large distance from sensitive viewer locations. The generation station and exhaust stacks will represent only a co-dominant feature within the landscape up to 3 miles distance, and only a subordinate feature within the landscape beyond 3 miles. Large distances from viewing locations will make the apparent size of the facility small to the viewer and should not become a focus of attention.

169. Haleakala National Park is classified as Class I under the Clean Air Act. To determine the impact of the plume from the four 58-MW units in the generating plant on the visibility in Haleakala National Park, Petitioner used the EPA VISCREEN model recommended by the NPS. The VISCREEN model assesses the visibility of a plume, not whether the plume contributes to reductions in general visibility.

170. When the level-1 analysis was performed for the proposed Waena Generating Station, potentially significant impacts were identified. Therefore, a level-2 analysis was performed. The onsite meteorological data were used for this visibility analysis. The Haleakala National Park is downwind from the Property only when wind directions are between 290° and 315°. Therefore, wind vector data in sectors to the east-southeast, southeast, and south-southeast were used in the analysis. The worst-case plume dispersion conditions were determined following the EPA guidance. The proposed Waena

Generating Station is not anticipated to exceed the Class I Area Screening Criteria inside Haleakala National Park.

171. The NPS provided the following comments on potential visible plume impacts inside Haleakala National Park:

“The Level 2 VISCREEN visibility analysis indicates that the Waena project will not impact the park with a coherent plume.”

172. Lighting used within the plant for nighttime security and operations will be visible to residents located upslope of the Property due to the absence of other urban uses surrounding it and the overall size of the proposed facility. Some night glow impacts will be noticeable to Upcountry residents from reflective lighting and general multiple light sources at the facility. These impacts will lessen with the distance and will diffuse into the ambient background within the 4 miles to the nearest Upcountry residents.

173. Impacts from night lighting at the plant will be mitigated by properly shielding all outside lighting to direct light downward and pavement will be made as non-reflective as possible. Petitioner will avoid the use of halogen or intense white lights. The project will not have a negative impact on the visual character of its immediate environs and will not have an adverse impact to scenic views or vistas related to coastal areas within the Central Maui region.

174. Visual impacts will be mitigated through landscaping and choices of paint colors appropriate to the area. The color of the facility and its exhaust stacks will be blended

with the tones of the background landscape to minimize the visible impact of the facility on the surrounding environs. A landscaping plan is being developed to assist in the overall visual mitigation. Landscaping will be installed during Phase I to allow for full maturation of vegetation by the installation of the final phase.

175. The landscape buffer will be outside of the security fence. The fence is needed for security and the landscaping will screen the industrial feeling the fence might have.

176. The fence will be around 12 feet tall. Many of the trees Petitioner is proposing for the screening will have a mature height of 40 feet. The mass (of trees) would be between 10 to 20 feet high.

177. It is anticipated that any visual impact from the proposed generating plant will be obscured within a year to a year and a half.

ENVIRONMENTAL QUALITY

Noise

178. Two different noise level regulations are available for assessing noise impacts from the proposed Waena Generating Station: DOH noise regulations under Title 11, Chapter 46 Community Noise Control; and the U.S. Department of Housing and Urban Development ("HUD") noise regulations.

179. DOH noise regulations under Title 11, Chapter 46 Community Noise Control, are expressed in maximum allowable property line noise limits, which cannot be exceeded for more

than 2 minutes in any 20-minute time period. For properties zoned for agricultural use, the noise limits are 70 dBA for both the daytime and nighttime periods.

180. HUD noise regulations indicate that an exterior day-night noise level of 65 Ldn or less is considered normally acceptable for residential housing developments. Because there are no housing developments located in the vicinity of the Property that was constructed using federal funds, the HUD noise regulations do not apply. Therefore, the HUD regulations can only be used as a guideline.

181. Studies prepared by Dames and Moore, 1995, and Belt Collins, 1992, measured short-term daytime background ambient noise levels in the vicinity of the Property with average values ranging from 54 to 60 dB, well below the 70 dBA DOH property line noise limit for agricultural and industrial uses.

182. An acoustic study of existing and anticipated noise conditions at and adjacent to the proposed Waena Generating Station was prepared by Y. Ebisu & Associates in May 1997.

183. Ebisu & Associates used the hourly average (Leq(h)) and Ldn noise descriptors to describe existing and future noise levels on the Property and to evaluate the risks of exceeding the 70 dBA DOH noise limit along the Property boundary lines of the proposed generating plant.

184. The study analyzed existing background ambient noise levels at several locations: 50 feet from Dairy Road, areas removed from existing developments, and areas closest and normally downwind of the Property to measure varying noise

levels. At 50 feet from the roadway centerline of Dairy Road, average daily traffic noise level was estimated to be 68 Ldn, and considered to be typical for major roadways in the area, such as Hana Highway and Haleakala Highway. The results of the measurements in the areas removed from the major roadways demonstrated that existing background ambient noise levels are very low, and ranged from 35 to 44 Leq. Existing background noise levels in the communities closest to the Property are believed to be very low and similar to those measured at the other locations, particularly if they are removed from major roadways.

185. Anticipated future noise emission levels from the proposed Waena Generating Station were evaluated for the four phases of planned station expansion. The closest noise sensitive properties to the proposed generating station are day-care and social services facilities located in Pu'unene, beyond 2 miles from the Property. Residences in the other closest communities of Kahului, Pukalani, Pa'ia, Spreckelsville, and Waiakoa are located beyond 3 miles from the station.

186. Using a Linear-Weighting filter (instead of the A-weighting filter), the predicted noise levels from the proposed generating station at the communities of Pu'unene, Kahului, Pukalani, Pa'ia, Spreckelsville, and Waiakoa ranged from 19.7 to 36.2 dBL for Phase I; 22.7 to 39.2 dBL for Phase II; 24.5 to 41.0 dBL for Phase III of the development; and 25.7 to 42.2 dBL for Phase IV of the development. Due to the large separation distances between the Property and the nearest communities, the

predicted dBA levels are approximately 28 dB units less than the dBL values measured in these communities and should not be audible at the levels computed with the Linear-Weighting filter. Even with the added 12 dB of reduced attenuation due to sound ducting (worst case scenario), predicted noise from the proposed generating station should not be audible.

187. Measured background ambient noise levels at the surrounding communities also indicate that the predicted sound levels from the proposed Waena Generating Station probably will be inaudible during even the nighttime and early morning hours.

188. The noise levels generated by the generating station at full buildout would exceed the DOH 45 dBA night time Class A residential and preservation zone noise limits at locations up to 4,600 feet from the station boundaries. Therefore, future development of lands for residential/preservation uses within 4,600 feet and for commercial/multi-family uses within 2,500 feet should be discouraged unless it can be demonstrated that local shielding effects from buildings, tanks, etc. on the Property allow for shorter buffer areas.

189. Compliance with the DOH 70 dBA standard along the station's property lines is expected following completion and operation of all four DTCC units.

190. No special noise mitigation measures will be required from Petitioner for the operation of the proposed generating station.

191. When measured 600 feet from the source, noise levels associated with the operation of diesel equipment

typically range from about 57 to 67 dBA. Predicted noise levels for the nearest noise sensitive properties (day-care and social services facilities) located in Pu'unene are not expected to exceed 24 dBA, below the existing ambient noise levels, during construction and well drilling activities. Also, twenty-four-hour well drilling operations should be possible without causing adverse noise impacts because of the Property's distance from noise sensitive properties.

192. No adverse noise impacts to the closest noise sensitive properties at Pu'unene are expected from construction noise due to the very low noise levels anticipated, due to the temporary nature of the work, and due to the administrative controls available for its regulation.

193. The intensity of the louder construction noise sources and the exterior nature of the work make it impractical to mitigate construction noise along the Property to levels less than 70 dBA. The use of properly muffled construction equipment and adherence to construction noise limits and curfew times are mitigation measures which can be applied to this project. A construction noise variance may also be requested from DOH prior to construction and well-drilling activities.

Air Quality

194. Existing air quality on Maui is heavily influenced by agriculture, the airport, and motor vehicles. Air pollutants include particulate matter, carbon monoxide ("CO"), and hydrocarbon emissions.

195. There are several significant industrial sources of air emissions located within a few miles of the Property.

These include:

- Pu'unene Sugar Mill, approximately 2.5 miles to the northwest
- Kahului Airport, approximately 3 miles to the north
- Kahului Power Plant, approximately 4 miles to the northwest
- Pa'ia Sugar Mill, approximately 4.5 miles to the northeast
- Ma'alaea Power Plant, approximately 5 miles to the southwest

196. An air quality monitoring station was operated at Ma'alaea Monitoring Station 235 between August 1993 and July 1994.

197. Data from Station 235 provided a conservative estimate of the existing air quality at the Property because the station is a post-construction site located close to the Ma'alaea Power Plant. The concentrations of SO₂, PM₁₀, ozone, NO₂, and CO measured at Station 235 are expected to be found in less concentrations at the Property, which is approximately 6 miles upwind from Ma'alaea.

198. The Best Available Control Technology ("BACT") is defined by the Clean Air Act as "an emissions limitation based on the maximum degree of reduction for each pollutant which the review authority, on a case by case basis, taking into account energy, environmental, and economic impacts and other costs,

determines is achievable..through the application of production processes or available methods, systems, and techniques...”

199. The application of BACT cannot result in the emissions of any pollutant that would exceed the level allowed by an applicable New Source Performance Standard or National Emissions Standard for Hazardous Air Pollutants.

200. The BACT for the proposed Waena Generating Plant has yet to be determined by Petitioner. The BACT cannot be determined until the DOH and the EPA review the design-specific elements and modeled air emissions through the air quality permit process. When the appropriate technologies have been determined by the DOH and EPA, the final design for the generating station will reflect the necessary BACT requirements.

201. The four combined cycle units for the proposed Waena Generating Station will be installed over 20 to 30 years. At the time of permitting for each of these units, Petitioner will have to do a new BACT analysis.

202. The EPA guidelines state that the background air quality data used in an application has to be no older than three years.

203. Emissions of air pollutants are regulated at the Federal level pursuant to the Clean Air Act.

204. To determine if there could be any emissions impact from the proposed project due to the interaction of the Maui Vortex, a streamline analysis and a simple box model were conducted using a worst-case scenario of one month of continuously steady tradewinds with no nocturnal vortex

dissipation. In addition, it was assumed that any emission entering the vortex would not leave the vortex, circulating within the vortex for the entire month. The results of these models showed the worst case concentrations of the significant criteria pollutants SO_2 , PM_{10} , and NO_2 to be insignificant, well below the EPA's 24-hour significance levels concentrations. Major factors for these low concentrations are: (1) the small portion of the plant's plume that would actually be entrained into the vortex, and (2) the large vortex volume. In analyzing the predicted plume dispersion in relationship to the existing vortex, only 0.35 percent of the entire plume would enter the vortex winds. This small amount of emissions would then mix within a vortex whose volume approached 40 billion cubic yards.

205. During construction, vehicle and equipment exhaust emissions will be small, localized, and transient. Dust emissions generated during site excavation and equipment movement will be elevated due to large-scale grading. As long as precautions are taken to water the Property during dry or windy periods, construction emissions are not expected to be significant.

206. Under certain emergency situations, steam from the combined cycle system currently in operation at Ma'alaea is vented to the atmosphere via pressure relief valves.

207. Since 1993, when the combined cycle system went into operation at Ma'alaea, steam is vented from the system on the average of once a year.

Electric and Magnetic Levels

208. The proposed transmission lines will pass through undeveloped land used for sugarcane cultivation. No residential areas or other sensitive receptors are located within 250 feet of any of the proposed transmission lines, and no development exists around the Property proposed for the Waena Generating Station.

209. Enertech Consultants calculated the Electric and Magnetic levels for the proposed generating station and transmission lines in May 1997. Their computer modeled calculations were based on five different overhead powerline configurations--the two 69-kV existing transmission lines running adjacent to the Property and the three proposed transmission lines.

210. The generating station equipment, due to its location near the center of the station, and the switchyard equipment will not contribute significantly to the magnetic field levels at the perimeter of the station. The major source of magnetic fields at the proposed station's boundaries and beyond is due primarily to the 69-kV and 12-kV overhead transmission lines which enter and leave the station along Pulehu and Waiko Roads. Although the proposed generating station will represent an increase in the magnetic field levels found along Pulehu Road and North Firebreak Road, studies to date have been inconclusive as to the health impacts from electric and magnetic fields.

ADEQUACY OF PUBLIC SERVICES AND FACILITIES

Roadway and Highway Services and Facilities

211. A traffic impact analysis was prepared for Petitioner in May 1997 by Austin Tsutsumi & Associates, Inc. Trip generation estimates were developed for 2016, following Petitioner's installation of Phase III of the project when the plant is expected to have its full complement of employees (46). The estimates included the number of employees per shift, service and delivery trips, and the number of fuel haul trucks to the plant on a daily basis.

212. The project will generate approximately 210 vehicle trips during the morning peak hour, 145 entering the site, and 65 exiting the site. Approximately 192 vehicle trips were estimated during the afternoon peak hour, 56 entering the site and 136 exiting the site.

213. Using a qualitative measure identified as Level of Service ("LOS") to describe the conditions of traffic flow, ranging from LOS A (free flow conditions) to LOS F (congested conditions), analyses were conducted at major intersections near the Property. To these, Petitioner added plant generated traffic data to estimated future traffic volumes.

214. Although a small number of individual approaches and turning movements will experience drops in LOS, no significant adverse impacts in the level-of-service for the area's roadways are anticipated. No intersection is expected to experience an approach or turning movement greater than LOS E,

and the vehicle to capacity ratio for the signalized intersections will not increase by any significant amount.

215. Future traffic improvements, currently in the environmental processing or design stage, are planned for completion by 1999. These improvements, including the construction of new roadways and traffic signals, will be implemented prior to the operation of the Waena Generating Station. Some of these improvements include the Department of Transportation's ("DOT") installation of traffic signals at the intersection of Hana Highway, Kamehameha Avenue, and Hobron Avenue. DOT is also proposing modifications to the present road network in the vicinity of the Property, including the construction of a new four-lane Airport Access Road as part of the Kahului Airport Master Plan. These modifications are anticipated to result in the diversion of regional and airport traffic from Dairy Road to the Airport Access Road, leaving Dairy Road to serve local traffic.

216. At full buildout, the operation of four DTCC units (eight CTs) will require approximately 44 truckloads of No. 2 diesel fuel daily, with deliveries averaging about 9,000 gallons of fuel.

217. The daily supply of diesel fuel (44 fuel trips) will be transported from Kahului Harbor in tanker trucks traveling along Hobron Avenue, Hana Highway, and Pulehu Road to the Property.

218. The DOT offered the following comments:

“Our State transportation facilities can adequately accommodate the subject project. We do not anticipate an adverse impact to our systems.”

Water Service

219. No existing potable water service from the County of Maui exists near the Property. The only existing municipal well source in the Central Maui Sector is located approximately 4.5 miles northwest of the Property outside of Kahului. Potable bottled water will be delivered by truck to the proposed Waena Generating Station. Petitioner anticipates no extension of the County water delivery system.

220. Four wells are proposed to provide the non-potable water needs for the generating plant. One well will be required for each of the four DTCC units planned and consequently their construction will be phased along with the proposed installation of each DTCC unit (2006, 2010, 2014, and 2017 or later).

221. Non-potable water needs for the proposed Waena Generating Station can be met by drilling and developing wells onsite without impacting basal groundwater quality. A net loss of 0.15 mgd of irrigation recharge to the aquifer would result from the withdrawal of 65.7 acres of land from active sugarcane cultivation. Half of the groundwater withdrawn (0.44 mgd) will be returned to the aquifer by means of injection wells,

representing a net loss of approximately 0.6 mgd from the underlying aquifer.

222. The estimated water use for one DTCC unit is approximately 220,000 gallons per day ("gpd"). The projected average daily water requirements for the four DTCC units proposed for the Waena Generating Plant would be 880,000 gpd.

223. The four brackish groundwater supply wells with pump capacities of 225 gallons per minute ("gpm") will be developed on the Property to meet water requirements of 880,000 gpd for the operation of the CTs and related facilities. Well water will be desalinated or treated as required and stored onsite.

224. Firewater tanks, pumps, piping, and hydrants will be installed to store and disburse water for the sole purpose of fire control.

225. Two separate 240,000-gallon storage tanks will be constructed to meet Maui County Water Systems Standards for a fire flow requirement of 2,000 gpm for 2 hours.

226. The CWRM indicated that a Well Construction Permit and a Pump Installation Permit from the CWRM would be required before groundwater is developed as a source of water supply for the project. The CWRM further recommended coordination with the County to incorporate the project into the County's Water Use and Development Plan.

Wastewater

227. Development of the 232-MW generating station will generate an average of 440,000 to 480,000 gallons of

wastewater per day, which will be disposed of by means of injection wells.

228. The principal source of wastewater will be from a process designed to produce relatively pure water from brackish groundwater. Brackish well water will be run through a dual media filter to take out particles not removed by filtration. The water will be processed further to clean out more of the constituents. Identified as reverse osmosis, this process will produce a concentrated solution of salts and minerals.

229. The treated water will be used for nitrogen oxide control and steam generation.

230. Another source of wastewater will be from the backwashing of cation and anion resin beds used to remove minerals from process water during demineralization. Demineralization results in a fairly clean water source for use in power plant operations. The wastewater from backwashing will contain minerals removed from the water, acid and caustic solutions used for neutralization, and traces of the resin chemicals.

231. The disposal of wastewater from the generating station is not expected to have any hydrologic impact on existing wells or the basal aquifer because the Property lies makai of the DOH's Underground Injection Control ("UIC") line. Any potential impact from the use of injection wells will be mitigated by appropriate well design and testing. Further, the injection wells will be constructed and operated in full compliance with

DOH UIC regulations. The disposal of 0.44 mgd of wastewater will not negatively impact the aquifer for the following reasons:

- The rate of the wastewater injection is extremely small when compared to the rate of groundwater movement indicated by the large withdrawals of groundwater in the area;
- The quality of the wastewater is estimated to be similar to the existing groundwater quality; and
- The wastewater plume will be diluted by mixing and diffusion and is not expected to be detectable at any existing well or coastal area as the plume becomes dispersed and diluted to ambient groundwater quality.

232. The DOH commented that 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 discharge from industrial activities;
- c. Construction dewatering activities;
- d. Noncontact cooling water discharge less than one million gallons per day;
- e. Treated groundwater from underground storage; and

f. Hydrotesting water.

233. The CWRM recommended that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality. 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.

234. Petitioner's Groundwater Resource Assessment recommended that an onsite test well should be drilled to provide more detailed information on aquifer parameters and potential impacts.

235. There is no existing domestic sewer service from the County of Maui near the Property. Sanitary wastewater facilities will be constructed on the Property.

236. Petitioner will use a septic tank and a leach field to treat effluent from sanitary facilities. Detailed plans for the domestic wastewater treatment system will be submitted to the DOH for review and approval as part of a treatment work approval application.

237. Petitioner does not anticipate extension of the county wastewater system.

Drainage

238. Drainage in the area is generally through a series of gulches extending radially from the upper slopes of Haleakala towards the central isthmus area. Slopes on the Property are minimal at approximately one degree. The Property

is drained by Kalialinui Gulch and by Pulehu Gulch. The flow from the Property is directed to the northwest, away from both gulches.

239. The development of the Property for the installation of the first 58-MW unit of generation by the year 2006 will include full grading of the Property and the installation of necessary infrastructure, such as drainage improvements, domestic wastewater systems, and roads to support all four DTCC generating units. At full buildout, approximately 50 acres will consist of both impervious, asphalt areas, and more pervious gravel-covered areas.

240. The proposed project is anticipated to increase stormwater runoff from approximately 45.5 cubic feet per second ("cfs") to approximately 215.4 cfs. Stormwater over the developed 50 acres is anticipated to increase from approximately 34 cfs to 204 cfs.

241. To avoid project specific runoff from reaching adjoining sugarcane lands, the proposed project will include stormwater runoff and infiltration ponds to collect and contain stormwater onsite. A 15-foot landscape buffer around the facility will also aid in stormwater percolation. Runoff ponds will have special sumps with oil/water separators to remove any oil before disposal of the storm runoff into an infiltration pond. An alternative disposal method of water from the runoff ponds could be through a shallow injection well (dry well).

242. Stormwater impacts and erosion to the onsite irrigation ditch are possible during the construction phase of

the proposed generating station. However, use of best engineering practices to prevent runoff into the ditch can minimize these temporary impacts. No significant adverse impacts to the HC&S irrigation system are anticipated from construction-related activities.

243. The proposed drainage improvements will be designed to produce no adverse impacts, due to stormwater runoff, on adjacent properties. All drainage improvements will conform to County of Maui standards.

Solid Waste Disposal

244. Solid waste disposal systems on Maui consist of the Central Maui Landfill and the Hana Landfill. The Central Maui Landfill accepts commercial, industrial, and residential waste.

245. The Central Maui Landfill does not accept hazardous materials or construction materials. Construction materials and waste from the project will be disposed of by the construction contractor into the Maui Demolition and Construction Landfill. The Waena Generating Station will salvage or recycle parts, materials, and equipment to the fullest extent possible in order to reduce the anticipated minimal amount of solid waste which will be generated during operation of the plant. The remaining waste will be disposed of at the Central Maui Landfill. Solids from the sanitary septic system will be disposed of periodically at a County wastewater treatment facility.

246. Solid waste generated by the proposed Waena Generating Station will consist of the following:

- Construction waste;
- Materials associated with plant operation, administration, housekeeping, and maintenance operations; and
- Parts, material, and equipment replaced during maintenance.

247. Hazardous materials which will be stored and used on a regular basis on the Property will be the No. 2 diesel fuel, caustic soda, H_2SO_4 , and cleaning solvent.

248. The fuel storage tanks will be placed on impervious surfaces which will be constructed within berms equipped with oil/water separators to remove oil before disposal and specially designed to contain fuel leakage or spills. These containment areas will have the capacity to contain the entire contents of the storage tank within its area. Each storage tank will be equipped with fuel level alarms to prevent overfills.

249. Caustic soda and H_2SO_4 will be added to the wastewater to adjust the pH level to within UIC permit limits prior to discharge to the ground via the underground injection wells.

250. Cleaning solvent is used for cleaning parts and equipment during routine maintenance and operations. The solvent is used at portable wash stations and recycled by vendors when it is spent and no longer useful.

251. If Selective Catalytic Reduction ("SCR") is required as BACT as a condition of the PSD permit, the wastewater will pass through additional steps which will remove excess

metals, adjust the pH level of the water, and air strip out the ammonia used in the SCR process.

252. Delivery of fuel, acids, and caustic materials used in production operations will be conducted through an independent contractor who will be responsible for all handling from the tanker into the bulk storage areas at the Property.

253. All transport contractors are required to file spill prevention and control and containment plans with the State which outline procedures to be carried out in the event of a spill incident.

254. Petitioner has a fuel oil pipeline operating manual that addresses fuel spills at the Kahului Harbor. The plan is required by the U.S. Coast Guard under Title 33 of the Code of Federal Register.

255. In the event of a spill, the first responders will be the transport contractor, county fire department, and Petitioner's safety personnel. Immediate priorities will include isolating the area for public safety and securing and containing the source of the spill. Qualified hazardous material clean-up organizations will immediately be contacted to restore the affected area to its previous condition.

Schools

256. The project will not directly result in any increase in school population, and therefore it will not adversely impact area school capacities.

Police and Fire Protection

257. The Maui County Police Department provides police protection for the Wailuku-Kahului, Kihei, and Upcountry areas. Development of the Property is expected to have minimal impact on any requirement for police protection.

258. Petitioner will develop onsite security procedures. Petitioner will also construct a fence around the Property, with full-time security manning, and install checkpoints at the access driveways.

259. Petitioner will install video monitoring and a remote control main gate.

260. Fire prevention, suppression, and protection services for the Wailuku-Kahului region are provided by the County Department of Fire Control. The nearest fire station to the Property is the Kahului Station, approximately 4 miles away. Other fire protection facilities in the Central Maui area include a fire station in Pa'ia and another in Wailuku.

261. Petitioner currently has fire control plans for its existing generation facilities. A fire control plan will be designed specifically for the proposed Waena Generating Station. Emergency plans detailing the procedures to be followed when there is a fire or fuel spill will be coordinated with the district fire department and health care facilities. All Federal and State regulations regarding the operation of a generating station and worker safety will be followed.

Civil Defense

262. There is no siren coverage in the area. The State Department of Civil Defense recommends that a siren simulator be purchased and installed inside the facility. Petitioner agrees with the recommendation.

Power and Communications/Electrical and Telephone Service

263. The Property is undeveloped and has no telephone or communications service.

264. Petitioner has two 69-kV transmission lines running adjacent to the Property. The first transmission line (Ma'alaea-Kealahou 69-kV) runs along Waiko Road to the intersection of Pulehu Road, then turns south and extends along Pulehu Road towards Kealahou. The second transmission line (Kanaha-Pukalani) runs from Kanaha Substation along Pulehu Road past the Property to the intersection of Waiko Road, crosses Pulehu Road diagonally and continues across cane lands towards Pukalani. In addition to Petitioner's transmission system, HC&S has some smaller distribution lines which run through cane land to service irrigation and water pumps.

Recreation Facilities and Public Access

265. Recreational and ocean-related facilities occur along the coastline from Kahului Harbor to Spreckelsville Beach. Existing facilities include Kahului Harbor Park and Kahului Beach, Kanaha Beach Park, and Spreckelsville Beach. The proposed generating plant will not have an adverse impact on the public's access and use of the shoreline area, and there will be no

adverse impact to nearshore waters from point and non-point sources of pollution.

266. The electricity generated by the proposed Waena Generating Station will provide the energy required for existing and planned recreational facilities throughout the entire island of Maui.

COMMITMENT OF STATE FUNDS AND RESOURCES

267. The proposed Waena Generating Station project will be funded through Petitioner's customer base and will not require expenditures by either the State of Hawai'i or the County of Maui.

CONFORMANCE TO URBAN DISTRICT STANDARDS

268. The proposed reclassification is in general conformance to §15-15-18 of the Commission rules regarding standards for determining "U" the Urban District boundaries. The Property will be zoned and developed for heavy industrial use and is located close to other industrial uses in the area, such as the Central Maui Landfill and the Ameron HC&D Quarry. The four-phased planned construction and operation of the proposed Waena Generating Station will be compatible with the existing and planned expansion of current heavy industrial uses in the area.

CONFORMANCE WITH THE GOALS, OBJECTIVE AND POLICIES OF THE HAWAI'I STATE PLAN; RELATIONSHIP WITH APPLICABLE PRIORITY GUIDELINES AND FUNCTIONAL PLANS

269. The proposed reclassification of the Property is in general conformance with the following objectives and policies of the State Plan:

§226-14 - Objectives and policies for facility systems-
in general.

- a. Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.
- b. To achieve the general facility system objective, it shall be the policy of this State to:
 1. Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.
 2. Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.
 3. Ensure that required facility systems can be supported within the resource capacities and at reasonable cost to the user.
 4. Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning,

construction, and maintenance of
facility systems.

The proposed Waena Generating Station is designed to meet the increasing demand for electricity on the island of Maui and to improve system reliability. As a result of its planned addition of generation capacity over the next 20-30 years, the Waena Generating Station can accommodate changing public demands and allow for the flexibility of future designs and technologies. Currently, a 58-MW dual-train, combined-cycle unit is the least-cost option in terms of both initial and long-term costs.

§226-18 - Objectives and policies for facility systems
- energy.

- a. Planning for the State's facility systems with regard to energy shall be directed towards the achievement of the following objectives:
 1. Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;
 2. Increased self-sufficiency where the ratio of indigenous to imported energy use is increased; and
 3. Greater energy security in the face of threat to Hawaii's energy supplies and systems.
- b. To achieve the energy objectives, it shall be the policy of this State to ensure the provision

of adequate, reasonably priced, and dependable energy services to accommodate demand.

c. To further achieve the energy objectives, it shall be the policy of this State to:

1. Support research and development as well as promote the use of renewable energy sources;
2. Ensure that the combination of energy supplies and energy-saving systems are sufficient to support the demands of growth;
3. Base decisions of least-cost supply-side and demand side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;
4. Promote all cost-effective conservation 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; and
5. Ensure to the extent that the new supply-side resources are needed, that the development or expansion of energy systems utilizes the least-cost energy supply option and maximizes efficient technologies;
 6. Support research, development, and demonstration of energy efficiency, load management, and other demand-side management programs, practices, and technologies; and
 7. Promote alternate fuels and energy efficiency by encouraging diversification of transportation modes and infrastructure.

The proposed project, in the context of Petitioner's integrated approach to energy production and conservation, conforms with these objectives and policies. The purpose of the proposed Waena Generating Station is to provide a system that meets the projected electrical demand, increases system reliability, and provides dependable electrical service to its customers.

Resource limitations and environmental, public health, and safety concerns were considered in selecting the site and appropriate technology for the generating facility. During the

development of Petitioner's IRP, a comparison of costs and benefits for both alternative fuels and alternative technologies was performed. At this time, alternative fuels and technologies do not represent the least-cost energy supply option or the maximum efficient technology. Diesel-fueled dual-train, combined-cycle units currently will be used while other renewable energy projects are being developed.

Petitioner is actively participating in education and research programs to further develop alternative fuels and technologies in Hawai'i, as is evident through their cooperation with the Pacific International Center for High Technology Research, the County of Maui, and the State of Hawai'i in examining biomass to electricity applications for Hawai'i and through Petitioner's continued installation of small photovoltaic systems on public schools through Petitioner's "Sun Power for Schools" project.

State Energy Functional Plan

270. The policy of the action items of the State Energy Functional Plan pertaining to Petitioner are as follows:

Policy A(1): Promote and Stimulate Greater Energy Efficiency and Conservation in Non-Transportation Sectors

Action A(1)(a): Provide Technical Support and Assistance to the State Government, County Governments, the PUC, and The Energy Utilities in Developing the Integrated Resource Planning (IRP) Process and Carrying Out Demand-Side Management (DSM) Assessments.

Action A(1)(b): Advance the Use of Demand-Side Management (DSM) by Creating Pilot Programs and Promoting Education of Local Energy Producers and Users.

Petitioner is a participant in IRP. Through the IRP process, Petitioner has developed a long-range energy plan for the island of Maui by considering not only the traditional supply-side resources but also the customer (demand-side) resources that are available.

IRP has brought about significant changes in the way utilities conduct their business, not only by including demand-side options as a resource but also by having the public participate in the planning process through advisory groups.

As a result of the IRP process, Petitioner formed four DSM resource programs based upon the common end-uses and market segments that they address. In addition, two service programs were included in the DSM action plan.

Altogether, these programs are projected to provide peak-demand saving of 1.5 MW in their first year of implementation and 14.6 MW of energy savings by the year 2004. However, because energy efficiency and peak capacity reductions have not been comprehensively pursued by any organization in Hawai'i to date, there is considerable uncertainty about how to structure the DSM programs. Therefore, monitoring of the implementation process will be important. Programs will need to be adjusted as the implementation process moves forward. Petitioner expects to update its DSM program plans annually to optimize program implementation and energy savings.

The State is encouraging development of alternative and renewable energy sources as Hawai'i primary energy source. These resources include geothermal, OTEC, solar photovoltaic, biomass,

wind, and hydropower. Although the State has made progress in alternative energy technologies, only geothermal currently provides a potential for firm, reliable electricity. It is the only commercially mature, indigenous resource available in large quantities that can be converted to baseload (24-hour-per-day) electricity. Other alternative energy resources, such as solar and wind technologies, do not provide firm, baseload power and are not economically feasible at this time.

Petitioner has contributed to and constructed facilities for alternative and renewable energy resources, such as wind and hydroelectric power. It also has PPAs with IPPs. These PPAs are based on alternative and renewable technologies. Examples include sugarcane bagasse and biomass-fueled ST generators. While extensive dependence on such contracts can increase supply risks, Petitioner has evaluated and continues to evaluate IPP alternatives and renewable energy power supply offers.

After examining the alternative to this project (including coal, non-firm renewable energy sources such as wind or hydropower, increased DSM programs, and IPP proposals), Petitioner has determined that the proposed Waena Generating Station is the only reasonable way to meet its PUC obligations of providing high-quality, reliable service at the least cost to the customer within the necessary timeframe.

Petitioner acknowledges that, in making the decision to expand with additional oil-fired units, it is contradicting the objective of energy self-sufficiency. As the project comes on-

line, however, it will be possible to retire less fuel efficient units, and the overall ratio of fuel consumption to megawatts produced should improve. In addition, Petitioner continues to pursue long-term conservation measures and alternative fuel sources that will lessen the dependency on imported fossil fuels.

CONFORMANCE WITH COASTAL ZONE MANAGEMENT OBJECTIVES AND POLICIES

271. The proposed reclassification of the Property is in general conformance with the Coastal Zone Management Program, chapter 205A, HRS, in the areas of recreational resources, historical/cultural resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

CONFORMANCE WITH THE COUNTY OF MAUI GENERAL PLAN
AND THE WAILUKU-KAHULUI COMMUNITY PLAN

272. The following objectives and policies of the County of Maui General Plan pertain specifically to the proposed Waena Generating Station:

B. Land Use

Objective 1 To preserve existing geographic, cultural and traditional community lifestyles by limiting and managing growth through environmentally sensitive and effective use of land.

Policy b Provide and maintain a range of land use districts sufficient to meet the social, physical, environmental and economic needs of the community.

Objective 2 To use the land within the County for the social and economic benefit of all the County's residents

Objective 3 To preserve lands that are well suited for agricultural pursuits

Policy a. Protect prime or productive agricultural lands from competing non-agricultural land use.

Policy d. Discourage the conversion of productive or potentially productive agricultural lands to non-agricultural uses.

The proposed Waena Generating Station will remove approximately 65.7 acres of prime agricultural land from active production. However, this amount represents only a small portion of the over 36,000 acres of land that HC&S has in production on the island of Maui. In selecting the Property for the proposed project, Petitioner examined several different areas which were not on prime agricultural lands. However, the results of the various environmental analyses and discussions with landowners determined that the Property was the most feasible for construction and operation of the generating station.

Conversion of the land from agricultural use to power generation will have no discernible impact upon the overall agricultural production on the island of Maui. In addition, providing the appropriate land use for the proposed project will ensure the provision of sufficient electricity to meet the social and economic needs of the community.

E. Public Utilities and Facilities

Objective 1 To anticipate and provide public utilities which will meet community needs in a timely manner.

Policy a. Maintain all power and utility systems so as to meet public health and safety standards.

Policy b. Encourage new and expanded power generation facilities to be

community planned based on sound land use and environmental planning principles.

Policy c. Assure the availability of power systems and sources that meet public health and safety standards.

Policy d. Locate energy producing plants in areas where they will not create health hazards.

The selection of the Property for the proposed Waena Generating Station was made only after careful consideration of all environmental and community concerns. Due to its distance from major sensitive receptors, the construction and operation of the proposed facility is not anticipated to have significant environmental impacts nor will it create a health hazard. In addition, all aspects of the plant's design, construction, and operation will follow applicable health and safety standards. The construction and operation of the proposed Waena Generating Station will meet the objective by allowing the timely provision of electrical power to meet community needs.

273. Because the purpose and need for the proposed Waena Generating Station is to provide for the increasing demand for energy forecast on the island of Maui, the energy the facility provides will allow the County of Maui to implement many of the objectives and recommendations of the Wailuku-Kahului Community Plan, specifically those pertaining to supporting economic growth and the provision of health and safety services.

RULING OF PROPOSED FINDINGS OF FACT

Any of the proposed findings of fact submitted by Petitioner or other parties not already ruled upon by the

Commission by adoption herein, or rejected by clearly contrary findings of fact herein, are hereby denied and rejected.

Any conclusions of law herein improperly designated as a finding of fact should be deemed or construed as a conclusion of law; any finding of fact herein improperly designated as a conclusion of law should be deemed or construed as a finding of fact.

CONCLUSIONS OF LAW

Pursuant to chapter 205, HRS, and the Hawai'i Land Use Commission Rules under chapter 15-15, HAR, and upon consideration of the Land Use Commission decision-making criteria under section 205-17, HRS, this Commission finds upon a clear preponderance of the evidence that the reclassification of the Property, consisting of approximately 65.7 acres of land in the State Land Use Agricultural District situated in the Wailuku and Makawao Districts, island of Maui, State of Hawai'i, identified as Tax Map Key No. 3-8-03: 23 and 24, into the State Land Use Urban District, is reasonable, is not violative of section 205-2, HRS, and is consistent with the policies and criteria established pursuant to sections 205-16 and 205-17, HRS.

DECISION AND ORDER

IT IS HEREBY ORDERED that the Property, which is the subject of this Docket No. A97-722 filed by Petitioner Maui Electric Company, Limited, a Hawai'i corporation, consisting of approximately 65.7 acres of land, situated in the Wailuku and Makawao Districts, island of Maui, State of Hawai'i, identified as Tax Map Key No. 3-8-03: 23 and 24, and approximately shown on

Exhibit "A" attached hereto and incorporated by reference herein, is hereby reclassified from the State Land Use Agricultural District to the State Land Use Urban District, and the State land use district boundary is hereby amended accordingly, subject to the following conditions:

1. Petitioner shall participate in an air quality monitoring program, coordinated with and approved by the State Department of Health (DOH) to monitor air quality impacts attributable to the operations of the Waena Generating Station. Mitigation measures for air quality impacts attributable to the operations of the Waena Generating Station shall be implemented by Petitioner if, based on applicable State and Federal air quality standards, the results of the monitoring program warrant them. Mitigation measures shall be developed in coordination with the DOH and implemented by Petitioner.

2. Petitioner shall consult with the State Department of Health (DOH) and, if necessary, Petitioner shall participate in a groundwater quality monitoring program in consultation with the County Department of Water and approved by DOH to monitor groundwater quality impacts directly attributable to the operations of the Waena Generating Station. Petitioner shall implement mitigation measures should the results of the monitoring program warrant them based on applicable State and Federal water quality standards. Mitigation measures shall be developed in coordination with the DOH and implemented by Petitioner.

3. Petitioner shall provide at its own expense, adequate non-potable water source, storage, and transmission facilities and improvements to accommodate the proposed project. The non-potable water improvements shall meet all applicable County, State, and Federal standards and shall be consistent with the County of Maui adopted water use and development plan.

4. Petitioner shall consult with the State Department of Health (DOH) and, if necessary, prepare a wastewater disposal plan subject to review and approval by the DOH. Petitioner shall provide at its own expense adequate wastewater treatment, transmission and disposal facilities for wastewater directly attributable to the operations of the Waena Generating Station.

5. Petitioner shall establish appropriate systems to contain spills and prevent materials associated with heavy industrial uses attributable to the operations of the Waena Generating Station, such as petroleum products, chemicals or other pollutants, from leaching or draining into above ground or subsurface storm drainage collection areas. Based on applicable State and Federal standards, Petitioner shall use best management practices to minimize non-point source pollution into irrigation ditches. Petitioner shall consult with the State Department of Health and County Department of Public Works and Waste Management and obtain any permits required or construct improvements required for storm water discharge on the Property.

6. Petitioner shall consult with the State Department of Health (DOH) regarding hazardous waste storage and, if necessary, prepare a hazardous waste storage plan.

7. Petitioner shall participate in the funding and construction of local and regional transportation improvements and programs attributable to the operations of the Waena Generating Station as determined by the State Department of Transportation (DOT) and the County of Maui.

8. Petitioner shall coordinate with the surrounding property owner to ensure that the proposed project will not adversely impact the use of cane haul roads and irrigation ditches or adversely impact the continued agricultural operation of adjoining sugarcane cultivation areas.

9. Petitioner shall participate in the pro rata funding and construction of adequate civil defense measures as determined by the State of Hawai'i and County of Maui civil defense agencies.

10. Petitioner shall implement effective soil erosion and dust control measures during and after construction in compliance with the applicable rules and regulations of the State Department of Health and the County of Maui.

11. Should any human burials or any historic artifacts, such as charcoal deposits, stone platforms, pavings or walls be found, Petitioner shall stop work in the immediate vicinity and contact the State Historic Preservation Division (SHPD). The significance of these finds shall then be determined and approved by the SHPD and, if applicable, an acceptable mitigation plan shall be approved by the SHPD. The SHPD must verify that the fieldwork portion of the mitigation plan has been successfully executed prior to work proceeding in the immediate

vicinity of the find. Burials must be treated under specific provisions of Chapter 6E, HRS.

12. Petitioner shall develop the Property in substantial compliance with the representations made to the Commission. Failure to so develop the Property may result in reversion of the Property to its former classification, or change to a more appropriate classification.

13. Petitioner shall give notice to the Commission of any intent to sell, lease, assign, place in trust, or otherwise voluntarily alter the ownership interests in the Property, prior to development of the Property.

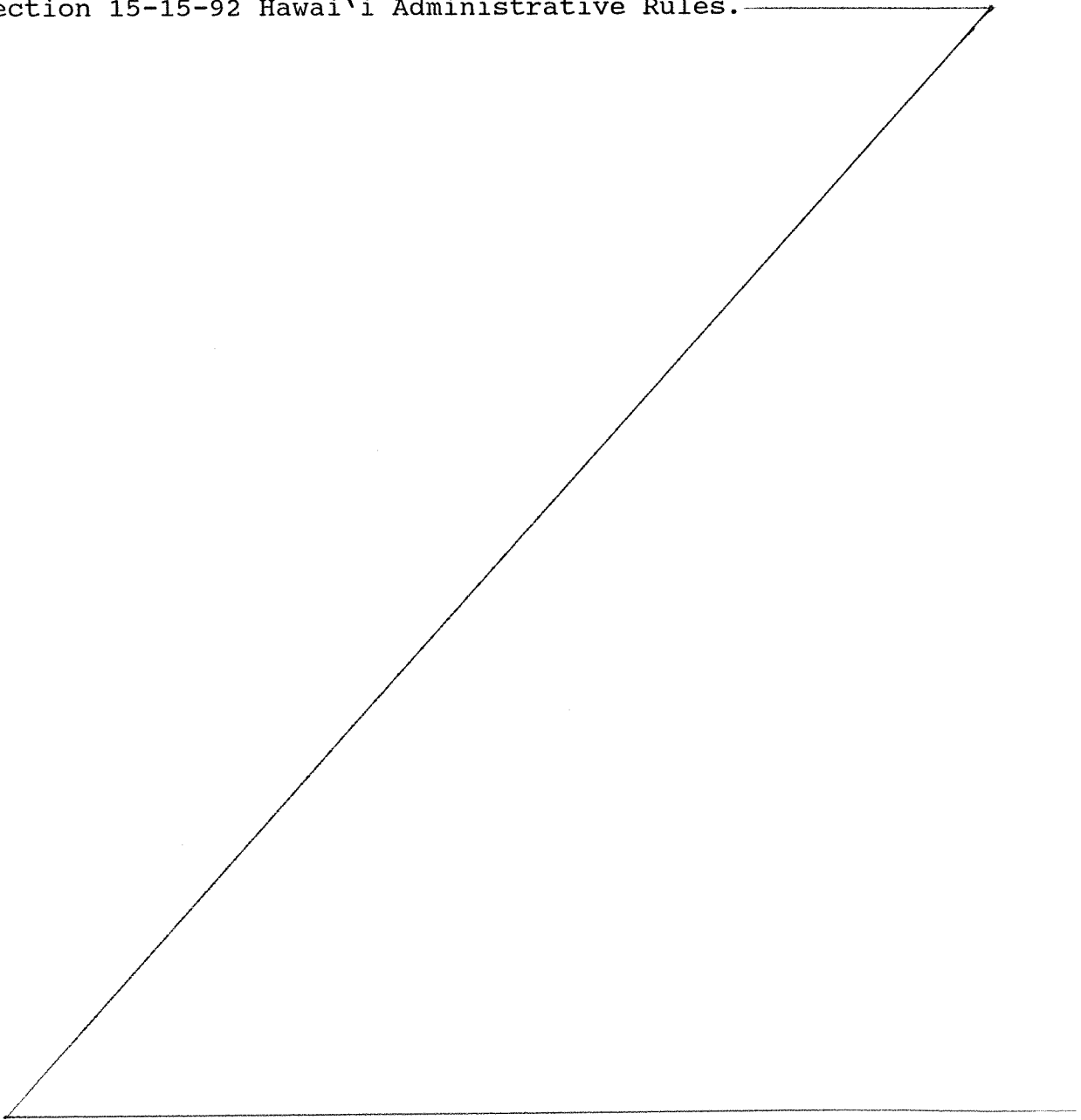
14. Petitioner shall timely provide without any prior notice, annual reports to the Commission, the Office of Planning, and the County of Maui Planning Department in connection with the status of the subject project and Petitioner's progress in complying with the conditions imposed herein. The annual report shall be submitted in a form prescribed by the Executive Officer of the Commission.

15. The Commission may fully or partially release the conditions provided herein as to all or any portion of the Property upon timely motion and upon the provision of adequate assurance of satisfaction of these conditions by Petitioner.

16. Within 7 days of the issuance of the Commission's Decision and Order for the subject reclassification, Petitioner shall (a) record with the Bureau of Conveyances a statement that the Property is subject to conditions imposed herein by the Land Use Commission in the reclassification of the Property, and

(b) shall file a copy of such recorded statement with the Commission.

17. Petitioner shall record the conditions imposed herein by the Commission with the Bureau of Conveyances pursuant to Section 15-15-92 Hawai'i Administrative Rules.

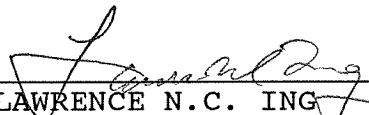


Done at Honolulu, Hawai'i, this 22nd day of June 1998,
per motion on June 18, 1998.

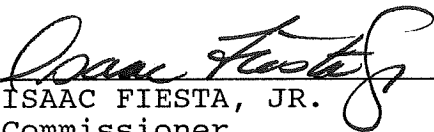
LAND USE COMMISSION
STATE OF HAWAI'I

By 
RUPERT K. CHUN
Chairperson and Commissioner

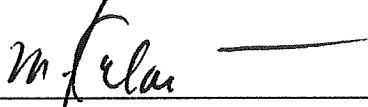
By _____ (opposed)
M. CASEY JARMAN
Vice Chairperson and Commissioner

By 
LAWRENCE N.C. ING
Vice Chairperson and Commissioner

By _____ (absent)
P. ROY CATALANI
Commissioner

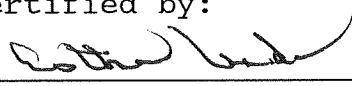
By 
ISAAC FIESTA, JR.
Commissioner


By _____ (absent)
HERBERT S.K. KAOPUA, SR.
Commissioner


By 
MERLE A. K. KELAI
Commissioner

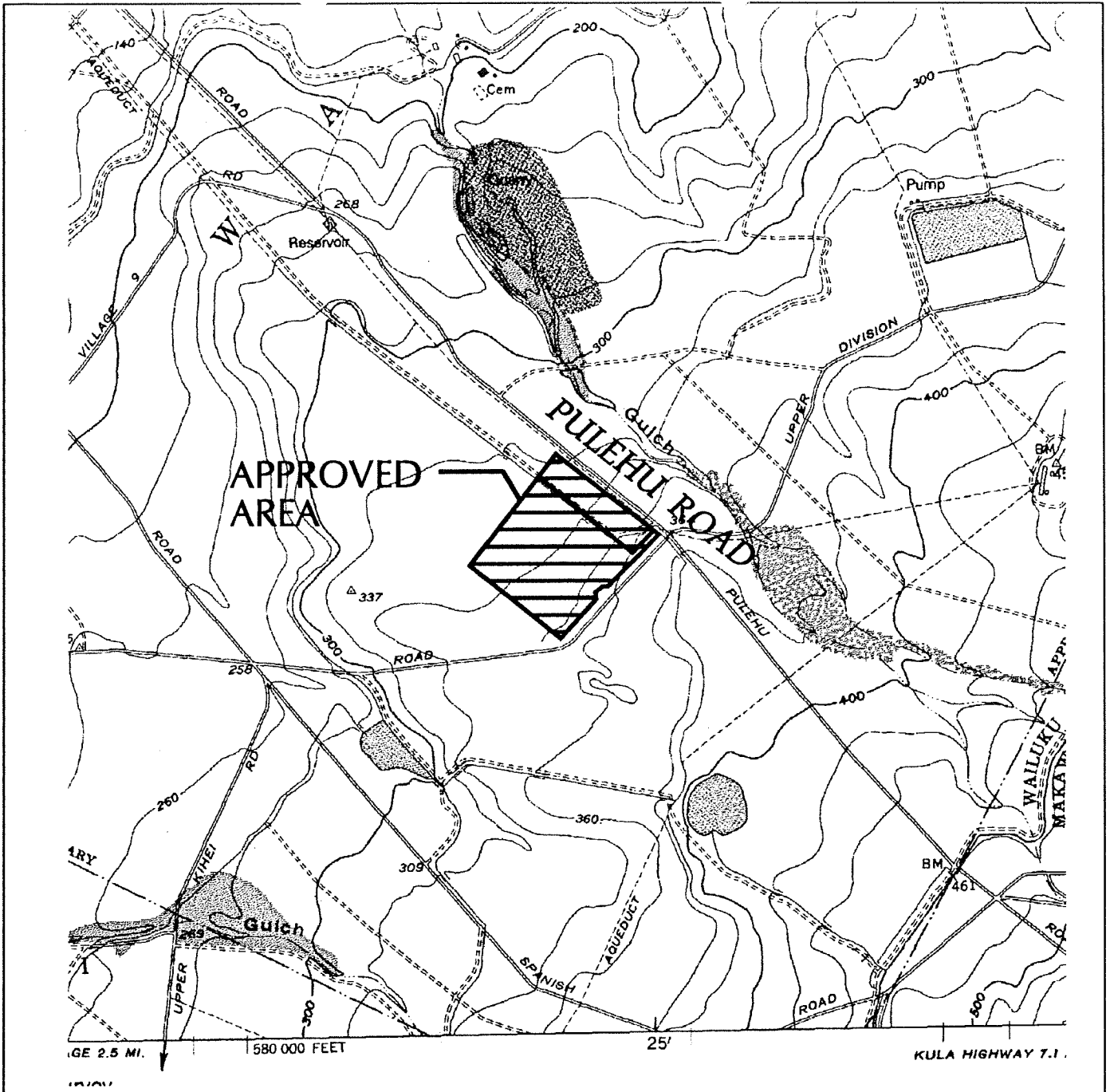
Filed and effective on
June 22, 1998

Certified by:


Executive Officer

By 
JOANN N. MATTSON
Commissioner

By 
PETER YUKIMURA
Commissioner

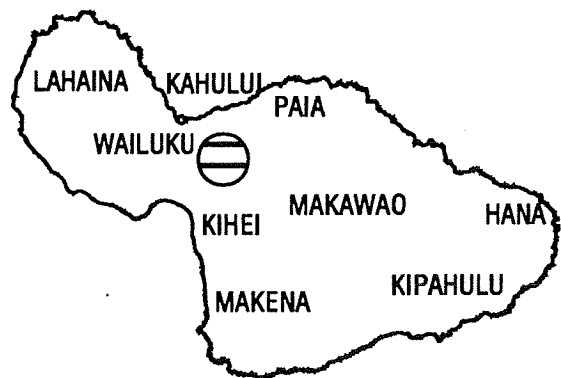


**A97-722 / MAUI ELECTRIC
COMPANY, LTD.,
a Hawai'i Corporation**

LOCATION MAP

TAX MAP KEY NO.: 3-8-03: 23
& 24
WAILUKU AND MAKAWAO
DISTRICTS, ISLAND OF MAUI,
STATE OF HAWAI'I

EXHIBIT "A"



BEFORE THE LAND USE COMMISSION
OF THE STATE OF HAWAI'I

In the Matter of the Petition of)	DOCKET NO. A97-722
)	
MAUI ELECTRIC COMPANY, LIMITED, a)	CERTIFICATE OF SERVICE
Hawai'i corporation)	
)	
To Amend the Agricultural Land Use)	
District Boundary into the Urban)	
Land Use District for Approximately)	
65.7 Acres of Land at Wailuku and)	
Makawao Districts, Island of Maui,)	
State of Hawai'i, Tax Map Key No.)	
3-8-03: 23 and 24)	
<hr/>		


CERTIFICATE OF SERVICE

I hereby certify that a copy of the Findings of Fact, Conclusions of Law, and Decision and Order was served upon the following by either hand delivery or depositing the same in the U. S. Postal Service by certified mail:

DEL.	RICK EGGED, Director Office of Planning P. O. Box 2359 Honolulu, Hawaii 96804-2359
CERT.	DAVID W. BLANE, Director of Planning Planning Department, County of Maui 250 South High Street Wailuku, Hawaii 96793
CERT.	JEFFREY SCHMIDT, ESQ. Corporation Counsel Office of the Corporation Counsel County of Maui 200 South High Street Wailuku, Hawaii 96793
CERT.	B. MARTIN LUNA, ESQ., Attorney for Petitioner Carlsmith Ball Wichman Case & Ichiki One Main Plaza, Suite 400 2200 Main Street Wailuku, Hawaii 96793-1086

CERT. MARK SHEEHAN, Representing Intervenor
President, Maui Tomorrow
P. O. Box 429
Makawao, Hawaii 96768

DATED: Honolulu, Hawaii, this 22nd day of June 1998.



ESTHER UEDA
Executive Officer