

State of Hawaii  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL  
235 South Beretania Street, Suite 702  
Honolulu, Hawaii 96813

FILE COPY

FINAL  
ENVIRONMENTAL IMPACT STATEMENT  
FOR  
AES-BARBERS POINT, INC.  
COAL-FIRED COGENERATION FACILITY

Prepared for

AES-BARBERS POINT, INC.

by

BELT COLLINS & ASSOCIATES

June 1989

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IN REPLY REFER TO:

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June 21, 1989

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OFFICE OF ENVIRONMENTAL  
QUALITY CONTROL

Dr. Marvin T. Miura, Director  
Office of Environmental Quality Control  
465 South King Street, Room 115  
Honolulu, Hawaii 96813

Dear Dr. Miura:

Final Environmental Impact Statement (FEIS)  
for the Coal-Fired Cogeneration Facility at  
Barbers Point Harbor

In accordance with Chapter 343, Hawaii Revised Statutes, we are notifying you of the acceptability of the Final Environmental Impact Statement (FEIS) for the subject project. AES Barbers Point, Inc., the applicant, submitted the FEIS on June 5, 1989 and has satisfactorily completed the content requirements specified under Chapter 343. We have enclosed a copy of the FEIS with the proposal and a completed OEQC Form 89-01 for publication in the OEQC Bulletin.

Should you have any questions on the action, please contact Mr. Harry Murakami of our Harbors Division at 548-2535.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Edward Y. Hirata".

Edward Y. Hirata  
Director of Transportation

Enclosures

**FINAL**  
**ENVIRONMENTAL IMPACT STATEMENT**  
**FOR**

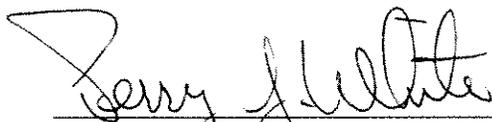
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**COAL-FIRED COGENERATION FACILITY**

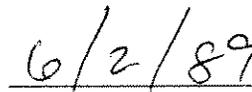
**Prepared for**

**AES-BARBERS POINT, INC.**

**by**

**BELT COLLINS & ASSOCIATES**

  
\_\_\_\_\_  
Perry J. White

  
\_\_\_\_\_  
Date

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## INTRODUCTION AND SUMMARY

### 1.0 PURPOSE OF THIS DOCUMENT

In November, 1988, AES Barbers Point, Inc. (AES-BP), asked the State of Hawaii Department of Transportation for an easement across State-owned land within the Barbers Point Deep Draft Harbor. The purpose of the easement is to allow it to construct a conveyor that will transport coal and limestone between the harbor and a coal-fired power plant that AES-BP intends to construct in Campbell Industrial Park. The use of State land subjects the project to Chapter 343, Hawaii Revised Statutes, and to the requirements of Title 11, Chapter 200, of the State Department of Health's Administrative Rules.

After reviewing the request, the Department of Transportation concluded that the power plant, which is directly associated with the conveyor for which an easement was being requested, had the potential to significantly affect the environment. Accordingly, it determined that an environmental impact statement (EIS) should be prepared and filed an EIS Preparation Notice with the Office of Environmental Quality Control on November 1, 1988.

Written comments concerning the project were solicited from interested parties, and a Draft Environmental Impact Statement (DEIS) was prepared. The DEIS was officially received by the State Office of Environmental Quality Control on March 8, 1989, and the 45-day comment period ended on April 24, 1989. A number of comment letters dated after the deadline were also received, and AES Barbers Point, Inc., responded to all those that arrived through May 20, 1989.

This Final Environmental Impact Statement contains copies of all the comment letters and the responses to them. Where appropriate, the text of the impact statement has been revised to expand the discussion of key issues, to incorporate additional information concerning the design of the project, and to correct minor inaccuracies. It meets the content requirements set forth in Section 18, Chapter 200, Hawaii Administrative Rules.

### 2.0 PROJECT DESCRIPTION

AES-BP has signed a contract with the Hawaiian Electric Company (HECO) committing it to construct a large coal-fired cogeneration facility (power plant) in Campbell Industrial Park. It will use fluidized bed combustion technology to achieve low air pollutant emission rates and high thermal efficiency. The facility will be located on the northern side of Kaomi Loop, between the City's HPOWER refuse-to-energy facility and the Hawaiian Cement Company plant. The power plant will be capable of supplying approximately 180 megawatts of electricity to HECO and 30,000 pounds of steam per hour to the nearby Chevron Hawaiian Refinery.

The AES-BP power plant will consume approximately 660,000 tons of coal and 40,000 tons of limestone each year. These materials will be delivered to the Barbers Point Deep Draft Harbor in 60,000 ton capacity ships. They will be unloaded using the bulk cargo handling facilities now being developed at Pier 6 and transported to the site via a 1.5-mile long conveyor that AES-BP will construct.

A preliminary site plan for the power plant is shown in Figure 1-4. Major features of the facility include the conveyor; the power generation building supporting the boilers, the steam

turbines, and the generator; storage piles for the coal and limestone used in the boilers and the ash produced by the combustion process; a cooling tower; and miscellaneous ancillary structures. Most structures will be under the 60-foot height limit applicable to the industrially zoned parcel, but the power generation building will be about 160 feet high, and several other structures will be 60-120 feet high. The smokestack, which is not governed by the building height limits will be approximately 290 feet high. This is the same as the stack on the adjoining HPOWER facility, and the FAA has already determined that it will not constitute a hazard to air navigation.

### **3.0 NEED FOR THE PROJECT**

All of the electrical power produced by the project will be sold to the Hawaiian Electric Company for distribution to its customers. HECO needs the generating capacity which the cogeneration facility will provide to meet the peak demand forecast for 1992 and beyond. Process steam from the facility will be sold to the Chevron Hawaiian Refinery for use in their refinery operations; this will make their products more competitive with those from other refineries.

HECO's analysis of the available alternatives and testimony before the State Public Utilities Commission has shown that the contract under which the power would be purchased is the most economical means of obtaining the power the utility needs to meet its customers' needs. Failure to add additional capacity will increase the likelihood that its customers will experience brown-outs and power failures that will cause them severe economic losses.

### **4.0 SUMMARY OF IMPACTS**

#### **4.1 EXISTING USES**

As noted above, the facility is located between a waste-to-energy facility and a cement plant near the middle of the island's largest heavy industrial area. Both the power plant site and the conveyor right-of-way are currently vacant, so that no existing uses need be displaced. Adherence to existing air and water quality standards, as well as to other development standards (such as noise, setback, and landscaping), is expected insure that the facility does not adversely affect its neighbors.

#### **4.2 SOILS AND AGRICULTURAL PRODUCTIVITY**

The soil on the land occupied by the power plant and conveyor is poorly suited for agriculture. While a portion of the conveyor route is still zoned "Agriculture", it is poor farmland, and there is virtually no possibility that it will ever be cultivated. Hence, its conversion to an urban use will not decrease agricultural productivity. The soils are suitable for the type of urban development that is proposed.

#### **4.3 WATER USE AND QUALITY**

The project will consume approximately 291,000 gallons of potable water per day. It is anticipated that this will be drawn from the existing Board of Water Supply system serving Campbell Industrial Park. The water would be made available under a joint agreement currently being negotiated between the Board of Water Supply, the Hawaiian Electric

Company, the James Campbell Estate, and AES Barbers Point. If successfully concluded, the agreement will make water from sources at HECO's Waiiau Generating Station available to the Board of Water Supply.

The project will increase the volume of storm runoff from the site. The Campbell Industrial Park storm drainage system has been sized to accommodate the increase; hence, no flooding is anticipated. The only aspects of the project which are substantially different from other development at the park are the coal, limestone, and ash storage piles, and these contain little soluble material. Runoff from these will be collected and held in retention basins until sediment has settled out. Consequently, the quality of the runoff from the facility is expected to be similar to the quality of the runoff from other parts of the industrial park.

Makeup water for the cooling system will be drawn from the upper limestone aquifer beneath the site via on-site wells. It is expected that this water will resemble seawater in quality. A portion of this water will be lost to evaporation as it passes through the evaporative cooling tower. In order to prevent the build-up of concentrated salts within the cooling system, water will be continuously removed from it and injected into a second, deeper limestone aquifer where water quality also resembles that of seawater. Small quantities of neutralized wastewater from the demineralizer blowdown, preboiler and boiler chemical cleaning waste, and internal drains will be mixed with the cooling water before reinjection into the lower aquifer.

These withdrawals and discharges are not expected to significantly alter surface water quality. Some change in groundwater quality (increased temperature and salinity) is to be expected, but since the water in the two limestone aquifers is already much too saline to be used for other purposes, this change is not believed to be significant. The discharge will increase the temperature of the groundwater body into which it is injected, but the heat will be dispersed over a wide area before seeping into offshore waters.

#### **4.4 AIR QUALITY**

The proposed project qualifies as a significant new source of sulfur oxides, nitrogen oxides, and particulates. An air quality impact analysis performed by Black & Veatch showed that the facility is utilizing the Best Available Control Technologies (BACT) and that the project will not cause or contribute to any violation of Federal Ambient Air Quality Standards. It also confirmed that the project would not cause the available PSD (Prevention of Significant Deterioration) increment to be exceeded.

#### **4.5 FLORA AND FAUNA**

Surveys of the power plant site and the conveyor route have shown the species present are typical of those found throughout the Ewa Plain. No rare or endangered flora or fauna would be adversely affected. Similarly, there are no plants or animals of commercial value.

#### **4.6 HISTORIC AND ARCHAEOLOGICAL SITES**

The Historic Sites Section of the State Department of Land and Natural Resources has indicated that there are no archaeological or historic resources on the power plant site. Valuable palaeontological remains are present in an area near the intersection of Hanua Street and Malakole Road through which the conveyor would pass. However, AES-BP has modified

the conveyor alignment and made other design provisions that eliminate the need to fill any of the sinkholes which contain these remains.

#### **4.7 NOISE IMPACTS**

Mechanical equipment at the facility, principally in the generation building and the coal and limestone crushing building, will create substantial amounts of noise. However, preliminary noise modeling indicates that State and City & County noise standards can be met through the use appropriate sound reduction design techniques.

#### **4.8 TRANSPORTATION IMPACTS**

The project will generate a substantial number of peak-hour vehicle-trips during the peak construction period. Total traffic will remain well within the capacity of the existing roadways, however. Hence, no significant adverse impact on service levels is anticipated.

The coal and limestone used by the facility will be delivered to the Barbers Point Deep Draft Harbor. A new bulk cargo handling facility is currently being developed there, and the AES-BP project will use only 10 to 20 percent of its capacity. Current plans are to use a conveyor to transport coal and limestone between the Barbers Point Deep Draft Harbor and the power plant site. In the event this proves impractical, trucks will be used instead. If local uses for the ash cannot be found it will be pelletized and trucked back to the harbor. Ships will carry it out-of-state for use or disposal. More than sufficient roadway capacity exists to accommodate the expected number of trucks.

#### **4.9 VISUAL IMPACTS**

Most of the proposed project is beneath the 60-foot height limit imposed by the Land Use Ordinance (LUO) and Ewa Development Plan. A few structures exceed this height, however, and an LUO waiver is being requested. The facility is located between the City's HPOWER facility and the Hawaiian Cement plant, both of which already contain structures higher than 60 feet. The addition of the proposed facility will not interfere with existing views or alter the existing visual character of the area.

#### **4.10 SAFETY/NATURAL HAZARDS**

The FAA has determined that the stack and other tall buildings associated with the project do not constitute a hazard to air navigation. The facility will meet current seismic design standards, and there is no significant threat of volcanic activity in the project area. The facility lies outside the tsunami inundation zone. On-site grading will be designed to insure that the facility is not subject to localized flooding. The use of toxic chemicals and other dangerous materials is not central to the facility's operation (although small quantities of a few hazardous materials may be on the site at times for cleaning and other maintenance work).

#### **4.11 SOCIOECONOMIC IMPACTS**

The project will not displace any existing uses, and it is compatible with nearby industries. Investment in the facility will exceed \$300 million, and this will generate jobs and dollar flows within the Hawaiian economy. Peak construction employment is estimated at over 450 full-time positions, and 70 persons will be employed full-time once the facility begins full-scale operation. Wages at the facility are expected to be well above the island-wide average, and total annual expenditures of \$30 million and \$16 million are forecast for the construction and operational periods, respectively.

The power produced at the facility will be sold to the Hawaiian Electric Company under the terms of a 30-year contract. The power's cost to HECO will increase more slowly than the overall rate of inflation, helping it to control electrical power costs to consumers. The availability of power from this coal-fired plant will help reduce Oahu's dependence on imported oil. This, in turn, will reduce the potential for damage to the island's economy as a result of rapid oil price fluctuations.

#### **5.0 SUMMARY OF PROPOSED MITIGATION MEASURES**

The project incorporates the most advanced combustion technology currently in use. As a result, air pollutant emissions are as low as those from any major power generation facility in the country, and significantly lower than the emissions from currently operating electric generating units.

Adverse water quality effects are being avoided by using groundwater, rather than surface water, for cooling, and by reinjecting the heated water into a separate aquifer from that used to supply existing cooling water wells in the vicinity. A portion of the water consumed by the facility will come from water that has already been allocated to the Campbell Industrial Park parcel on which it is located. Negotiations are underway which are expected to result in the remainder of the potable water that the project will draw from the Board of Water Supply system being offset by water from its Waiiau Generating Station that HECO will make available to the Board of Water Supply.

By using a conveyor to transport coal and limestone between the harbor and the generating station, AES-BP is attempting to minimize the effect that the project will have on the roadways within Campbell Industrial park. Even if it became necessary to transport the materials by truck, traffic volumes on Hanua Street and Malakole Road would remain well below their capacities.

The project site will be landscaped in accordance with the James Campbell Estate's design guidelines for the industrial park. This will match existing development in the area and insure that the facility blends pleasingly into the neighborhood.

#### **6.0 SUMMARY OF PERMITS REQUIRED AND UNRESOLVED ISSUES**

The analyses presented in this report indicate that the proposed project will not have a significant adverse impact on the environment. No major controversies concerning its implementation are known to exist at the present time. However, some uncertainties remain and, as indicated in Table A, numerous discretionary permits are required before the project can be implemented. The issues relating to each of these permits are summarized below.

## **6.1 AIR AND WATER PERMITS**

The proposed facilities require construction and operation permits from the State Department of Health air quality section. The analyses carried out by AES-BP indicate that the project will easily meet Federal and State emission and ambient air quality standards, as well as the requirement for the use of Best Available [air pollution] Control Technology. It appears as though the combined emissions from all facilities within Campbell Industrial Park may exceed the available PSD increment for particulates, but the AES-BP facility makes no contribution at the point where this occurs. The State Department of Health and the U.S. Environmental Protection Agency have not yet completed their review of the permit applications. Hence, their final position relative to the matter cannot be determined at this time.

Cooling water for the proposed facility will be drawn from the limestone aquifer underlying the site. Exploratory drilling and testing permits have been issued, but the State Water Commission will not approve water withdrawal permits until after the wells have been drilled and tested. The major question that remains relative to this aspect of the proposal is the extent to which it might adversely affect cooling water wells located at the adjacent HPOWER project. AES-BP's analysis indicates that this will not be a problem, but this cannot be confirmed until the pump tests have been completed.

As previously indicated, it is expected that the potable water needed by the proposed facility will be obtained from the Board of Water Supply system. This involves a complex agreement between AES-BP, HECO, the James Campbell Estate, and the BWS; hence, many of the factors that are involved are beyond AES-BP's control. While it is considered highly likely that the parties will reach a satisfactory agreement, one has not yet been finalized. Alternate means of obtaining the water are technically feasible, but their economic viability is uncertain. Hence, the water issue remains an important one for the project.

## **6.2 CONVEYOR VERSUS TRUCK TRANSPORT**

AES-BP intends to use an overland conveyor to transport coal from the Barbers Point Deep Draft harbor to the power plant site. However, final plans and binding cost proposals for the conveyor are not yet available. Similarly, while tentative easement agreements have been reached with the owners of the land which the conveyor would cross, final agreements containing specific contractual language and costs have not yet been signed. Consequently, it is still possible that AES-BP will transport materials using trucks rather than the conveyor. The effects of this alternative transportation method are discussed in the body of the report.

## **6.3 EXCEPTIONS FROM LAND USE CONTROLS**

Parts of the proposed power plant and conveyor exceed the applicable building height limits. Hence, an LUO waiver is required. Numerous other industrial activities within Campbell Industrial Park have already been granted exceptions to the height limit, and it is expected that this request will not be controversial. However, the Department of Land Utilization must act on the request before this can be stated with certainty.

A portion of the conveyor crosses the State Agricultural District. The proposed use is a conditional use, rather than a principal use in the Agricultural District. Hence, AES-BP expects to file a Conditional Use Permit request for that part of the project. Although the power plant itself is essentially an industrial use, it is not a permitted use in the I-2 District; hence, a Conditional Use Permit will also be required for it.

## **CHAPTER 1** **PROJECT DESCRIPTION**

### **1.1 INTRODUCTION**

In the spring of 1988, AES Barbers Point, Inc. (AES-BP) signed a contract with the Hawaiian Electric Company (HECO) committing AES-BP to construct and operate a coal-fired, 146,000,000-watt-capacity net power plant in Campbell Industrial Park (see Figure 1-1). The contract is for a minimum of 30 years. The contract was negotiated as a result of a request for proposals issued by HECO on June 4, 1987, and contains many performance guarantees which protect the utility's interests.

Subsequently, AES-BP has determined that a slightly larger unit would provide substantially better economic performance and has discussed the possibility of integrating a 180-megawatt facility into its system. Consequently, AES-BP is currently seeking approval of a 180-megawatt cogeneration facility, and the analyses presented in this report are based on that size. They also assume the sale of up to 30,000 pounds of steam per hour to the Chevron Hawaiian Refinery.

All of the electrical power generated by the facility will be sold to HECO and distributed to customers through the utility's existing power transmission grid. The facility will also sell steam to the existing Chevron Hawaiian Refinery. Hence, it will be treated as a "qualifying co-generation facility" as defined by the Public Utilities Regulatory Act of 1978 (PURPA) and Hawaii Administrative Rules (§6-74).

The power plant will use an environmentally advanced coal-burning technology known as "Circulating Fluidized Bed" (CFB) combustion. In this technology, the coal is burned together with limestone, which absorbs virtually all the sulfur naturally present in the coal before it enters the exhaust gases. This virtually eliminates the release of sulfur dioxide (SO<sub>2</sub>), the major pollutant associated with the use of coal as a fuel. The low combustion temperatures used in the boiler also significantly reduce nitrogen oxide emissions as compared to conventional boilers.

AES Barbers Point, Inc. has negotiated a long-term contract for Indonesian coal with a joint venture composed of British Petroleum, Ltd. and CRA, Ltd. (a major Australian coal supplier); the contract ensures a steady supply of fuel for the facility at favorable prices. Because of this and the high thermal efficiency of the proposed units, the electrical power generated at the proposed facility will be less expensive over the long term than power from other power generation alternatives available to HECO. These cost savings will lead to lower electrical power prices for Oahu's consumers than if the power is obtained from other sources. The contract with AES will also tend to reduce the volatility of electrical rates caused by rapid changes in oil prices.

On June 1, 1988, HECO submitted an application to the Public Utilities Commission requesting a "Certificate of Service" for the proposed new facility. Hearings on the project were conducted on October 26-28, 1988, and a decision on the application is expected in the second quarter of 1989.

The remainder of this chapter discusses the need for the proposed power generation facility and describes its major components. It is organized as follows:

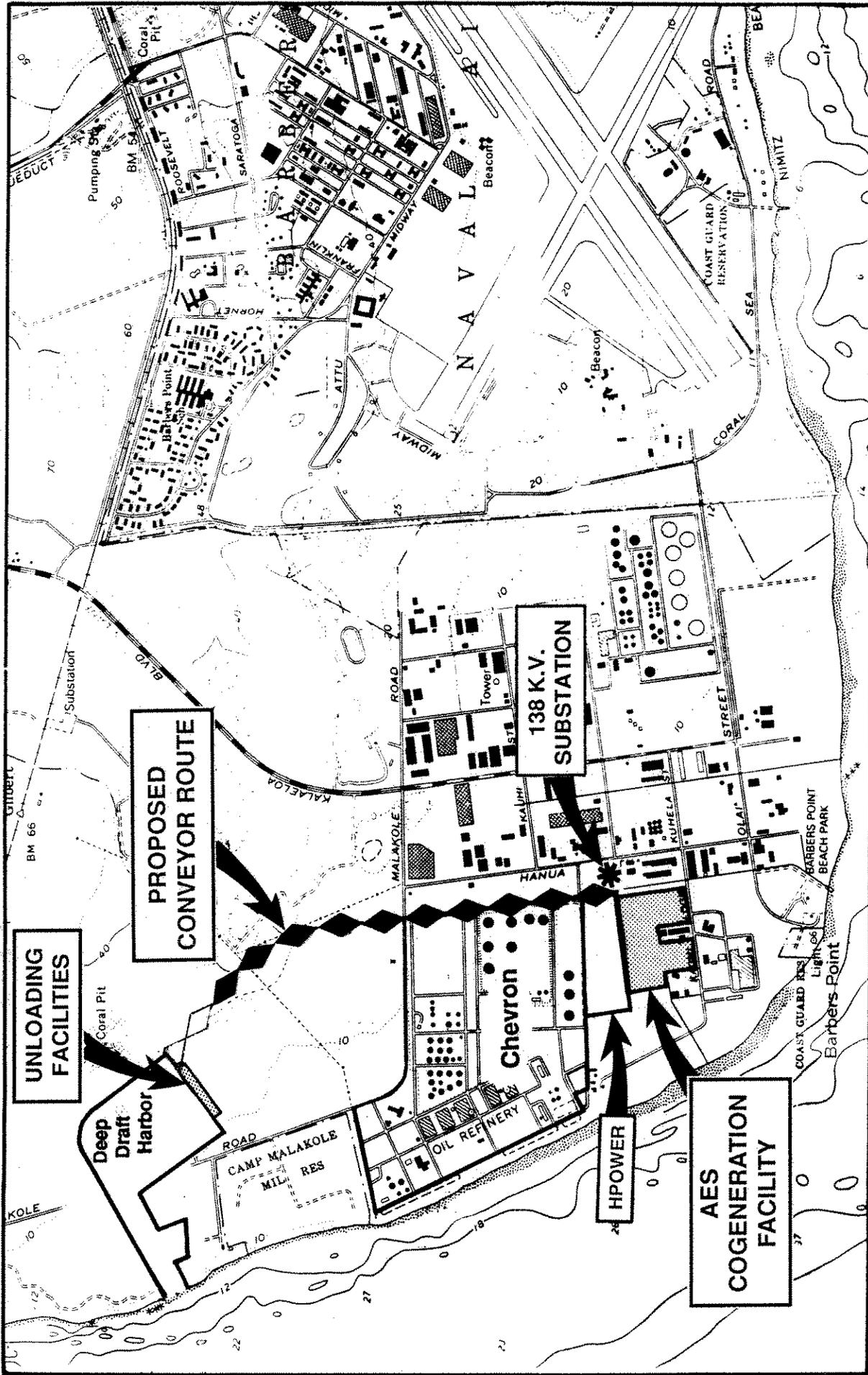


Figure 1-1  
**PROPOSED PROJECT**



Prepared By: BELT COLLINS & ASSOCIATES  
 Honolulu, Hawaii

- **Section 1.2** describes the relationship between the Hawaiian Electric Company's existing and planned generating capability and the forecast demand for electrical power. It explains why additional generating capability is needed.
- **Section 1.3** briefly describes AES Barbers Point's contract with HECO and its parent company's experience with similar power generation projects on the Mainland.
- **Section 1.4** describes the details of the proposed facilities, including the power plant itself; the conveyor system that will transport coal, limestone, and ash between the Barbers Point Deep Draft Harbor and the cogeneration facility; and other ancillary facilities.
- **Section 1.5** summarizes the construction schedule and estimated cost of the project.

## **1.2 EXISTING AND PLANNED POWER GENERATION AND TRANSMISSION FACILITIES**

### **1.2.1 EXISTING AND PLANNED POWER GENERATION FACILITIES**

The Hawaiian Electric Company is the designated electric utility company for Oahu. As shown in Figure 1-2, it owns and operates three fossil-fuel fired generating stations on the island. They are located in downtown Honolulu, at Waiiau on the northern shore of Pearl Harbor's East Loch, and at Kahe on the island's Leeward coastline. The "installed capacity" (as of December 31, 1987) and the amount of electrical power generated at each facility during calendar year 1986 are shown in Table 1-1.

In addition to HECO's three conventional generating stations, the utility also obtains power from several other sources as shown in Table 1-2. In 1986, about 1.5 percent of the electrical power HECO delivered to its customers was obtained from these sources under "purchase power" agreements. All of these agreements are for "surplus" power, meaning that HECO is not assured that it will be available when needed by the utility.

In addition to these existing units, HECO has also entered into a purchase power agreement with Kalaeloa Partners, Inc. Under the terms of the contract, Kalaeloa Partners, Inc. will construct and operate a "combined-cycle" cogeneration facility in Campbell Industrial Park. That facility will produce electrical power using a combination of combustion and steam turbines. Approximately 180 megawatts of the power will be sold to HECO. The remainder will be sold to Hawaiian Independent Refinery, Inc. (HIRI) in the form of steam; to be used in HIRI's petroleum refining operations. It is expected that the first phase of the Kalaeloa project (a 70-megawatt combustion turbine) will begin operation in late 1989, with the other units coming on-line in 1991. The availability of power from this source will help HECO meet the immediate need for additional generation capacity. Over the long term, it will complement the AES-Barbers Point facility.

### **1.2.2 EXISTING AND PLANNED POWER TRANSMISSION FACILITIES**

Power from existing generating units is transmitted to users throughout the island via an integrated system of overhead lines and underground cables. Transmission Lines are used to carry electricity over relatively long distances from HECO's generating stations to major substations located throughout the island (see Figure 1-2). On Oahu these are typically energized at either 138 or 46 kilovolts (KV) ( a kilovolt is 1,000 volts). All other electric power lines are known as Distribution Lines. On Oahu these are typically energized at less than 46 KV.



Table 1-1. Installed Capacity and Power Generated by Generating Station: 1986.

**INSTALLED CAPACITY:**

<u>Power Plant/Unit</u>	<u>Rated Capacity (in megawatts)<sup>2</sup></u>		<u>Type of Unit</u>	<u>Year Installed</u>
	<u>Normal</u>	<u>Emergency</u>		
HONOLULU: Unit 8	58	58	Steam Turbine	1954
Unit 9	<u>58</u>	<u>60</u>	Steam Turbine	1957
Honolulu Total =	116	118		
WAIUAU: Unit 3	50	50	Steam Turbine	1947
Unit 4	50	50	Steam Turbine	1950
Unit 5	58	61	Steam Turbine	1959
Unit 6	58	60	Steam Turbine	1961
Unit 7	92 <sup>1</sup>	95	Steam Turbine	1966
Unit 8	92 <sup>1</sup>	95	Steam Turbine	1968
Unit 9	52	55	Combustion Turbine	1973
Unit 10	<u>50</u>	<u>53</u>	Combustion Turbine	1973
Waiiau Total =	502	519		
KAHE: Unit 1	92	95	Steam Turbine	1963
Unit 2	90 <sup>1</sup>	95	Steam Turbine	1964
Unit 3	92 <sup>1</sup>	97	Steam Turbine	1970
Unit 4	93 <sup>1</sup>	97	Steam Turbine	1972
Unit 5	146 <sup>1</sup>	156	Steam Turbine	1974
Unit 6	<u>146<sup>1</sup></u>	<u>156</u>	Steam Turbine	1981
Kahe Total =	659	696		
SYSTEM TOTAL =	<u>1,277</u>	<u>1,333</u>		

**POWER GENERATED BY GENERATING STATION:**

<u>Generating Station</u>	<u>Net1986 MW-Hours<sup>3</sup></u>
Honolulu	217,037
Waiiau Steam	1,663,396
Combustion Turbine	6,170,840
Kahe:	<u>3,951,583</u>
	5,838,189

<sup>1</sup> These ratings are based on the unit operating at five percent over-pressure, all heaters in.

<sup>2</sup> Unit ratings are based on the HECO Production Department's testing program.

<sup>3</sup> Net MW Hours are total megawatt-hours generated less requirements for in-plant auxiliary equipment.

Source: Hawaiian Electric Company, Inc., "HECO Generating Unit Ratings for Long-Range Planning", dated August 25, 1986; 1986 Power Generation is from HECO Technical Services Department.

**Table 1-2. Non-Utility Electrical Power Generating Units From Which HECO Purchases Power.**

<u>Name of Source</u>	<u>Generation Type</u>	<u>Rated Capacity</u>	<u>1986 Sales to HECO (KW hours)</u>
Waialua Plantation	Biomass	12.5 MW	29,552,000
Oahu Sugar	Biomass	12.5 MW	21,864,000
Hawaiian Electric Systems (HERS)	Wind	12.2 MW	7,424,000
Hawaiian Indep. Refinery (gas turbine)	Co-generation	2.4 MW	35,664,000
C & H Aiea Refinery	Co-generation	.99 MW	542,000
Kahuku Seafood Plantation	Wind	.4 MW	0
Amorient Aquacultural Intl.	Wind	.2 MW	184,320
Tanaka Store	Wind	.012 MW	937
Kalihi Photovoltaic Home	Photovoltaic	.002 MW	not avail.
			95,231,257

Source: Facilities data from Ladd, R.D., Manager, HECO Distribution Engineering Department (December 20, 1985). Internal Memorandum entitled Summary of Customer Generation Connected in Parallel with HECO System; 1986 purchase power figures are from HECO Customer Service Department, Revenue Accounting Division (no date) "Purchased Power (Feedback) Report for 1986".

The Hawaiian Electric Company is currently in the process of selecting an alignment for new 138-KV power transmission lines to serve the Ewa Plain. In addition to these regional improvements, HECO expects to install:

- new termination facilities at the Campbell Industrial Park (CEIP) 138-KV Substation;
- new switching facilities at the proposed Kalaeloa Power Plant (see Section 1.2.1, above);
- a new single-circuit 138-KV transmission line from the CEIP Substation to the Kalaeloa Power Plant and on to the AES-BP facility; and
- a double-circuit 138-KV transmission line between the proposed AES-BP power plant and the CEIP Substation.

The interconnection facility will also serve the City's waste-to-energy plant.

### 1.2.3 NEED FOR ADDITIONAL GENERATION CAPABILITY

#### 1.2.3.1 Forecast Power Use

HECO's Forecast Planning Committee is responsible for developing and updating the utility's load forecasts. The forecasts are based on observed changes in customer use patterns, development proposals which could affect the number and/or type of customers, and other relevant factors. The System Planning Department utilizes these forecasts, along with other relevant data, to determine when additional generation capacity will be required.

Table 1-3 and Figure 1-3 show the actual annual peak electrical power use on Oahu for the years 1976 through 1987 and the Forecast Planning Committee's April 12, 1988, peak load forecast for 1988 through 1994. They indicate a significant increase in the peak load that must be served.

#### 1.2.3.2 System Capacity Criteria

HECO employs three long-range planning criteria to determine the need for additional generating capacity. They are:

- (1) **30-Percent Reserve Rule.** HECO conducts a regular maintenance program that minimizes unplanned unit outages. (For example, over the past few years unplanned outages of HECO's steam units have forced them off-line only 3 percent of the time.) When similar unplanned outages occur on the mainland, many utility companies are able to meet their system needs by purchasing power from other companies interconnected on the same regional power grid. Because its isolation prevents HECO from doing this, the company's goal is to maintain a generating capacity 30 percent higher than the expected peak demand.
- (2) **Load Service Capability Rule.** This rule states that the sum of the normal capability ratings of all available units (i.e., all units that are not off-line for planned maintenance) minus the normal capability rating of the largest available unit must equal or exceed the system peak load to be supplied at 60 Hz. In practice, this means that the utility must be able to serve the system's peak demand even if its two largest units (currently Kahe Units 5 and 6) are inoperative.

**Table 1-3. HECO System Capacity and Reserve Margin (in Megawatts): 1976 Through 1994.**

Year	Gross Firm System Peak <sup>1</sup>	Year-End System Capacity	Additions/(Reductions) To Generating Capacity During Year		Reserve Margin At Time of System Peak	
			Source	Capacity	MW	Percent
1976	899	1,209		257 <sup>2</sup>	28.6	
1977	919	1,209		290	31.6	
1978	917	1,209		292	31.9	
1979	953	1,209		256	26.9	
1980	938	1,209		271	28.9	
1981	920	1,327 <sup>3</sup>	<b>K-6; (H-5)</b>	<b>+141; (23)</b>	407	44.2
1982	932	1,347 <sup>4</sup>	<b>Re-rate</b>	<b>+20</b>	428	46.6
1983	944	1,283 <sup>5,5</sup>	(W-1, 2; H-7)	(64)	339	35.9
1984	935	1,283		348	37.2	
1985	943	1,283		340	37.2	
1986	986	1,277 <sup>4</sup>	(Re-rate)	(6)	291	29.5
1987	1,044	1,277		233	22.3	
1988	1,067	1,277		210	19.7	
1989	1,093	1,277		184	16.8	
1990	1,116	1,347	<b>KPGT-11</b>	<b>+70</b>	231	20.7
1991	1,141	1,457	<b>KP-2<sup>8</sup></b>	<b>+110</b>	316	27.7
1992	1,166	1,607 <sup>+</sup>	<b>AES<sup>9</sup></b>	<b>150<sup>+</sup></b>	441 <sup>+</sup>	37.5
1993	1,192	1,607 <sup>+</sup>			415 <sup>+</sup>	34.5
1994	1,218	1,607 <sup>+</sup>			389 <sup>+</sup>	31.6

**Note:** **Bold face** indicates additions during the year; parentheses indicate generating capacity reductions during the year.

<sup>1</sup> Figures through 1986 are actual. Figures for 1987 and beyond are the Hawaiian Electric Company Forecast Planning Comm. September 24, 1986 forecasts.

<sup>2</sup> Waiiau 10 off 2/9-12/31/76 to repair bore fan. System peak occurred 12/13/76.

<sup>3</sup> Honolulu Unit 5 on extended layup beginning 1/1/81 until retirement 3/31/82, decreasing system capacity 23 MW.

<sup>4</sup> Several units re-rated based on Generation Department testing program.

<sup>5</sup> Waiiau Units 1 and 2 retired 12/31/82, decreasing system capacity 24 MW.

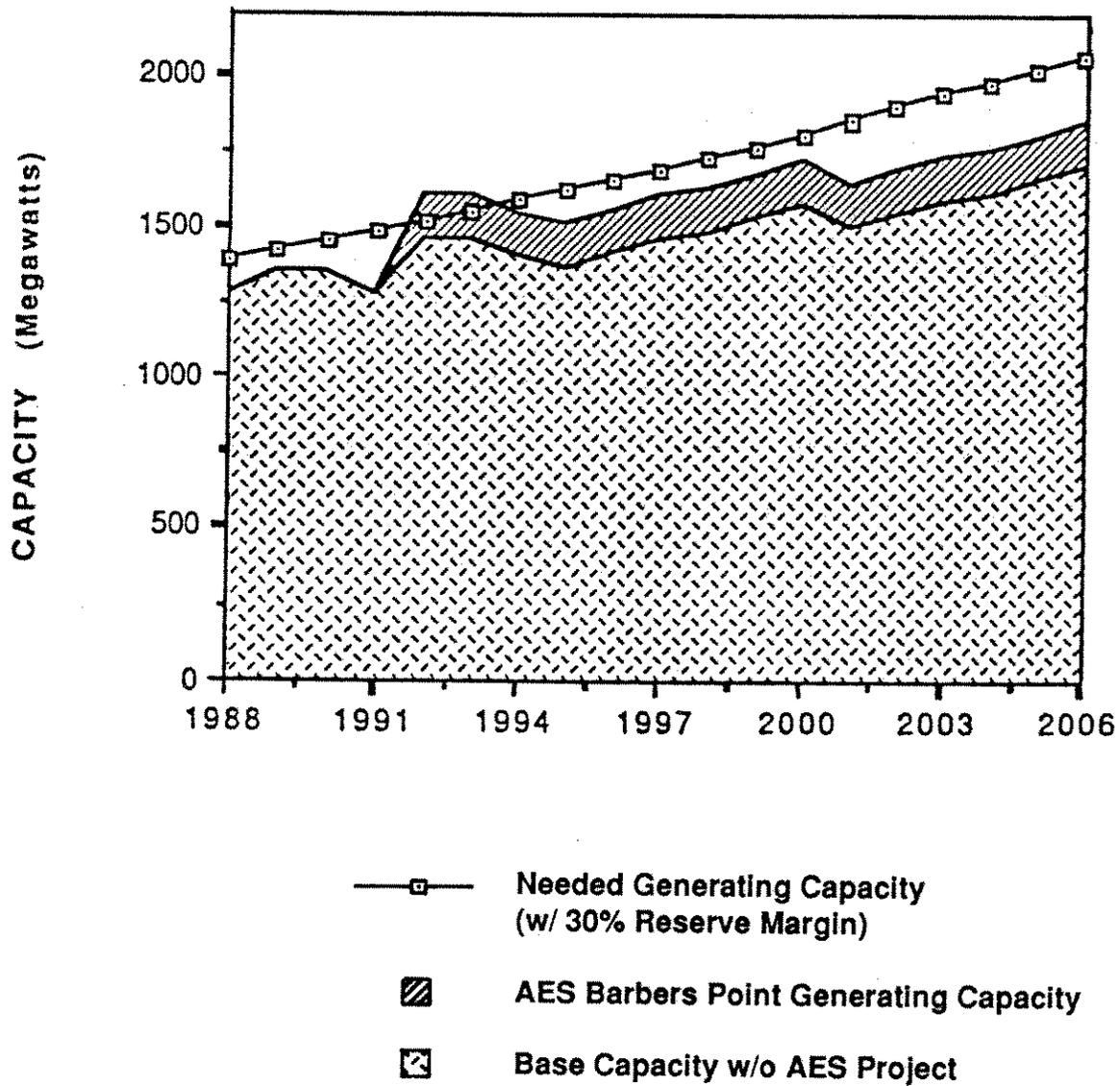
<sup>6</sup> Honolulu 7 retired 12/1/83 prior to occurrence of system peak, decreasing capability 40 MW.

<sup>7</sup> Kalaeloa Partners Phase 1 Gas Turbine.

<sup>8</sup> Kalaeloa Partners Phase 2 (additional gas turbine plus steam turbine).

<sup>9</sup> AES Barbers Point, Inc. coal-fired 150+-megawatt steam turbine.

Source: Hawaiian Electric Company



**Figure 1-3  
ELECTRICAL POWER  
DEMAND VS. SUPPLY**

- (3) **Quick Load Pickup Rule.** This rule states that there must be enough generation capacity running in economic dispatch (referred to as "spinning reserve") so that upon trip out of any one unit, the remaining units will have sufficient quick-load pickup capability to restore system frequency to at least 58.5 Hz within 3 seconds.

To maintain the reliability of the system, individual generating units are periodically taken off-line for routine maintenance, which includes boiler cleaning, overhaul of auxiliary equipment, and disassembly, inspection, and repair of the turbine-generator. While units are off-line, the generating capacity of the system is reduced accordingly. The frequency and duration of these planned outages varies with the type, size, and age of the unit, but each unit is typically off-line for two to eight weeks at least once every other year. Whenever possible, regular maintenance activities for the largest units are scheduled between the March and July the time when the peak demand for electrical power is typically lowest.

### 1.2.3.3 HECO Generation Resources Plan

HECO regularly reviews the adequacy of its generation resources. The purpose of these reviews is to determine, using the peak load forecast provided by the Forecast Planning Committee:

- When additional generating capacity would be required;
- The type and size of additional generating capability that should be installed; and
- Where the new generating capacity should be located.

In making these determinations, the company attempts to achieve three fundamental objectives:

- (1) Lowest total costs (i.e., the sum of capital, operating and maintenance, and fuel costs) to the utility.
- (2) High reliability, including a dependable fuel supply.
- (3) Compatibility with HECO's existing plans to integrate large-scale non-utility generation sources, such as the City's refuse-to-energy plant (HPOWER) and geothermally-produced electrical energy, with the HECO generation system.

### 1.2.3.4 Forecast Peak Demand Versus Existing Generating Capacity

As shown in Table 1-1, the installed capacity of the generating units at HECO's three generating stations amounts to 1,277 MW. The existing "purchase power agreement" sources (see Table 1-2) provide power to HECO's system and reduce fuel use by the utility. However, they do not provide power on a regular and predictable basis, and so cannot be relied upon to meet peak demand.

Figure 1-3 shows the generating capability that HECO needs to satisfy the criteria described in Section 1.2.3.2. It assumes (1) continuation of HECO's regular scheduled maintenance program and (2) completion of all phases of the Kalaeloa Power Plant described in Section 1.2.1, above. The chart shows that additional generating capability is needed now, and that power will be needed from both of the proposed power plants in order to meet the forecast demand. This need, together with the cost savings offered by AES's modern fluidized bed

combustion system, led HECO to conclude the purchase power agreement with AES-BP described in Section 1.3 below.

### **1.3 AES-BP'S PURCHASE POWER CONTRACT WITH HECO**

#### **1.3.1 BACKGROUND**

##### **1.3.1.1 Kahe Unit 7**

Its September 24, 1986 load forecast led HECO to decide to construct a seventh oil-fired generating unit at its existing Kahe Generating Station. Known as "Kahe Unit 7", the unit was to have a capacity of 146 Megawatts and to be generally similar to Units 5 and 6 at that facility. The boiler's combustion units were to be designed so that they could be converted from heavy fuel oil to coal at some point in the future if this was determined to be economically advantageous; however, plans did not include a delivery system for coal. The Public Utilities Commission was notified of HECO's intent to construct Kahe Unit 7 on April 15, 1987, and HECO began applying for the necessary permits. At the same time, HECO continued to explore the possibility of purchasing the power it needed from independent power producers.

One of the purposes of the Federal Public Utilities Regulatory Act of 1978 (PURPA) and Hawaii Administrative Rules §6-74 is to increase efficient energy use in the United States by encouraging the development of "cogeneration facilities". Co-generation facilities are defined as ones which produce both electrical power and useful forms of thermal energy (such as heat and steam) for industrial, commercial, heating, or cooling purposes.

The above-referenced regulations require public utilities to purchase power from qualifying co-generation facilities if the cost is less than their "avoided cost". Avoided cost is defined as the incremental or additional costs that a utility would incur if it had to generate power at its own facilities rather than buying it from the qualifying facility. For the purposes of AES-BP's proposed facility, this was determined to be the cost of constructing and operating Kahe Unit 7.

##### **1.3.1.2 Request for Proposals From Independent Power Producers**

As noted above, while HECO pursued the permits necessary to construct Kahe Unit 7, it continued to explore the possibility of purchasing the power it needed from independent power producers. A request for proposals was issued, and seven serious responses were received. HECO evaluated these using the criteria specified by the PUC for use in determining avoided cost. These included:

- (1) the ability of the proposed facility to provide electrical power to the system during the utility's peak use periods;
- (2) the ability of the proposed unit to dispatch power to the grid as needed;
- (3) the expected reliability of the facility; and
- (4) the contract terms.

Two of the proposals passed HECO's initial screening and were the subject of further negotiations. These were Kalaeloa Partners, Inc.'s (then known as Hawaiian Cogeneration Associates') proposal to construct a combined cycle unit and AES-BP's proposal for a coal-fired

a coal-fired unit utilizing a circulating fluidized bed boiler. Further review and contract negotiations confirmed that both these proposals would result in lower total costs to the utility than if it pursued the preliminary Kahe Unit 7 design. Hence, design and permitting work on Kahe Unit 7 were suspended, and purchase power contracts were signed with both Kalaeloa Partners and AES-BP. On June 1, 1988, HECO requested Public Utilities Commission approval of AES-BP's contract.

### 1.3.2 APPLIED ENERGY SERVICE'S EXPERIENCE

AES-Barbers Point, Inc. (AES-BP), is an indirect wholly-owned subsidiary of Applied Energy Services, Inc. (AES). AES-BP was organized specifically for the purpose of constructing, owning, operating, and maintaining a coal-fired cogeneration facility at Barbers Point. Applied Energy Services, Inc., the parent company, is a privately held Delaware corporation formed in 1981. Its primary business is to provide steam and electricity produced at cogeneration facilities to industrial and utility customers.

Since it was established in 1981, Applied Energy Services, Inc., has obtained Public Utility Commission approvals of power contracts for approximately 1,600 megawatts of electric generating capacity. This is more than HECO's total generating capacity. The last six projects it has initiated have all utilized the same circulating fluidized bed technology incorporated in the facility proposed for Campbell Industrial Park. Not just a contractor or developer, AES owns and operates its cogeneration plants; this ongoing involvement gives it a vested interest in the long-term efficiency and reliability of its projects. AES's power plant experience to date includes the following:

<u>Plant/Location</u>	<u>Size Type</u>	<u>(in MW)</u>	<u>Constr. Cost (in millions)</u>	<u>1st Year of Operation</u>
Deepwater/Texas	Pet. Coke	140	\$ 275	1986
Beaver Valley/PA	Coal	120	226	1987
Placerrita, CA	Gas CC	100	120	1988
Thames, Conn.	Coal CFB	180	250	1989
Shady Point, OK	Coal CFB	300	475	1990
Riverside, New Eng.	Coal CFB	180	280	1993
Cedar Bay, FL	Coal CFB	225	420	1992
Middle Branch, MD	Coal CFB	225	420	1994
Cumberland, MD	Coal CFB	180	300	1995
	Total	1,650	\$2,766	

## 1.4 PROJECT DESIGN

### 1.4.1 LOCATION

The proposed power plant is located on the northern side of Kaomi Loop in Campbell Industrial Park (portion of TMK 9-1-26:28). It is immediately south of the City and County of Honolulu's resource recovery facility and just north of the Hawaiian Cement Company's cement plant (see Figure 1-1). The parcel on which the cogeneration facility will be constructed is currently owned by the James Campbell Estate and leased by Hawaii Project Management, Inc. Once the power plant receives the necessary governmental approvals, AES-BP will sub-lease the property. The conveyor used to transport coal and limestone between the harbor and the power plant site will be constructed within easements AES-BP is acquiring from the City &

County of Honolulu, Hawaiian Electric Company, Hawaii Project Management, Inc., Chevron USA, the James Campbell Estate, and the State of Hawaii.

Road access to and from the power plant site is via the Palailai Interchange of the H-1 Freeway, Kalaeloa Boulevard, and Kaomi Loop. The H-1 Freeway, Malakole Road and Kalaeloa Boulevard are publicly owned and maintained roadways. The other streets that would be used are owned and maintained by Campbell Estate, which developed the industrial park.

The power plant site is relatively level. Consequently, construction of the facility will require only modest amounts of grading. No blasting will be required. The electrical substation site and the conveyor alignment are also level. Hence, no substantial site grading will be required for these facilities.

#### 1.4.2 GENERATING STATION

The proposed power generation complex consists of six major subsystems:

- power generation units (boilers, turbine generators, and related subsystems);
- steam condenser cooling system;
- waste treatment and disposal systems;
- electrical power transmission system; and
- process steam delivery system.

Brief descriptions of each of these subsystems are provided below. Figure 1-4 presents a preliminary site layout of the power generating station site. A perspective drawing based on a preliminary plan for the power plant is shown in Figure 1-5; the site layout has since been refined, but the overall appearance is similar. A simplified process flow diagram showing the movement of fuel, water, and waste materials through the facility is shown in Figure 1-6. The off-site coal, limestone, and ash handling systems are described in Section 1.4.3.

##### 1.4.2.1 Boilers and Turbine-Generators

At the heart of the planned cogeneration facility are two coal-fired, circulating fluidized bed (CFB) boilers (see Figure 1-7). This steam will drive one single-shaft condensing steam turbine generator. The boilers will be equipped with economizers and air pre-heaters to increase their thermal efficiency.

The proposed cogeneration facility will consume approximately 660,000 tons per year of 0.4 to 1.5 percent sulfur coal. All coal contains sulfur. In traditional boilers this is converted into sulfur dioxide (SO<sub>2</sub>) when it is burned, and the SO<sub>2</sub> must then be removed from the flue gases using "scrubbers" before being released to the environment. AES-BP's circulating fluidized bed (CFB) design uses a more advanced approach. It burns coal at a relatively low temperature on a bed of limestone; high pressure air is injected into the limestone to keep it circulating. The limestone captures the sulfur in the coal before it is converted into SO<sub>2</sub>, eliminating the need for scrubbers and providing very low emission rates. The lower combustion temperature used by this technology is also beneficial in that it inhibits the formation of nitrogen oxides, another major pollutant produced by conventional fossil fuel power plants.

The exhaust gases leaving the boilers will contain three major types of particulate matter. The first is gypsum (calcium sulfate), which is formed by the reaction between sulfur in the coal and the calcium in the limestone (calcium carbonate). The second is fly ash, which is unburned minerals entrained in the hot exhaust gas. The last is un-reacted limestone (calcium oxide). Fabric filters will remove approximately 99.9 percent of these from the exhaust gases before they are released to the atmosphere. As a result, the exhaust gases will be essentially invisible when they leave the smokestack.

Because its operating costs will be low relative to Hawaiian Electric's existing units, it is expected that the power plant will be operated nearly continuously as a base load unit. Small amounts of low sulfur No.2 fuel oil will be used for short periods during start-up and very-low-load operation. The fuel oil will be purchased from one of the two oil refineries located in Campbell Industrial Park and trucked or piped to a 100,000 gallon capacity, above-ground storage tank located on the power plant site. The storage tank will be surrounded by a pollution control berm and will comply with all applicable codes.

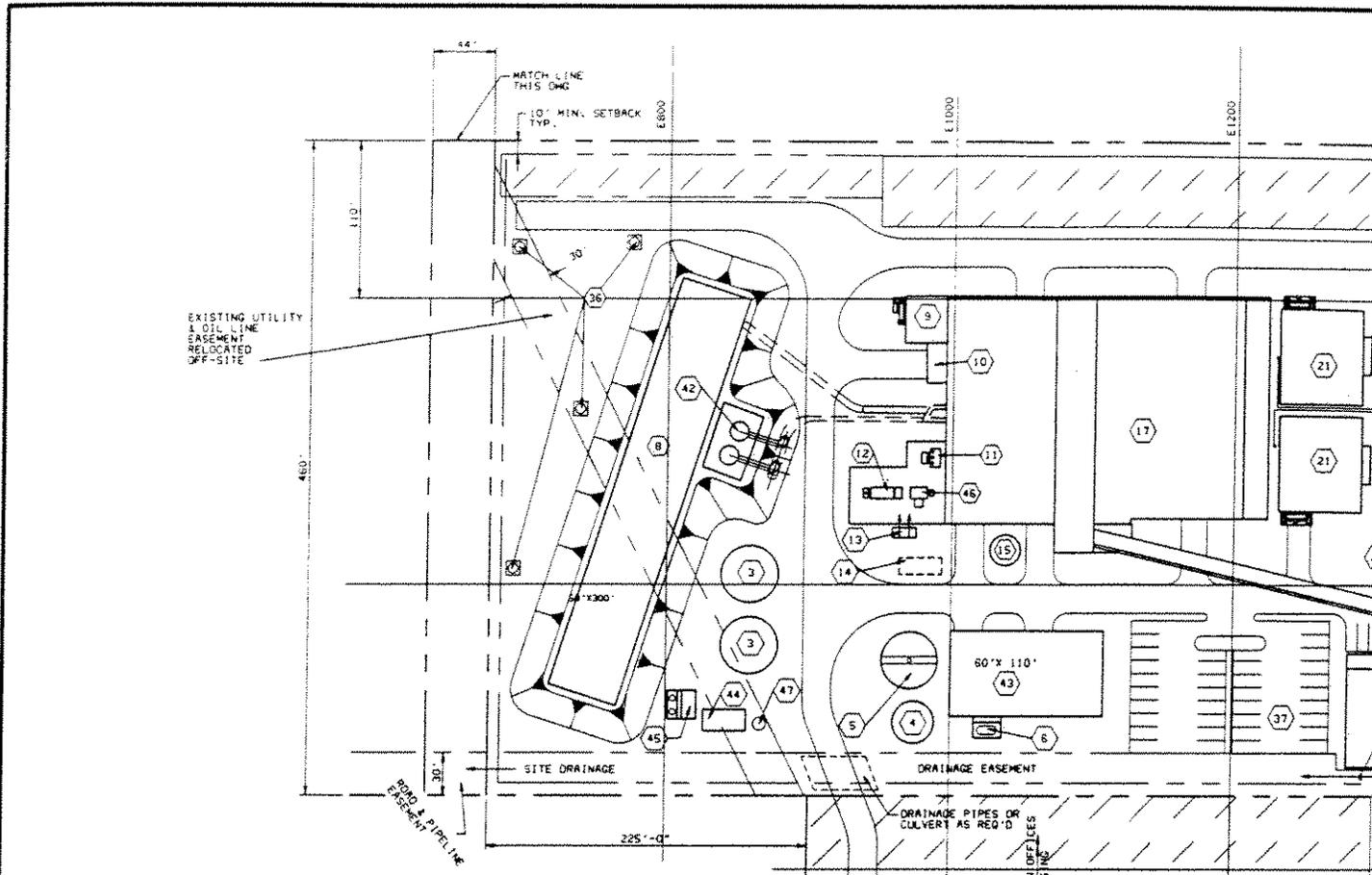
The boilers, turbine-generators, and other equipment will be housed in metal frame structures similar to those used at HECO's existing power plants. Standard construction techniques will be employed, with construction materials being brought to the site by truck. The facility contains several very large components, including the turbine, electrical generator, and boiler. Because of their size and weight, special oversize trailers will be used to transport them, and special arrangements will be made to insure that their delivery does not unnecessarily disrupt traffic.

#### 1.4.2.2 Cooling System

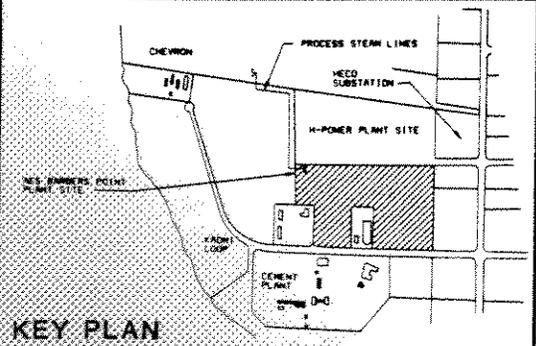
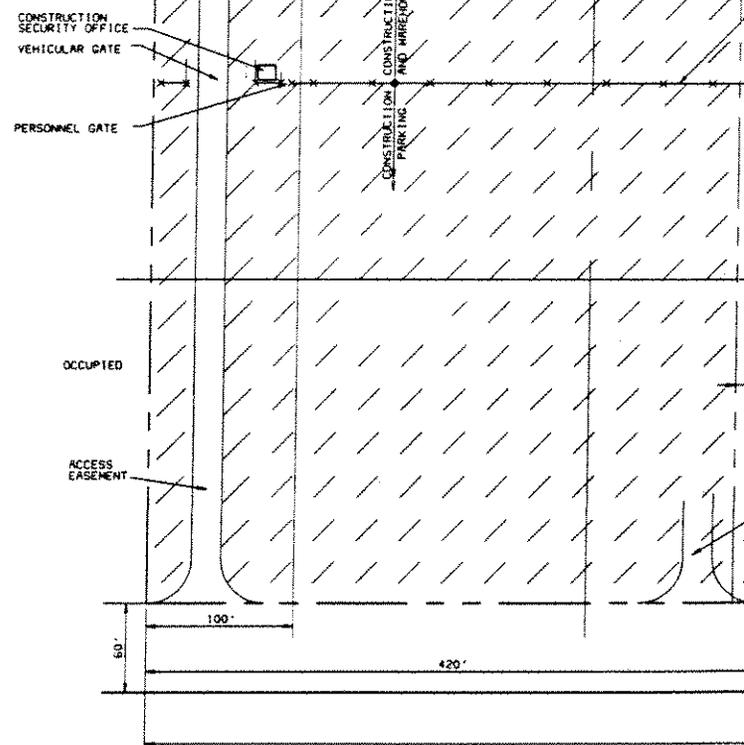
After steam passes through the turbine-generator it must be returned to a liquid state by cooling. This will be done in a wood-frame, counterflow, mechanical draft cooling tower. The system keeps the extremely pure water used in the steam side of the system separate from the saline cooling water flow (See Figure 1-8).

The cooling water flow consists of saline groundwater from four 100-foot deep wells located on the project site. Three wells can supply all the cooling water needed for full power operations, with the fourth serving as a backup source. The extra well also allows normal rotational maintenance of the supply wells. As shown in Figure 1-8, total pumpage during full-power operations will be approximately 7,400 gallons per minute (gpm). This will come from the upper limestone aquifer which underlies the site. Evaporation losses from the system at full-power operation will be approximately 1,500 gpm.

After passing through the cooling tower, the groundwater will be re-injected into a lower limestone aquifer, probably at a depth of about 350 feet. Results of previous testing indicates that a relatively impermeable sedimentary aquiclude separates the upper limestone aquifer from which the saline cooling water will be withdrawn from the lower aquifer into which it will be reinjected. It is expected that this aquiclude will prevent the reinjected water from being drawn into the supply wells.

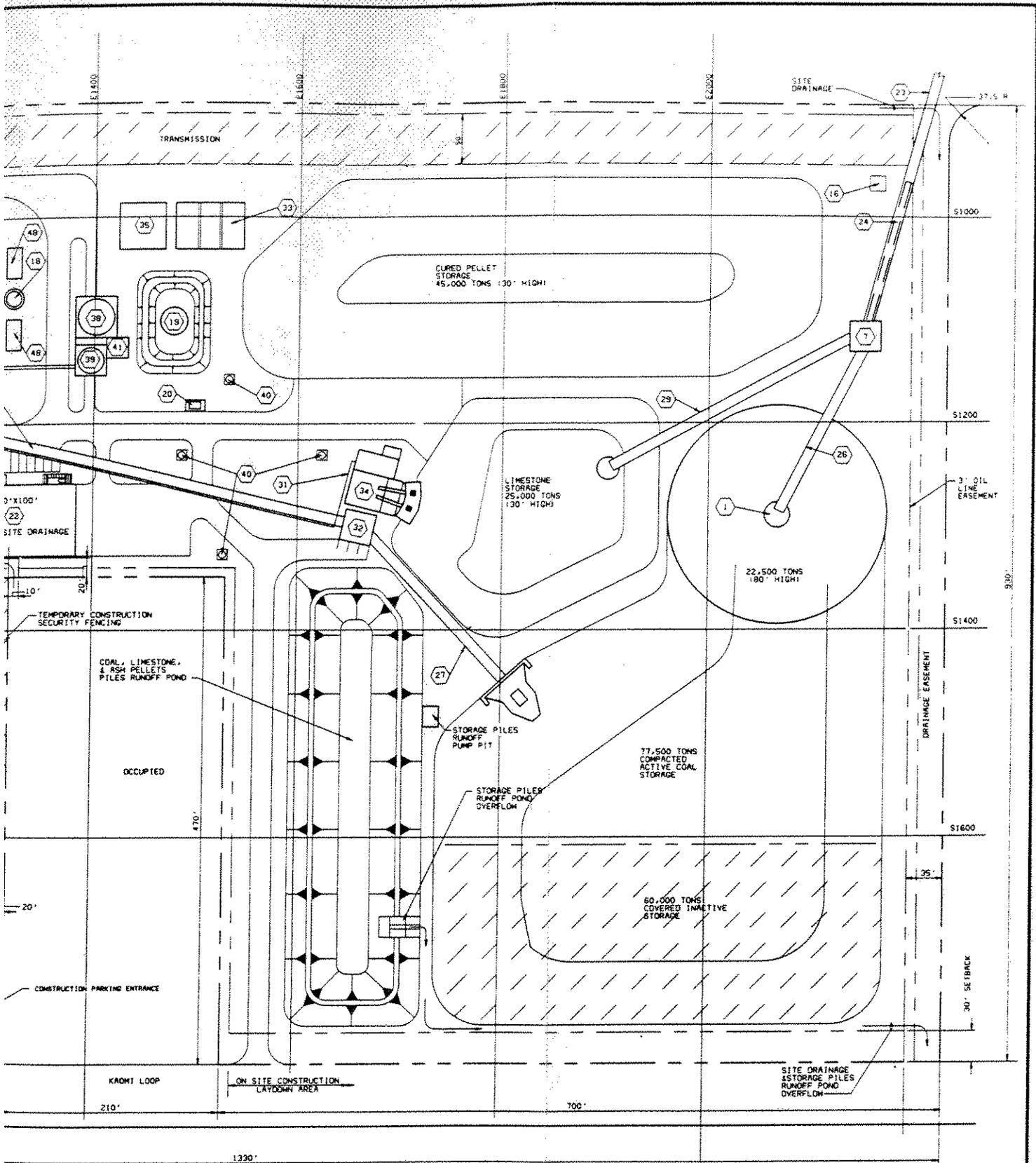


LEGEND	ESTIMATED HEIGHT (FT)
1. COAL LOWERING WELL	1. 100
2. COAL COZER TRAP RECLAIM	2. 30
3. FIREWATER STORAGE TANK	3. 30
4. DEMINERALIZED WATER STORAGE TANK	4. 30
5. NEUTRALIZATION BASIN	5. 15
6. DEMINERALIZER ACID STORAGE TANK	6. 15
7. TRANSFER STRUCTURE	7. 90
8. COOLING TOWER	8. 55
9. CHEMICAL FEED EQUIPMENT & WATER CHEMISTRY LABORATORY	9. 30
10. GAS STORAGE	10. 15
11. MAIN AUXILIARY TRANSFORMER	11. 20
12. GENERATOR TRANSFORMER	12. 20
13. MOTOR OPERATED DISCONNECT	13. 20
14. OIL SEPARATOR	14. BELOW GRADE
15. CONDENSATE STORAGE TANK	15. 25
16. TAKE-UP TOWER	16. 65
17. GENERATION BUILDING	17. 160
18. CHIMNEY	18. 285
19. FUEL OIL STORAGE TANK	19. 30
20. FUEL OIL UNLOADING STATION	20. 10
21. FABRIC FILTER BUILDING	21. 95
22. SERVICES BUILDING	22. 40
23. PORT TO PLANT SITE CONVEYOR	23. SLOPES UP TO 70
24. BELT TAKE-UP	24. 10
25. CONVEYOR	25. 25
26. COAL CONVEYOR 1	26. VARIES
27. COAL CONVEYOR 2	27. VARIES
28. COAL CONVEYOR 3	28. VARIES
29. LIMESTONE CONVEYOR 1	29. VARIES
30. LIMESTONE CONVEYOR 2	30. VARIES
31. PULVERIZED LIMESTONE PIPING	31. NA
32. COAL CRUSHER BUILDING	32. 90
33. GREEN PELLETS STORAGE (3 DAYS)	33. 20
34. LIMESTONE PULVERIZER BUILDING	34. 40
35. ASN PELLETIZING BUILDING	35. 30
36. WASTEWATER RE-INJECTION WELLS	36. 10
37. EMPLOYEE PARKING	37. AT GRADE
38. FLY ASH SILO	38. 110
39. RED ASH SILO	39. 110
40. MAKE-UP WELLS	40. 10
41. ASH HANDLING EQUIPMENT BUILDING	41. 30
42. CIRCULATING WATER PUMP STRUCTURE	42. 15
43. WATER TREATMENT BUILDING	43. 30
44. TREATMENT PLANT (SEWAGE)	44. 15
45. WETWELL & WASTEWATER INJECTION PUMPS	45. AT GRADE
46. RESERVE AUXILIARY TRANSFORMER	46. 20
47. SEWAGE LIFT STATION	47. AT GRADE
48. INDUCED DRAFT FAN	48. 10



Source: Black & Veatch (15638-1STU-S1001), Rev. A, 5/5/89





**Figure 1-4  
PRELIMINARY  
SITE PLAN**

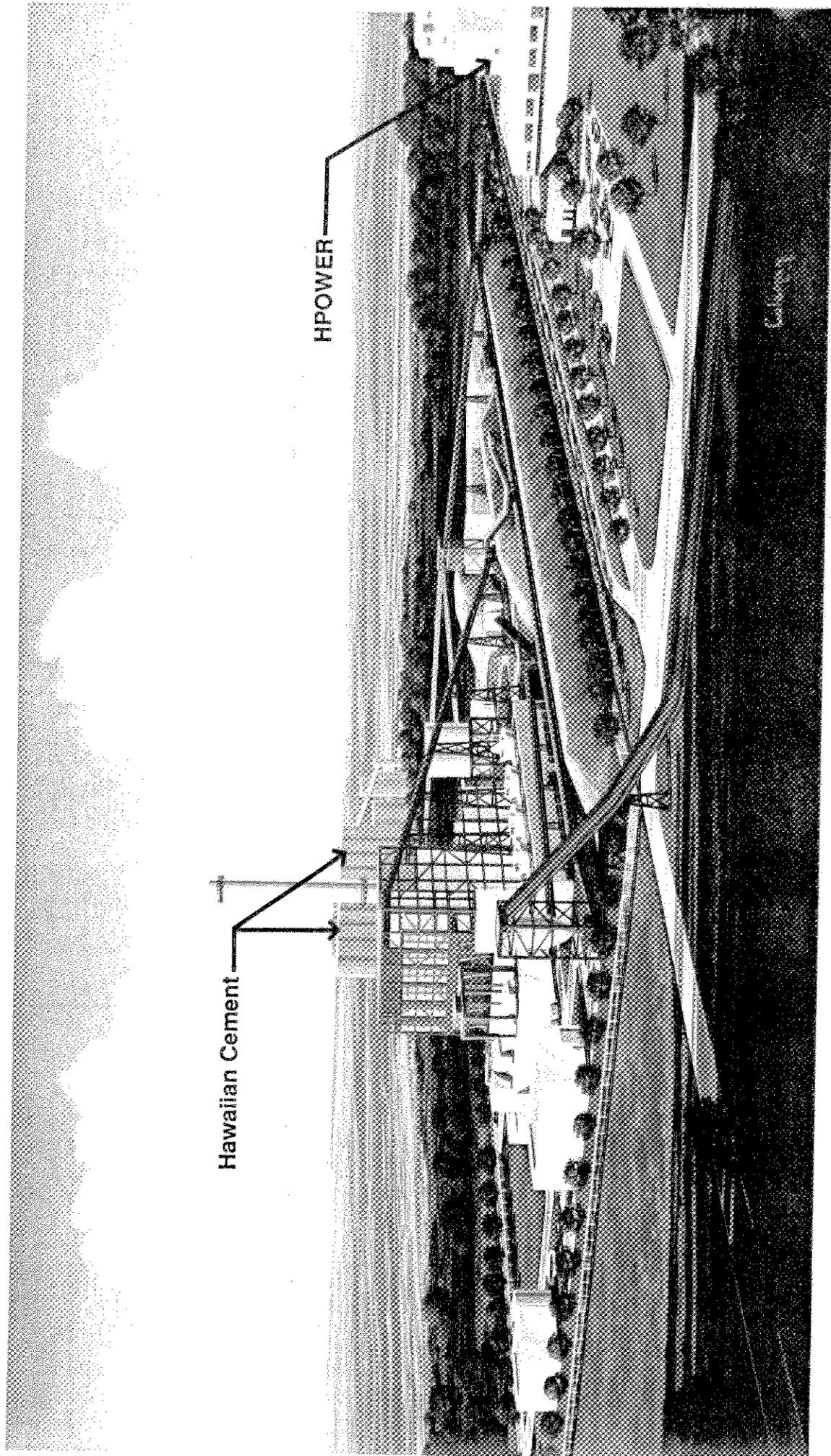


Figure 1-5  
PERSPECTIVE DRAWING  
OF COGENERATION FACILITY



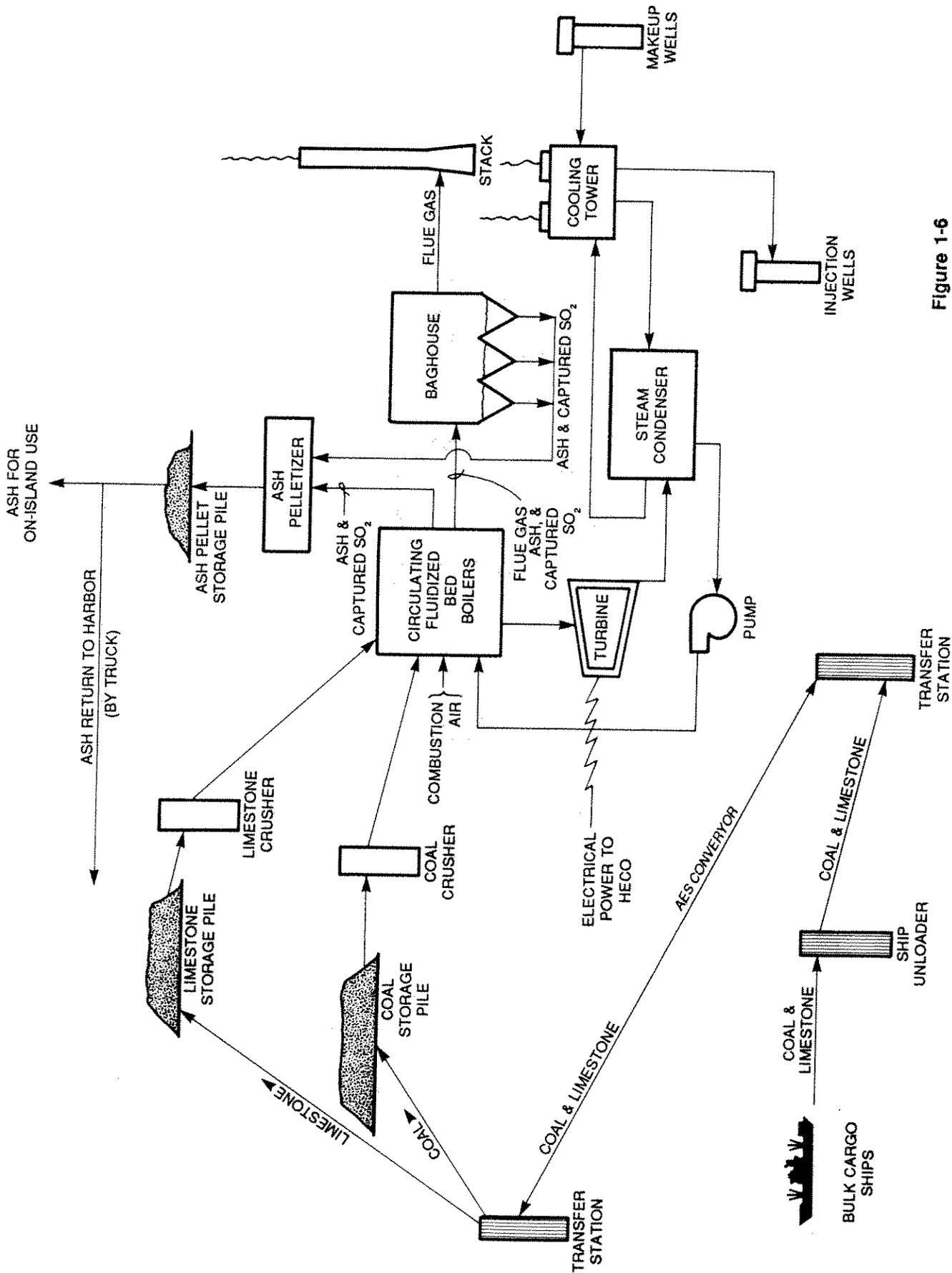
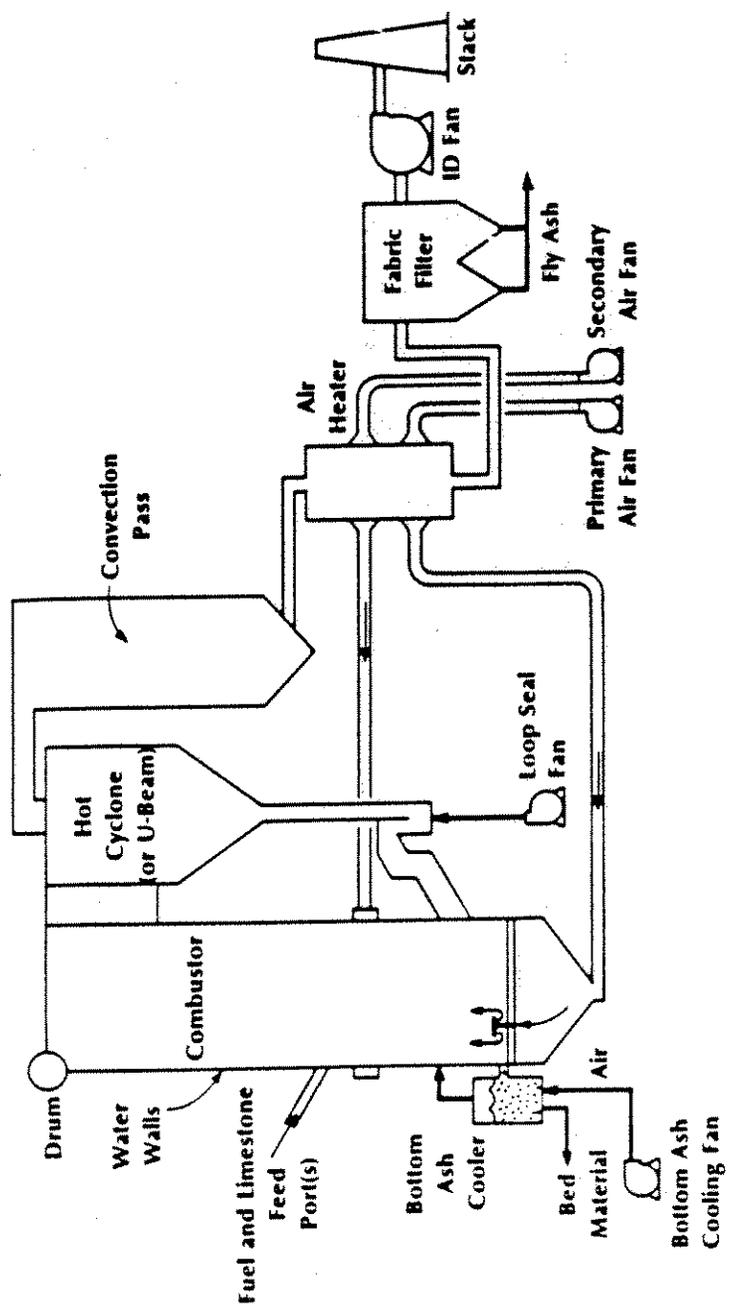
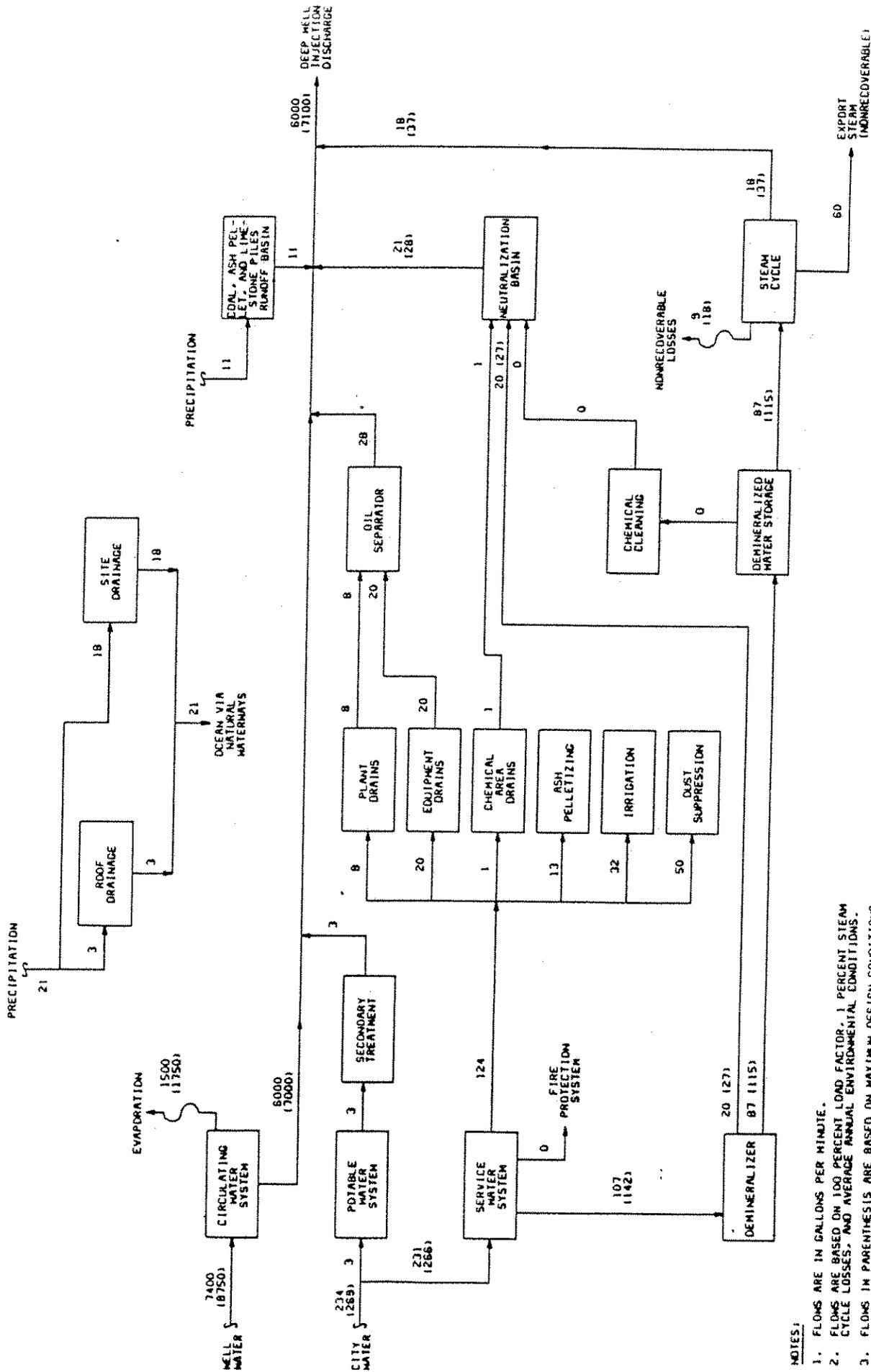


Figure 1-6  
PROCESS FLOW DIAGRAM



Source: Black & Veatch, Inc. (October 1988)

Figure 1-7  
 CIRCULATING FLUIDIZED BED (CFB)  
 BOILER DIAGRAM



- NOTES:
1. FLOWS ARE IN GALLONS PER MINUTE.
  2. FLOWS ARE BASED ON 100 PERCENT LOAD FACTOR, 1 PERCENT STEAM CYCLE LOSSES, AND AVERAGE ANNUAL ENVIRONMENTAL CONDITIONS.
  3. FLOWS IN PARENTHESES ARE BASED ON MAXIMUM DESIGN CONDITIONS, 2 PERCENT STEAM CYCLE LOSSES, AND ENVIRONMENTAL CONDITIONS WHICH RESULT IN MAXIMUM CIRCULATING WATER SYSTEM EVAPORATION.
  4. FLOWS ARE BASED ON 20,000 POUNDS PER HOUR OF EXPORT STEAM WITH NO CONDENSATE RETURN.
  5. CIRCULATING WATER SYSTEM FLOWS ARE BASED ON OPERATION AT 1.25 CYCLES OF CONCENTRATION.
  6. RUNOFF FLOWS BASED ON AVERAGE ANNUAL PRECIPITATION

Source: Black & Veatch, Inc. One Unit Water Mass Balance

Figure 1-8  
WATER MASS  
BALANCE DIAGRAM

### 1.4.2.3 Waste Treatment and Disposal

As shown in Figure 1-8, the power plant will generate several types of waste streams. These include sanitary wastewater; output from the chemical treatment (neutralization) facility and blowdown water from the demineralizer; effluent from plant and equipment drains; evaporation from the cooling water system; runoff from the coal, ash pellet, and limestone storage piles (after settling in the detention basins); and surface rainfall runoff. The amount and composition of each of these are summarized below and discussed further in Section 3.2.

- Sanitary Wastewater. The facility is expected to generate an average of 4-5,000 gallons per day of sanitary wastewater from toilets, sinks, etc. This will be collected and given secondary-level treatment in an individual wastewater treatment plant before being injected into the upper limestone aquifer.
- Chemical Wastewater. Approximately 95 percent of the chemical wastewater from the facility will be in the form of demineralizer blowdown. This demineralizer waste consists of materials removed from the potable-quality water obtained from the Honolulu Board of Water Supply system. The remainder of the wastewater consists of preboiler and boiler chemical cleaning waste and flows from chemical feed area drains, chemical storage area drains, and laboratory drains. These wastes will be neutralized on a batch basis in a chemical-resistant neutralization basin. A mixer will be used to enhance the self-neutralizing tendencies of the alkaline and acid waste streams that enter it. The neutralized wastes (which are classified non-hazardous) will be combined with cooling tower blowdown and other plant wastewater and discharged into the cooling water reinjection wells.
- Plant and Equipment Drains. Water that collects in plant and equipment drains will be passed through oil separators. The clean portion will be mixed with the cooling water and reinjected with it. The oily residue will be periodically removed from the separators and sent to a recycling facility.
- Storage Pile Runoff. Runoff from the coal, limestone, and ash pellet storage piles will be collected and held in retention basins to remove suspended sediment, then discharged to the deep-well injection system. The basins are designed to hold runoff from a 24-hour rainfall having an average recurrence interval of once in 10 years. Overflows from the storage basins caused by more severe rainfall events, as well as other site runoff, will be directed into the existing stormwater drainage system.
- Fly and Bed Ash. The power plant is expected to generate approximately 100,000 tons per year of fly and bottom ash. Two uses for this are being considered. The first, and most desirable from the viewpoint of AES-BP, is to sell it locally or to off-island users for use in cement, concrete, and other construction materials. The second, which will be employed if a productive use for the ash cannot be found, is to transport it back to the harbor and return it to the mine from which it originated. AES's contract with the coal supplier requires the supplier to accept the ash. If the ash is to be transported back to the mine, it will be enclosed and stabilized to eliminate dust. The current design calls for the ash to be "pelletized", i.e., mixed with water and shaped into pellets the size and shape of marbles. The pellets are hard, inert, and dust free. Analyses of fly and bottom ash from facilities similar to that proposed by AES Barbers Point, Inc., indicate that it will not qualify as a hazardous waste.

- Cooling Water Evaporation and Drift. Approximately 1,500 gallons of water per minute will be lost from the cooling tower to evaporation and drift. It is estimated that between 98 and 99 percent of this will be in the form of evaporation. Drift losses are expected to be less than 1 to 2 percent of the total loss.

#### **1.4.2.4 Electrical Power Transmission Lines**

Dispatch and routing of the electrical power generated at the facility will be controlled by HECO. It will use the transmission system described in Section 1.2.2 above.

#### **1.4.2.5 Process Steam System**

As previously stated, AES-BP will sell steam to the Chevron Hawaiian Refinery. The steam will be used to satisfy a portion of Chevron's process steam needs. While this steam will account for only a small percentage of the total energy output of the facility, it is important because it makes the power plant a "qualifying facility" as defined by the Public Utility Regulatory Act of 1978 and Title 6, chapter 74, Hawaii Administrative Rules.

### **1.4.3 COAL, LIMESTONE, AND ASH PELLET HANDLING AND STORAGE**

The proposed power plant will consume approximately 660,000 tons per year of coal and 40,000 tons per year of limestone. It will also generate approximately 100,000 tons per year of fly and bottom ash. Current plans call for materials to be carried to and from Oahu in 60,000 metric ton ocean-going ships having a maximum draft of 37 feet. The ships will dock at Pier 6 in the new Barbers Point Deep Draft Harbor. The coal and limestone will be transferred between the plant site and the harbor using a mechanical conveyor system or by truck.

#### **1.4.3.1 Ship Unloading/Loading**

Hawaii Pacific Industries, Inc. (HPI) will provide ship loading and unloading facilities at the Barbers Point Harbor. The facility will be a general purpose design and will be a multi-user bulk unloading and loading system. The Harbors Division has issued a Negative Impact Declaration for construction of the Bulk Cargo Handling Facility.

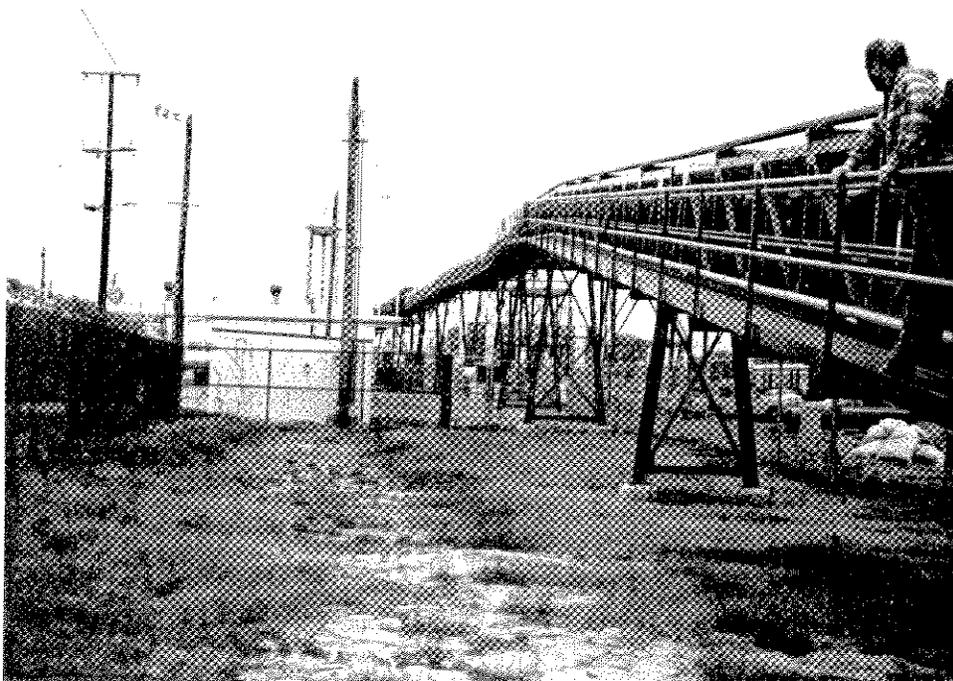
#### **1.4.3.2 Overland Conveyor System**

An overland conveyor will transport coal 1.5 miles from the harbor to the power plant site. The proposed route is shown in Figure 1-1. the design being employed (see Figure 1-9 for a photograph of a similar facility) is referred to as a "pipe conveyor" because the belt is shaped into the form of a tube, or pipe, except at the transfer stations at either end; there, it is opened to permit the loading and unloading of material. Because it will completely enclose the coal and limestone, the pipe conveyor virtually eliminates the escape of dust. Another advantage of the pipe conveyor design is that it, unlike conventional conveyors that can run only in straight lines, can follow a curved path. The design is also extremely quiet, all power being provided by an enclosed electrical motor located in the transfer station on the power plant site.

The conveyor system is not limited to coal. In fact, it can accommodate most bulk products. Several tenants of Campbell Industrial Park have indicated an interest in using it to transport such things as gypsum, cement, silica sand, clinker, and bulk grain.



Figure 1-9. Typical Pipe Conveyor.





### 1.4.3.3 Coal, Limestone, and Ash Pellet Storage

Coal and limestone will be stored in open piles located on the power plant site (see Figure 1-4). Sufficient coal and limestone will be stored on-site to operate the power plant at full capacity for about 3 months. Water or a non-toxic surfactant will be applied to these piles as needed to control dust. Up to 45,000 tons of ash pellets can be stored on-site.

### 1.4.3.4 Ash Handling System

If a local market cannot be found for the ash, it will be stored on-site until a ship arrives at the harbor. Then, trucks will transport the ash back to a 100-ton dual hopper surge bin located just inside the harbor boundary. The ash will then either continue on the dock conveyor to a ship loader or be transferred into 20-ton capacity containers. The containers will then be transferred by truck to the harbor. There, a crane will lift them into the ship's hold, where they will be emptied.

## 1.5 PROJECT SCHEDULE AND COST

### 1.5.1 PROJECT COST

AES-BP does not yet have a firm construction contract for the proposed facilities. However, it currently estimates that costs will be roughly as follows:

Power Plant	\$330,000,000
Conveyor System	<u>10,000,000</u>
TOTAL:	\$340,000,000

## 1.5.2 PROJECT SCHEDULE

Major milestones for implementing the proposed cogeneration facility are as follows:

MILESTONE	TARGET DATE
Submit P.U.C. Application	6/1/88*
Submit ATC/PSD Permit Application	7/26/88*
Apply for Harbor Use Permit	11/1/88*
Publish EIS Preparation Notice	11/8/88*
DOT Approves Harbor Use Permit	2/4/89*
Submit SMA Application	3/10/89*
Publish Draft EIS	3/6/89*
Award Plant Construction Contract	6/2/89
Submit Final EIS	6/5/89*
P.U.C. Application Approved	6/15/89
ATC/PSD Permit Approved	7/15/89
SMA Permit Approved	8/1/89
Long-Term Financing Secured	9/15/89
Begin Powerplant Construction	10/1/89
Begin Conveyor Construction	6/1/90
Conveyor Completed	10/15/91
Coal Arrives	12/1/91
Initial Plant Operation	2/1/92
Begin Commercial Operation	7/1/92

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\*Already completed.

CHAPTER 2  
RELATIONSHIP TO STATE AND COUNTY  
LAND USE PLANS, POLICIES, AND CONTROLS

**2.1 STATE AND COUNTY POLICY PLANS**

**2.1.1 HAWAII STATE PLAN**

Section 226-18 of the Hawaii State Plan makes it a State goal: (1) to provide dependable, efficient, and economical statewide energy and communications systems capable of supporting the needs of the people; and (2) to increase Hawaii's energy self-sufficiency. By increasing the generating capacity available to the Hawaiian Electric Company and by securing long-term supplies of relatively inexpensive fuel, the proposed coal-fired power plant will clearly contribute to the first of these objectives. The project's relationship to the second, which is more complex, is discussed below.

By diversifying the fuel sources used to generate electrical power for the island, the project will help to stabilize the energy supply and to decrease the State's vulnerability to interruptions in the fuel supply. However, in the sense that the coal for the project must still come from an outside the state, it will not increase Hawaii's energy self-sufficiency.

The question has another side; that is whether or not HECO's commitment to purchase power from a coal-fired power plant will decrease the likelihood that geothermal and other indigenous energy resources will be developed. For at least two reasons, we do not expect that it will.

First, and most importantly, the power from the AES-BP facility is need at least two years before geothermal can be made available to Oahu. HECO's customers cannot curtail their power use during this period while they wait for the geothermal resource to be developed and an underwater cable to be constructed between the Big Island and Oahu. This is particularly true since both the geothermal resource and the technology needed to bring power from the Big Island to Oahu have not been fully tested. Cutting-edge technology such as this frequently takes longer than expected to implement, and this, together with possible public opposition, could put the geothermal project well behind its current schedule.

Second, even if 500 megawatts of geothermal power can eventually be delivered to Oahu at a reasonable price, it will satisfy only a portion of the island's total power needs. The remainder will have to come from existing or new generation facilities. Because the AES-BP facility will produce power at a lower operating cost than HECO's existing units, it makes economic and environmental sense to replace the older, less cost effective units with power from the AES-BP facility for base load demand.

**2.1.2 STATE FUNCTIONAL PLANS**

State functional plans are intended to provide more detail to the *Hawaii State Plan* in 12 specific areas of concern—agriculture, conservation lands, education, higher education, energy, health, historic preservation, housing, recreation, tourism, transportation, and water resources development. As defined in the *Hawaii State Plan* (section 2-10), a functional plan sets forth "the policies, programs and projects designed to implement the objectives of a specific field of activity when such activity or program is proposed, administered, or funded by an agency of the State." The 12 State functional plans were examined to determine the relationship of the proposed AES Cogeneration Project to each. Only one—the State Energy Functional Plan—was found to have direct relevance.

The following aspects of the project are consistent with the State Energy Functional Plan:

- As a cogeneration facility, the AES power plant will be a thermally efficient producer of electricity. This is in keeping with the objectives of the Functional Plan which include the provision of "dependable, efficient, and economical statewide energy...system capable of supporting the needs of the people."
- Being more thermally efficient, the cogeneration facility is consistent with the State's objectives relating to energy conservation.
- The proposed plant will use coal, an energy source that provides an alternative to petroleum. In the long term, coal may be a more reliable energy source, given the United States' abundant coal reserves.
- The State Energy Functional Plan identifies actions which are meant to conserve energy in the transportation sector; for example, energy-conserving alternatives to the use of automobiles. The AES facility includes a conveyor system for the movement of coal from the harbor to power plant. This mode of transport uses less energy than the trucks that would otherwise be required.

### **2.1.3 OAHU GENERAL PLAN**

The General Plan of the City and County of Honolulu is a statement of long-range social, economic, environmental, and design objectives and broad policies to facilitate the attainment of the stated objectives. Identified below in italics are the objectives and the respective policies which relate to the AES Cogeneration Project. Comments on how the proposed action relates to the objectives and policies are presented in plain text.

#### **2.1.3.1 Natural Environment**

*Objective A: To protect and preserve the natural environment of Oahu.*

- *Protect Oahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development.*
- *Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive land forms, and existing vegetation.*
- *Design surface drainage and flood-control systems in a manner which will help preserve their natural settings.*
- *Protect the natural environment from damaging levels of air, water, and noise pollution.*

Due consideration will be given to slope, as well as flood and erosion hazards, in the design of the proposed facilities. A detailed discussion of these issues is contained in section 3.1 and 3.2.

Mitigation measures will be carried out to protect the environment from potentially damaging levels of air, water, and noise pollution. Air quality impacts are discussed in section 3.4, and noise impacts in section 3.3. Water quality concerns are addressed in the section 3.2.

Existing vegetation on the site is comprised largely of exotic weeds, and no endemic species were encountered in the botanical survey conducted for the project (see section 3.7).

*Objective B: To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.*

- *Locate roads, highways, and other public facilities and utilities in area where they will least obstruct important views of the mountains and the sea.*

The proposed power plant and conveyor system will be in an industrial area next to similar facilities. No significant views of the mountains or the sea will be affected.

#### **2.1.3.2 Transportation and Utilities**

*Objective C: To maintain a high level of service for all utilities.*

- *Plan for the timely and orderly expansion of utility systems.*

As explained in Chapter 1, the proposed facilities are needed to meet the increased demand for electricity on the island.

*Objective D: To maintain transportation and utility systems which will help Oahu continue to be a desirable place to live and visit.*

- *Evaluate the social, economic, and environmental impact of additions to the transportation and utility systems before they are constructed.*

Social, economic, and environmental impacts of the project are being evaluated as part of the EIS process.

#### **2.1.3.3 Energy**

*Objective A: To maintain an adequate, dependable and economical supply of energy for Oahu residents.*

- *Establish economic incentives and regulatory measures which will reduce Oahu's dependence on petroleum as its primary source of energy.*

The AES plant will use coal rather than petroleum to generate power.

#### **2.1.3.4 Physical Development and Urban Design**

*Objective A: To coordinate changes in the physical environment of Oahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.*

- *Plan for the construction of new public facilities and utilities in the various parts of the Island according to the following order of priority: first, in the primary urban center; second, in Ewa; and third, in the urban-fringe and rural areas.*

The project will be located in Ewa, an area targeted for growth by both the State and the City and County of Honolulu. Ewa is the site of new developments such as Ko Olina Resort and the City of Kapolei.

*Objective C: To develop a secondary urban center in the West Beach-Makakilo area.*

- *Encourage the continuing development of Barbers Point as a major industrial center.*

Construction of the AES facility in the Barbers Point area is consistent with this policy.

## **2.1.4 COASTAL ZONE MANAGEMENT (CZM) PROGRAM**

The Hawaii Coastal Zone Management Act (Act 188, SLH 1977), which became Chapter 205A, Hawaii Revised Statutes, established State policies for any actions affecting the coastal zone. Objectives and policies in seven broad categories are specified, and the relationship of the proposed project to the three that are relevant to it is discussed below.

### **2.1.4.1 Scenic and Open Space Resources**

The CZM program seeks to "protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources." As explained in section 3.8, the AES facilities will not affect significant views:

### **2.1.4.2 Coastal Ecosystems**

Another CZM objective is to "protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems." One concern here is with sediment runoff into streams and offshore waters due to erosion from the site during excavation. Due to the site's permeable soils and level terrain, runoff is not expected to pose a problem. Measures designed to retain runoff from the on-site materials storage piles are discussed in section 3.2.

### **2.1.4.3 Economic Uses**

The objective is to "provide public or private facilities and improvements important to the State's economy in suitable locations." The AES project will be located in an industrial area and is intended to support new development, such as that taking place on the Ewa plain, as well as existing utility customers.

## **2.2 STATE AND COUNTY LAND USE PLANS**

### **2.2.1 STATE LAND USE DISTRICTS**

All lands in the State have been placed in one of four land use districts (Urban, Agriculture, Conservation, or Rural) by the State Land Use Commission (SLUC). State Land Use District Boundary Reviews are undertaken by the SLUC to update its Land Use District Maps. Besides this SLUC-initiated review, provisions for applicant-initiated amendments to the district boundaries have been established in Section 205-4 of the Hawaii Revised Statutes (HRS), and further promulgated in the *State Land Use Commission: Rules of Practice and Procedure and District Regulations*(12-21-75 as amended).

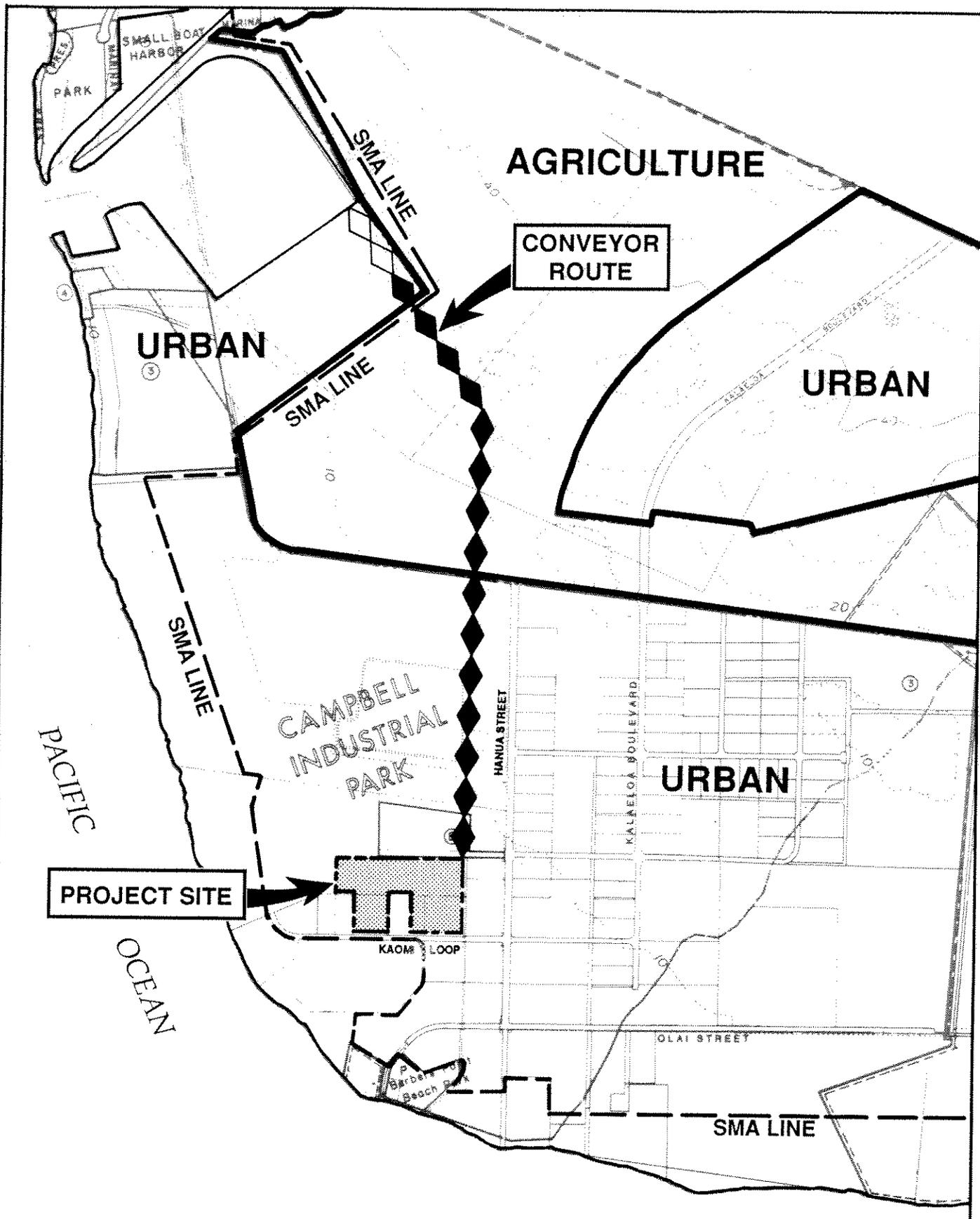
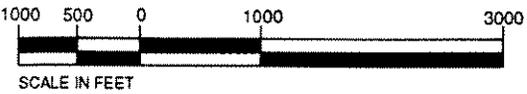
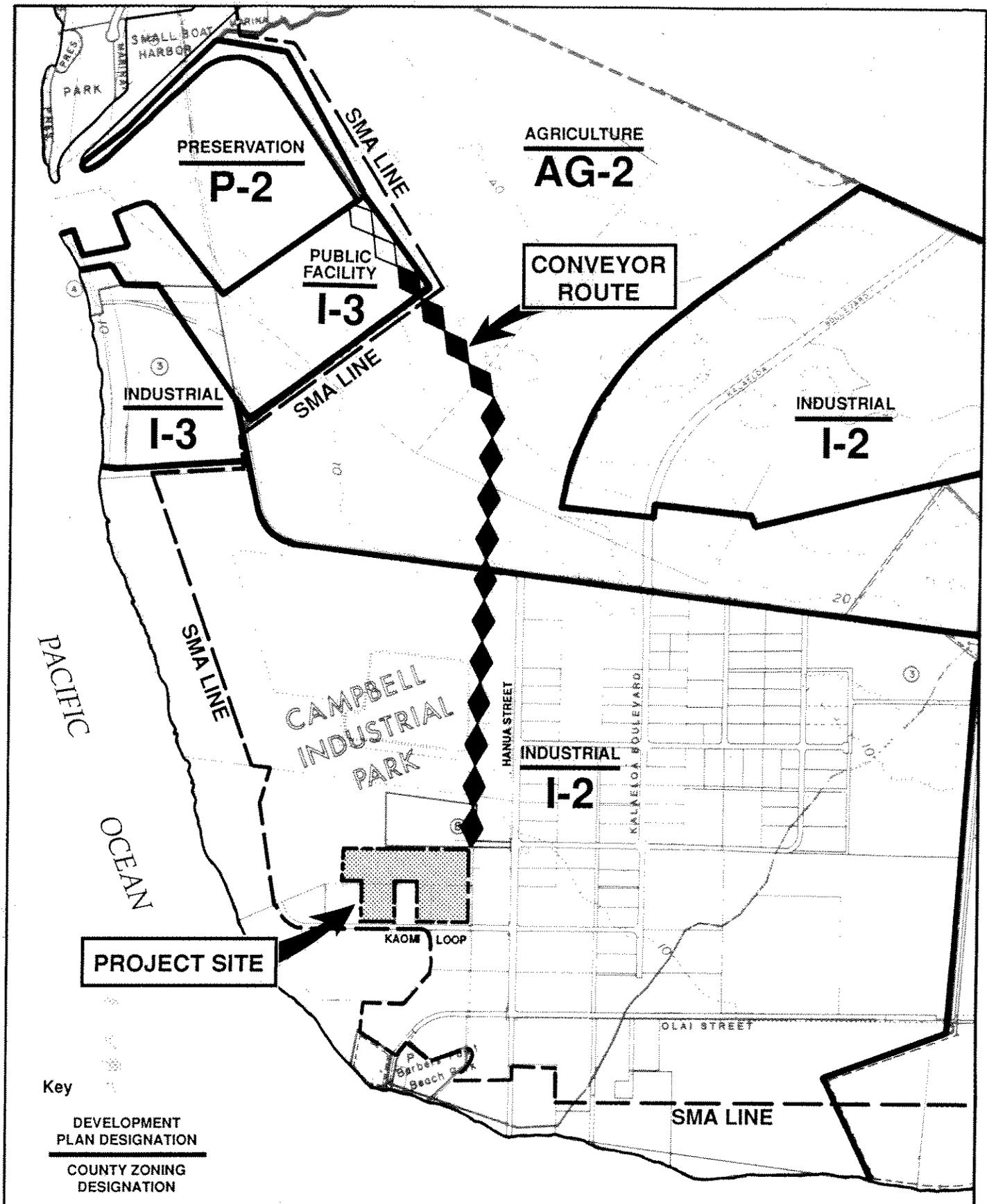


Figure 2-1  
**STATE LAND USE DISTRICT  
 BOUNDARIES**



Prepared By: BELT COLLINS & ASSOCIATES  
 Honolulu, Hawaii



The sites of the proposed power plant and part of the conveyor are in Urban designated land. These uses are permitted in the Urban District. The middle portion of the conveyor route is in the State Agricultural District. A Special Use Permit is required since the proposed uses are not "permitted" in the Agricultural District. Section 15-15-95(b) State Land Use Commission Rules and Regulations lists five guidelines that are to be used in deciding whether or not a project should be permitted as a special use in the State Agricultural District. The proposed conveyor is consistent with the guidelines as follows:

- The project is consistent with the objectives of Chapters 205 and 205A, HRS, and the rules of the Commission.
- The proposed use will not adversely affect surrounding property (see section 3.5).
- The use will not unreasonably burden the ability agencies to provide public services and facilities. A tentative agreement for water has already been reached (see section 3.2). The AES-BP will provide its own electrical power and will have its own wastewater treatment and disposal facilities.
- Unusual conditions, trends, and needs have arisen since the district boundaries and rules were established. Efficient and economical development of the CIP industrial area requires that the conveyor be constructed to link it directly with the deep draft harbor.
- The site is unsuited for the uses permitted within the district. The land is poorly suited to agricultural use, and it is virtually certain that it will never be used for that purpose.

Moreover, the Campbell Estate's long-term plan calls for this area to be converted to industrial use; hence, it is expected that the Urban District will eventually be expanded to include the entire route.

## **2.2.2 CITY AND COUNTY OF HONOLULU EWA DEVELOPMENT PLAN**

The proposed project is consistent with the policies, guidelines, and standards set forth in the City and County of Honolulu Ewa Development Plan. The site of the power plant and part of the conveyor system is designated "Industrial," while the remaining conveyor route is designated "Agriculture" on the Development Plan.

On March 21, 1989, the Honolulu City Council amended the Ewa Development Plan Public Facilities Map to show AES-Barbers Point's proposed power plant as a planned "public facility." The City and County's Chief Planning Officer has ruled that construction of the conveyor does not require an amendment to the Development Plan Land Use or Public Facilities Maps.

## **2.2.3 CITY AND COUNTY OF HONOLULU LAND USE ORDINANCE**

The City and County of Honolulu's Land Use Ordinance (LUO) regulates land use in accordance with adopted policies, including the Oahu General Plan and Development Plans. The zoning provisions of the LUO provide development and design standards relating to location, height, and size of structures; yard areas; off-street parking; open space; and the use of structures and land for agriculture, industry, business, residences, or other purposes.

The power plant and a portion of the conveyor will be constructed on land zoned I-2, General Industrial District. Type B utility installations, such as the proposed AES facility, are Type 1 Conditional Uses in this District; a Conditional Use Permit (CUP) will be required from the Department of Land Utilization. Type B utility installations are those with potential major impact

due to appearance, noise, size, traffic generation, or other characteristics. Power generating plants are included in this category. The difference between the types of Conditional Uses is essentially in the processing; a public hearing is required for Type 1 applications but not for Type 2.

A part of the conveyor system will be on land zoned AG-2, General Agricultural District, and I-3, Waterfront Industrial District. As a Type B utility installation, the conveyor is a Type 1 Conditional Use in both the AG-2 and I-3 Districts. The AG-2 designation is given to areas which are not deemed as important to the production of food, feed, forage, fiber crops, and horticultural crops as those lands in the AG-1, Restricted Agricultural District. In view of the absence of any existing agricultural activities within the project site and the extremely low agricultural potential of its soils, the present AG-2 designation seems to have been established primarily as an interim means of protecting the area from uses which would conflict with the Oahu General Plan's long term goal of using it for industrial purposes.

### **2.3 SPECIAL MANAGEMENT AREA (SMA)**

Ordinance 84-4, commonly referred to as the Special Management Area (SMA) Ordinance, makes it the policy of the City and County of Honolulu to: "Preserve, protect, and where possible, to restore the natural resources of the coastal zone of Hawaii." Towards that end, it establishes special controls over development near the ocean. Portions of the conveyor route are located within the Special Management Area. Hence, they are subject to these controls.

Section 4 of the SMA Ordinance contains review guidelines for determining the appropriateness and acceptability of proposed actions within the SMA. It allows the City to establish terms and conditions of development which insure:

- adequate access to publicly owned or used beaches, recreation areas, and natural reserves;
- adequate and properly located public recreation areas and wildlife preserves;
- adequate solid and liquid waste treatment, disposal, and management facilities and procedures; and
- minimal adverse effect from development activities.

Section 4 also stipulates that projects within the SMA may be approved only if it is determined that:

- potential adverse effects have been minimized to the extent practical;
- potential adverse effects are outweighed by public health and safety and/or a compelling public interest;
- the development is consistent with the objectives and policies of the ordinance and the guidelines contained in 205A-26, Hawaii Revised Statutes (the State's Coastal Zone Management Law); and
- the development is consistent with the County General Plan, Development Plans, Land Use Ordinance and subdivision codes, and with other applicable ordinances.

Finally, 4.C. of the ordinance requires the agency issuing the permit to seek to minimize the following (where reasonable):

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

The remainder of this section discusses the proposed conveyor's consistency with each of these SMA guidelines.

### **2.3.1 MINIMIZATION OF ENVIRONMENTAL EFFECTS**

The portion of the proposed conveyor that is within the SMA is located on land that has already been disturbed during construction of the Deep Draft Harbor. For this and other reasons outlined below, its construction and operation would not have significant adverse effects on the resources or other uses of the Special Management Area.

#### **2.3.1.1 Coastal Resources**

There will be no in-water construction as part of the proposed project. Hence, existing areas of open water will remain free of visible structures. Construction of the conveyor does not require any dredging or filling or other alteration to bays, estuaries, salt marshes, river mouths, sloughs, or lagoons. No major drainage channels lie along the SMA portion of its route. Similarly, no beaches or other resources usable for public recreation are present within the conveyor right-of-way. Hence, the proposed project would not have any adverse effect on these coastal values.

The conveyor will be covered throughout its entire length. Hence, there will be no opportunity for runoff-generating rainfall to contact the material being transported. Ground disturbance within the conveyor right-of-way will be limited to the footings for the conveyor and the fences, and the change in impermeable surface will be slight. Consequently, there will be no significant change in water quality.

Because the conveyor will not physically disturb them and will not change the quantity or quality of surface runoff or groundwater recharge, it will not affect existing or potential fisheries or fishing grounds. Similarly, it will not affect significant coastal wildlife habitats.

Finally, the conveyor route is through land planned for urban use which is unsuited for farming or other agricultural uses. Consequently, its use for the conveyor will not adversely affect agricultural production.

### **2.3.1.2 Public Access**

At its closest, the proposed conveyor will be at least 500 feet from the water's edge. All roadway crossings will be above- or below-grade. Hence, erection and operation of the conveyor would not restrict public access to tidal or submerged lands, beaches, rivers, or streams.

### **2.3.1.3 Coastal Views**

The conveyor itself stands only 7 feet tall. At its highest point, (i.e., where it is elevated for road and drainageway crossings), its top will be less than 40 feet above-grade. In general, most of the portion within the SMA will be at grade, with the highest point reaching less than 40 feet above ground. At their closest, Farrington Highway and the H-1 Freeway are over 1.5 miles northeast of the conveyor. Moreover, dredged spoils from harbor construction already partially block the view of the conveyor alignment, and the industrial buildings that will eventually be built in Phase II of the industrial park will eventually block the view of the remainder. Consequently, the conveyor would not substantially interfere with or detract from the line of site toward the sea from the State highway nearest the coast.

### **2.3.1.4 Waste Treatment and Disposal**

The proposed conveyor is powered by electrical motors located in the transfer stations at its ends. The remainder consists only of the support structure, rollers on which the conveyor moves, and the belt itself. The conveyor itself does not generate liquid or solid wastes. The bag house at the transfer station does accumulate dust. This will be collected periodically and returned to the coal handling system within the power plant for combustion in the boiler.

## CHAPTER 3 PROBABLE IMPACTS AND MITIGATION MEASURES

This chapter focuses on the environmental effects likely to result from construction and operation of the proposed power plant, harbor facilities, and conveyor. It is divided into the following sections:

- topography, geology, and soils;
- hydrology and water use;
- noise;
- air quality;
- land use;
- historical, paleontological, and archaeological resources;
- biological resources;
- scenic and visual resources;
- recreation;
- air navigation;
- transportation; and
- regional economic impact.

### 3.1 TOPOGRAPHY, GEOLOGY, AND SOILS

#### 3.1.1 TOPOGRAPHY

Campbell Industrial Park is located on the seaward portion of Oahu's Ewa Plain. The power plant site is relatively level, with ground elevations ranging from 8-feet above sea level at its makai end to 14 feet above sea level along Hanua Street. Small depressions associated with the sinkholes common throughout the Ewa Plain are evident in a few areas, but most of the sinkholes that were probably once present on the project site were filled when the site was graded during the 1960s. No significant changes to the topography are needed to construct the power plant.

The conveyor route crosses the naturally level terrain of the Ewa Plain. The route avoids the 20- to 30-foot high piles of dredge spoils that occupy some of the area between the harbor and the developed portions of the industrial park. Moreover, the conveyor itself will be constructed on small footings that can readily be adjusted to accommodate uneven terrain. Consequently, its construction will require little mass grading.

#### 3.1.2 GEOLOGICAL SUITABILITY FOR PROPOSED USE

##### 3.1.2.1 Geological Overview

The Island of Oahu is a volcanic doublet formed by the Waianae Volcano on the west and the Koolau Volcano on the east. Each is the remnant of a large shield volcano which has been eroded into a long, narrow ridge. Lava from the Koolau Volcano, the younger of the two, banked against the already-eroded flank of the Waianae Volcano.

The Ewa Plain is composed of interbedded layers of coral reef formations, marine sediments, and alluvium overlying basaltic lava from the Waianae Volcano (see Section 3.2 for schematic cross-sections). The sediments are piled as a wedge on the sloping volcanic basement and are approximately 1,000 feet thick at the shoreline. The sediments are referred to as "caprock" because at its contact with the volcanic basement it is poorly permeable and inhibits the escape of groundwater from the basalt aquifers. Fossil reef limestone is exposed on about two-thirds of the surface of the Ewa Plain, including all of the Campbell Industrial Park.

### 3.1.2.2. Seismicity and Volcanism

The eruptive activity that formed Oahu occurred during three distinct periods. Potassium-argon dating indicates that the lavas that form the Waianae Volcano are the oldest, having been laid down between 3.5 and 2.75 million years ago. Dating of lavas from the Koolau Volcano gives ages between 2.5 and 2 million years old (McDougall, 1964). The third eruptive period, which produced the vents in the Honolulu Volcanic Series, began about 1 million years ago; the most recent eruptive activity that has been scientifically dated ended at least 30,000 years ago. These last eruptions were concentrated near the shoreline on the southeasternmost part of the island between Koko Head and Manana (Rabbit) Island (Gramlich et al., 1971). The nearest of the vents in this group is approximately 20 miles from the project site.

Mullineaux et al. (1987) conclude that the possibility that additional eruptions may occur on Oahu is small, but cannot yet be completely discounted. However, they anticipate that if such activity were to occur, it would most likely be at the eastern end of the island. In view of this, the danger to the project site is considered insignificant.

A seismic risk map of the Hawaiian islands was compiled by the U.S. Coast and Geodetic Survey in 1949 as part of a nationwide study. All of Oahu was placed in Zone 1, the next-to-lowest risk category. The maps were later withdrawn as a result of objections to the way in which some of the boundaries were drawn, but the map has continued to be used as the basis for the seismic design standards contained in the City and County of Honolulu Building Code.

Furumoto et al. (June 1972:43) note that the current classification probably assumes that the April 2, 1968 quake centered in Kau on the Island of Hawaii is the most severe event likely to affect Oahu. They argue that this may not constitute the most serious threat to the island and suggest that it might be wise to upgrade Oahu to a Zone 2 classification. In a series of more recent reports, Cox (January 1985a and b; August 1986; 1986a,b and c) has assembled and analyzed a large amount of data concerning the intensity and frequency of earthquakes felt on Oahu. The final report in the series, which addresses the appropriate seismic design standards for Oahu, is now in preparation, but was not available at the time this was written. However, a review of the data suggests that Cox may also recommend an upgrade in the seismic design standards, although not necessarily for the reasons put forth by Furumoto.

AES-BP intends to construct the proposed facilities using the structural design standards incorporated in the building code at the time the foundation and structural plans for the project are approved. This will insure a reasonable level of protection for the persons working in the power plant and for the generation capacity that it represents.

### 3.1.2.3 Foundation Conditions

No site-specific foundation studies have yet been done on the project site. Soils engineers familiar with adjacent areas indicate that bearing capacities are typically on the order of seven tons per square foot. Because of the numerous sinkholes and solution channels present in the limestone, it is normal practice to investigate the proposed location of column footings by boring or other methods. When voids are discovered, they are filled with concrete grout. These conditions do not impose any unusual design constraints or potential risks on the proposed facilities.

### 3.1.2.4 Mineral Resources

With the exception of limestone, there are no known exploitable mineral resources along the conveyor route or on the power plant site. Limestone is readily available from other sources. Hence, the site's use for a power plant will not significantly reduce the supply of this resources.

### 3.1.3 SOILS

#### 3.1.3.1 Suitability of Soils for the Proposed Use

The power plant and other facilities would be constructed on an area designated by the U.S. Soil Conservation Service as "Coral Outcrop." Coral or cemented calcareous sand typically cover about 80 percent of the surface in such areas; the remainder is covered by a thin, friable red soil material that has accumulated in cracks and depressions. This soil type is poorly suited to agriculture. It is well suited to urban uses, except that the presence of solution cavities in the underlying limestone necessitates careful foundation design where heavy loads are to be imposed.

#### 3.1.3.2 Lost Agricultural Potential of Soils

As indicated by the following summation, there is general agreement that the agricultural potential of areas designated "Coral Outcrop" is extremely poor:

- The Soil Conservation Service Land Capability Rating for the soil is VIII. This is the lowest in the rating system and indicates that it is unsuitable for commercial agriculture.
- None of the area that would be occupied by components of the project is designated as "Agricultural Land of Importance to the State of Hawaii."
- The Land Study Bureau of the University of Hawaii gives coral outcrop areas an overall productivity rating of "E", the lowest in their "A" to "E" classification system.
- The proposed Land Evaluation and Site Assessment (LESA) system, which evaluates the agricultural potential of land based upon soil characteristics, location, and existing and planned area land use, does not identify the land needed for the proposed facilities as having a significant agricultural value.

In view of this, it appears that the project will not have an adverse impact on agricultural productivity.

### 3.2 HYDROLOGIC AND WATER USE IMPACTS

#### 3.2.1 LISTING OF POTENTIAL IMPACTS

The proposed facilities have the potential to affect the hydrologic environment in the following ways:

- by consuming potable water from the Honolulu Board of Water Supply (BWS) system for industrial and domestic uses;
- by increasing the volume of surface runoff from the 28.5-acre project site;
- by withdrawing large volumes of saline groundwater for cooling purposes; and
- by disposing heated cooling water and treated industrial and domestic wastewater in onsite injection wells.

The significance of these potential impacts is discussed below. Diagrams of the water mass balance (Figure I-8) and site plan (Figure I-4) presented previously will be useful references throughout this discussion.

### 3.2.2 POTABLE WATER USE

Estimated average potable use will be 291,000 gallons per day (GPD). A small amount of this, 4,000 to 5,000 GPD, will be for human consumption by the power plant's staff. The balance of the supply will be for industrial uses and landscape irrigation. Supply to the plant's demineralizer will be the largest component of industrial use.

A joint water agreement is currently being negotiated among the Board of Water Supply (BWS), the Hawaiian Electric Company (HECO), and the James Campbell Estate. Key aspects of the negotiation are:

- conversion of HECO's Waiau Wells and Tunnel System from its present power plant cooling use to a new potable source for the BWS;
- construction of a collecting sump with pumps and connecting pipelines and related facilities from the Waiau Tunnel;
- construction of a pipeline from the collection sump to the BWS system;
- conversion of certain service water systems in the Waiau Power Plant from well water to seawater sources; and
- water commitments from the BWS to Campbell Estate and HECO (on behalf of AES Barbers Point).

Over the short term, the water can be delivered to the power plant using existing facilities; however, additional transmission and storage facilities may be needed to serve the project on a permanent basis.

### 3.2.3 DISPOSAL OF SURFACE RUNOFF

The 28.5-acre site is totally within JCIP. As such, its stormwater runoff has been accounted for in the sizing of open channels and other elements of the JCIP drainage system. To achieve adequate conveyance capacity in JCIP's very flat terrain, this system is generally comprised of open channels located within drainage easements rather than buried pipe conduits within roadways.

Two existing drainage channels may be utilized by the project. One of these is 2000 feet long. It begins within the west side of the project site and extends westward to the shoreline. A minor realignment of the upper end of this channel within the project will be necessary. The channel is irregularly shaped but approximately four feet deep and 10 to 20 feet wide for the portion which crosses the site. It progressively widens to about 30 feet enroute to the shoreline. The drainage easement which contains the channel is 30, 50, and then 65 feet wide. Campbell Estate retains responsibility for its maintenance. Keeping the channel open at the shoreline is a continuous problem because runoff events are infrequent, the velocity of flow in the channel is low, and waves at the shoreline continually build and maintain a sand berm across the channel mouth. When shoreline discharge of runoff is inhibited by the berm, flooding of the lowlying, undeveloped nearshore parcel occurs. While this land now functions as a retention basin, consistent maintenance of the channel mouth will be required if and when the parcel is occupied by an industrial use.

The other available drainage channel is located along the eastern boundary of the project site. It runs south for approximately 2,300 feet to the shoreline. Its discharge point on the east side of a 7.4-acre City & County park has a similar, ongoing problem of a wave-built sand berm forming across its mouth. Since most of the parcels adjoining this channel are occupied by tenants, the sand must be routinely removed.

### **3.2.4 SUPPLY AND RE-INJECTION OF SALINE GROUNDWATER**

The withdrawal of saline groundwater from the underlying limestone for cooling purposes and its re-injection along with treated industrial and domestic wastewater streams will be the most hydrologically significant aspect of the project. This supply and disposal scheme is designed to take advantage of the very good permeability of the limestone, its vertical stratification into physically separate layers, and the fact that the saline content of its groundwater makes it suitable only for cooling and other uses which are not quality-dependent. The discussion of this supply and disposal scheme is presented in four parts: hydro-geologic structure; design of the source wells; design of the disposal wells; and anticipated impacts.

#### **3.2.4.1 Hydro-Geologic Structure**

The Ewa Plain is comprised of a sequence of permeable limestone aquifers separated vertically by layers of calcareous muds which function as aquicludes. The depths and correlations of these layers among wells and test borings are summarized in Table 3-1. Figures 3-1, -2, and -3 present a graphical interpretation of this data. Further discussions of this structure in varying levels of detail can be found in Mink, Yuen, & Chang (1988), Dames & Moore (1972), and Dames & Moore (1986). Coring and pump testing on the nearby Conoco-Dillingham site in 1972 was the first field demonstration of the hydrologic separation of the upper two aquifers. Design of the adjacent HPOWER source and disposal wells is based on this condition. AES-BP will undertake a full-scale test of prototype source and disposal wells shortly to fully demonstrate the viability of the concept. However, available evidence provides confidence regarding its success.

The Ewa Plain as a whole can generally be characterized as an accumulation terrestrial and marine sediments in the form of a wedge resting on a sloping volcanic basement. On the east side of the Ewa Plain approximately eight miles from the project site, the thickness of the sediments near the shoreline is established by bore hole T-133 to be approximately 1,100 feet. The deepest bore hole on the west side near the project is 300 feet, not deep enough to reach the volcanic basement. Projections of the inland, exposed slope of the Waianae mountain suggest they may be 600 to 800 feet deep on this side. Accumulation of this formation in physically distinct layers appears to have begun initially by island subsidence and then been continued by transgressions and regressions of sea level during interglacial and glacial epochs.

As established by the 1972 Conoco-Dillingham test boring, the HPOWER source and injection wells, and the Reynolds injection wells, the uppermost 250 to 300 feet of the caprock beneath the project site is comprised of two coralline aquifers and two sedimentary aquicludes. The upper aquifer will be utilized to supply the cooling water. The lower aquifer will be used for disposal by gravity injection. These aquifers are separated by a 40- to 50-foot thick layer of calcareous silt and clay.

Table 3-1

## Data From Selected Wells and Test Borings on the Ewa Plain

Well or Test Boring		Ground Elevation (Feet)	Total Depth (Feet)	Formation Thickness in Vertical Sequence From Ground Level				Depth to Volcanic Basement (Feet)
Name / Owner	State Number			Aquifer 1 (Feet)	Aquiclude 1 (Feet)	Aquifer 2 (Feet)	Aquiclude 2 (Feet)	
Conoco - Dillingham	1806-07	10	300	150	41	50	30	Not Reached
HPOWER IW-1	none	12	256	157	32	50	--	Not Reached
Reynolds Aluminum	none	20	250	95	40	30	35	Not Reached
Ewa Mill Pump 9	2002-01 to -08	46	550	104	20	105	95	410
U.S. Navy	2100-01	15	362	25	67	Unable to determine from log		Between 270 and 345
Ewa Plantation Co.	2059-01	16	972	165	Unable to determine from log			730
T-133	1959-05	5	1100	212	41	106	136	1070
T-134	2100-02	20	525	87	39	24	94	508

Source: Well data in the office files of the U.S. Geological Survey and the State Division of Water and Land Development.

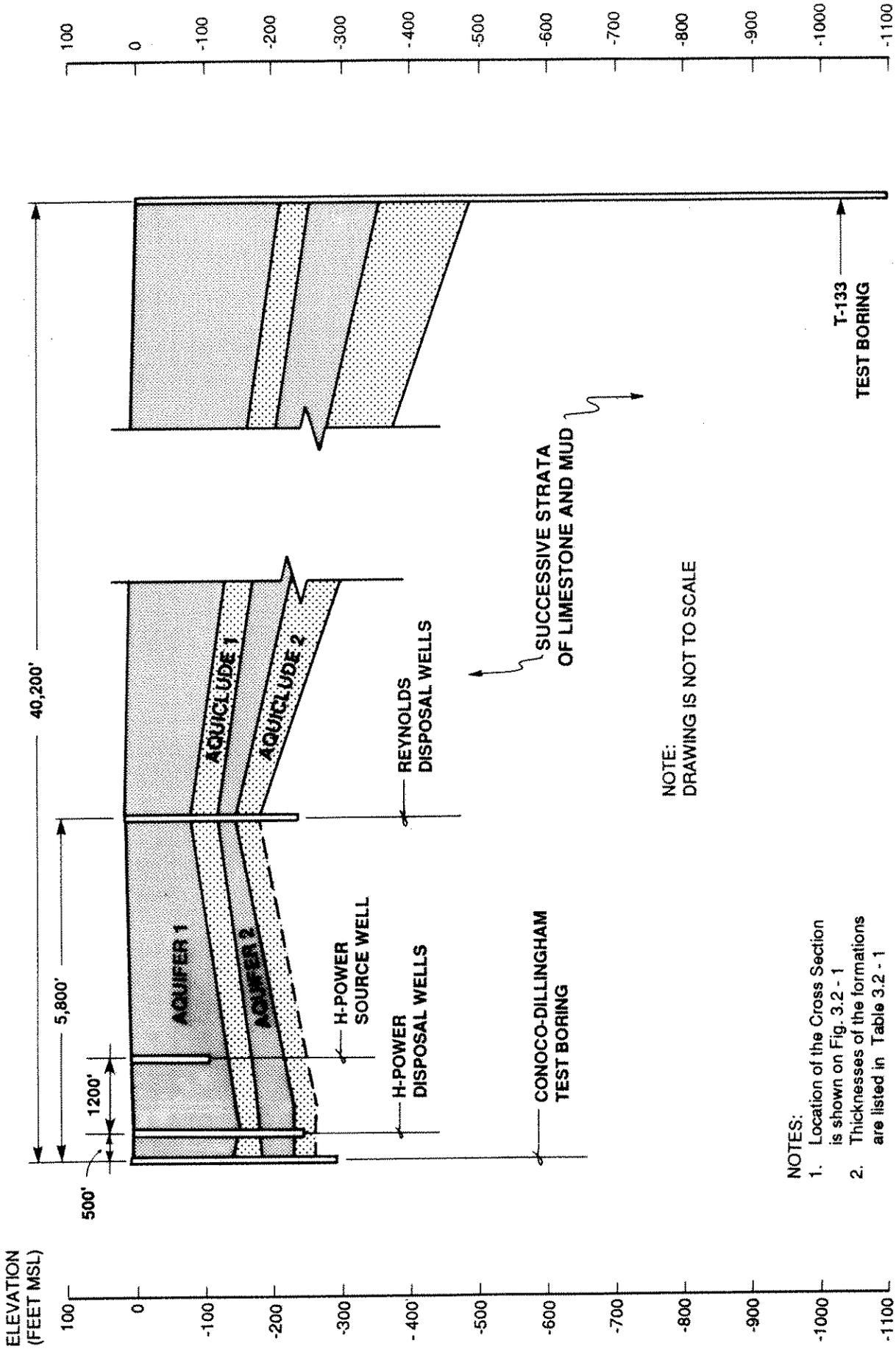
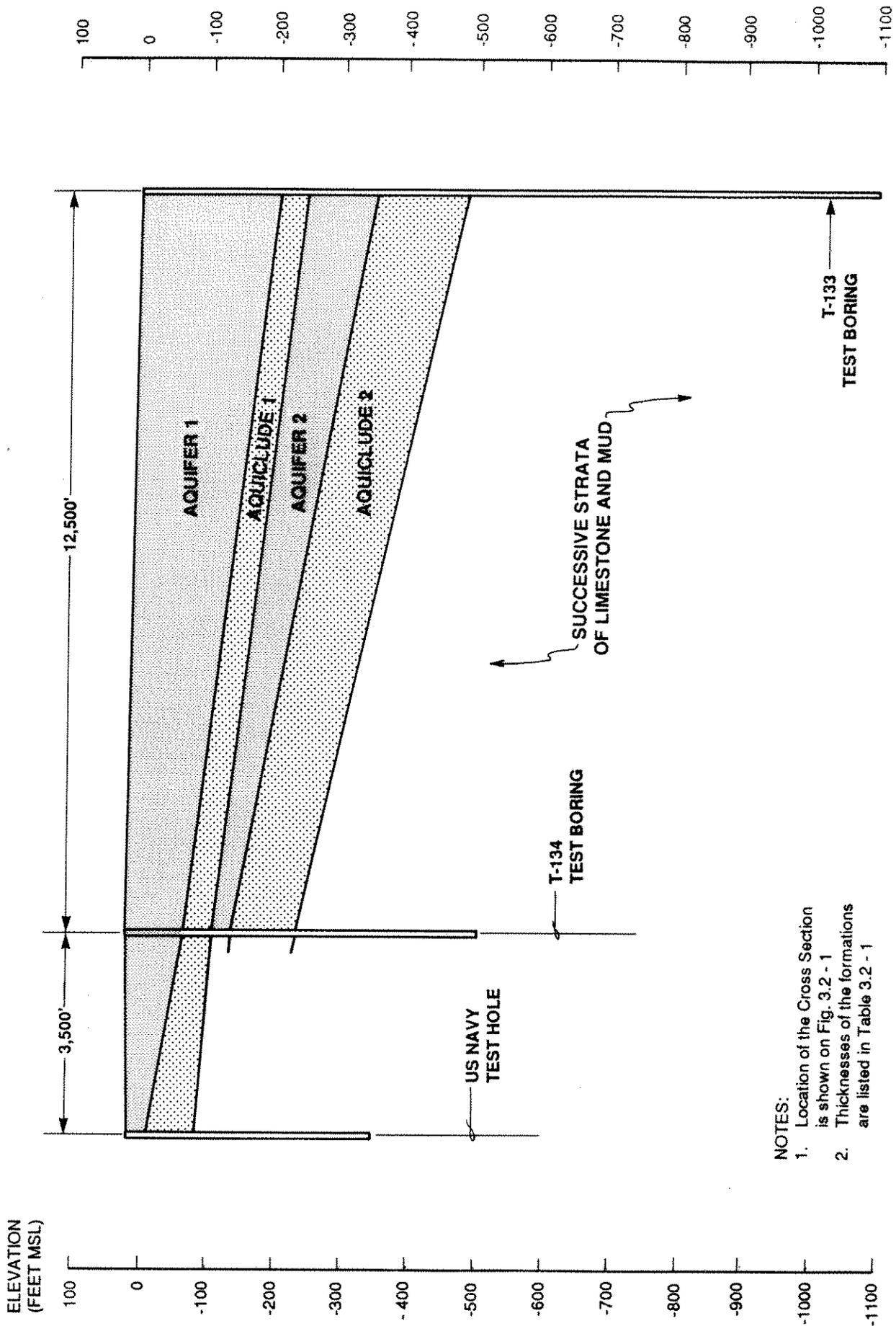


Figure 3-1  
SECTION AA' ACROSS  
THE EWA PLAIN

- NOTES:
1. Location of the Cross Section is shown on Fig. 3.2 - 1
  2. Thicknesses of the formations are listed in Table 3.2 - 1



- NOTES:
1. Location of the Cross Section is shown on Fig. 3.2 - 1
  2. Thicknesses of the formations are listed in Table 3.2 - 1

Figure 3-2  
SECTION BB' ACROSS  
THE EWA PLAIN

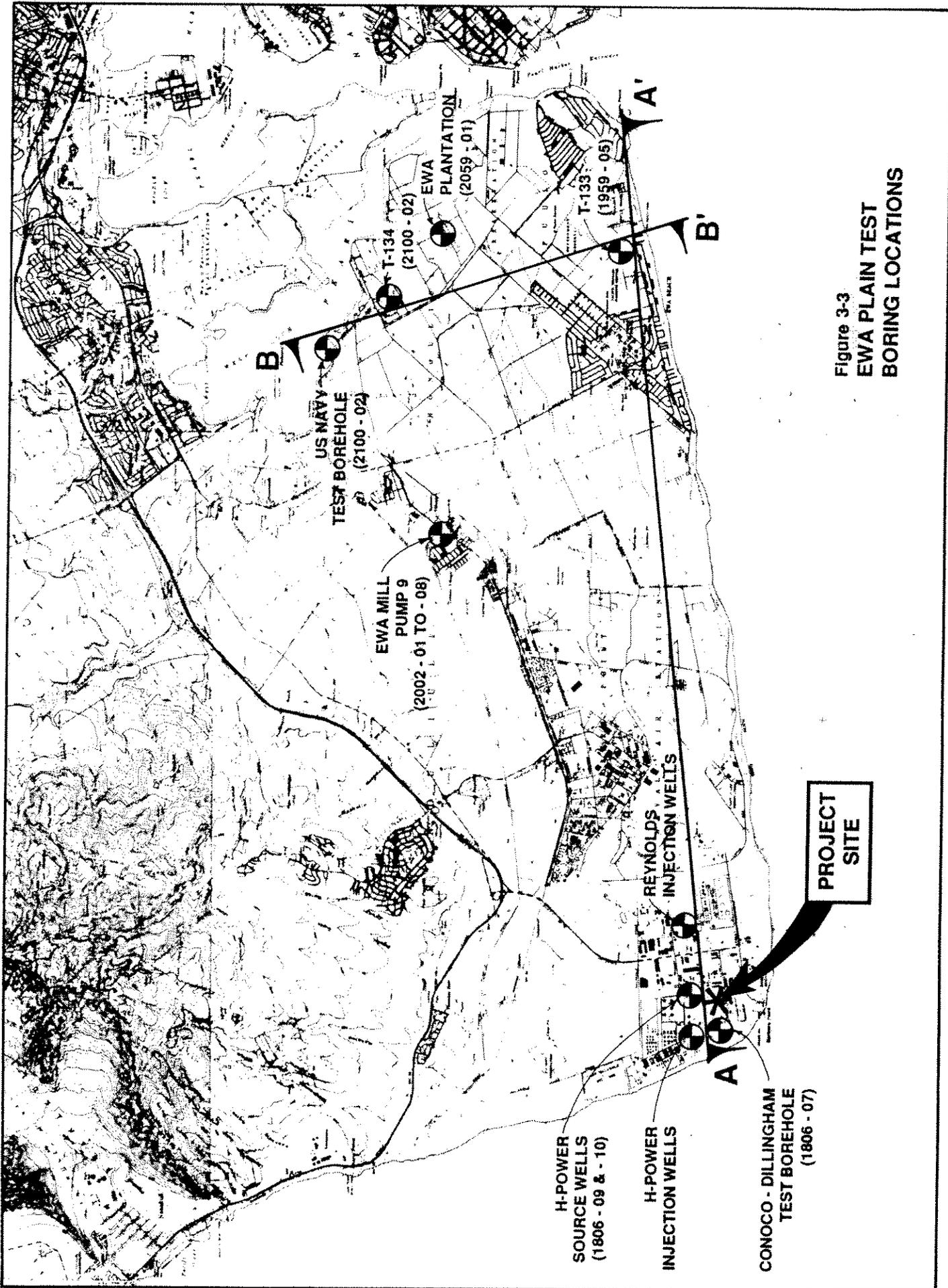


Figure 3-3  
EWA PLAIN TEST  
BORING LOCATIONS

#### **3.2.4.2 Design of the Cooling Water Supply Wells**

The uppermost limestone aquifer will supply the cooling water. This formation is approximately 150 feet thick beneath the project site. Based on data from the Conoco-Dillingham borehole and HPOWER wells, the salinity of its water is typical of a brackish basal lens: 5 to 6 parts per thousand (PPT) from the water surface at +2 feet to a depth of (-)15 feet; a transition zone from (-)15 to (-)40 feet in which salinity rapidly increases from 6 to 30 PPT; and a very gradual salinity increase from 30 to 34 PPT to a depth of (-)140 feet. All of the water in this aquifer, extending inland above Malakole Road, is too salty for irrigation or other quality-dependent uses.

Four cooling water source wells will be located near the middle of the project site. They will be approximately 50 feet apart and over 500 feet southwest of the HPOWER cooling water wells and will draw from the same aquifer as those wells. Each will have a depth of 110 to 140 feet. The upper 60 feet of their 16- or 18-inch casings will be solid; the lower 50 to 80 feet will be perforated. Each well will be outfitted with a 3,000 GPM capacity pump. Based on test results of nearby wells, drawdowns of four to six feet at these rates are expected. Table 3-2 summarizes the constituent concentrations of water from the HPOWER source wells and seawater. It is expected that the salinity of water pumped from the project's wells will be close to or identical to seawater. It is also expected that the variations from seawater of some of the major cations which were found in water pumped the HPOWER wells will also exist in the project's wells. The significance of these concentrations is that the wells will be utilizing seawater which has been drawn to the site through the limestone formation.

A permit to drill and test the cooling water source wells has been granted by the State Water Commission. After drilling and pumpage tests are completed, a water use permit application will be submitted. Permits for the other source wells will also be handled in a two-stage process.

#### **3.2.4.3 Design of the Gravity Injection Wells**

The second limestone aquifer in vertical sequence will be utilized for disposal by gravity injection. The approximate depths of this 50-foot thick formation are from (-)190 to (-)240 feet beneath the project site. Data on the quality of water in this second aquifer is not available. In an underlying aquifer, the third in vertical sequence, the chloride concentration in the 1972 Conoco-Dillingham test boring was 19,560 milligrams per liter, essentially equivalent to or slightly higher than seawater. It is reasonable to assume that a similar salinity exists in the second aquifer.

Based on an expected 2,500 GPM disposal capacity for each well, three wells will provide sufficient capacity, and a fourth should be installed to provide standby. These wells are expected to be about 300 feet apart and will be located at the west end of the site. They will be approximately 750 feet from the project's supply wells and a minimum of 300 feet south of HPOWER's nearest disposal well. Each well will be approximately 240 feet deep. Solid casing with grouted annular space will extend to a depth of 190 feet. The 50 feet below that will be open hole unless a caving formation requiring installation of a well screen is encountered. Based on test results of the HPOWER disposal wells, head build-up of four to seven feet at each well during injection disposal is expected. A two step permit from the State Department of Health's Underground Injection Control (UIC) program is required for these wells. The initial permit submittal has already been made.

The expected quality of the re-injected wastewater is summarized on Table 3-3. Blowdown from the cooling system will comprise approximately 98 percent of the wastewater flow so its physical and chemical characteristics will dominate the wastewater stream. However, each of the wastewater components is discussed below.

**Table 3-2 Water Quality of the HPOWER Cooling Water Wells and Seawater**

Parameter	Units	HPOWER Supply Wells <sup>1</sup>	Seawater <sup>2</sup>
Total Dissolved Solids	MGL	30,920	34,500
Chloride	MGL	17,060	18,980
Nitrate (as NO <sub>3</sub> )	MGL	5.9	0.05 to 3.0
Phosphate (as PO <sub>4</sub> )	MGL	0.2	0.003 to 0.3
Sulfate (as SO <sub>4</sub> )	MGL	2,410	2,650
Iron	MGL	0.13	0.002 to .02
Manganese	MGL	0.05	0.001 to 0.01
Copper	MGL	0.05	0.001 to 0.01
Lead	MGL	0.25	0.004
Arsenic	MGL	0.05	0.01 to 0.02
Selenium	MGL	0.01	not available
Chromium	MGL	0.05	not available
Silica (as SiO <sub>2</sub> )	MGL	1.9	0.04 to 8.6
Sodium	MGL	6,820	10,560
Potassium	MGL	560	380
Magnesium	MGL	1,840	1,270
Calcium	MGL	460	400

<sup>1</sup> Water analysis of July 1986 by Industrial Analytical Laboratory. Results in the table are an average of six samples, three each from HPOWER wells SW-1 and SW-2.

<sup>2</sup> Seawater concentrations are from Sverdrup, Johnson & Fleming (1963:176-177).

- Cooling Tower Blowdown. Saline cooling water will be recycled through wood frame, mechanical-draft cooling towers at a rate of about 65,000 GPM. Blowdown of approximately 6,000 GPM will be necessary to keep the salinity of the cooling water at an acceptable level. Blowdown water will be heated (up to 120 degrees F. vs. 80 degrees F. of the makeup supply) and also more saline (42 PPT vs. 34 PPT of makeup water). The salinity enrichment is due to the evaporative loss of water but not salt at the cooling towers.
- Neutralization Basin Discharge. This basin will provide neutralization treatment for demineralizer blowdown, preboiler and boiler chemical cleaning waste, chemical feed and storage area drains, and laboratory drains. Demineralizer waste will comprise 95 percent of the 21 GPM average discharge.
- Discharge From Plant and Equipment Drains. Discharge from these drains will pass through oil separators before being introduced into the injection disposal system. Captured oil will be periodically removed from the separators and sent to a recycling facility.
- Steam Cycle Blowdown. The steam cycle blowdown is necessary to maintain water purity in the boiler. However, this blowdown is actually very low in chemical constituents.
- Coal, Limestone, and Ash Pellet Pile Runoff. These storage piles will be located outdoors, with all runoff directed to stormwater runoff basins. The basins will be designed to impound runoff from a 10-year, 24-hour storm to allow settling of suspended material prior to its discharge into the injection disposal system. In the event of a more severe storm, excess runoff will overflow to JCIP's surface drainage system.
- Sanitary Wastewater. Sanitary wastewater will receive secondary treatment and chlorination in a small on-site package plant prior to its discharge into the injection disposal system.

#### 3.2.4.4 Anticipated Impacts of the Saline Water Supply and Disposal Scheme

The effects of the proposed supply and disposal will be to increase the salinity in the uppermost limestone aquifer, to increase both the salinity and temperature in the underlying, second limestone aquifer, and to cause the dispersion of heat into the ocean environment by offshore discharge from the second aquifer. There may also be some minor interference effects by the project's wells on the nearest existing wells on adjacent parcels. None of these effects are considered significant. The basis for this judgement is explained below. It should be noted that since the hydrologic separation of the limestone aquifers from the underlying basalt aquifer is an established fact, no impact to the basalt aquifer will occur.

The cooling water supply wells will remove an average of 10.6 MGD from the uppermost limestone aquifer. Since this is greater than the aquifer's freshwater recharge rate (Mink, Yuen, & Chang, 1988), seawater intrusion and a consequent rise in aquifer salinity must occur. Since this project is one of three power plants to be located in the makai end of JCIP, and since there are similar uses elsewhere in JCIP, a progressive increase in the salinity of portions of the aquifer is expected. However, because the value of this groundwater resource is not associated with its salinity, this change is not significant. The water is already too salty for irrigation or other salinity-dependent uses, and this fact is embodied in the controls of the resource established by regulating agencies and the landowner, Campbell Estate. The State Department of Health's Underground Injection Control (UIC) line is 3,000 feet inland on Malakole Road. While the State Water Commission is currently considering maximum pumping limits for sectors of the Ewa "caprock" aquifer, no limits have been proposed for this portion of the aquifer in recognition of

its present quality. The value of this groundwater resource is primarily for cooling and fire protection. The proposed use will not diminish this value.

The proposed disposal by gravity injection will be confined to the second aquifer by the existence of calcareous mud layers above and below. In general, the injected water will mix with the ambient groundwater on its way to shoreline discharge. It is expected that the receiving limestone will respond as a confined aquifer, resulting in a flow pattern which will generally be conical shaped toward the shoreline. The upgradient stagnation point might be on the order of one hundred to several hundred feet from the well. Downgradient, the width of discharge might be several hundred to several thousand feet. However, it is not presently possible to estimate these dimensions more specifically. Although the aquifer's thickness and permeability can be estimated reasonably, the flow pattern is also dependent on the aquifer's prevailing pressure gradient; data for this is not available. If it is assumed that hydraulic separation of the upper two aquifers is complete, the prevailing flow through the lower aquifer would be minimal to non-existent and its pressure gradient would be extremely flat. In this case, greater distance to upgradient stagnation and a wider discharge offshore would prevail.

Maximum potential interference of the project's wells on the nearest existing wells, those at the adjacent HPOWER site, can be estimated using steady-state flow equations and the permeabilities computed during pump and injection tests of the HPOWER wells. The supply wells will fully penetrate the 140-foot thick, upper confined aquifer which has an approximate permeability of 5,000 feet per day. When three of the project's wells are operating at an average of 3,000 GPM each, estimated aquifer drawdown in the nearest HPOWER well 300 feet away will be 0.7 to 1.1 feet. This magnitude will not significantly affect its operation.

The disposal wells will be discharging into the 50-foot thick second limestone layer; it has an estimated permeability coefficient of 2,500 feet per day. Typically, all four disposal wells will be operating to dispose of a total of 6,000 GPM. These wells will be 300, 600, 900, and 1,200 feet away from the nearest HPOWER disposal well. Computed combined buildup in the HPOWER wells is 1.6 to 2.4 feet. It should be noted that the permeability coefficients used for this computation are conservative. For example, permeability coefficients computed for the 1972 Conoco-Dillingham borehole were an order of magnitude greater. Consequently, the actual build-up is not likely to be as large as estimated here.

The travel time from the disposal wells to their ocean discharge will be on the order of several months. The water will be diluted and cooled by the ambient groundwater prior to discharge. The thermal effects of the discharge will then be quickly dissipated in the ocean environment.

### **3.3 NOISE IMPACTS**

The proposed power plant is a major industrial facility containing numerous noise sources. The harbor unloading facilities and the conveyor that will be used to transport coal, limestone, and ash pellets between the harbor and the power plant site will also generate noise. Black & Veatch (January 1989) assessed the magnitude and significance of this noise. Their analysis involved:

- characterizing existing noise in the vicinity of the proposed facilities;
- determining noise levels allowed by Federal, State, and City & County regulations;
- estimating the probable noise impacts from the generation and harbor facilities; and

Table 3-3

Anticipated Quantity and Quality of Gravity-Injected Wastewater

Parameter	Units	Components of the Wastewater Stream										Combined Discharge
		Cooling Tower Blowdown	Neutralization Basin Discharge	Plant and Equipment Drains	Steam Cycle Blowdown	Coal, Limestone, and Ash Pellet Pile Runoff	Sanitary Wastewater					
Quantity												
Average Flowrate	GPM	6,984	28	28	37	11	3	7,091				
Percent of Total	%	98.50	0.39	0.39	0.52	0.16	0.04	100.00				
Chemical Content												
Chloride	MGL	24,730	706	138	0	*	138	24,360				
Sulfate (SO <sub>4</sub> )	MGL	3,494	6,252	60	0	2,803	60	3,470				
Nitrate (NO <sub>3</sub> )	MGL	11	54	10	0	*	10	11				
Silica (SiO <sub>2</sub> )	MGL	3	368	72	0	*	72	5				
Lead	MGL	0.36	*	*	*	0.01	*	0.357				
Arsenic	MGL	0.07	*	*	*	0.01	*	0.071				
Selenium	MGL	0.01	*	*	*	0.18	*	0.015				
Chromium	MGL	0.07	*	*	*	0.01	*	0.071				
Mercury	MGL	*	*	*	*	0.01	*	0.005				
Cadmium	MGL	*	*	*	*	0.01	*	1.6x10 <sup>-5</sup>				
BOD	MGL	*	*	*	0	1,150	30	2				
COD	MGL	*	*	*	0	6,000	30	10				
Sodium	MGL	9,890	5,023	110	10	*	110	9,760				
Potassium	MGL	810	20	4	0	*	4	800				
Magnesium	MGL	2670	87	17	0	4	17	2,630				
Calcium	MGL	670	88	17	0	*	17	660				

\* This symbol indicates that no data are available on this constituent in the particular wastewater stream. However, the concentration is expected to be low and will not contribute significantly to the combined wastewater discharge.

- evaluating compliance with all applicable ordinances and regulations.

The results of Black & Veatch's analysis are summarized below.

### 3.3.1 NOISE DESCRIPTORS AND LAND USE COMPATIBILITY

Scientists have developed a wide variety of noise descriptors. In recent years, the "Day-Night Sound Level" (Ldn) has become the most frequently used. It is the 24-hour average sound level in which nighttime (10:00 p.m. to 7:00 a.m.) noise levels are increased by 10 decibels before calculating the 24-hour average. Ldn has been recommended by the American National Bureau of Standards (May 29, 1980) for determining of land use compatibility.

The Ldn levels typical of different kinds of neighborhoods are illustrated in Table 3-4. The table shows that noise levels of Ldn 60 and above are common along city streets with traffic volumes in excess of 2,500 vehicles per day. Ldn values of 65 to 70 are typical of city business districts where vehicular noise is the dominant noise source.

Noise limits contained in the State Department of Health (DOH) Public Health Regulations and in the City and County of Honolulu's Land Use Ordinance (LUO) (see Table 3-5) do not use the Ldn metric. Instead, they express noise limits in terms of maximum allowable decibels (dB). In general, they prohibit noise levels in excess of 70 decibels at the property line and establish limits (by octave band) on the noise levels that a project may cause in noise-sensitive locations (such as residential areas).

**Table 3-4. Typical Average Day-Night Sound Levels.**

<u>Type of Area</u>		<u>Ldn</u>
Rural (Undeveloped)		35
Rural (Partially Developed)		40
Quiet Suburban	45	
Normal Suburban		50
Urban		55
Noisy Urban		60
Very Noisy Urban	65	

Source: National Research Council, National Academy of Sciences (1977)

**Table 3-5. Noise Standards Applicable to the Proposed Project.**

<u>Jurisdiction</u>	<u>Zoning District Adjoining Noise Source</u>	<u>Daytime/Nighttime Allowable Noise Level</u>	<u>Measurement Location</u>
State Dept. of Health	Industrial/ Agricultural	70/70 dB (A-weighted) <sup>1</sup>	Property Line
C & C of 4 Honolulu LUO	I-2 and I-3	See octave band limits below <sup>2</sup>	At I-2 Dist. Boundary Line

<sup>1</sup>Levels not to be exceeded for more than 10 percent of the time within any 20-minute period.

<sup>2</sup>Octave band noise limits for activities within the I-2 District as follows:

<u>Octave Band Center Frequency (in Hz)</u>	<u>Allowable Sound Pressure Level, dB</u>		
	<u>At Adjoining Residential, Apartment or Hotel District Boundary</u>		<u>At All Other Boundaries</u>
	<u>Daytime Hours<sup>b</sup></u>	<u>Nighttime Hours<sup>c</sup></u>	<u>All Hours</u>
31.5	72	69	79
63	72	69	79
125	67	64	74
250	59	56	66
500	52	49	59
1,000	46	43	53
2,000	40	37	47
4,000	34	31	41
8,000	32	29	39
(A-Weighted) <sup>d</sup>	(56dBA)	(53 dBA)	(63 dBA)

<sup>a</sup>Applies only to General Industrial (I-2) and Waterfront Industrial (I-3) District.

<sup>b</sup>Between 8:00 AM and 6:00 PM.

<sup>c</sup>Between 6:00 PM and 8:00 AM the following day.

<sup>d</sup>The A-weighted sound level is not a part of the ordinance; it is presented for comparative purposes only.

Source: Compiled by Belt Collins & Associates from Title 11, Chapter 43, and from Section 3-100 of the City & County of Honolulu Land Use Ordinance.

### 3.3.2. EXISTING NOISE ENVIRONMENT

Background sound levels were measured in 1983 at two locations within the James Campbell Industrial Park (CIP). The measurements were part of a noise study performed for the City and County of Honolulu's HPOWER waste-to-energy project (City and County of Honolulu Department of Public Works, August 18, 1983). Results of the study indicated that the existing noise environment near Malakole Road is controlled by heavy truck traffic and aircraft. Background noise levels (between vehicle passes) at the time of the study were approximately 50 dBA. Measurements made 50 feet from the centerline of Hanua Street immediately inland of the HPOWER site indicated background noise levels of 45 to 50 dBA. The study concluded that background levels are relatively uniform throughout the CIP. It also noted that the 50 dBA levels measured are somewhat low for heavy industrial areas, and attributed this to the relatively undeveloped nature of the industrial park.

A limited amount of additional industrial development has occurred within CIP since the measurements for the HPOWER project were made. Black & Veatch (1989:3-13), which prepared the noise impact analysis on which this section is largely based, concluded that the additional development had probably increased the background noise level slightly. No new measurements were taken to confirm this, however. Citing the analysis contained in the EIS for the HPOWER project, Black and Veatch estimated that background noise levels on the portion of the AES-BP site closest to HPOWER will rise to approximately 60 dBA once HPOWER is in commercial operation. It also estimated that HPOWER will increase background sound levels throughout the rest of CIP by only a few decibels, i.e., to the low 50 dBA range.

Because it is on undeveloped land removed from artificial noise sources, noise levels along the conveyor route are almost certainly lower than those in the vicinity of the power plant site. Neither Black and Veatch nor the preparers of the HPOWER EIS measured noise levels along the conveyor route. However, measurements made in similar situations elsewhere in Hawaii suggest that it is probably on the order of 40 to 45 dBA.

### 3.3.3. APPLICABLE NOISE REGULATIONS

No existing Federal noise regulations apply directly to off-site noise from the proposed power plant and conveyor facilities. However, both State and City and County of Honolulu regulations are applicable.

Chapter 43 of the Administrative Rules of the State Department of Health (Community Noise Control for Oahu) regulates noise emissions from industrial and other land uses. Allowable noise levels for industrial and agricultural zoning districts are presented in Table 3-5. (Readers should note that the limits apply at the property line.)

Chapter 43 allows the Department of Health to issue permits for the operation of construction equipment which emits noise in excess of the normal limits. Such permits can be for a period of up to one year, and the following conditions are imposed:

- Excessive noise (greater than the defined allowable levels) is prohibited at all times on Sundays and on 10 specified holidays; it is prohibited between the hours of 6:00 p.m and 7:00 a.m. on other days.
- Noise in excess of 95 dBA is not allowed except on weekdays between the hours of 9:00 a.m. and 5:30 p.m.

§3.100 of the City and County of Honolulu Land Use Ordinance (LUO) specifies allowable noise levels which supplement those established by the State Department of Health. These noise limits are also presented in Table 3-5.

Because the regulatory limits represent short-term noise levels rather than 24-hour averages, they are not directly comparable to noise compatibility criteria expressed in Ldn. However, the following general statements can be made:

- State DOH limits for Industrial/Agricultural districts are approximately equal to 76 Ldn.
- The LUO limits for heavy industrial and non-dwelling (e.g., agricultural) areas equate to approximately 69 Ldn. [Note that these limits must be met only at the zoning district boundary, not at the individual parcel boundary as is the case with the DOH regulations].
- No explicit federal standards exist that are applicable to these land uses. However, the federal guidelines intended for land use planning are generally similar to the State and County standards described above.
- Compliance with the LUO noise regulations (expressed as octave band noise limits) insures that objectionable pure tones or concentrated bands of noise are not generated that would make the facility incompatible with its industrial neighbors.

### **3.3.4 PROBABLE NOISE IMPACTS**

#### **3.3.4.1 Construction Noise**

Project-related construction activity will produce noise in excess of the Department of Health's 70 dB property-line limit for the power plant and the conveyor. Consequently, a construction noise permit will be needed from the State Department of Health. The increase in noise levels will vary according to the particular phase of construction. The noisiest periods will occur during site preparation, when large earth-moving equipment is active. Even then, however, compliance with the noise regulations described above will ensure that project-related noise does not have a significant adverse effect on its neighbors.

#### **3.3.4.2 Operational Noise**

The major sources of operational noise at the generating facility are expected to be the equipment in the exposed generation building, the boiler draft fans, the cooling tower, and coal and limestone processing equipment. Other less significant sources include various electric motors, transformers, and fans used for dust collection. The coal and limestone processing operations at the power plant (which includes reclaim, transfer and crushing), will operate eight hours per day, seven days a week. All other power plant operations will take place 24 hours per day, seven days a week.

Ambient sound levels caused by operation of the power plant, conveyor, and harbor facilities were predicted by Black & Veatch (January 1988) using its "Sound Pressure Level Plot" computer model. This model takes into account wave divergence, directivity, atmospheric absorption, and the characteristic resistance of air in calculating the sound pressure level (in octave bands) from each source for each receiver location specified. However, it does not take into account noise attenuation provided by intervening structures; consequently, the noise levels forecast by the model tend to be higher than those actually experienced.

The noise source levels used in the model were estimated on the basis of proposed equipment specifications and data assembled by the Edison Electric Institute. Black & Veatch adjusted the noise source levels to reflect the use of the noise control measures incorporated in the preliminary design (see Section 3.3.4.3, below).

Figures 3-4 and 3-5 depict the A-weighted sound levels resulting from operation of the proposed facilities. Note that the contours are for periods of material delivery from the harbor and material processing at the generating facility, activities which will occur only a part of the time. Hence, the contours represent of "worst case," rather than "typical" conditions. Sound levels during periods when these activities are not underway will be somewhat lower.

Figure 3-4 indicates that the sound levels produced by the proposed power plant would be less than 70 dBA along the great majority of the property line. It also suggests three small potential problem areas with respect to noise. Once AES-BP has selected a contractor to build the facility, some adjustments in the site layout and equipment specifications will be made. Once they are, noise emissions from the facility will be re-evaluated and design and/or operational changes needed to insure compliance with the Department of Health's 70 dbA limit will be made.

To evaluate compliance with the noise limits contained in the City and County of Honolulu's Land Use Ordinance (LUO), sound pressure levels resulting from the power plant and harbor facilities were calculated for four specific points (see Points A, B, C, and D on Figure 3-5). These were then compared with the octave-band noise standards contained in the LUO.

Point A, on the northern edge of Barbers Point Beach Park, was selected for analysis because it represents the point along the I-2 (General Industrial) zoning district boundary which is closest to the proposed power plant. The Barbers Point Beach Park is zoned P-2, Preservation; hence, the LUO sound level limits shown in the right-hand column of Table 3-5 are applicable. Black & Veatch's analysis of this location indicates that noise from the generating and harbor facilities will be below the LUO limits for all octave bands.

Black & Veatch's estimate of the sound pressure levels around the power plant and conveyor are shown in Table 3-6. The analysis indicates that the applicable noise limits at these location will be met.

Points B, C, and D were analyzed because information on existing and proposed land use contained in Campbell Estate's long range master plan for Ewa indicates that they constitute the noise-sensitive areas nearest the proposed project. Point B represents proposed housing north of the abandoned railroad tracks; it is approximately 3,500 feet northeast of the harbor facilities. Point C is located at the northwest corner of the Barbers Point Naval Air Station; it is approximately 1.75 miles northeast of the generating facility. Point D is at the Ko Olina Resort.

#### **3.3.4.3 Summary of Proposed Noise Mitigation Measures**

During construction, the following measures will be used to reduce noise impacts:

- Exhaust mufflers will be used on all internal combustion engines.
- Particularly noisy operations will be conducted only during daytime hours on weekdays if needed to comply with the construction noise permit.

The following are among the steps that will be taken to limit operational noise from the facility:

- High performance silencers will be installed on the inlets of primary air and secondary air boiler draft fans.
- A high performance silencer will be installed on the boiler's induced draft fan exhaust ducts. The silencer will remove all pure tones created by the induced draft fan operation.





**Table 3-6. Predicted and Allowable Sound Levels by Octave Band.**

	Sound Level (dB) by Octave Band (Hz)									
	31	63	125	250	500	1K	2K	4K	8K	Overall
Allowable	79.0	79.0	74.0	66.0	59.0	53.0	47.0	41.0	39.0	63.1
Forecast at Point A	75.4	65.6	64.3	56.8	51.4	46.7	42.4	35.3	19.2	54.5

	Sound Level (dB) by Octave Band (Hz)									
	31	63	125	250	500	1K	2K	4K	8K	Overall
Allowable Daytime	72.0	72.0	67.0	59.0	52.0	46.0	40.0	34.0	32.0	N.A.
Allowable Nighttime	69.0	69.0	64.0	56.0	49.0	43.0	37.0	31.0	29.0	N.A.
Point B	59.0	54.0	51.9	43.6	35.4	26.5	13.3	0.0	0.0	37.6
Point C	59.4	51.7	49.8	41.2	33.2	22.8	2.3	0.0	0.0	39.9
Point D	59.0	53.4	51.4	43.0	34.9	26.4	13.5	0.0	0.0	39.4

\*Allowable levels as defined by City and County of Honolulu.

Source: Black and Veatch (November 1988).

- All transformers will be specified as NEMA "quieted".
- Coal-crushing and limestone-pulverizing will take place inside enclosures.
- Ash silo blowers will be contained in an enclosed building.
- Quiet fans will be specified for the cooling tower.

### 3.4 CLIMATOLOGY AND AIR QUALITY IMPACTS

The proposed facilities have the potential to impact air quality in several ways. By far the most important pollutants are the combustion by-products that would be created in the facility's boilers. Other potential sources of air emissions from the project include unloading facilities at Barbers Point Deep Draft Harbor; the conveyor used to transport coal, limestone, and ash pellets between the harbor and the power plant; coal and ash handling and storage facilities on the power plant site; and the cooling tower. This section describes these emissions in more detail, estimates the effect that they would have on air quality, and evaluates the ability of the project to meet State and Federal emission and ambient air quality standards. The final part discusses the facility's use of the best available pollution control technology.

#### 3.4.1 CLIMATOLOGY

The Naval Oceanographic Command Detachment has collected meteorological data at the Barbers Point Naval Air Station (NASBP) since 1949. The monitoring location is only three miles east of the project site, and the data from it is representative of conditions at Campbell Industrial Park. Because of this, it has been used as the basis for the air quality impact analysis performed for AES-BP's proposed cogeneration project. Meteorological data relevant to the assessment of air quality impacts is summarized below.

##### 3.4.1.1 Temperature and Humidity

Oahu's mid-oceanic location gives it a mild and equable climate. Temperature varies relatively little through the year. Mean monthly temperatures range from a low of 72.1°F. in February to a high of 79.1°F in August and September (see Table 3-7). Average daily minimums range from 65.3°F in February to 72.6°F in August; the average daily maximum ranges from 79.0°F. in February to 85.9°F in September. The lowest and highest dry bulb temperatures ever recorded at NASBP are 50°F. and 94°F, respectively. The wet-bulb and dry-bulb temperatures used in designing the power plant are shown in Table 3-8. Relative humidity data from NASBP is summarized in Table 3-9. They indicate that there is relatively little seasonal variation in relative humidity at the project site. Diurnal variations are more pronounced.

##### 3.4.1.2 Precipitation and Barometric Pressure

Average annual rainfall at Barbers Point is just under 20 inches (see Table 3-9). As shown by the monthly breakdown in that table, there is substantial seasonal variation. For example, the average precipitation in January (4.29 inches) is fifteen times as high as the average rainfall in July (0.28 inches). Fog rarely occurs (less than 1 percent of the time).

Extreme monthly rainfalls are also shown in Table 3-10. Historically, the highest monthly rainfall (17.27 inches) occurred in March, while the record for the lowest monthly total (a trace) is shared by seven months. The highest recorded 24-hour rainfall (10.51 inches) and occurred in March, 1958. Between 1951 and 1980, the barometric pressure at Barbers Point Naval Air Station averaged 29.89 inches of mercury.

**Table 3-7. Dry-Bulb and Wet-Bulb Temperature Data At Barbers Point Naval Air Station, Barbers Point, Hawaii: 1944-1983.**

Month	DRY-BULB TEMPERATURES (in degrees F.)					Mean Wet-Bulb Temp.(°F)
	Mean Mean Monthly	Mean Daily Minimum	Daily Maximum	Extremes Low High		
January	72.3	65.6	79.1	50	87	66.5
February	72.1	65.3	79.0	52	89	66.1
March	72.9	66.1	79.8	54	87	66.3
April	74.2	67.6	80.9	54	90	67.2
May	75.7	69.0	82.4	62	90	67.9
June	77.5	70.7	84.2	61	93	69.0
July	78.6	72.1	85.1	62	94	69.9
August	79.1	72.6	85.6	61	94	70.7
September	79.1	72.3	85.9	63	93	70.8
October	78.0	71.4	84.6	61	93	69.8
November	76.0	69.6	82.3	57	90	68.4
December	73.7	67.2	80.2	53	90	66.7
Annual	75.8	69.1	82.4	58	91	68.3
<u>Season</u>						
Summer	78.4	71.8	85.0	61	94	69.9
Fall	77.7	71.1	84.3	60	92	69.7
Winter	72.7	66.0	79.4	52	89	66.4
Spring	74.3	67.6	81.0	57	89	67.1

Source: Naval Weather Service Detachment, Summary of Meteorological Observations, Surface (SMOS), September 1984, Ashville, North Carolina.

**Table 3-8. Wet-Bulb and Dry-Bulb Power Plant Design Temperatures.**

Percent of Time	Wet-Bulb Temperature (in ° F)	Dry-Bulb Temperature (in ° F)
1.0 <sup>a</sup>	76	86
2.5 <sup>a</sup>	75	85
5.0 <sup>a</sup>	74	84
10.0 <sup>a</sup>	73	83
97.5 <sup>b</sup>	--	64
99.0 <sup>b</sup>	--	62

<sup>a</sup>Percentage of the time the temperature is exceeded during the months of June through September.

<sup>b</sup>Percentage of the time the temperature is exceeded during the months of December, January, and February.

Source: The Marley Company (1982). Cooling Tower Fundamentals and Application Principles. Kansas City, Missouri: Author.

Table 3-9. Relative Humidity Data for Barbers Point, Hawaii: 1973-1982.

<u>Month</u>	<u>Relative Humidity in % by Hour (Hawaiian Standard Time)</u>				
	<u>0200</u>	<u>0800</u>	<u>1400</u>	<u>2000</u>	<u>Average</u>
January	78.2	80.3	60.1	72.2	72.7
February	78.8	80.3	59.5	71.5	72.5
March	77.5	75.5	56.1	70.9	70.0
April	78.1	71.0	56.5	71.5	69.3
May	76.3	66.3	55.3	68.6	66.6
June	74.5	63.3	53.0	65.6	64.1
July	72.7	63.7	50.2	64.6	62.8
August	74.9	66.3	52.9	66.9	65.3
September	74.1	65.4	52.9	66.0	64.6
October	73.6	67.0	54.4	67.7	65.7
November	77.5	74.1	58.0	71.4	70.3
December	74.8	75.8	56.8	70.0	69.4
Annual	75.9	70.8	55.5	68.9	67.8
<u>Seasonal Average:</u>					
Summer	74.0	64.4	52.0	65.7	64.0
Fall	75.1	68.8	55.1	68.4	66.9
Winter	77.3	78.8	58.8	71.2	71.5
Spring	77.3	70.9	56.0	70.3	68.6

Source: Naval Weather Service Detachment, Summary of Meteorological Observations, Surface (SMOS)--September 1984, Asheville, North Carolina.

### 3.4.1.3 Wind Speed and Direction

Ten years of wind data (1973-1982) from NASBP were used to generate annual and seasonal wind roses for the area (Table 3-11). The annual wind data show a general dominance of east-northeasterly winds, i.e., from the plant site toward the ocean. On an annual basis, wind speed averages about 7.9 knots (9.1 miles per hour) for the dominant wind direction. It should be noted that the tradewinds are not always present; land-sea breezes and Kona winds are occasionally present for prolonged periods, and it is the meteorological conditions that determine the location and magnitude of the short-term air quality impacts.

### 3.4.2 AIR QUALITY

Evaluating the air quality impacts of the proposed project involved:

- Establishing if the area is attainment or nonattainment for all regulated pollutants.
- Determining if the proposed source is a major new stationary source (emissions of a regulated pollutant exceed 100 tons per year).
- Determining if pollutant emissions from the proposed source exceed Prevention of Significant Deterioration (PSD) significant emission levels. Those pollutants with significant emissions were further evaluated.
- Determining background ambient air quality concentrations using monitoring data for SO<sub>2</sub>, TSP, PM<sub>10</sub>, NO<sub>2</sub>, and Pb from monitoring stations in the vicinity of the Campbell Industrial Park.
- Modeling estimated emissions from the proposed project to determine which pollutants had significant ambient air quality impacts. Those pollutants with significant impacts were further evaluated to determine the project impacts on National Ambient Air Quality Standards (NAAQS) and the PSD increment.
- Modeling existing source emissions to determine their impacts on NAAQS and the PSD increment.
- Combining the background concentrations and the project and existing source impacts for comparison with NAAQS.
- Combining the existing source and project PSD increment consumption for comparison with the Class II PSD increments.
- Evaluating the proposal's compliance with the PSD requirement that the "Best Available Control Technology" be employed.

The results of this evaluation are presented below.

#### 3.4.2.1 Source and Pollutant Applicability

PSD guidelines state that a source must undergo a formal PSD applicability determination if it has the potential to emit any regulated pollutant in excess of 100 tons per year and its actual emissions after the application of pollution control equipment exceeds significant emission rate values.

**Table 3-10. Precipitation At Barbers Point Naval Air Station: 1949-1982.**

Month	Precipitation (in inches)			
	Average	Maximum Monthly	Minimum Monthly	Maximum 24-Hour
January	4.29	14.09	0.47	5.25
February	2.39	9.98	Trace	4.62
March	2.31	17.27	0.03	10.51
April	1.39	12.03	0.03	3.90
May	0.95	8.45	Trace	3.07
June	0.33	1.96	Trace	1.37
July	0.28	1.24	Trace	1.21
August	0.35	2.09	Trace	1.90
September	0.39	1.65	0.02	1.37
October	1.83	10.82	Trace	7.81
November	2.38	11.71	0.01	7.03
December	2.82	8.04	0.10	4.70
ANNUAL	19.71	17.27	Trace	10.51

SOURCE: Naval Weather Service Detachment, Summary of Meteorological Observations, Surface (SMOS), September 1984, Asheville, North Carolina

**Table 3-11. Percent Frequency of Wind by Speed and Direction.**

Direction Sector	Per Cent Frequency by Wind Speed in Knots						Average Wind Speed (knots)	
	0-3	4-6	7-10	11-16	17-21	21+		Total
N	0.2	0.4	0.4	0.2	0.0	0.0	1.2	7.4
NNE	0.5	2.1	3.2	1.6	0.3	0.0	7.7	8.5
NE	2.1	9.2	7.3	3.7	0.4	0.0	22.7	7.4
ENE	2.2	13.4	11.2	7.4	0.5	0.0	34.7	7.9
E	0.7	4.1	6.0	3.9	0.2	0.0	14.9	8.6
ESE	0.2	0.4	1.1	0.7	0.0	0.0	2.4	9.1
SE	0.1	0.3	1.0	1.4	0.1	0.0	2.9	10.8
SSE	0.0	0.3	1.1	0.9	0.1	0.0	2.4	10.1
S	0.1	0.6	1.4	0.7	0.2	0.0	3.0	9.3
SSW	0.1	0.3	0.8	0.4	0.2	0.0	1.8	9.4
SW	0.0	0.2	0.7	0.4	0.0	0.0	1.3	9.5
WSW	0.0	0.2	0.5	0.5	0.1	0.0	1.3	10.5
W	0.1	0.2	0.5	0.6	0.1	0.0	1.5	10.9
WNW	0.0	0.1	0.4	0.4	0.1	0.0	1.0	10.9
NW	0.0	0.1	0.2	0.2	0.0	0.0	0.5	9.4
NNW	0.0	0.2	0.1	0.0	0.0	0.0	0.3	6.2
Calm	0.4	----	----	----	----	----	0.4	----
Total	6.3	32.1	35.9	23.0	2.3	0.0	100.0	8.3

SOURCE: Naval Weather Service Detachment, Summary of Meteorological Observations, Surface (SMOS), Asheville, North Carolina, September 1984.

**Table 3-12 Significant and Estimated Pollutant Emission Rates for PSD-Regulated Pollutants.**

<u>Pollutant</u>	<u>Significant Emission Rate (t/yr)</u>	<u>Estimated Emission Rate* (t/yr)</u>
Carbon monoxide**	100	1,789
Nitrogen oxides**	40	1,036
Sulfur dioxide**	40	2,825
Particulate matter (TSP)	25	141
Particulate matter (PM <sub>10</sub> )**	15	141
Ozone (volatile organic compounds)**	40	141
Lead**	0.6	4.7
Asbestos	0.007	<<0.007
Beryllium	0.0004	0.05
Mercury	0.1	0.02
Vinyl Chloride	1	<<1
Fluorides	3	2.5
Sulfuric acid mist	7	188
Total reduced sulfur (including H <sub>2</sub> S)	10	<<10

\* Emission estimates based on a 2-boiler, 180 megawatt unit operating at 100 percent load for the entire year (8760 hours).

\*\* Criteria Pollutants.

Source: Black & Veatch, 1989.

Table 3-12 lists the estimated pollutant emission rates for the proposed project and the PSD significant emission rate values. From this table, it can be seen that five regulated pollutants from the proposed facility exceed the 100 ton per year criteria for major stationary source designation. In addition, lead, beryllium and sulfuric acid mist exceed the significant emission rate criteria for PSD review.

### 3.4.2.2 Existing Ambient Air Quality Monitoring Data

The state of Hawaii Department of Health (HDOH) has monitored ambient air quality concentrations of selected pollutants in and around Campbell Industrial Park since 1971. Sulfur dioxide (SO<sub>2</sub>) has been monitored on a 24-hour average basis from 1971 to the present. Nitrogen dioxide (NO<sub>2</sub>) was monitored from 1971 to 1976, and then discontinued statewide. Total suspended particulates (TSP) were sampled from 1971 to September 1985. PM<sub>10</sub> sampling began in October 1985 and continues to the present. The results of these monitoring programs are summarized in Table 3-13. Insufficient monitoring data is available to demonstrate compliance or non-compliance with existing ambient air quality standards. However, the modeling described below indicates that ambient air quality standards are being met.

### 3.4.2.3 Proposed Source Maximum Pollutant Impacts

Table 3-14 lists the PSD significant ambient impact levels for determining if a pollutant must undergo an ambient air quality impact analysis. Based on the modeling results, SO<sub>2</sub>, NO<sub>x</sub>, TSP and PM<sub>10</sub> must be evaluated for ambient air quality impacts.

## 3.4.3 AIR QUALITY MODELS AND INPUTS

### 3.4.3.1 Choice of Computer Models

In accordance with requirements of the State Department of Health and the U.S. Environmental Protection Agency, computerized air quality modeling techniques were used to define potential air quality impacts. Both screening-level and refined dispersion models were used. Following recommendations contained in the EPA publication entitled Procedures for Evaluating Air Quality Impacts of New Stationary Sources--Volume 10, Revised, the PTPLU-2 model was used to determine the operating scenario of the proposed power plant that would produce the highest ground-level pollutant concentrations. The results of this analysis indicated that these would occur under full-load conditions; hence, these were assumed throughout the remainder of the modeling. The stack characteristics input in the screening-level analysis were as follows:

Operating Level as Percent of Rated Capacity	Stack Height (in feet)	Stack Diameter (in feet)	Exit Velocity (ft/sec.)	Volumetric Flow Rate (ft <sup>3</sup> /min)	Exit Temp. (° F.)
50	285	12	67	454,000	237
75	285	12	80	543,500	247
Maximum	285	12	115	781,000	265

Table 3-13. Air Quality Monitoring Data--Campbell Industrial Park: 1971-Present.

Year	SO <sub>2</sub> (µg/m <sup>3</sup> )			NO <sub>2</sub> (µg/m <sup>3</sup> )			TSP (µg/m <sup>3</sup> )			PM <sub>10</sub>		
	24-Hour Average Range	Annual Mean	>AQS <sup>1</sup>	24-Hour Average Range	Annual Mean	>AQS <sup>1</sup>	24-Hour Average Range	Annual Mean	>AQS <sup>1</sup>	24-Hour Average Range	Annual Mean	>AQS <sup>1</sup>
1971	<5-16	<5	0	<20-49	29	0	18-471	125	54	--	--	--
1972	<5-7	<5	0	<20-49	21	0	24-155	55	5	--	--	--
1973	<5-5	<5	0	<20-33	<20	0	14-129	50	1	--	--	--
1974	<5-10	<5	0	<20-40	25	0	23-132	47	1	--	--	--
1975	<5-11	<5	0	<5-25	11	0	13-137	52	1	--	--	--
1976	<5-7	<5	0	<5-29	14	0	12-101	40	1	--	--	--
1977	<5-18	<5	0	DISCONTINUED MONITORING			25-134	54	1	--	--	--
1978	<5-40	<5	0				22-127	48	1	--	--	--
1979	<5-27	<5	0				23-223	76	10	--	--	--
1980	<5-10	<5	0				29-158	53	2	--	--	--
1981	<5-40	<5	0				26-188	51	2	--	--	--
1982	<5-12	<5	0				15-63	41	0	--	--	--
1983	<5-28	<5	0				30-109	55	1	--	--	--
1984	<5-<5	<5	0				17-112	50	1	--	--	--
1985	<5-25	<5	0				24-138 <sup>2</sup>	57 <sup>2</sup>	3	10-26 <sup>3</sup>	20 <sup>3</sup>	NA
1986	<5-10	<5	0				--	--	--	7-66	26	NA
1987	NOT AVAILABLE						--	--	--	5-40 <sup>4</sup>	23 <sup>4</sup>	O

<sup>1</sup>Air quality standards for the given time period.

<sup>2</sup>Sampling period from 1/85-9/85.

<sup>3</sup>Sampling period from 10/85-12/85.

<sup>4</sup>Sampling period from 1/87-10/87 (only data available).

<sup>5</sup>PM10 standards became effective on July 1, 1987.

Source: Hawaii Air Quality Data; State of Hawaii, Department of Health, 1971-1987.

Table 3-14. Identification of "Significant Impact Pollutants" for PSD Analysis.

**PSD "SIGNIFICANT IMPACT" LEVELS:**

Pollutant	Pollutant Concen. in $\mu\text{g}/\text{m}^3$ by Averaging Period				
	Annual	24-hour	8-hour	3-hour	1-hour
SO <sub>2</sub>	1	5	---	25	---
NO <sub>2</sub>	1	---	---	---	---
PM <sub>10</sub>	1	5	---	---	---
TSP	1	5	---	---	---
CO	--	---	500	---	2,000

**IMPACT OF AES-BP COGENERATION PLANT ON AIR QUALITY:**

Pollutant	Pollutant Concen. in $\mu\text{g}/\text{m}^3$ by Averaging Period				
	Annual	24-hour	8-hour	3-hour	1-hour
SO <sub>2</sub>	4	34	--	148	--
NO <sub>2</sub>	2	--	--	--	--
PM <sub>10</sub>	6	19	--	--	--
TSP	6	19	--	--	--
CO	--	--	61	--	112

Note: Estimates are for a 2-boiler, 180-megawatt facility.

Source: Black & Veatch, 1989.

Following completion of the screening analysis, a detailed evaluation was conducted using two other EPA-approved dispersion models. The Industrial Source Complex Short Term (ISCST) dispersion model was used to estimate impacts in areas where the terrain is below the facility's stack height evaluation of 300 feet. The COMPLEX-1 dispersion model was used to estimate pollutant levels in areas that are above the top of the stack. The version of the ISCST model that was used included the recently revised building downwash features (UNMAP 6, Change 8), and this feature was employed for sources having stack heights less than a "good engineering practice" (GEP) height whenever adequate building dimension data was available.

In addition to emissions from the main stack, the proposed facility will also generate particulate emissions from coal, limestone, and ash handling operations. EPA publication AP-42 (Compilation of Emission Factors) was used to estimate emissions from these sources and to determine the efficiencies of the air emission control techniques that are to be used. These estimates are summarized in Tables 3-15a and 3-15b.

### **3.4.3.2 Meteorological Data Used**

The ISCST and Complex-1 dispersion models require sequential hourly meteorological data for wind speed and direction and twice-daily mixing heights (early morning and afternoon). Five years of data collected at the nearby Barbers Point Naval Air Station from 1967 to 1971, inclusive, were used to create the wind roses previously presented. The twice-daily mixing height data for the same period was obtained from Lihue, Kauai. These were the most representative data available from the National Climatic Center. The meteorological data was preprocessed into the "CRSTER" format for use in the models.

### **3.4.3.3 Receptor Locations Used**

The ISCST and Complex-1 dispersion models use receptor locations expressed in either polar or Cartesian (rectangular) coordinates to predict ground-level pollutant impacts. Cartesian coordinates were used in this analysis. For the ISCST modeling, a coarse grid of receptors spaced at 500-meter intervals was used to identify the general area of maximum impact. A refined grid of receptors spaced at 250-meter intervals around the maximum impact coarse grid receptor was used to identify the maximum pollutant impact concentration. The Complex-1 modeling utilized a 250-meter interval coarse receptor grid similar to the grids used in previous EPA funded and PSD application modeling studies for this area.

## **3.4.4 APPLICABLE REGULATIONS AND STANDARDS**

### **3.4.4.1 New Stationary Source Performance Standards**

The U.S. Environmental Protection Agency has promulgated performance standards for major new stationary sources of air pollutants. These standards include maximum allowable emission rates for specific pollutants. The new source performance standards that are applicable to the proposed project are as follows:

<u>Pollutant</u>	<u>New Source Pollution Standard Limit</u>
SO <sub>2</sub>	1.20 lbs/MBtu (see 40 CFR60 Subpart 60.43a.d(3))
NO <sub>x</sub>	0.60 lb/MBtu (based on a 30-day rolling average)
Particulates	0.03 lb/MBtu, >=99% particulate removal, and opacity <=20%

**Table 3-15a. Annual Particulate Emission Assumptions for Material Handling Operations**

Operational Parameters

Limestone Consumption (~15.7 t/hr)	137,700 ton /year
Coal Consumption (~107.5 t/hr)	941,700 ton/year
Combustion Waste (~21.3 t/hr)	186,800 ton/year
Transfer points drop height, H	varies

Material Characteristics

Coal Silt Content, S (AP-42 mean)	6.2 percent
Coal Surface Moisture. M (AP-42 mean)	6.9 percent
Limestone Silt Content. S (AP-42 mean)	1.6 percent
Limestone Moisture Content. M (AP-42 mean)	0.7 percent
Combustion Waste Silt Content. S (AP-42 mean)	70 percent
Combustion Waste Moisture Content. M (AP-42 mean)	2.0 percent

Meteorological Conditions

Wind Speed . U (mean)	9 mph
Number of Days With Precipitation >0.01 in., p (mean)	70 days
Percentage of Time Wind Speed >12 mph. f (mean)	25 percent

TABLE 3-15b. ANNUAL PARTICULATE EMISSIONS FROM MATERIAL HANDLING OPERATIONS FOR THE BARBERS POINT COGENERATION PLANT

No.	Source	Activity	AP-42 Equation	H	U	S	M	Y	Emission Factor	Use Rate	Uncontrolled Emissions	Control Method	Control Efficiency	Total Controlled Emissions	Point Source Emissions	Area Source Emissions
1	Conveyor Transfer Structure #1	Coal Belt Transfer	Continuous Drop	3	9	6.2	6.9		0.0001 lb/t	941,700 ton/yr	0.04 ton/yr	Enclosure & Baghouse	99%	0.00 ton/yr	0.00 lb/h	
		Limestone Belt Transfer	Continuous Drop	3	9	1.6	0.7		0.0020 lb/t	137,700 ton/yr	0.13 ton/yr	Enclosure & Baghouse	99%	0.00 ton/yr	0.00 lb/h	
2	Plant Conveyors	Coal Conveying	Conveying						0.0034 lb/t	941,700 ton/yr	1.60 ton/yr	Covers	70%	0.48 ton/yr	0.11 lb/h	
		Limestone Conveying	Conveying						0.0034 lb/t	137,700 ton/yr	0.23 ton/yr	Covers	70%	0.07 ton/yr	0.02 lb/h	
3	Coal Stacker	Coal Stockout	Continuous Drop	40	9	6.2	6.9		0.0010 lb/t	941,700 ton/yr	0.49 ton/yr	Telescopic Chute	75%	0.12 ton/yr	0.03 lb/h	
4	Coal Storage	Wind Erosion	Wind Erosion			6.2			14.7012 lb/ac/dy	4 acres	10.73 ton/yr	Wet Suppression	50%	5.37 ton/yr	1.23 lb/h	
5	Coal Reclaimer	Coal Reclaim	Batch Drop	5	9	6.2	6.9	10	0.0002 lb/t	941,700 ton/yr	0.10 ton/yr	None	0%	0.10 ton/yr	0.02 lb/h	
6	Conveyor Transfer Structure #2	Coal Belt Transfer	Continuous Drop	3	9	6.2	6.9		0.0001 lb/t	941,700 ton/yr	0.04 ton/yr	Enclosure & Baghouse	99%	0.00 ton/yr	0.00 lb/h	
		Limestone Belt Transfer	Continuous Drop	3	9	1.6	0.7		0.0020 lb/t	137,700 ton/yr	0.13 ton/yr	Enclosure & Baghouse	99%	0.00 ton/yr	0.00 lb/h	
7	Limestone Stacker	Limestone Stockout	Continuous Drop	20	9	1.6	0.7		0.0130 lb/t	137,700 ton/yr	0.90 ton/yr	Telescopic Chute	75%	0.22 ton/yr	0.05 lb/h	
8	Limestone Storage	Wind Erosion	Wind Erosion			1.6			3.7939 lb/ac/dy	1 acres	0.69 ton/yr	Wet Suppression	50%	0.35 ton/yr	0.08 lb/h	
9	Limestone Pit	Limestone Reclaim	Batch Drop	5	9	1.6	0.7	7	0.0059 lb/t	137,700 ton/yr	0.40 ton/yr	None	0%	0.40 ton/yr	0.09 lb/h	
10	Reserve Coal Pile	Wind Erosion	Wind Erosion			6.2			14.7012 lb/ac/dy	3.5 acres	9.39 ton/yr	Emulsion or Cover	100%	0.00 ton/yr	0.00 lb/h	
11	Coal Crusher Bus Collector	Coal Crushing	Stone Crushing						0.28 lb/t	941,700 ton/yr	131.8 ton/yr	Enclosure & Baghouse	99%	1.32 ton/yr	0.30 lb/h	
12	Pulverizer Vent Bus Collector	Limestone Crushing	Stone Crushing						0.28 lb/t	137,700 ton/yr	19.28 ton/yr	Enclosure & Baghouse	99%	0.19 ton/yr	0.04 lb/h	
13	Conveyor Transfer Structure #3	Coal Belt Transfer	Continuous Drop	3	9	6.2	6.9		0.0001 lb/t	941,700 ton/yr	0.04 ton/yr	Enclosure & Baghouse	99%	0.00 ton/yr	0.00 lb/h	
14	Generation Building	Plant Coal Silo	Continuous Drop	40	9	6.2	6.9		0.0010 lb/ton	941,700 ton/yr	0.49 ton/yr	Enclosure & Baghouse	99%	0.00 ton/yr	0.00 lb/h	
		Limestone Hopper	Continuous Drop	40	9	1.6	0.7		0.0261 lb/ton	137,700 ton/yr	1.79 ton/yr	Enclosure & Baghouse	99%	0.02 ton/yr	0.00 lb/h	
15	Ash Silo Filler	Fly/Bed Ash Silo Fill	Continuous Drop	40	9	7.0	2		0.1397 lb/ton	186,800 ton/yr	13.05 ton/yr	Enclosure & F. Filter	99%	0.13 ton/yr	0.03 lb/h	
16	Ash Conditioning Unloader	Ash Unloading	Continuous Drop	10	9	7.0	2		0.0349 lb/ton	23,350 ton/yr	0.41 ton/yr	Partial Enclosure & Wet Suppression	90%	0.04 ton/yr	0.01 lb/h	
17	Ash Pelletizing Building	Ash Pelletizing	Ash Handling						110 lb/ton	163,450 ton/yr	8,990 ton/yr	Total Enclosure & Wetting	100%	0.00 ton/yr	0.00 lb/h	
18	Ash Pellet Storage	Wind Erosion	Wind Erosion			7.0			165.98 lb/ac/dy	2 acres	60.58 ton/yr	Pelletization	99%	0.61 ton/yr	0.14 lb/h	
19	Ash Pellet Loadout	Ash Reclamation	Batch Drop	5	9	7.0	2	7	0.0315 lb/ton	163,450 ton/yr	2.57 ton/yr	Pelletization	99%	0.03 ton/yr	0.01 lb/h	
20	Ash Pellet Conveying and Transfer Points								nil	163,450 ton/yr	0.00 ton/yr	Pelletization, encl. and Baghouse	100%	0.00 ton/yr	0.00 lb/h	
TOTAL														9.45 ton/yr	0.38 lb/h	1.78 lb/h

#### **3.4.4.2 State Emission and Fossil Fuel Content Limits**

The State of Hawaii Department of Health has established emission standards for certain activities. These are contained in Title 11, Chapter 60, of the Department's Administrative Rules. Four of these are applicable to the proposed power plant.

11-60-3 establishes a 20-percent opacity limit on visible emissions from stationary sources. This is the same as the Federal limit.

11-60-5 stipulates that no visible emissions of fugitive dust are allowed beyond the property line of the source unless it can be shown that the best practical operation and/or treatment procedures are being implemented. This requirement will apply to the conveyor and to the materials storage and handling facilities at the power plant. Examples of the "practical procedures" listed in the standards include:

- use of water or chemicals to control dust from construction sites;
- application of water or chemicals to materials stockpiles which can give rise to airborne dust; and
- provisions for containing dust generated by process operations.

11-60-8 establishes emission standards for processing operations. The fuel and ash preparation and ash pelletizing operations at the proposed facility are covered by these standards. The allowable emissions (in tons per hour) are equal to 4.1 times the process weight (in tons per hour) raised to the two-thirds power up to a maximum of 40 pounds per hour. Emissions in excess of 40 pounds per hour are not allowed from a single processing activity.

Finally, 11-60-9 prohibits fossil-fuel fired power plants larger than 25 megawatts from using fuel containing more than 0.5 percent sulfur by weight. An exception may be made only if the Director of the Department of Health determines that the use of fuel with a higher sulfur content will not result in a violation of the State Ambient Air Quality Standard for sulfur oxides.

#### **3.4.4.3 National and State Ambient Air Quality Standards**

Pursuant to the Federal Clean Air Act, the U.S. Environmental protection Agency has promulgated ambient air quality standards for a number of air pollutants. These "criteria pollutants," as they are called, are listed in Table 3-16. The "primary" standards shown in the table are intended to protect the public's health with an adequate margin of safety. The "secondary" standards are intended to prevent adverse effects on comfort, visibility, vegetation, animals, aesthetic values, and soiling and deterioration of materials.

The State of Hawaii has adopted ambient air quality standards which parallel those promulgated by the EPA. These are contained in 11-59-4 of the Administrative Rules. These standards, which are also summarized in Table 3-16 are in some cases more stringent than their Federal counterparts.

**Table 3-16. Summary of Federal and Hawaii State Ambient Air Quality Standards.**

<u>Federal Standards</u>				
<u>Pollutant</u>	<u>Sampling Period</u>	<u>Primary</u>	<u>Secondary</u>	<u>State Stds.</u>
Total Suspended Particulate Matter (TSP)	Annual Geometric Mean	None	None	60µg/m <sup>3</sup>
	Maximum Average in Any 24 Hours	None	None	150µg/m <sup>3</sup>
PM-10	Annual Average	50	50	None
	Maximum Average in Any 24 Hours	150	150	None
Sulfur Dioxide	Annual Arithmetic Mean	80µg/m <sup>3</sup>	None	80µg/m <sup>3</sup>
	24-Hour Average	365µg/m <sup>3</sup>	None	365µg/m <sup>3</sup>
	3-Hour Average	None	1,300µg/m <sup>3</sup>	1,300µg/m <sup>3</sup>
Nitrogen Dioxide	Annual Arithmetic Mean		100µg/m <sup>3</sup>	70µg/m <sup>3</sup>
Carbon Monoxide	8-Hour Average		10mg/m <sup>3</sup>	5mg/m <sup>3</sup>
	1-Hour Average		40mg/m <sup>3</sup>	10mg/m <sup>3</sup>
Photochemical Oxidants (as O <sup>3</sup> )	Maximum Average in Any 1 Hour		240µg/m <sup>3</sup>	100µg/m <sup>3</sup>
Lead	Maximum Average in Any Calendar Quarter		1.5µg/m <sup>3</sup>	1.5µg/m <sup>3</sup>

- (1) Limits shown for 1-, 3-, 8-, and 24-hours may be exceeded once per year without violating the standard.
- (2) Federal "primary" standards are intended to prevent adverse effects on public health. "Secondary" standards are intended to prevent adverse effects on comfort, visibility, vegetation, animals, aesthetic values, and soiling and deterioration of materials.

Sources: Title 40, Code of Federal Regulations, Part 50 (Federal) Title 11, Administrative Rules, Chapter 59 (State)

#### **3.4.4.4 Prevention of Significant Deterioration (PSD) Regulations**

The U.S. Environmental Protection Agency has also adopted regulations designed to maintain air quality in areas which currently meet Federal ambient air quality standards. These "Prevention of Significant Deterioration", or PSD, regulations apply to areas designated as "attainment" for criteria pollutants. All of the facilities proposed as part of this project are in such an attainment area. The PSD regulations stipulate that new sources that emit regulated air pollutants in "significant" amounts must be shown to comply with these regulations before they will be given a permit to construct or a permit to operate.

An important aspect of the PSD Program is the limit which it places on the amount of air quality degradation which is allowed in a particular geographic area. The size of this PSD "increment" depends on the classification of the affected area.

PSD regulations divide the country into three "classes." Class I areas are the most restrictive air quality regions. Most often, National Parks and primitive wilderness areas where air quality impacts could have the greatest detrimental effect are designated as Class I areas. The PSD Class I area closest to the proposed facility is Haleakala National Park. It is over 100 kilometers from the proposed site, too far to be impacted by emissions from it.

The remainder of the State, including the area within which the proposed project is located, is classified as a Class II area. The applicable Class II PSD pollutant increments and the current increment consumption are given in Table 3-17. The current PSD Class II increment consumption shown in the table is based on a 1983 study funded by the EPA plus PSD and state air quality permits issued from 1983 to 1987. Table 3-17 also shows the available PSD SO<sub>2</sub> and TSP increments based on the 1983 EPA study and subsequent permit applications. The table indicates that 70 and 63 percent of the Class II annual average and 24-hour average SO<sub>2</sub> increments, respectively, are available to new sources. It also shows that 85 percent of the total 3-hour Class II PSD increment is available to new sources, but NAAQS limit the availability to 70 percent of the total increment. The available increment for TSP is 79 and 62 percent of the Class II allotment for the annual and 24-hour averages, respectively.

Currently, there are no Class III areas in Hawaii.

**Table 3-17. Prevention of Significant Deterioration (PSD) Class II Increments and Existing Increment Consumption Levels.**

<u>Pollutant</u>	<u>Averaging Period</u>	<u>PSD Class II Increment (µg/m<sup>3</sup>)</u>	<u>Current Levels (µg/m<sup>3</sup>)</u>	<u>Remaining Increment (µg/m<sup>3</sup>)</u>
TSP	Annual Geom. Mean	19	4	15
	24-hour Average	37	14	23
SO <sub>2</sub>	Annual Arith. Mean	20	6	14
	24-hour Average	91	34	57
	3-hour Average	512	78	434
NO <sub>x</sub>	Annual Arith. Mean	25	0	25

<sup>1</sup>Remaining 3-hr SO<sub>2</sub> increment is restricted to 264 µg/m<sup>3</sup> by the 3-hr SO<sub>2</sub> NAAQ standard.

Source: Compiled by Black & Veatch using the following sources:

- (1) Evaluation of PSD Increment Consumption and Baseline Air Quality at the Campbell Industrial Park, Hawaii; Prepared for EPA by Engineering Science, Arcadia, California; November 1983.
- (2) Addendum to PSD Application: Honolulu Program of Waste Energy Recovery (HPOWER); September 1985.

### 3.4.5 AIR QUALITY IMPACTS

#### 3.4.5.1 Compliance With Ambient Air Quality Standards Combustion

Table 3-18 compares the modeled pollutant concentrations with the National Ambient Air Quality Standards. The results show that emissions from the facility would not cause or contribute to a violation of these standards. The PM<sub>10</sub> levels of 39.6 and 87.6 µg/m<sup>3</sup> are approximately 79 and 58 percent of the annual and 24-hour National Ambient Air Quality Standards, respectively. These levels are based on monitored background levels, impacts from the project, and impacts from the other existing sources in the Campbell Industrial Park. The SO<sub>2</sub> levels of 43.6, 169.5 and 945.2 µg/m<sup>3</sup> are approximately 55, 46, and 75 percent of the annual, 24-hour, and 3-hour National Ambient Air Quality Standards, respectively. Finally, NO<sub>2</sub> and Pb levels of 47.1 and 0.9 µg/m<sup>3</sup> are approximately 47 and 60 percent of their respective annual and calendar quarterly averages. All State Ambient Air Quality Standards are met as well.

#### 3.4.5.2 Compliance With Ambient Air Quality Standards: Process Emissions

While the combustion products that would be emitted from the main stack at the power plant are of greatest concern from an air quality standpoint, particulate emissions from storage piles, coal, limestone and ash processing facilities, material handling conveyors and transfer points are also of concern. The air quality impacts of these are presented in Table 3-18. Because the tube conveyor completely encloses the material being transported, there is no in-transit release of particulate matter.

#### 3.4.5.3 Compliance With PSD Increment

Table 3-19 shows the results of the PSD increment analysis. The TSP impacts of 5.2 and 46.6 µg/m<sup>3</sup> are 27 and 126 percent of the allowable annual and 24-hour PSD increments, respectively. However, the AES impacts on these locations are 1.6 and 0.0 percent respectively. Hence, the AES-BP project does not cause or contribute to a violation of the PSD increment.

The SO<sub>2</sub> impacts of 9.2, 33.6, and 152.3 are approximately 46, 37 and 30 percent of the total annual, 24-hour, and 3-hour Class II PSD increments, respectively. The AES contributions at the maximum increment consumption location are 0.1, 33.0, and <0.1 µg/m<sup>3</sup> for the annual, 24-hour and 3-hour averaging periods, respectively.

The NO<sub>x</sub> impact of 1.6 µg/m<sup>3</sup> represents 6.4 percent of the available increment. Note that PSD impacts are based on PSD sources and increases or decreases in emission rates from non-PSD baseline sources. The TSP and SO<sub>2</sub> increment impacts are based on modeled data from all sources in the Campbell Industrial Park.

#### 3.4.5.4 Additional Air Quality Impacts

A recent application to construct a 200 MW combined cycle, oil-fired turbine, steam-electric generating facility has been submitted to HDOH by Kalaeloa Partners, LP. This facility will also be located in Campbell Industrial Park. Ambient air quality analyses provided as a part of their air permit application demonstrate that Kalaeloa alone or in conjunction with the existing sources and the AES-BP facility will not cause or contribute to an exceedance of the NAAQS or the applicable PSD increments.

To illustrate this fact, Kalaeloa maximum impacts were added directly to the combined impacts of the background pollutant levels, the existing CIP sources, and the AES impacts. This approach assumes that the maximum impacts from both projects occur at the same location.

**Table 3-18. Comparison of Modeled Ambient Air Quality With Ambient Air Quality Standards.**

	Concentrations ( $\mu\text{g}/\text{m}^3$ )			
	<u>SO<sub>s</sub></u>	<u>NO<sub>2</sub></u>	<u>PM<sub>10</sub></u>	<u>Pb<math>\pm</math></u>
Annual NAAQS	80	100	50	1.5
Annual SAAQS	80	70	-	5
Monitored Background	8 <sup>a</sup>	15 <sup>b</sup>	26 <sup>c</sup>	0.8 <sup>d</sup>
Existing Sources	35.1	32.1	13.5	0.0
AES Project	<u>0.5</u>	<u>&lt;0.1</u>	<u>0.1</u>	<u>0.1</u>
Total	43.6	47.1	39.6	0.9
UTM East	590.25	593.25	592.50	592.50
UTM North	2356.50	2356.25	2355.75	12356.75
Year	1970	1969	1970	1967
24-hour NAAQS	365	-	150	-
SAAQS	365	-	-	-
Monitored Background	24 <sup>a</sup>	-	43 <sup>c</sup>	-
Existing Sources	169.5	-	40.9	-
AES Project	<u>&lt;0.1</u>	-	<u>3.7</u>	-
Total	193.5	-	87.6	-
UTM East	593.50		592.25	
UTM North	2361.00		2355.75	
Year	1969		1968	
(Day)	(40)		(298)	
3-Hour NAAQS	1,300	-	-	-
3-Hour SAAQS	1,300	-	-	-
Monitored Background	89 <sup>a</sup>			
Existing Sources	805.1			
AES Project	<u>51.1</u>			
Total	945.2			
UTM East	594.00			
UTM North	2360.50			
Year	1969			
(Day/Period)	(40/3)			

- a. SO<sub>2</sub> concentrations are based on HPower Ambient Monitoring Data recorded near Palailai (Station 151) from February 1984 to February 1985 short term averages represent the highest, second-highest concentrations.
- b. The NO<sub>2</sub> concentration is based on HDOH monitoring at the Barbers Point Monitoring Station during 1976. NO<sub>2</sub> monitoring was discontinued statewide in 1977.
- c. PM<sub>10</sub> concentrations are based on NDOH monitoring at the Barbers Point Monitoring Station October 1985 to October 1987.
- d. The Pb concentration is based on HDOH monitoring at the Liliha Monitoring Station during 1984.

\*Pb standards are based on a calendar quarter averaging period. AES Project impacts are based on a highest, second-highest 24-hour impact.  
Source: Black and Veatch, 1989.

**Table 3-19. Results of Prevention of Significant Deterioration (PSD) Analysis.**

<u>Averaging Time</u>	<u>Concentrations (µg/m<sup>3</sup>)</u>		
	<u>TSP</u>	<u>SO<sub>2</sub></u>	<u>NO<sub>x</sub></u>
Annual PSD Increment	19	20	25
Project Increment Consumption*	0.3	0.1	1.6
Existing Source Consumption	4.9	9.1	0.0
Total	5.2	9.2	1.6
% of Increment Consumed (Total)	27.0%	46.0%	6.4%
Increment Remaining	13.8	10.8	23.4
% of Increment Consumed (AES only)	1.6%	0.5%	6.4%
24-Hour PSD Increment	37	91	
Project Increment Consumption*	0.0	33.0	
Existing Source Consumption	46.6	0.6	
Total **	46.6	33.6	
% of Increment Consumed (Total)	126.0%	37.0%	
Increment Remaining	(9.6)	57.4	
% of Increment Consumed (AES only)	0.0%	36.0%	
3-Hour PSD Increment		512	
Project Increment Consumption*	--	<0.1	
Existing Source Consumption	--	152.3	
Total	--	152.3	
% of Increment Consumed (Total)	--	30.0%	
Increment Remaining	--	359.7	
% of Increment Consumed (AES only)	-	<0.5%	

\* Project Increment Consumption represents the consumption related to AES at the maximum combined PSD Increment consumption receptor for the CIP area. It does not represent the maximum AES consumption.

\*\* Total Increment consumption exceeds Class II 24-hour increment. However, AES-BP's contribution to the point at which the increment was exceeded was 0.0.

Source: Black & Veatch, 1989.

Based on the most conservative approach, the NAAQS are maintained at all times (see Table 3-19a). This approach is conservative because the maximum impact points for the Kalaeloa facility and the AES-BP facility in fact do not coincide. Adding the two together overstates the actual effect of the combined projects.

Kalaeloa PSD increment impacts were also added directly to the PSD increment consumption totals to predict the total PSD impacts (see Table 3-19b). The PSD increments were not exceeded with the exception of the 24-hour TSP increment. However, this increment was previously shown in the AES and Kalaeloa applications to be in excess of the Class 11 increment prior to the addition of the AES or Kalaeloa projects, and at the point of increment exceedence, neither project makes any contribution to the violation. Therefore, neither project causes or contributes to the exceedence.

The following are a summary of the maximum air pollutant impacts, including the Kalaeloa facility:

### **3.4.6 BEST AVAILABLE CONTROL TECHNOLOGY**

The proposed facility represents the state-of-the-art in pollution control technology. Emission rates are significantly lower than those from other power plants. These low air emission rates are the result of numerous pollution control technologies. This section briefly describes these technologies and their effectiveness at reducing pollution.

#### **3.4.6.1 Sulfur Emissions**

Sulfur is present in all coal in varying quantities. All modern coal-fired facilities utilize some method of limiting sulfur emissions. The principal ones are the use of low sulfur coals and the removal of sulfur from the flue gas. AES Barbers Point's facility uses both methods.

With regard to fuel, it will burn coal containing no more than 1.5% sulfur. This is considered moderate by national standards.

With regard to sulfur removal, most of the sulfur which is released in the combustion is removed by the inherent operation of the circulating fluidized bed technology. The coal is burned in the presence of limestone within the boiler. During combustion, the calcium carbonate in the limestone reacts with the sulfur to form calcium sulfate. Calcium sulfate is a stable, nontoxic substance more commonly known as gypsum; it is the principal ingredient in wall board (drywall). The plant can remove up to 90% of the sulfur contained in the fuel and will comply with the emission limits specified by the Hawaii Department of Health. Further, this technology is considered "Best Available Control Technology" by the Environmental Protection Agency (EPA).

#### **3.4.6.2 Nitrogen Oxide Emission**

Nitrogen oxides ( $\text{NO}_x$ ) are formed when the nitrogen present in the air and fuel react with oxygen in the high temperature of the boiler. The fluidized bed boiler operates at a lower temperature than conventional oil- or coal-fired boilers and so produces less  $\text{NO}_x$ . In addition, AES-BP will be applying selective noncatalytic reduction technology (commonly referred to as "Thermal de- $\text{NO}_x$ ") to further reduce  $\text{NO}_x$  emissions. In the Thermal de- $\text{NO}_x$  process, ammonia ( $\text{NH}_3$ ) added to the boiler in particular locations. The ammonia reacts with the  $\text{NO}_x$  and converts it back into the Nitrogen gas  $\text{N}_2$ , normally found in air, and to  $\text{H}_2\text{O}$ , ordinary water. Thermal de- $\text{NO}_x$  advanced pollution control technology that the EPA considers the "Best Available Control Technology".

**Table 3-19a. Worst Case Estimate of Ambient Air Quality Impacts (including Kalaeloa)**

	PM <sub>10</sub>	Concentrations (µg/m <sup>3</sup> )	
		SO <sub>2</sub>	NO <sub>2</sub>
<b><u>Annual</u></b>			
National Ambient Air Quality Standards	50	80	100
State Ambient Air Quality Standards	--	80	70
Existing & Background	39.5	43.1	47.1
AES-BP	0.1	0.5	<0.1
Kalaeloa at Max. Impact Point*	<u>0.3</u>	<u>2.0</u>	<u>2.3</u>
<b>Total:</b>	<b>39.9</b>	<b>45.6</b>	<b>49.4</b>
<b><u>24-Hour</u></b>			
National Ambient Air Quality Standards	190	365	
State Ambient Air Quality Standards	--	--	
Existing & Background	83.9	193.5	
AES-BP	3.7	<0.1	
Kalaeloa at Max. Impact Point*	<u>4.5</u>	<u>27.1</u>	
<b>Total:</b>	<b>92.1</b>	<b>220.6</b>	
<b><u>3-Hour</u></b>			
National Ambient Air Quality Standards	1300		
State Ambient Air Quality Standards	1300		
Existing & Background	894.1		
AES-BP	51.1		
Kalaeloa at Max. Impact Point*	<u>159.3</u>		
<b>Total:</b>	<b>1104.5</b>		

Source: Black and Veatch

**Table 3-19b. Worst Case PSD Impacts (including the Kalaeloa Power Plant)**

	Concentrations ( $\mu\text{g}/\text{m}^3$ )		
	Annual	24-Hour	3-Hour
<b><u>TSP Increment</u></b>			
Max. PSD Increment	<b>19</b>	<b>37</b>	
Existing Sources	4.9	46.6	
AES-BP	0.3	0.0	
Kalaeloa at Max. Impact Point <sup>1</sup>	<u>0.3</u>	<u>0.2</u>	
<b>Total:</b>	<b>5.5</b>	<b>46.6</b>	
<b><u>SO<sub>2</sub> Increment</u></b>			
Max. PSD Increment	<b>20</b>	<b>91</b>	<b>512</b>
Existing Sources	9.1	33.5	152.3
AES-BP	0.1	0.1	<0.1
Kalaeloa at Max. Impact Point <sup>1</sup>	<u>2.0</u>	<u>27.1</u>	<u>153.0</u>
<b>Total:</b>	<b>11.1</b>	<b>60.3</b>	<b>305.3</b>

1. Represents maximum air quality impact by Kalaeloa at any point. These maximum impacts do not occur the same place as AES maximum impacts, so these figures overstate the total air quality impacts from both projects. Actual combined figures are likely to be much lower, but cannot be estimated without extensive additional air quality monitoring.
2. Actual Kalaeloa impact at this point is known to be 0.0 so the actual impact at the receptor is included, rather than maximum of all points.

Source: Black and Veatch

### 3.4.6.3 Particulate Emissions

Particulate (dust) emissions occur when fine particles of ash and limestone are carried through the boiler and by handling the coal, limestone and ash outside the boiler. The latter are called fugitive emissions because they are emitted from many small points, rather than a single stack. The air permitting process considered both of these as emission sources when setting particulate emission limitations for the project. The dust from the boiler is removed using a "baghouse"; this is essentially a room full of large fabric filters which separate out the dust in much the same way as a vacuum cleaner bag. This technology removes more than 99.9% of the dust from the flue gas; it is also considered "Best Available Control Technology" by the EPA. Fugitive dust is reduced to minimal levels by enclosing all conveyors and transfer areas, and by spraying water or a non-toxic surfactant on the coal, limestone and ash piles to keep loose dust from being blown away by wind.

Table 3-15b shows in detail the types of dust control measures employed by the project. The removal efficiencies are based on Environmental Protection Agency (EPA) Publication AP-42 which specifies the expected control efficiency of individual technologies for use in air quality monitoring. Note that virtually all dust is recovered from the conveyors, transfers, crushers and other loading systems.

In addition to the controls applied to the movement of material into the plant, there are numerous operating procedures that will be utilized to control dust from the material storage piles. These procedures include compacting the surface of the piles with heavy equipment to minimize any loose material which could blow off of the pile and orienting the piles and recovery areas so as not to be in the direct line of wind. Finally, the routine consolidation, and other non-essential movement of material can be limited during extreme wind conditions.

In addition to these operating procedures, water sprays and other surfactants are quite effective in controlling dust from material storage areas. Wet suppression on the material storage area controls at least 50% of the dust otherwise generated. More advanced control methods such as surfactants and crusting agents are also available and can control 90%-100% of dust emissions.

Surfactants are nontoxic foams which bind to small particles and make them too heavy to be carried by wind. The surfactants are applied in an enclosed system before the material is placed on the pile and adhere immediately to the small particles. Thus, no free sprays of the surfactant are exposed to be carried by the wind.

Crusting agents (such as latex foams) are sprayed on the pile and form a hard surface resistant to rain and wind. The shell created by these agents lasts for up to one year between applications. Because they are long lasting, they can be applied during low wind conditions when carryover of the sprays will not occur.

Both products are nontoxic and approved for these applications by the EPA. A summary brochure has been attached which discusses some of these products.

The best combination of all the above options depends on numerous factors, including wind and rain conditions, the moisture content of the material as it arrives, and the volume of material at the site at any given time. These types of material storage areas are routinely located in developed areas (not infrequently adjacent to residential areas) without adversely impacting adjacent land owners. Finally, the coal we will be receiving from Indonesia is very low in dust compared to many coals (including the coal assumed in developing Table 3-15b). The combination of this low dust coal and the numerous control options discussed above will achieve a high degree of dust control.

### **3.5 EXISTING AND PLANNED LAND USE**

#### **3.5.1 POWER PLANT SITE & VICINITY**

##### **3.5.1.1 Existing Land Use**

The site of the proposed power plant is presently undeveloped and occupied largely by kiawe woodlands. There are no businesses or residents on-site that would have been displaced. The entire area is owned by the James Campbell Estate and leased to Hawaii Project Management, Inc. Land uses in the vicinity of the power plant are shown on Figure 3-6.

As indicated on that figure, the City and County of Honolulu's HPOWER waste-to-energy is located immediately north of the site. Chevron's Hawaiian refinery and the Brewer Chemical Company's manufacturing facilities lie just beyond that. Hawaiian Western Steel's reinforcing bar plant occupies the land between the eastern side of the power plant site and Hanua Street. The land on the makai (western) side of the facility is currently vacant, but its lessor, Hawaii Project Management, Inc. is currently in the process of subdividing the parcel; when the subdivision is complete, it will lease the lots to industrial users. Finally, the southern side of the site abuts Kaomi Loop and two parcels occupied by small industrial firms.

The other notable existing use is the Hawaiian Cement Company's plant, which is located along the southern side of Kaomi Loop opposite the AES cogeneration facility. In terms of bulk, the cement plant is the most imposing industrial complex within Campbell Industrial Park. The large storage silos and materials piles are substantially larger than the coal and limestone storage piles at the proposed power plant.

None of these existing land uses are particularly sensitive to the kinds of activities that would take place on the power plant site. The most serious concern that has been expressed by neighbors is the fear that coal dust or other emissions from the power plant could interfere with their operations. The evidence presented in the air quality impact analysis contained in Section 3.4 of this report indicates that emissions of particulates and other pollutants from the proposed facilities, including the coal, limestone, and pelletized ash storage piles, will be quite low. Hence, interference of this nature is unlikely.

While not strictly a land use impact, the presence of the 2.27-acre parcel currently occupied by Honomach, Inc. requires the design of the facility to be somewhat different than is considered ideal. AES-BP has had preliminary discussions with its lessors for the purpose of determining if they would consider relocating their facilities. The results of these preliminary discussions suggest this may be an option in the future.

##### **3.5.1.2 Planned Land Use**

Except for the vacant land immediately makai of the power plant site, all of the adjoining property is already occupied by industrial users. The makai land is part of the same large parcel controlled by Hawaii Project Management, Inc., that is being subdivided to accommodate the AES-BP power plant. Based on that firm's current plans, it is expected that most of it will be occupied by industrial activities sometime during the lifetime of the power plant.

Taken together, the 1-2 zoning, the Campbell Industrial Park design controls, and other factors make it extremely unlikely that future land uses in the area will be incompatible with the proposed power plant.

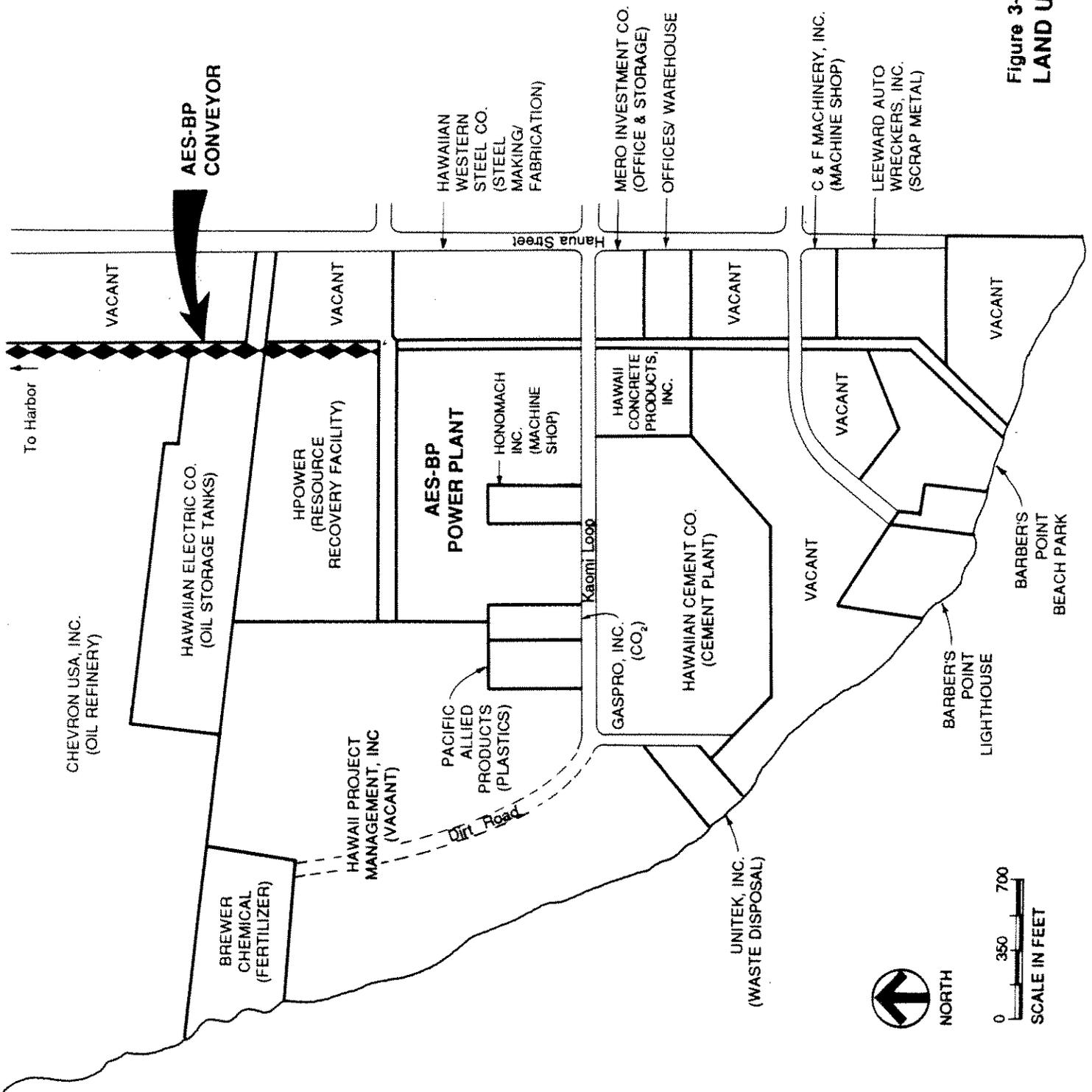


Figure 3-6  
LAND USES NEAR SITE

### 3.5.2 CONVEYOR RIGHT-OF-WAY & VICINITY

#### 3.5.2.1 Existing Land Use

With respect to adjoining land uses, the proposed conveyor route can be divided into three different segments. These segments, the general character of the existing land uses, and the compatibility of those uses with the presence and operation of the conveyor are summarized below.

- Segment 1 of the proposed conveyor extends parallel to Hanua Street from the power plant to Malakole Road. It crosses the HPOWER site, the eastern side of the Chevron refinery, and Malakole Road. The area between the proposed alignment and Hanua Street is subdivided into a number of parcels, most of which are still vacant. Based on the minimal impacts of the enclosed conveyor design, it does not appear that noise, dust, or other effects of the conveyor would adversely affect the ability to use these parcels in a way that is consistent with their 1-2 zoning. The minimum clearance between the bottom of the conveyor and Malakole Road will be 25 feet. This clearance is larger than that provided on freeways and other major road arterials. Hence, the crossing should not restrict normal truck traffic. Because trucks carrying over-size cannot generally exceed 25 feet in height no significant adverse effect is anticipated.
- Segment 2 runs from Malakole Road to the Barbers Point Deep Draft Harbor. Most of this area is currently bare coral, but a small portion is occupied by parts of the dredged materials stockpiles created during construction of the harbor. The Campbell Estate is continually removing the dredged material in the stockpiles, and the timing of conveyor construction appears to be consistent with their plans. Because of this, no adverse effect is anticipated.
- Segment 3 extends from the boundary of the Barbers Point Deep Draft Harbor to the dockside loading and unloading facilities. This area is currently vacant.

#### 3.5.2.2 Planned Land Use

Current plans call for the industrialization of virtually all of the land which the conveyor crosses. Because of this, its effect on future land use was also evaluated.

- Future development near Segment 1 of the conveyor will consist of the same types of industrial uses present on the parcels that have already been developed. This conveyor system is expected to be compatible with this further growth.
- The presence of the conveyor on presently undeveloped land between Malakole Road and the harbor (Segments 2 and 3) will have to be taken into account if and when its owner, Campbell Estate, subdivides the property. AES-BP has worked closely with the Estate to plan and design a conveyor route which will not hamper eventual industrial development of the area in accordance with the Estate's long range master plan. A tentative agreement has been reached concerning the easements that will be needed. It insures that the conveyor will not hamper future use of the area adjoining it.

### 3.6 HISTORIC, PALEONTOLOGIC, AND ARCHAEOLOGIC RESOURCES

Barbers Point and the Ewa plain were the subject of intense archaeological study during the late 1970's and early 1980's. Most of this was due to the development of the Barbers Point Deep Draft Harbor by the State Army Corps of Engineers. Although the coralline reef that forms

the plain now appears to be a somewhat hostile environment, this research shows that the area was occupied by dispersed clusters of fishing or marine-oriented inhabitants. Surveys and excavations in the Barbers Point area have determined that the sinkholes common to the plain were used by aboriginal Hawaiians as refuse pits, and that these pits may contain archaeological and paleontological remnants. More recently, the sinkholes have been found to be a resource for studying the pre-historic bird populations of Oahu. The birds took cover in the sinkholes and then found they could not escape.

Campbell Estate records indicate that the area now occupied by the industrial park has been extensively disturbed. The Army conducted manuevers there during World War II, but no permanent facilities were erected. During the late 1940's through 1958, the area was used for grazing. In 1962, the entire industrial park area was bulldozed for development, filling many of the sinkholes mentioned above.

There are no known archaeological resources on the power plant site, and neither it nor the conveyor included in the nearby Barbers Point Harbor Archaeological Complex, according to the Department of Land and Natural Resources (DLNR). After reviewing plans for the project, the Historic Sites Section of DLNR initially concluded that it would have no effect on significant historic sites and would not require further archaeological surveys.

As a result of comments received on the Draft EIS, it became apparent that the proposed conveyor alignment would interfere with plans for an archaeologic/palaeontologic science reserve and park proposed for the area northwest of the Malakole Road/Hanua Street intersection. Once this was known, the situation was discussed with Dr. Alan Ziegler (the scientist who has been most active in efforts to establish the preserve and park), with Dr. Joyce Bath of the Historic Sites Section of the State Department of Land and Natural Resources, with the prospective conveyor supplier, and with representatives of the James Campbell Estate (which owns the land across which the conveyor would pass). Based on these discussions, the conveyor was rerouted to the alignment shown in Chapter 1 of this report.

The new conveyor alignment completely avoids the area north of Malakole Road that the Honolulu City Council has indicated an interest in incorporating into a future educational park. Because of the presence of the 30- to 40-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated in an archaeological/palaeontological science reserve. However, AES Barbers Point has agreed to keep the conveyor elevated in this area and to design the support structures for the conveyor so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that those sinkholes are not accidentally damaged by construction equipment.

The portion of the conveyor route south of Malakile Road is within an existing roadway thatains no archaeological or other historic remains. As confirmed by Dr. Bath, there are no sinkholes or archaeological remains along the proposed alignment between the proposed science reserve and the harbor.

### **3.7 BIOLOGICAL RESOURCES**

#### **3.7.1 FLORAL IMPACTS**

##### **3.7.1.1 Existing Flora**

As previously noted, the project site is part of a much larger area that was cleared, grubbed, and rough-graded many years ago when Campbell Industrial Park was first constructed.

"Volunteers" plants have subsequently revegetated most of the site, the exception being a few acres adjacent to Hawaiian Western Steel's ironworks. That area has been kept cleared and used to store equipment and materials.

A botanical survey of the AES-BP cogeneration facility site conducted by Kenneth M. Nagata (1988) concluded that common kiawe (Prosopis pallida) woodland (the Ewa Plain's climax lowland vegetation community) covers over 75 percent of the site. Koa haole (Leucaena leucocephala) is the most common understory shrub. Ground covers and grasses common in scattered open areas of the kiawe woodlands include feathery pennisetum (Pennisetum setosum), swollen fingergrass (Chloris inflata), bristly foxtail (Setaria verticillata), golden crown-beard (Verbesina encelioides), and Chinese violets (Asystasia gangetica).

Early in 1989 Mr. Nagata also surveyed the vegetation along the proposed conveyor route. Most of the conveyor route between the power plant site and Malakole Road is on land that has already been cleared for the existing industrial uses. Only scattered kiawe trees and a few species of weedy grasses and shrubs are present for most of this distance. Approximately 0.1 mile of the route passes through kiawe woodlands similar to that found on the power plant site.

West of malakole Road the conveyor route is on vacant land that has been disturbed during construction of the Barbers Point Deep Draft harbor. Some of it, as well as much of the surrounding terrain, is covered by piles of coral and sand dredged from the harbor. Mr. Nagata found no vegetation of note on this portion of the route.

Achyranthes splendens, v. rotundata is a low shrub with an inconspicuous floral display borne on a terminal spike. The leaves are blunt-tipped, nearly rounded, and are covered with short silky silvery hairs on both sides. The flowers and leaves are used in local cultural ceremonies. Confined to a few relatively dry coastal areas, it was listed as federally endangered in March 1986. One population of Achyranthes is located along the Barbers Point shoreline, including the area makai of the AES-BP power plant site. Knowing that Achyranthes had been found near the project site, the scientists who conducted the botanical survey of the AES-BP site made a special effort to search for it on the project site. Despite this, no Achyranthes had been found near the project site, the scientists who conducted the botanical survey of the AES made a special effort to search for it on the project site. Despite this, no Achyranthes were found.

### 3.7.1.2 Floral Impacts

Essentially all of the existing vegetation on the power plant site and within the conveyor easement would be removed during construction of the proposed project. As can be seen from the site plan in Figure 1-4, most of this would not be replaced. Limited numbers of landscape plants would be installed around the perimeter of the cogeneration facility in accordance with the Campbell Estate's site development guidelines. Current plans do not call for landscaping within the conveyor easement.

Three plants listed as endangered are found in the Barbers Point area. These include the Ewa Plains 'akoko (Euphorbia skottsbergii, variety kalaeloana, ko'olua'ula (Abutilon menziesii), and Achyranthes splendens rotundata U.S. Fish and Wildlife Service, December 7, 1988). Because it has been so thoroughly disturbed, it was considered unlikely that any of these would be present along the conveyor route. Nagata's botanical survey of the conveyor route confirmed that this is the case.

Previous studies had not found representatives of the first two species in the immediate vicinity of the project site. However, a colony of Achyranthes splendens rotundata had been identified near the project site on the land Hawaii Project Management, Inc., is leasing from the Campbell Estate (Elliott & Hall, 1980). (Achyranthes splendens, v. rotundata is a low shrub with an inconspicuous floral display borne on a terminal spike. The leaves are blunt-tipped, nearly

rounded, and are covered with short silky silvery hairs on both sides. The flowers and leaves are used in local cultural ceremonies). Because of this, AES-BP insisted that a thorough botanical survey of the power plant site and surrounding areas be conducted before finalizing its sub-lease. A special effort was made to delineate the extent of the Achyranthes colony so that it could be avoided when subdividing the area to be used for AES-BP's cogeneration facility.

The results of Nagata's botanical survey were used in establishing the present project limits. Consequently, more than 270 feet separate the boundary of the facility from the nearest Achyranthes. This is more than enough to insure that it will not be directly affected by construction or operational activity at the power plant. The survival of the Achyranthes colonies during the construction of the equally close HPOWER facility is evidence that there will be no direct or indirect construction impacts on the plants.

Air emissions are the only conceivable mechanism through which operation of the facility could harm the Achyranthes colonies. However, results of ambient air quality modeling described in Section 3.4 show that the project will have little effect on air quality where the plants are located. No scientific studies have been conducted which clearly establish the tolerance levels of the Achyranthes, but the modeled levels are well below those at which significant adverse impacts on other plants have been observed. It is also worth noting that existing particulate emissions from the area are at least an order of magnitude larger than those expected from the power plant, yet no apparent injury to the achyranthes has been noted.

In summary:

- The sparse vegetation present on the power plant site and within the conveyor easement is typical of that found in similar environments throughout the state.
- No endangered species are present in the areas that would be affected by construction of the project.
- No mechanisms exist which could result in significant indirect effects to vegetation off the project site.

Consequently, the project will not adversely affect flora.

### 3.7.2 FAUNAL IMPACTS

#### 3.7.2.1 Existing Fauna

Field studies of the project site and environs (CONOCO-Dillingham Oil Company, 1972: 11-46; Eddinger, November 1979) indicate that the mammals that are present are typical of those found throughout lowland areas of Oahu. Mongooses (Herpestes auropunctatus) are abundant in the vegetated portions of both the power plant site and the conveyor easement. They are most common near the edges of the kiawe woodlands, while they are relatively sparse on the dredged spoils.

Feral dogs (Canis familiaris) and cats (Felis catus) and a variety of rodents are also present. The house mouse (Mus musculus) and Hawaiian rat (Rattus exulans) were the most abundant species encountered at the time of the survey conducted in 1971-72 for the CONOCO-Dillingham Oil Company, 11-49. That same study suggests that the shallow soils on the power plant site may make burrowing difficult, thereby limiting the size of the rat and mouse population and hypothesizes that the mouse population, at least, may show large seasonal fluctuations due to changes in food availability.

Three ornithological surveys have been conducted of the power plant site and immediate environs. Two of them (Randall, December 1971 and April 1972) included the proposed cogeneration facility site, while the third (Bruner, 1980) was of the neighboring HPOWER site. Table 3-20 lists the species encountered during these surveys.

Except for the black-crowned night heron (*Nycticorax nycticorax*), all of the birds observed on the site are introduced. The dramatic, man-induced changes in vegetation and land use that have occurred in the area have eliminated the endemic species that were formerly present. Randall (1971), made the following observations concerning the distribution of these birds:

*Two species of migrating shorebirds, the gold plover and the wandering tattler, utilize this area as wintering grounds. Plovers were most frequently observed along the shoreline, in field roads and in fields where sugar cane had recently been planted. The only observations of a wandering tattler were made along the rocky shoreline on the site. Barred doves and spotted doves were prevalent throughout the area, but were particularly abundant at the edge of wooded and open areas, where they feed on small weeds and grass seeds. Doves were frequently flushed and seen loafing and feeding on the site. One dove was found nesting in a wooded area adjacent to the site. Observations of American cardinals and Brazilian cardinals were most frequent around brushy and wooded habitats. Flocks of ricebirds and Japanese white-eyes were commonly observed around wooded edges and in grassy open areas adjacent to the edge. House sparrows and Indian mynahs were most widespread in areas where buildings had been constructed.*

No ornithological survey has been conducted of the conveyor route since the dredging of the Barbers Point Deep Draft Harbor. However, the birds present in the small wooded portion are almost certainly similar to those observed on the power plant site. The area that has been disturbed during construction of the Barbers Point Deep Draft Harbor offers few feeding and/or nesting opportunities. Consequently, it appears to have a relatively small bird population.

No threatened or endangered animals are known to be present on the power plant site or along the conveyor right of way.

### **3.7.2.2 Impact on Existing Fauna**

The loss of the kiawe woodlands habitat will affect the area's fauna in several ways:

- It will reduce the food and resting areas available to wildlife.
- Site fencing and other security measures will prevent the larger mammals (such as feral dogs and cats) from entering the power plant site and the conveyor easement.
- Mongooses, mice, and rats will not be deterred by the fencing. However, removal of the existing vegetation from the power plant site and the conveyor right-of-way will decrease the food supply and the nesting, loafing, and hiding opportunities available to these animals. Hence, their population density is expected to decline slightly. These species are widely distributed, however. Hence, the decline is not expected to be significant.
- Construction of the power plant will also eliminate some woodland bird habitat. Some of the species will undoubtedly adapt to the new habitat created by construction of the power plant, and the bird population as a whole is sufficiently mobile to relocate to similar habitats nearby. Relocation is viable only if those habitats are not already at their carrying capacity, however. To the extent that nearby areas are already at their carrying capacity, a slight, selective, reduction in the total number of birds is to be expected.

Table 3-20. Species List of Birds Observed In the Vicinity of the Power Plant Site.

<u>Common Name</u>	<u>Scientific Name</u>
Lace-Necked Dove	<u>Streptopelia chinensis chinensis</u>
Barred Dove	<u>Geopelia striata striata</u>
Spotted Dove	<u>Streptopelia chinensis</u>
Ring-Necked Pheasant	<u>Phasianus colchicus</u>
Mockingbird	<u>Mimus polyglottos</u>
Indian Mynah	<u>Acridotheres tristis tristis</u>
Japanese White-eye	<u>Zosterops japonica japonica</u>
Rice Bird	<u>Lonchura punctulata</u>
House Sparrow	<u>Passer Domesticus</u>
American (Kentucky) Cardinal	<u>Richmondena cardinalis</u>
Northern Cardinal	<u>Cardinalis cardinalis</u>
Brazilian Cardinal	<u>Paroaria cristata</u>
Red-Crested Cardinal	<u>Paroaria coronata</u>
House Finch	<u>Carpodacus mexicanus frontalis</u>
Golden Plover	<u>Pluvialis dominica</u>
Wandering Tattler	<u>Heteroscelus incanum</u>
Black-Crowned Night Heron	<u>Nycticorax nycticorax</u>
Black-Headed Manniken	<u>Lonchura malacca</u>
Cattle Egret	<u>Bubulcus ibis</u>
Red Billed Leiothrix	<u>Leiothris lutea</u>
Bard Owl	<u>Tyto alba pratincola</u>
Red-Vested Bulbul	<u>Pycnonotus cafer</u>
Common Pigeon	<u>Columba livia</u>
Ruddy Turnstone	<u>Arenaria interpres</u>

Sources:

- (1) Randall, John (December 1971). Avian Survey of the proposed CONOCO-Dillingham Oil Company Oil Refinery Site. Honolulu: Author, B.P. Bishop Museau.
- (2) Bruner, Phillip (June 1980). Ornithological and Mammalian Survey of the Proposed HPOWER Resource Recovery Facility Site. Prepared for Belt Collins & Associates. Laie, Oahu: Author.

- Conveyor construction and operation is not expected to affect fauna significantly. This is because it entails only modest land disturbance on parcels already slated for industrial development.

### **3.8 IMPACTS ON SCENIC AND VISUAL RESOURCES**

#### **3.8.1 EXISTING CONDITIONS**

Because the terrain is flat and there are no distinguishing features, the project site is visible at short and medium range only from the parcels which immediately adjoin it. These include the HPOWER complex, Kaomi Loop, short segments of Hanua Street, and the industrial parcels to the south and west.

The Land Use Ordinance and the Ewa Development Plan limit the height of industrial structures in Campbell Industrial Park to 60 feet. However, several facilities within CIP, such as the City's waste-to-energy facility (HPOWER) adjacent to the AES-BP site, have obtained waivers and variances which allowed them to exceed this limit. The main boiler building at HPOWER, for example, is over 150 feet high, and the storage silos at the Hawaiian Cement plant are even higher.

Adherence to the Campbell Industrial Park design guidelines (which are intended to promote architectural and aesthetic quality) has resulted in wide setbacks and attractive landscaping along Kaomi Loop. The absence of special landscape plantings on and adjacent to the parcels which have not yet been developed, including the AES-BP cogeneration facility site, makes them generally less attractive than the parcels which have been built on.

Despite the landscaping, the overall appearance of the area is heavily industrial, with HPOWER facility, the Hawaiian Cement plant and the Chevron and HIRI Refineries dominating the scene. These are particularly visible from the public areas along the shoreline, in part because of the absence of any development on the intervening property.

The undeveloped area crossed by the conveyor is flat and generally free of vegetation. The exceptions are the large piles of dredge spoils which now occupy a portion of the area. These piles will eventually be removed and additional industrial buildings, uses, and structures developed.

#### **3.8.2 PROBABLE IMPACTS**

##### **3.8.2.1 Power Plant**

The major structures on the power plant will be visible from Hanua Street, Kaomi Loop, and nearby intersections. From a distance, it will share the horizon with the HPOWER and Hawaiian Cement plants.

The stack will be visible from some distance, but design features such as a relatively narrow-cross-section and light colored paint, will help reduce their impact. The Federal Aviation Administration will, however, require flashing white lighting at the top of the stack.

The boilers, turbine-generators, and other equipment will be housed in metal frame structures similar to those used at HECO's existing power plants. Because the equipment is relatively large, several of the structures will exceed the existing 60-foot height limit. These include:

<u>Structure</u>	<u>Height (in ft.)</u>
Stack	290
Generation Building	160
Fabric Filter Building	85
Coal Crusher Building	80
Fly Ash Silo	110
Bed Ash Silo	110
Transfer Stations & Conveyor	80
Lowering Well	100

Consequently, AES Barbers Point, Inc., is seeking a height waiver as provided for in Section 3.150 of the City and County of Honolulu Land Use Ordinance. Designation of the project as a "public facility" obviates the need for an amendment to the height provisions of the Development Plan.

These structures are the latest of many tall buildings in Campbell Industrial Park. For example, the boiler building in the HPOWER complex immediately north of AES-BP's proposed cogeneration facility is over 150 feet high, and the storage silos in the Hawaii Cement plant just to the south are even higher. The mass of the Hawaiian Cement complex already dominates the skyline, and the addition of the proposed structures will do little to alter this.

The bulkiest features on the power plant site are the coal, limestone, and ash storage piles and the coal lowering well. Only the last exceeds 40 feet in height. Appropriate landscaping will be used to minimize the project's visual impact.

The plant will not emit smoke or other visible plumes. The baghouses incorporated in the design collect over 99.9 percent of the particulate matter from the boilers, insuring that the exhaust gases are clear. The proposed facility will use a hard coal that is relatively dust-free. Specifications call for 4" lumps or smaller, and severely limit the amount of "fines" that can be present. The limestone and ash pellets are also hard materials that produce a minimum of dust. Moreover, the storage piles will be sprayed with water and dust control chemicals as well. Hence, there will be no visible wind-born dust plumes from the piles.

Under most meteorological conditions, there will be little, if any condensation above the cooling tower. Only during periods of particularly high humidity and/or low temperatures will a visible plume form. Occasionally, during periods of high humidity and low wind, a visible plume may form. It will be white, and it is expected that it will disappear within a few hundred feet of the cooling tower.

The site will be landscaped following construction to partially shield the facility and structures from direct views in accordance with Land Use Ordinance and Campbell Industrial Park guidelines. A landscape plan for both the power plant and the conveyor must be approved as part of the LUO Waiver process; this will provide additional assurance that visual impacts will be minimized.

### **3.8.2.2 Overland Conveyor and Harbor Facilities**

As indicated in Chapter 1, the conveyor will be elevated 25 feet above ground where it crosses Malakole Road. The conveyor structure at the crossing will have a maximum height of 40 feet and will be fully enclosed, preventing fugitive dust and materials loss at this crossing. It will be visible to motorists on Malakole Road and the other roadways that it crosses, as well as to workers on adjoining parcels. The conveyor will be lower than the majority of the industrial structures on adjoining land, and it will be painted to blend in with the surroundings. Hence, it is not expected to interfere with views or otherwise significantly alter the visual environment.

### 3.9 RECREATIONAL IMPACTS

No recreational resources are present on the project site or along the conveyor route. The shoreline is located approximately one-third of a mile to the north and west of the power plant site, but fishing, and perhaps some occasional beachcombing, is the only known use. Neither of these would be directly affected by construction of the cogeneration facility.

The City & County of Honolulu's Barbers Point Beach Park is located 1,500 feet south of the power plant site. The Hawaiian Cement plant lies between the power plant and the beach park. Because of this, the proposed facilities will not be visible to the park's users.

The only mechanism through which the proposed cogeneration facility could affect nearshore waters adjacent to the beach park is through stormwater runoff. And the settling basins incorporated in the design eliminate this as a significant factor. Similarly, noise control measures will make the facility inaudible at the beach park.

The air quality impact analysis described in Section 3.3 evaluates the effect of power plant emissions (including stack emissions and particulates from the storage piles).

### 3.10 AIR NAVIGATION

The power plant site is located approximately 9,400 feet southwest of the approach end of Runway 11 at Naval Air Station Barbers Point (NASBP). In response to a Notice of Intent to Construct filed by AES-BP, the Federal Aviation Administration conducted an aeronautical study (No. 88-AWP-917-OE) of the proposed structures. The study concluded that the 290 feet AGL/300 foot AMSL stack associated with the facility would constitute an obstruction because:

- its top would be more than 200 feet above the reference level of the airport (33 feet above mean sea level [FAR Part 77, Subpart C, 77.23(a)(2)], and
- it would break the conical surface for NASBP (as defined in FAR 77.28) by 22 feet [FAR Part 77, Subpart C, 77.23(a)(5)].

The FAA's aeronautical study noted that AES-BP's stack would be immediately adjacent to a stack for the City and County of Honolulu's resource recovery facility. That stack was the subject of two previous aeronautical studies (86-AWP-1144-OE and 83-AWP-625-OE). Both concluded that the HPOWER stack would not have a substantial adverse effect on the safe and efficient use of navigable airspace, and would not be a hazard to air navigation.

Finding that the proposed stack would have no greater effect on aeronautical procedures than the previously studied facility, the FAA concluded that "it would not adversely affect the safe and efficient use of navigable airspace and would not be a hazard to air navigation." On that basis, a "Determination of No Hazard to Air Navigation" was issued on July 5, 1988. The determination requires only that the stacks should be marked as obstructions in accordance with FAA Advisory Circular 70/7460-1G, Chapters 3, 4, 5, and 9. Flashing white lights will be located at the top of the stack and will operate 24-hours per day. No special painting is required; hence, AES-BP will choose a finish that blends into the area.

One response to the EIS Preparation Notice for the AES-BP project was received which bears on the air navigation question. The Engineering Office, Office of the Adjutant General, Department of Defense, State of Hawaii stated that the Hawaii Air National Guard unit wanted the height and location of the stack to be coordinated with the Barbers Point NAS Air Operations Office because of concerns over its effect on flight safety. The comment noted that

the Air National Guard operates an Air Traffic Control Center at NAS Barbers Point, and that their acting commander had expressed a concern in this regard as well.

As a result of these comments a representative of AES-BP spoke with Mr. Bill Liu at COMNAVBASE, Pearl Harbor, the individual the Navy designated as the contact for matters related to this EIS. Mr. Liu indicated that his office had not been aware that the FAA had issued a Determination of No Significant Impact at the time the comments were made. When informed that this was the case, he indicated that his office's concerns had been satisfactorily resolved.

### **3.11 TRANSPORTATION IMPACTS**

The proposed project will impact existing and proposed transportation facilities in several different ways:

- Fuel and limestone shipments to the facility will increase usage of the Barbers Point Deep Draft Harbor.
- Construction will cause a temporary increase in truck traffic on the streets in and around Campbell Industrial Park.
- Operation of the facility will increase employee traffic on the roads serving the Industrial Park.

A fourth type of potential impact, increased heavy truck traffic between the Barbers Point Deep Draft Harbor, also exists. However, it will occur only if AES-Barbers Point is unable to complete its planned conveyor.

The magnitude of these impacts, as well as their significance with respect to highway service levels, safety, and other transportation-related matters, is discussed below. Where appropriate, potential mitigation measures are also identified.

#### **3.11.1 HARBOR USAGE**

As indicated in Chapter 1, the proposed facility will consume large quantities of coal and limestone. If a local user cannot be found, it may also need to ship pelletized ash out of the State. Both these activities will involve the Barbers Point Deep Draft Harbor. Based on the use of 60,000-ton capacity colliers and the level of coal and limestone consumption described in Chapter 1, it is expected that shipments of these materials will involve approximately 15 landings per year. If the ash must be exported, it will most likely be accomplished in two to three shipments per year.

The Barbers Point Deep Draft Harbor has been planned as the island's principal bulk cargo handling facility since its conception. Hawaii Pacific Industries is now in the process of developing the bulk cargo handling facilities needed to accomplish this at Pier 6, and they are expected to be completed well before the first coal shipment for the power plant will arrive. The planned facilities are capable of handling more than 500,000 tons per month (20,000 tons per day, six days per week). Consequently, shipments for the proposed power plant would consume no more than 10 to 15 percent of their available capacity. This would leave more than enough surplus capacity to accommodate all of the bulk cargo likely to be landed on Oahu for the foreseeable future.

### 3.11.2 EFFECT OF CONSTRUCTION TRAFFIC

#### 3.11.2.1 Trip Generation

Construction of the power plant, conveyor, and electrical substation will stretch over approximately 30 months. The level of construction activity, and, therefore, construction traffic will vary significantly during that period.

Black and Veatch (October 12, 1988) estimates that peak on-site construction employment may reach 450. Assuming an average of 2.2 one-way person trips per employee per day, 1.2 persons per vehicle, and 45 percent of the average daily employee-trips occurring during the peak hour, this will produce approximately 375 peak-hour vehicle-trips. This level of activity will persist for only a very short period of time, however. It is anticipated that 250- to 300-peak-hour vehicle trips will be a more representative figure.

Assuming use of the planned access points to the parcel, all of these trips will affect Kaomi Loop, inbound in the morning and outbound in the afternoon. A variety of possible routes exist between the intersection of Kaomi Loop and Hanua Street and the Kalaeloa Boulevard/Malakole Road intersection, and it is expected that employees will select the route that has the least traffic.

#### 3.11.2.2 Existing Conditions

The State Department of Transportation makes regular traffic counts at the entrance to Campbell Industrial Park (the intersection of Kalaeloa Boulevard and Malakole Road). The most recent of these was conducted on November 18-19, 1987 and is summarized in Table 3-21.

The morning peak is 1,339 and occurs between 6:30 and 7:30 a.m. It is very directional, with over 87 percent of the trips being made inbound direction. The afternoon peak of 1,046 is lower than the morning peak, but, with 84 percent of the trips being in the outbound direction, it is nearly as directional.

The existing performance of the roadway was calculated using procedures outlined in the Highway Capacity Manual (Transportation Research Board, 1985; Federal highway Administration, June 1984). The analysis indicated that the vehicle: capacity ratio (v/c ratio) on Kalaeloa Boulevard north of Malakole Road is currently about 0.43 during the peak hour in the morning and 0.36 during the afternoon rush hour. Traffic volumes on Kalaeloa Boulevard decrease farther to the south, and so the v/c ratios there are even lower. Tables in the Highway Capacity Manual indicate that this is equivalent to Service Level "B". (Level of Service "B" is the next-to-best service level; it is indicative of free-flowing conditions and relatively high average speeds).

Table 3-21. Traffic at the Kalaehoa Boulevard/Malakole Road Intersection.  
November 18-19, 1987.

<u>Time</u>	<u>Number of Vehicle-Trips Per Hour</u>		
	<u>Inbound</u>	<u>Outbound</u>	<u>Total</u>
Midnight-1 am	8	12	20
1-2:00	3	5	8
2-3:00	2	5	7
3-4:00	27	4	31
4-5:00	61	13	74
5-6:00 am	279	38	317
6-7:00	1,169	134	1,303
7-8:00	750	275	1,025
8-9:00	348	245	593
9-10:00	251	220	471
10-11:00	309	266	575
11-12:00 pm	257	285	542
12-1:00	275	290	565
1-2:00	267	263	530
2-3:00	307	317	624
3-4:00	210	759	969
4-5:00	142	682	824
5-6:00 pm	120	421	541
6-7:00	77	167	244
7-8:00	28	63	91
8-9:00	30	50	80
9-10:00	26	62	88
10-11:00	49	22	71
11-midnight	12	31	43
A.M. Peak-Hour (6:30-7:30 a.m.)	1,173	166	1,339
P.M. Peak-Hour (3:15-4:15 p.m.)	164	882	1,046

Source: State Department of Transportation traffic Counts: November 18-19, 1987.

The Kalaeloa Boulevard/Malakole Road intersection is the busiest intersection in Campbell Industrial Park. The unsignalized intersection module of the Highway Capacity Manual was used to assess the current peak-hour performance of the intersection. Results of the evaluation indicated that the intersection was generally operating satisfactorily. At the same time, it suggested that the stop-controlled intersection places significant constraints on the number of vehicles that can turn left out of Malakole Road onto Kalaeloa Boulevard northbound. On-site observations were made during the course of this study to check the accuracy of this theoretical analysis. They confirmed that no significant congestion now occurs at the locations that would be most affected by construction traffic associated with the proposed project.

### **3.11.2.3 Project-Related Construction Impacts**

The construction traffic generated by the proposed project (see Section 3.11.2.1, above) was added to the existing values for both morning and afternoon peak hours. The totals were then compared with the roadway capacity calculated using the Highway Capacity Manual. This analysis indicated that the construction traffic would temporarily increase the peak morning and afternoon v/c ratios on Kalaeloa Boulevard to 0.53 and 0.48, respectively. The peak-hour service level was forecast to decrease from "B" to "C". At level of service "C", vehicles' ability to manoeuvre freely within the traffic stream and to select an operating speed is clearly affected by the presence of other vehicles. However, the calculations suggest that the average speed will be only 3-4 miles per hour lower than at present, a relatively small decrease.

The analysis of the Kalaeloa Boulevard/Malakole Road intersection showed that the increased traffic would have only a slight adverse effect on the level of service at that point. Outbound vehicles would probably be discouraged from attempting to turn left out of Malakole Road onto Kalaeloa Boulevard northbound during peak traffic hours because of the increase in conflicting movements. Numerous other routes are available, however, so that this is not expected to pose a significant problem.

### **3.11.3 EFFECT OF OPERATIONAL TRAFFIC**

#### **3.11.3.1 Employee Trips**

Black & Veatch (October 1988) estimate that approximately 70 workers will be employed at the power plant after it enters full-scale operation. These will staff a 24-hour a day, 365-day per year operation.

Regular maintenance activities will be scheduled for the day shift. Hence, employee travel will be heaviest during the morning (6:30 to 7:30 a.m.) and afternoon (3:30-4:30 p.m.) commute periods. Assuming a staff of 10 on the evening and night shifts, it is estimated that approximately 30 employees will be on-site during a typical day shift. Ignoring the effect of car-pooling, it is estimated that employees will generate about 30 inbound and 10 outbound trips during the morning peak hour, and about 30 outbound and 10 inbound during the afternoon peak hour.

This is a small number, both in absolute terms and relative to the number of trips generated during the construction phase of the project. It would not significantly affect service levels on any of the roads serving Campbell Industrial Park. In fact, reference to standard trip generation rates for heavy industrial areas strongly suggests that traffic will be lower if the proposed power plant is developed on the 25-acre site than if other industrial uses are developed instead.

### **3.11.3.2 Truck Trips**

A variety of service vehicles will visit the site, mostly during the day shift. These trips will coincide with the existing peak, and they are not expected to have a measurable effect on service levels.

Current plans call for coal and limestone to be carried between the harbor and power plant using the conveyor system described elsewhere in this report. However, it is possible that it may be necessary to use trucks in lieu of the conveyor if mechanical breakdowns or cost factors preclude this choice. If this occurs, truck traffic on Kaomi Loop, Hanua Street, and Malakole Road will be increased several days each month.

Assuming the use of trucks with a net carrying capacity of 30 tons of coal, transporting the 50,000 tons that might be unloaded from a coal delivery ship would require about 1,700 round-trips. This volume would be moved over three 20-hour days, producing an average of between 45 and 50 one-way trips per hour. Given a one-way travel distance of approximately 2.0 miles, an average speed of 25 miles per hour, and a turn-around time of about 10 minutes at either end, each truck would make about four one-way trips per hour. This means that a fleet of about 14-15 trucks would be required.

Kaomi Loop, Hanua Street and Malakole Road are all lightly traveled at the present time. Moreover, the width and other characteristics of the roads are designed to accommodate large trucks of the type that would be used to haul coal. They have sufficient excess capacity to accommodate the necessary trucks without a substantial decrease in service level.

## **3.12 REGIONAL ECONOMIC IMPACT**

Construction and operation of the proposed project will have a positive economic benefit on the Oahu economy. These benefits will be in the form of increased employment and capital investment, expanded business activity, and higher tax revenues to State and Local governments. Over the long-term, it is also expected that the project will tend to help stabilize electricity prices, and this will improve the competitiveness of island businesses.

The remainder of this section discusses these effects. Expected changes are quantified where possible. However, some of the analysis is necessarily qualitative in nature.

### **3.12.1 CONSTRUCTION EXPENDITURES AND EMPLOYMENT**

Plant construction and the installation of manufactured equipment for the power plant and conveyor is a major undertaking. As indicated in Chapter 1, AES-BP estimates that construction costs will exceed \$300 million. A substantial portion of that will flow directly into the Hawaiian economy.

AES-BP estimates that total construction payroll, purchases, and property and sales taxes will amount to approximately \$83 million. Peak construction employment is estimated at approximately 450 full-time positions. Average construction employment will be lower, probably on the order of 300 persons.

According to the State Department of Labor and Industrial Relations, employment in Oahu's contract construction industry averaged 16,500 in 1987, the most recent year for which complete data is available. Forecast peak construction employment for the project (460 jobs) is equivalent to only 2.8 percent of the 1987 construction industry employment. However, due to the specialized nature of many tasks required to construct this type facility, there may be insufficient qualified local labor in certain skilled trades. Skilled boilermakers, electricians,

pipefitters, and insulators may need to be brought in from the Mainland to supplement the local labor force. Naturally, all efforts will be made to fully utilize the available local labor pool. The other projects on Oahu currently utilizing these personnel (H-Power and the Kalaeloa Partners cogeneration facility) will be nearing completion just as AES Barbers Point requires its peak construction manpower. This will provide continuity for the workers employed by these projects, and will minimize the number of off-island personnel required to complete the project.

### **3.12.1 OPERATIONAL EMPLOYMENT AND EXPENDITURES**

AES-BP estimates that the facility will employ 70 full-time staff members. The average wages (direct plus fringe benefits) are estimated at about \$50,000 per year, well above the average figure for Oahu [note that these and other figures cited here are in 1988 dollars]. This is equal to a direct payroll of \$3.5 million per year.

AES-BP expects that local purchases and contract services, combined with the total property, income, and various sales taxes that the project will generate, will amount to nearly \$13 million in 1993, its first full year of operation. It calculates the direct benefits of the plant over the entire 30-year operating life of the project at roughly \$1.2 billion.

A review of the attributes of the Oahu labor force indicates that workers already in the islands possess virtually all of the skills necessary to operate the proposed facility. Consequently, it is expected that the operating facility will be drawn almost entirely from among local workers.

### **3.12.3 INDIRECT IMPACTS**

The direct expenditures described above will generate secondary, or indirect, effects in the economy as well. These secondary impacts represent jobs and income in other parts of the economy, especially the retail and service sector, that result from purchases by the plant, its staff, and its suppliers. AES-BP used the multipliers for indirect construction wages and investment contained in the State's "Hawaii Construction Model" (Department of Planning and Economic Development, 1982) to estimate the indirect effects of construction expenditures. Multipliers for indirect impacts during the plant's operation were taken from an input-output model developed by the Regional Analysis Division of the Bureau of Economic Analysis (U.S. Department of Commerce, May 1986).

The analysis of construction-period impacts indicates that approximately 590 full-time positions, most of them in the retail and service sectors, will be indirectly supported by construction expenditures for the proposed project. Total indirect wages in 1991, the peak year of construction, are expected to be nearly \$11 million. Non-wage, project-related secondary investment in that year is forecast to exceed \$6 million, again primarily in the retail and service sectors.

The Department of Commerce's model indicates that indirect employment supported by expenditures during the operational phase of the project will amount to approximately 160 full-time positions. These, in turn, will provide \$3.3 million per year in wages and \$8.1 million per year in non-wage secondary investment wages.

### **3.12.4 SUMMARY OF ECONOMIC IMPACTS**

In summary, construction and operation of AES-BP's proposed facility will provide both direct regional and indirect economic benefits to the community. Table 3-22 summarizes these impacts over the project's anticipated 33-year life (3 years of construction plus 30 years of operation).

Table 3-22. Impacts of the Barbers Point Cogeneration Plant on the Hawaiian Economy.

	<u>Construction Period</u>	<u>Operational Period</u>
<b><u>DIRECT IMPACTS</u></b>		
Number of Jobs	459	70
Annual Expenditures	\$30 million	\$16 million
Cumulative Total for the Project	\$82 million	\$1,109 million
<b><u>INDIRECT IMPACTS:</u></b>		
Number of Jobs	590	164
Annual Expenditures	\$17 million	\$11 million
Cumulative Total for the Project	\$39 million	\$747 million
<b>TOTAL DIRECT &amp; INDIRECT EXPENDITURES:</b>	<b>\$121 million</b>	<b>\$1,856 million</b>

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Source: AES Barbers Point based on multipliers contained in an input-output model developed by the Regional Analysis Division of the Bureau of Economic Analysis (U.S. Department of Commerce, May 1986) and the State's "Hawaii Construction Model" (Department of Planning and Economic Development, 1982)



## CHAPTER 4 ALTERNATIVES TO THE PROPOSED ACTION

The proposed project is intended to provide up to 180 megawatts of base-load electrical power to the Hawaiian Electric Company (HECO) for distribution to its customers. As explained in Chapter 1, HECO has determined that the additional power will be needed to meet the forecast demand on its system and that purchasing this power from AES-Barbers Point, Inc., is the most economical means of obtaining it.

This chapter discusses the alternative means of insuring that HECO continues to maintain adequate generating capacity that were considered. It does this from two points of view. The first discusses conservation measures designed to decrease peak system demand. The second addresses means of increasing the electrical energy supply using alternative energy sources. The analysis was prepared by AES-BP as part of its on-going work on the project.

### 4.1 ENERGY CONSERVATION

The Hawaii State Department of Business and Economic Development administers several Federal and State energy conservation programs. These programs are designed to reduce or reverse the upward trend in energy use, as well as to reshape the utility's load curve by shifting some discretionary use to off-peak time periods.

Much of the energy used in Hawaii is consumed in homes. This, together with the high cost of electrical energy, encourages energy conservation. Many of the energy conservation programs administered by the Department of Business and Economic Development take advantage of this potential to help reduce electricity use.

Water heating is the single largest component of residential energy use. Consequently, home use of solar water heating devices offers a significant opportunity for energy conservation. During the early part of this decade, many of the island's residents took advantage of the significant Federal and State tax credits that were available to those who installed solar energy water heating systems. The end of Federal tax credits dramatically reduced the number of such systems being installed, but State tax credits remain in effect, and there is still a small solar industry in Hawaii.

The Federally-funded Solar Bank Program was established to encourage the conversion to solar water heating. It funds 20 percent of the improvement cost for energy conservation measures and 40 percent of the improvement costs for effective solar energy systems. To be eligible, a project must be a multi-family residential, commercial, or agricultural building.

Another promising program is the Hawaii Energy Efficiency Investment Program. This program provides funds to hire contractors to determine the conservation potential in existing buildings and to fund the necessary improvements. The contractors' compensation is based on their success at lowering customers' future energy costs. This program makes it possible to implement energy conservation measures without a large initial capital outlay.

Establishment and enforcement of energy efficiency standards for appliances and buildings is another means of reducing electricity use. The DBED is enforcing interim energy-efficiency standards for water heaters, and is currently developing a strategy to make energy efficiency standards more stringent.

In addition to the specific programs listed above, DBED is conducting a media outreach program. This program uses television, radio, and print media advertisements to encourage better energy conservation practices by consumers.

Experience in other regions has shown that energy conservation programs can play an important role in reducing the need for new generation capacity. However, it has also shown that the savings can only be attained over a long period of time. Cost-effective energy conservation programs take years to develop and implement. More significantly, perhaps, the results are not sufficiently predictable to allow utilities to defer capacity increases needed to meet demand over the next five years.

Hearings before the Hawaii Public Utilities Commission have demonstrated that the electricity from the AES-BP facility will be needed as early as 1992 in order to maintain an adequate reserve margin in HECO's system. Because of this, AES-BP believes that deferring construction of the proposed power plant or attempting to substitute an energy conservation program for it would entail a significant risk of power shortages. Because of the very substantial costs that the community will incur if such shortages occur, this course of action is undesirable.

While energy conservation measures cannot achieve the same objectives as the proposed project over the short term (and are not, therefore, viable alternatives to the proposed project), reduced energy consumption is clearly an attainable long-term goal. AES-BP will support efforts by the Department of Business and Economic Development, other State, Local, and Federal agencies, and consumers to enhance overall energy efficiency and to decrease waste.

## **4.2 ALTERNATE FUELS/COMBUSTION TECHNOLOGY**

### **4.2.1 FOSSIL FUELS**

Oahu currently relies almost entirely on oil as fuel for its electrical power plants. All of Hawaiian Electric's existing power plants burn petroleum (either heavy fuel oil or diesel), and the company purchases only a small amount of its total supply from outside alternate energy sources.

As indicated in Chapter 1 of this report, HECO originally planned to increase its generating capacity by constructing a new oil-fired generating unit at its existing Kahe Generating Station. In addition to the AES-BP project, it has subsequently signed a contract with Kalaeloa Partners, to provide additional capacity to satisfy the need for increased power before the AES-BP facility is operational. That firm is constructing a 205-megawatt, combined cycle power (combustion turbine plus steam turbine) plant in Campbell Industrial Park. The Kalaeloa Partners facility will burn petroleum fuels (gas and oil).

Initially, the cost of power from the AES-BP facility is expected to be similar to the cost of power produced at Kalaeloa Partners' new combined cycle plant. AES-BP believes that, since the cost of the coal it burns will increase only at the overall inflation rate, its power is likely to have long-term cost advantages over other fossil-fuels. In addition, the different operational characteristics of the Kalaeloa Partners and AES-BP facilities mean that they are largely complementary rather than directly competitive within the HECO system.

AES-BP has a contract with a joint venture comprised of British Petroleum, Ltd., and CPA, Ltd., (a large Australian coal supplier) to supply Indonesian coal for a minimum of 15 years. However, the presence of large coal reserves within the United States give it the ability to switch to a domestic supplier if the international situation makes that necessary. This provides a level of fuel-supply security which is not available for fuel oil.

## 4.2.2 BIOMASS

### 4.2.2.1 Waste Materials

The City and County of Honolulu has nearly completed its HPOWER waste-to-energy facility on a parcel adjacent to the AES-BP project. It will produce and burn about one-half million tons per year of refuse derived fuel (RDF). The fuel will be made from garbage collected by the City and County of Honolulu Department of Public Works and private haulers. The HPOWER facility is designed to produce approximately 50 megawatts of power; this will be sold to the Hawaiian Electric Company for distribution to its customers.

The HPOWER facility is large enough to handle virtually all of the garbage currently being generated on Oahu, and it has been designed to be expanded if that proves desirable. In view of this, construction of additional waste recovery facilities cannot be expected to significantly increase the available power supply.

It is worth noting that the purchase of electrical energy from the HPOWER facility is being taken into account in HECO's system planning, and that the utility expects to take full advantage of the power which it will generate. At the same time, because the reliability of the system is not yet proven, power from this source cannot be counted on to meet peak system demand.

### 4.2.2.2 Wood

Because of Hawaii's good growing conditions, the use of wood chips has been actively investigated as an alternate fuel source for the state's power plants. Wood chips are currently being used on a small scale on at least one of the neighbor islands. However, the economic performance of the fuel has been disappointing, and there have been substantial objections to the level of logging activity needed to sustain even a small wood-fired power plant.

AES-BP estimates that it would require at least 100,000 acres of trees to provide fuel for a biomass-fired power plant the size of its proposed facility. Oahu lacks the existing tree resource needed to supply a facility of this size. A wood supply could be established over the long-term, but it would require vast amounts of land. For example, 100,000 acres is about 2.5 times the acreage currently being used to cultivate all crops on the island (Department of Business and Economic Development, November 1988:515). Even the agricultural land that is available could not begin to be converted to forest land in time to meet the near-term energy needs addressed by the AES-BP project. Just as significantly, it is extremely unlikely that the tree plantations that would be needed to support it could be economically developed on an island with development densities and land costs as high as Oahu's.

The total existing forest land on Oahu (including federal military, state, miscellaneous corporate, and miscellaneous individual) on the island is estimated at about 125,000 acres (Department of Business and Economic Development, November 1988:530). However, much of this forest land contains native forests which it is the State's policy to protect and which serve as valuable watershed area. In view of existing public policy, it is inconceivable that these forests would be made available as a fuel source for a biomass-fired power plant.

### 4.2.2.3 Bagasse

For many years the state's plantations have used bagasse (the part of sugarcane that remains after milling) to generate electricity. They have sold part of this to the electrical utilities on the islands where they are located.

On Oahu, the Hawaiian Electric Company already purchases bagasse-generated power from both the Oahu Sugar Company and the Waialua Sugar Company. These plantations are

already fully utilizing the bagasse currently available to them. Since forecasts for the sugar industry make it clear that the amount of bagasse that is available is unlikely to increase, it does not constitute a viable energy alternative to the proposed power plant. In fact, there is great concern that the existing level of operations cannot be maintained and that the plantations will close by the end of the century. If this occurs, Hawaiian Electric will have less, not more, power from this source.

### 4.2.3 NUCLEAR ENERGY (FISSION OR FUSION)

Nuclear fuels, which were once viewed as a major future source of inexpensive power, are not a viable alternative to the proposed coal-fired power plant. This is due largely to the fact that commercially available nuclear power plants are too large for the limited Hawaii market. However, cost overruns, the difficulty in developing a practical emergency evacuation plan, public policies which discourage the introduction of nuclear power to the State, and numerous other problems make fission inviable for Oahu.

Fusion reactors solve many of the problems inherent in fission reactors, but they carry with them problems of their own. More importantly, scientists have not solved the problem of sustaining controlled fusion reactions. Even the most optimistic proponents of fusion believe that it will not be ready for full-scale commercial implementation for at least another quarter century. Consequently, it is not a practical alternative to the proposed project.

### 4.2.4 SOLAR ENERGY

#### 4.2.4.1 Direct Solar Energy

There are two methods of generating electricity using direct solar radiation. They are solar thermal energy conversion (STEC) and solar photovoltaic power systems. The advantages of using solar power include its abundant supply, the fact that the "fuel" is free, and the absence of direct air and water pollution.

STEC systems concentrate solar energy using mirrors and lenses; the heat that is generated is used to produce steam which drives a turbine-generator. They are most suitable for centralized power plant applications. A 150-megawatt STEC system would require at least three square miles of land (compared to less than 30 acres for the proposed coal-fired facility).

The technology is promising, but it is still in the early stages of development. Consequently, the costs are high and the reliability low compared to those of the proposed coal plant. Equally important, the plant produces power only while the sun is shining. Consequently, it must be paired with other power generation technologies in order to fully address the total needs of the system. Current estimates are that the system will not be commercially viable before the end of the century, and it is quite possible that it may be much longer. Because of this, STEC systems are not an alternative to the proposed project.

Unlike STECs, which convert sunlight into heat before producing electricity, photo-voltaic systems convert sunlight directly into electrical energy. Moreover, they are suitable for small-scale, decentralized applications. Photo-voltaic systems have been used for many years in applications which have low power usage. However, their high cost and relatively limited output has limited their usefulness as substitutes for conventional power generation technologies. Recent advances in photovoltaic technology have significantly lowered their cost and increased their performance. Nonetheless, power from such systems remains much more expensive than that produced by the proposed power plant.

The output:cost factors of photovoltaic systems are expected to continue to improve fairly rapidly, and it is possible that such systems may prove competitive with fossil fuel systems in certain applications by the end of the century. However, within the time frame of the current project, they remain prohibitively expensive. Because of this, and the fact that they must be paired with other power sources which function during hours of darkness, they do not constitute a viable alternative to the proposed project.

#### **4.2.4.2 Wind**

Approximately 13 megawatts of wind-driven generators are currently installed on Oahu. The great majority of this is at the Makani Moa'e windfarm at Kahuku. The technology is relatively advanced and, in windy locations, the cost of energy from wind systems is competitive with the best alternative sources. Another advantage of windpower is the total absence of air and water pollutant emissions.

Researchers at the University of Hawaii have been identified several additional Oahu sites which are suitable for wind generating units. However, even if all these locations are fully developed, there will still be a need for the proposed power plant. This is because the intermittent nature of windpower makes it suitable only when used in conjunction with more reliable sources of energy. Hence, it is cannot be substituted for the base load power which the AES-BP facility will produce.

#### **4.2.4.3 Ocean Thermal Energy Conversion (OTEC)**

Ocean Thermal Energy Conversion (OTEC) facilities exploit temperature differences between warm surface water and the colder layers at depth to produce usable power. The temperature difference is used to vaporize a working fluid, which is then used to drive a turbine. OTEC facilities must be located in areas where the water deepens rapidly.

The Natural Energy Laboratory of Hawaii on the Big Island is the foremost testing place for the OTEC concept, and the technology has been successfully tested at a pilot-scale plant located there. Many OTEC-related experiments are on-going, but the technology has not yet reached commercial status. The major limitation to this source is the extremely low efficiency and the high capital and maintenance costs of the generation facilities. Until these costs can be reduced or energy prices rise sufficiently, the technology does not constitute a viable alternative to the proposed project.

#### **4.2.5 HYDROELECTRIC**

Developable hydroelectric power sources are not available on Oahu. Consequently, they do not constitute a viable alternative to the proposed project.

#### **4.2.6 GEOTHERMAL**

The Hawaiian island chain was formed by extensive volcanic activity extending over many millions of years. However, research done to date suggests that exploitable geothermal resources are present in only a few areas. None of these are on Oahu.

While an Oahu-based geothermal power plant does not appear to be practical, commercial development of the Big Island's geothermal heat does appear to be practical. A 3-megawatt pilot plant is currently in operation near Pahoa, in the Puna District, and developers have announced plans to develop 25 megawatts of additional geothermal capacity within the next 2-3 years. The geothermal steam will be used to generate electrical power which will be sold to the Hawaii Electric Light Company and distributed throughout the island.

Concurrently, various private and governmental agencies are evaluating the feasibility of developing an inter-island electrical transmission cable and the additional wells and generating facilities needed to export up to 500 megawatts of power to Oahu. If successful, the Big island could become a major source of electrical power for Oahu.

A number of uncertainties still surround the project, including the technical feasibility of constructing the cable through the very deep waters that separate the islands, the cost-competitiveness of the power, and the ability of developers to overcome public concerns regarding such things as air and water pollution and land use impacts. Removal of steam from the volcano also conflicts with the religious beliefs of some Big Island residents, and opposition from this group adds another level of political uncertainty to the development proposals.

The Hawaiian Electric Company has recently issued a request for proposals to develop 500 megawatts of geothermal power and the undersea cable. The response to this RFP will help determine the technical and financial feasibility of the cable and associated geothermal development. However, even if the responses are favorable on all counts, HECO's current timetable does not anticipate the power being available on Oahu until 1995 at the earliest. Consequently, the Big Island geothermal development does not constitute a viable means of providing the additional generating capacity that HECO needs beginning in 1993.

#### **4.3 ALTERNATIVE SITES**

A number of criteria were used in evaluating potential sites for the proposed cogeneration facility. The most important were:

- A minimum usable area of 25 to 30 acres.
- Existing I-2 zoning.
- Adequate infrastructure (roads, water, sewer, etc.).
- Access to non-potable groundwater for use in cooling.
- Proximity (no more than one-third of a mile) to an industrial user who would accept a minimum of 30,000 pounds per hour of process steam. This is needed so that the project will be rated as a "Qualifying Facility" under the Public Utilities Regulatory Act (PURPA) and the Federal air quality regulations. Only two potential users who meet these qualifications, the Chevron Refinery and the Hawaiian Independent Refinery, are present in Campbell Industrial Park.
- Reasonable proximity to the bulk unloading facilities being developed at the Barbers Point Deep Draft Harbor, with preference given to areas that could be linked to the harbor using a conveyer.
- An ability to increase emissions without violating air quality regulations, including the PSD increment.
- Proximity to the Hawaiian Electric Company's power transmission system.
- Freedom from significant natural resources that would preclude or otherwise constrain development.

Campbell Industrial Park is the only location which has sufficient I-2 zoned land and reasonable proximity to the harbor unloading facilities. Because of this, AES Barbers Point

quickly narrowed its search to that area. The need to have the project on-line by 1992 meant that it was not practical to consider sites which did not already have the necessary Development Plan Land Use Map and Zoning designations; hence, the search was restricted to parcels within the existing I-2 Zone.

HIRI, one of the two potential users of the steam, has already negotiated a tentative steam purchase contract with Kalaeloa Partners, Inc., developers of the Kalaeloa Power Plant. This left the Chevron Refinery as the only potential steam customer. This further restricted the area that AES Barbers Point could consider to within one-third mile of the Chevron facility. All of the parcels within this area were evaluated by AES, and discussions were held with representatives of the James Campbell Estate and Chevron to determine their availability.

The results of the screening show that a portion of the parcel leased by Hawaii Project Management, Inc., is the only area available that satisfies these locational requirements. Land on the southwestern corner of the intersection of Malakole Road and Hanua Street was found to be even better from a functional viewpoint, but it is owned by Chevron and is reserved for expansion of their existing refinery; hence, it was not available to AES Barbers Point.

At the time of the initial screening, the Hawaii Project Management, Inc., parcel had not yet been subdivided; hence, all possible locations within the parcel were evaluated. When investigations showed that the makai portions of the property were encumbered by flood zones, the presence of endangered plant species, and other factors, the present location was selected.



**CHAPTER 5**  
**RESOURCE COMMITMENTS AND TRADE-OFFS**

**5.1 COMMITMENT OF RESOURCES**

The proposed project involves the commitment of the 28.5-acre parcel occupied by the power plant for at least the 35-year contract period. In all probability, the commitment will be for a much longer period of time, since the service life of the unit is much greater. Similarly, the use of the conveyor easement, which totals about five acres, is likely to continue indefinitely unless changing economic factors or technology make alternate transport means preferable.

The power plant will consume approximately 660,000 tons of coal per year, or a total of almost 20 million tons over its 30-year economic life. Limestone consumption will average 30,000-40,000 tons per year, or about a million tons over the life of the facility. Consumption of these materials can, of course, be halted at any point if necessary.

**5.2 ENVIRONMENTAL TRADEOFFS**

**5.2.1 RESOURCE CONSUMPTION**

The tradeoff to the coal and limestone consumption is the electrical power and process steam that will be generated. Average annual electrical output is expected to be on the order of 1.2 million megawatt hours. This is about one-sixth of the power sold by the Hawaiian Electric Company in 1987. This percentage is much greater than the facility's percentage of installed capacity because its low operating cost relative to other generating units in the system will lead HECO to use it to produce base load power.

**5.2.2 AIR AND WATER QUALITY**

The proposed project is a source of additional air pollutants. However, the impact analyses presented in Chapter 3 of this report indicate that it will not significantly degrade the environment. Ambient concentrations of air pollutants are expected to remain well below the level at which significant adverse health effects occur. Moreover, the air pollutant emission rates that are anticipated are below those likely to occur if alternate power generation technologies that are currently available are substituted for it.

The coal and limestone consumed by the project are relatively inert; thus, there is little danger of environmental accident from that source. A 100,000 gallon capacity oil storage tank located on-site provides storage for fuel to be used in starting up the boilers. The tanks are located above ground, and they are surrounded by a berm; this will prevent the spread of oil in the event the tank develops a leak. Moreover, the tanks are not located over a potable water source.

Small quantities of caustic and acidic chemicals are used in the water treatment and boiler cleaning operations at the facility. These chemicals are already used at other power plants on the island. They will be handled in accordance with good operating practices and with all applicable Federal, State, and City and County regulations.

### 5.2.3 OTHER CONCERNS

The facility is designed in accordance with the applicable building and structural codes. Hence, it should resist the most severe earthquake expected in the area. While it is near an airport, it is outside the flight path of the aircraft that use it, and the FAA has determined that the stack does not constitute a hazard to air navigation. The facilities are outside the tsunami inundation area.

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## CHAPTER 7

### LIST OF CONSULTED PARTIES AND PERSONS CONTRIBUTING TO THE EIS

#### 7.1 INTRODUCTION

In October, 1988, AES-Barbers Point, Inc. asked the Harbors Division of the State Department of Transportation for permission to construct a conveyor across state-owned land at the Barbers Point Deep Draft Harbor (see Section 7.2). The conveyor will be used to transport coal, limestone, and ash between the harbor and the coal-fired power plant which the company proposes to construct in Campbell Industrial Park.

After reviewing the request, the Department determined that an environmental impact statement should be prepared in accordance with Chapter 343, Hawaii Revised Statutes. Consequently, it filed an EIS Preparation Notice with the Office of Environmental Quality Control (OEQC) on November 1, 1988 (see Section 7.3). The Department's decision was announced in the OEQC Bulletin on November 8, 1988.

Immediately after the EIS Preparation Notice was published, AES Barbers Point, Inc., wrote all the parties it believed might have an interest in the proposed project (see list in Section 7.4). Its letters, which were accompanied by a copy of the environmental assessment for the project, asked readers to identify any special concerns that should be addressed in the EIS for the project.

A number of those written replied with "no comment" letters; these are reproduced in Section 7.5. Others responded with substantive comments, and the letters containing these are reproduced in Section 7.6. In some cases, AES-Barbers Point, Inc., followed up with further communications, and these are also reproduced in that section.

A number of different persons and firms helped prepare this document. Their names and roles are listed in Section 7.7.

## 7.2 REQUEST FOR DOT ACTION

October 28, 1988

Mr. Dan Kochi  
Deputy Director  
Department of Transportation  
Harbors Division  
79 S. Nimitz Highway  
Honolulu, Hawaii 96813

Dear Mr. Kochi:

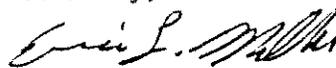
In conjunction with the construction of our Barbers Point coal fired cogeneration facility, which will sell electricity to Hawaiian Electric, AES plans to build a conveyor system to carry coal from the proposed Pier 6 bulk unloader to our plant site. As this conveyor crosses property controlled by the Harbors Division, AES desires to gain an easement within the Harbors Division controlled land. A proposal to lease this land is attached. In addition, we have included an environmental assessment of the entire project.

It is our understanding that you will agree our facility will have impacts significant enough to warrant an environmental impact statement (EIS) under Chapter 343. A notice of preparation of the EIS is included with this letter. The Office of Environmental Quality Control's regulations call for the notice to be sent to Dr. Marvin Miura, OEQC, 465 South King Street, Room 104, Honolulu, Hawaii 96813.

Harry Murakami of your Division is familiar with our project, and I have discussed the EIS Preparation Notice with him on several occasions. He has been very helpful, and has agreed to expedite submittal of the EISPN so that it reaches the Office of Environmental Quality Control by November 1. This will allow OEQC to publish an official EIS Preparation Notice in their November 8, 1988 bulletin. Hawaiian Electric has an urgent need for power from our facility, and the Harbors Division's special assistance is greatly appreciated.

Thank you for your cooperation and assistance.

Sincerely,



Eric L. Miller  
Asst. Project Director

ELM:mf

 Barbers Point, Inc.

1000 Br Top Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6346 • Telex: 90047

A PROPOSAL TO USE STATE LANDS TO CONSTRUCT AND OPERATE A COAL CONVEYOR

AES Barbers Point, Inc. is currently developing plans for a cogeneration facility at Barbers Point. The facility will burn coal in a fluidized bed boiler, and the heat from this combustion will be used to generate steam. A portion of the steam will be sold to the adjacent Chevron USA Barbers Point Refinery; the remainder will be used to generate 146 megawatts of electrical power for sale to the Hawaiian Electric Company (HECO). HECO has signed a firm contract for the power with AES Barbers Point, and is expecting the power plant to have received all of its environmental permits by fall 1989.

In order for the facility to be economically feasible, the coal must be brought in by ship to the Barbers Point Deep Draft Harbor, unloaded there, and carried by conveyor from the harbor to the power plant site in Campbell Industrial Park. As indicated by the attached drawings, a portion of the conveyor route crosses State-owned lands administered by the Harbors Division. Hence, your approval (and the State Department of Land and Natural Resources) is required.

Based on the Harbors Division's current harbor development plans, we understand that bulk cargo ships will unload at Pier 6. We hereby request a nonexclusive easement across the mauka end of the harbor between the dock and the limits of State land as shown on Attachment 1. The conveyor that would be constructed within this easement will be used to transport coal and limestone to the facility and to carry ash from the power plant back to waiting ships. The conveyor will be elevated so that there will be no interference with other planned harbor uses. Because the proposed conveyor will be made available to other users when not in use by the power plant, it will increase the harbor's usefulness by permitting users of bulk materials located within Campbell Industrial Park easy access to the bulk handling facilities at Pier 6.

As you may know, we have a signed Letter of Intent with Hawaii Pacific Industries, Inc. to unload coal for the Barbers Point facility using the bulk cargo loading and unloading facilities they have proposed. As a result of this arrangement, our involvement with at least a portion of the conveyor system may be as a sublessee. However, because the coal conveyor facility is critical to the success of our undertaking, because we are working on an extremely tight time schedule, and to insure that the needs and benefits of the entire project can be taken into account by the Department during its review of the project, we have submitted this request directly to the Department.

To facilitate your review of our proposal, we have prepared an environmental assessment for the entire cogeneration facility. A copy is enclosed for your use.

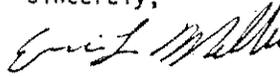
 AES/Barbers Point, Inc.

1000 H. Deep Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6316 • Telex 9001-1000

Once again, let me thank you for the assistance that your staff has provided us thus far. As you know, the Hawaiian Electric Company needs to have the power that our facility will provide available to its customers no later than 1992. Your cooperation will make that possible.

I will contact you in a few days to arrange a meeting to discuss our proposal. In the meantime, if you have any questions concerning this request, please call me at 538-6346.

Sincerely,



Eric Miller  
Asst. Project Director

Enclosure

7.3 EIS PREPARATION NOTICE

JOHN WAIHEE  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HARBORS DIVISION

1555 KALANIL'UOHI • 1555 KALANIL'UOHI

EDWARD Y. HIRATA  
DIRECTOR

DEPUTY DIRECTORS  
JOHN K. UCHIMA  
RONALD N. HIRANO  
DAN T. KOCHI  
JEANNE K. SCHULTZ

IN REPLY REFER TO

November 2, 1988

HAR-EP 1872

Mr. Eric L. Miller  
Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Environmental Impact Statement Preparation Notice  
AES Barbers Point, Inc.'s Proposed Coal-Fired Power Plant

Thank you for your letter of October 28, 1988 on the subject project.

Our review of your proposal and the Environmental Assessment (EA) indicates that the power plant, which the conveyor would serve may involve activities which could cause significant environmental effects. Consequently, we have determined that an Environmental Impact Statement should be prepared. A copy of our letter to OEQC is enclosed.

If you have any questions, please call Mr. Howard Miura at 548-2559.

Very truly yours,

Dan T. Kochi  
Deputy Director for Harbors

Enclosure

cc: Black & Veatch  
EBASCO  
Sargent & Lundy  
United Engineers & Constructors  
Perry White  
Donna Leong  
Arl. File



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

IN REPLY REFER TO

November 1, 1988

HAR-EP 1871

Dr. Marvin T. Miura, Director  
Office of Environmental Quality Control  
465 South King Street  
Kekuanaoa Building, Room 104  
Honolulu, Hawaii 96813

Dear Dr. Miura:

Environmental Impact Statement Preparation Notice - AES  
Barbers Point, Inc.'s Proposed Coal-Fired Power Plant

Pursuant to Chapter 343, HRS, I have determined that an Environmental Impact Statement (EIS) will be necessary for the subject project. We request that this Environmental Impact Statement Preparation Notice be published in the OEQC Bulletin at your earliest convenience.

APPLICANT: AES Barbers Point, Inc.  
APPROVING AGENCY: State of Hawaii  
Department of Transportation (DOT)  
Harbors Division

DESCRIPTION OF PROPOSED ACTION:

The DOT has received a request from AES Barbers Point, Inc., for permission to construct a conveyor system between the Barbers Point Deep-Draft Harbor and the company's proposed coal-fired power plant in Campbell Industrial Park. The conveyor would be used to convey coal from the harbor to the power plant site. The easement for the conveyor system is a necessary component of a larger project that includes a major new coal-fired power plant.

Dr. Marvin T. Miura, Director  
Page 2  
November 1, 1988

HAR-EP 1871

DETERMINATION: Our review of the applicant's proposal and the Environmental Assessment (EA) indicates that the power plant, which the conveyor would serve may involve activities which could cause significant environmental effects. Consequently, we have determined that the applicant should prepare an Environmental Impact Statement.

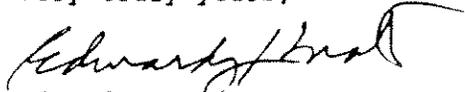
REASONS SUPPORTING DETERMINATION:

Based on granting a lease which involves a commitment of State-owned land, the action is, therefore, subject to the provisions of Chapter 343, Hawaii Revised Statutes [Title 11, Chapter 200, Section 6(b)(1)(A), Administrative Rules]. The State Environmental Impact Statement Rules [11-200-7(1) and (2)] require that a group of actions proposed by an applicant be treated as a single action when the components of the proposed action are phases or increments of a larger undertaking or are a necessary precedent for the larger undertaking.

If there are any questions concerning the EIS Preparation Notice or the Environmental Assessment (attached), please contact:

Mr. Perry J. White  
Belt Collins and Associates  
680 Ala Moana Boulevard, Suite 200  
Honolulu, Hawaii 96813  
Telephone: 521-5361

Very truly yours,



Edward Y. Hifata  
Director of Transportation

Attachment

cc: Mr. Perry J. White  
AES, Barbers Point, Inc.  
Black & Veatch  
EBASCO Services, Inc  
Sargent & Lundy Engineers  
United Engineers & Constructors

Donna Leong  
Arl. File

## 7.4 LIST OF CONSULTED PARTIES

### CONSULTED PARTIES

#### Federal Agencies

- \* Department of the Army, U.S. Army Engineer District, Honolulu
- \* Department of the Navy, Commander, Naval Base Pearl Harbor
- \* U.S. Army Support Command Hawaii
- \* U.S. Department of Agriculture, Soil Conservation Service
- \* U.S. Department of Defense, Naval Facilities Engineering Command (NAVFACENGCOCM). Commander, Naval Base Pearl Harbor, responded to letter addressed to NAVFACENGCOCM)
- \* U.S. Department of Energy
- \* U.S. Department of the Interior, Fish & Wildlife Service
- \* U.S. Department of the Interior, Geological Survey
- \* U.S. Department of Labor, Occupational Safety & Health Administration
- \* U.S. Department of Transportation, Federal Aviation Administration

#### State Agencies

- Department of Accounting & General Services, Public Works Engineer
- \* Department of Agriculture
- \* Department of Business & Economic Development
- \* Department of Defense, Office of the Adjutant General
- \* Department of Hawaiian Home Lands, Hawaiian Homes Commission
- \* Department of Health
- \* Department of Human Services, Hawaii Housing Authority
- \* Department of Labor & Industrial Relations
- \* Department of Land & Natural Resources
- Department of Social Services & Housing
- Department of Taxation
- \* Department of Transportation, Harbors Division
- Office of the Governor
- Office of the Governor, Hawaii Coastal Zone Management Program
- \* Office of the Governor, Office of State Planning
- \* Office of Hawaiian Affairs

#### County Agencies

- \* Board of Water Supply, Planning & Engineering Division
- \* Board of Water Supply, Manager & Chief Engineer

- \* Building Department
- \* Department of Finance
- \* Department of General Planning
- \* Department of Housing & Community Development
- \* Department of Land Utilization
- \* Department of Parks & Recreation
- \* Department of Public Works
- \* Department of Transportation Services
- \* Fire Department
- \* Oahu Civil Defense Agency
- \* Office of the Mayor
- \* Office of the Managing Director
- \* Police Department

### Lawmakers

The Honorable Spark M. Matsunaga, U.S. Senate  
 The Honorable Daniel K. Akaka, U.S. Congress  
 The Honorable Ron Menor, Hawaii State Senator, 6th District  
 The Honorable James Aki, Hawaii State Senator, 24th District  
 The Honorable Mitsuo Shito, Hawaii State Representative, 45th District  
 The Honorable Paul T. Oshiro, Hawaii State Representative, 46th District  
 The Honorable Michael Crozier, Hawaii State Senator, 23rd District  
 The Honorable Henry Haalilio Peters, Hawaii State Representative, 48th District  
 The Honorable Peter Apo, Hawaii State Representative, 49th District  
 The Honorable Richard Matsuura, Chairman, Agriculture, Energy & Ocean Resources Committee  
 The Honorable Anthony Chang, Chairman, Business Development Committee  
 The Honorable Mazie Hirono, Chairperson, Consumer Protection & Commerce Committee  
 The Honorable James T. Shon, Chairman, Health Committee  
 The Honorable Dwight Takamine, Chairman, Labor & Public Employment Committee  
 The Honorable Mark Andrews, Chairman, Planning, Energy & Environmental Committee  
 The Honorable Andrew Levin, Chairman, Water & Land Use Development & Hawaiian Affairs Committee  
 Chairman, Planning Committee  
 The Honorable John DeSoto, Honolulu County Council  
 The Honorable Donna Mercado-Kim, Chairperson, Zoning Committee

The Honorable Arnold Morgado, Jr., Chairman, City Council, City &  
Council of Honolulu

Other Organizations

- \* American Lung Association
- \* Conservation Council for Hawaii, Oahu Chapter
- Ewa Neighborhood Board No. 23
- Honokai Hale Community Association
- \* Life of the Land
- Nanakuli Hawaiian Homesteaders Association
- Nature Conservancy
- Opelu Project
- \* Pacific Allied Products, Ltd.
- \* Sierra Club of Hawaii
- \* The Pele Defense Fund
- Waianae Neighborhood Board No. 24
- Manager, Waianae Satellite City Hall
- \* Waimana Enterprises, Inc.
- Waipahu Neighborhood Board No. 22
- Mr. Rick Warshauer
- \* WESTEC Services

Others

- \* Hawaiian Telephone Company
- \* Hawaiian Telephone Company, Oahu Engineering & Construction  
Manager
- Leeward Community College, Director of Special Programs
- University of Hawaii Environmental Center
- University of Hawaii, Seagrant Waianae Coordinator
- University of Hawaii, Water Resources Research Center

\* denotes response received

## 7.5 CONSULTED PARTIES RESPONDING WITH "NO COMMENT" LETTERS

### AGENCIES, ORGANIZATIONS, AND INDIVIDUALS RESPONDING TO STANDARD TRANSMITTAL LETTER WITH "NO COMMENT"

#### Federal Agencies

- \* U.S. Army Support Command Hawaii
- \* U.S. Department of Energy

#### State Agencies

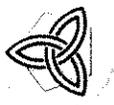
- \* Department of Labor & Industrial Relations
- \* Department of Accounting & General Services, Division of Public Works

#### County Agencies

- \* Office of the Mayor
- \* Office of the Managing Director
- \* Building Department
- \* Department of Housing & Community Development
- \* Department of Public Works
- \* Fire Department



DEPARTMENT OF THE ARMY  
 HEADQUARTERS, UNITED STATES ARMY SUPPORT COMMAND, HAWAII  
 DUNNING HALL  
 FORT SHAFTER, HAWAII 96856-5000



REPORT TO  
 AUTHORITY OF  
 Directorate of Facilities  
 Engineering

28 NOV 1988

UNITED STATES  
 DEPARTMENT OF ENERGY

P.O. BOX 50168  
 HONOLULU, HAWAII 96850

November 15, 1988

Mr. Eric Miller  
 Assistant Project Director  
 AES/Barbers Point Inc.  
 1000 Bishop Street, Suite 810  
 Honolulu, Hawaii 96813

Dear Mr. Miller:

On behalf of Colonel Harold V. Floody Jr.,  
 Commander, United States Army Support Command, Hawaii  
 we have reviewed the Draft Environmental Impact  
 Statement pertaining to the proposed AES Barbers Point  
 Coal-Fired Cogeneration Project and have no comments.

Thank you for allowing us the opportunity to review  
 this document.

Sincerely,

*John L. Notes II*  
 John L. Notes II  
 Lieutenant Colonel, U.S. Army  
 Director of Facilities Engineering

Eric Miller  
 Asst. Project Director  
 AES Barbers Point Inc.  
 1000 Bishop Street Suite 810  
 Honolulu, Hawaii 96813

Subject: EISP Notice for Coal-Fired Cogen Project

Dear Mr. Miller:

Thank you for sending me the above listed EISP Notice. I  
 found it to be interesting, complete, and an excellent  
 reference source for questions that arise on the project.

My office has no direct jurisdiction over this project, but  
 I appreciate being kept informed on its progress. The areas  
 of particular interest to me are the environmental issues.  
 The specific areas which you list on page 2-1 seem complete.  
 I look forward to reviewing your coverage of these topics.

Best wishes with the project.

Sincerely,

*John W. Shupe*  
 John W. Shupe, Director  
 Pacific Site Office

Copy sent to: Perry White

JOHN WAHNEE  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS  
820 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813

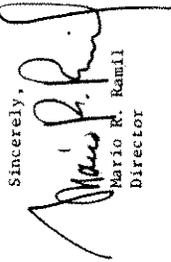
December 12, 1988

Mr. Eric Miller  
Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Thank you for providing us the opportunity to review the Environmental Impact Statement Preparation Notice for the AES Barbers Point Coal-Fired Cogeneration Project.

We have reviewed the subject document and, at this time, have no additional comments to offer.

Sincerely,  
  
Mario R. Ramil  
Director

MARIO R. RAMIL  
DIRECTOR  
SHARON Y. MITSUSHIRO  
DEPUTY DIRECTOR

JOHN WAHNEE  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES  
DIVISION OF PUBLIC WORKS  
P. O. BOX 119 HONOLULU HAWAII 96810

LETTER NO. (P)1045.9

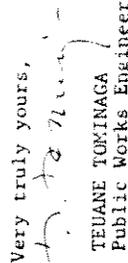
JAN 20 1989

Mr. Eric Miller  
Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Subject: Environmental Impact Statement  
Preparation Notice for AES Barbers  
Point Coal-Fired Cogeneration Project

We have reviewed the subject document and have no comments to offer.

Very truly yours,  
  
TEDANE TOMINAGA  
State Public Works Engineer

MY:jk

OFFICE OF THE MAYOR  
CITY AND COUNTY OF HONOLULU

HONOLULU, HAWAII 96813 • AREA CODE 808 • 527-5151



FRANK F. AS  
MAYOR

November 21, 1988

Mr. Eric Miller  
Asst. Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Thank you for your letter dated November 10, 1988, describing your plans to construct a co-generation facility at Campbell Industrial Park and requesting preparation of an environmental impact statement.

I understand you have sent similar letters to several City departments. These agencies will send you their comments individually, addressing their respective areas of interest, responsibility and expertise.

Sincerely,

FFF:kp

OFFICE OF THE MANAGING DIRECTOR  
CITY AND COUNTY OF HONOLULU

HONOLULU, HAWAII 96813 • AREA CODE 808 • 527-5154



FRANK F. AS  
MAYOR

JEREMY HARRIS  
MANAGING DIRECTOR  
DUKE T. KAWAHAU  
OFFICE MANAGING DIRECTOR

November 21, 1988

Mr. Eric Miller  
Asst. Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Thank you for your letter dated November 10, 1988, describing your plans to construct a co-generation facility at Campbell Industrial Park and requesting comments for the preparation of an environmental impact statement.

I understand you have sent similar letters to several City departments. These agencies will send you their comments individually, addressing their respective areas of interest, responsibility and expertise.

Sincerely,

JEREMY HARRIS  
Managing Director

JH:et

BUILDINGS DEPARTMENT  
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING  
450 SOUTH KING STREET  
HONOLULU, HAWAII 96813



FRANK F. FASO  
DIRECTOR

HERBERT K. MURAKA  
DIRECTOR AND BUILDING SUPERINTENDENT

PB 88-1022

FRANK F. FASO  
DIRECTOR

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT  
CITY AND COUNTY OF HONOLULU

450 SOUTH KING STREET  
HONOLULU, HAWAII 96813  
PHONE: 322-4116



MIKE MOON  
DIRECTOR  
Michael N. Scarfone  
DEPUTY DIRECTOR

November 21, 1988

November 17, 1988

Mr. Eric Miller  
Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Mr. Eric Miller, Assistant Project Manager  
AES Barbers Point, Incorporated  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Subject: Environmental Impact Statement Preparation Notice  
AES Barbers Point Coal-Fired Cogeneration Project

Dear Mr. Miller:

Subject: Environmental Impact Statement Preparation Notice  
AES Barbers Point Coal-Fired Cogeneration Project  
We have reviewed the subject Environmental Impact Statement Preparation Notice and have no comments.

Thank you for the opportunity to comment on the project.

Thank you for the opportunity to review and comment.

Very truly yours,

HERBERT K. MURAKA  
Director and Building Superintendent

Sincerely,

MIKE MOON  
Director

cc: J. Harada

DEPARTMENT OF PUBLIC WORKS  
CITY AND COUNTY OF HONOLULU  
835 SOUTH KING STREET  
HONOLULU HAWAII 96813



FRANK F. FAS  
MAYOR

ALFRED J. THIEDE  
DIRECTOR AND CHIEF ENGINEER

In reply refer to:  
PRO BB-326(449)

November 18, 1988

Mr. Eric Miller  
Asst. Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Subject: Environmental Impact Statement  
Preparation Notice - (EISP) AES Barbers Point  
Coal-Fired Cogeneration Project

Based on the information provided in this EISP, we have no comment to offer at this time.

Very truly yours,

*Alfred J. Thiede*  
ALFRED J. THIEDE  
Director and Chief Engineer

FIRE DEPARTMENT  
CITY AND COUNTY OF HONOLULU  
1455 K. BENTLEY STREET ROOM 302  
HONOLULU HAWAII 96814



FRANK F. FAS  
MAYOR

FRANK K. KAROCHANOHANO  
FIRE CHIEF  
LIONELLE CAMARA  
DEPUTY FIRE CHIEF

November 28, 1988

Mr. Eric Miller  
Assistant Project Director  
AES Barbers Point Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

We have reviewed your proposal and have no objections or comments at this time. Existing and planned fire protection services and facilities are considered adequate.

Should you have any questions, please contact Battalion Chief Kenneth Word of our Administrative Services Bureau at 943-3838.

Very truly yours,

*Frank K. Karochanohano*  
FRANK K. KAROCHANOHANO  
Fire Chief

DF:ny

## 7.6 CONSULTED PARTIES' COMMENTS ON THE EIS PREPARATION NOTICE

### AGENCIES, ORGANIZATIONS, AND INDIVIDUALS RESPONDING TO STANDARD TRANSMITTAL LETTER WITH "COMMENTS"

#### Federal Agencies

- \* Department of the Army, U.S. Army Engineer District, Honolulu
- \* Department of the Navy, Commander, Naval Base Pearl Harbor
- \* U.S. Department of the Interior, Fish & Wildlife Service
- \* U.S. Department of the Interior, Geological Survey
- \* U.S. Department of Labor, Occupational Safety & Health Administration
- \* U.S. Department of Transportation, Federal Aviation Administration

#### State Agencies

- \* Department of Agriculture
- \* Department of Business & Economic Development
- \* Department of Defense, Office of the Adjutant General
- \* Department of Hawaiian Home Lands, Hawaiian Homes Commission
- \* Department of Health
- \* Department of Human Services, Hawaii Housing Authority
- \* Department of Land & Natural Resources
- \* Department of Transportation, Harbors Division
- \* Office of the Governor, Office of State Planning
- \* Office of Hawaiian Affairs

#### County Agencies

- \* Board of Water Supply, Manager & Chief Engineer
- \* Department of Finance
- \* Department of General Planning
- \* Department of Land Utilization
- \* Department of Parks & Recreation
- \* Department of Transportation Services
- \* Oahu Civil Defense Agency
- \* Police Department

#### Other Organizations

- \* Conservation Council for Hawaii, Oahu Chapter

- \* Life of the Land
- \* Sierra Club of Hawaii
- \* The Pele Defense Fund

Others

- \* Hawaiian Telephone Company, Oahu Engineering & Construction  
Manager
- \* Pacific Allied Products, Ltd.
- \* Waimana Enterprises, Inc.
- \* Rick Warshauer
- \* WESTEC Services





DEPARTMENT OF THE NAVY

COMMANDER, HARBOR  
NAVAL BASE PEARL HARBOR  
BOX 110  
PEARL HARBOR, HAWAII 96860-5020

IN REPLY REFER TO  
11010  
Ser 03(09P2)/3138  
06 JAN 1989

Mr. Eric Miller  
Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, HI 96813

Dear Mr. Miller:

ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE FOR  
AES BARBERS POINT COAL-FIRED COGENERATION PROJECT

The Commander Naval Base, Pearl Harbor (COMNAVBASE) serves as the Navy point of contact for all environmental documentation such as Environmental Assessments (EA) or Environmental Impact Statements (EIS). The subject EIS preparation notice which was originally sent to Commander, Pacific Division, Naval Facilities Engineering Command was readdressed to COMNAVBASE Pearl Harbor for action.

The preparation notice was reviewed and we note that the document does not address any impacts, if any, the project may have on the Barbers Point Naval Air Station. For example, will the plant have any stacks tall enough to interfere with aircraft operations?

The EIS document must adequately address the plant's impact on the surrounding facilities and activities including Barbers Point Naval Air Station.

The Navy's point of contact is Mr. Bill Liu, telephone 471-3324. Thank you for the opportunity to review the EIS Preparation Notice.

Sincerely,

*W.K. Liu*

W. K. LIU  
Assistant Base Civil Engineer  
by direction of  
Mr. Commander

*1/16/89 - EIS to Army bid. AEA, 4/16/89*

*Let's meet to discuss  
this project to  
Barbers Point. 1/16/89  
W.K.L.*

2

January 20, 1989

Mr. William K. Liu  
Assistant Base Civil Engineer  
Naval Base Pearl Harbor  
Box 110  
Pearl Harbor, Hawaii 96860-5020

Dear Bill:

Thank you for your response to the Environmental Assessment for the cogeneration project we are proposing at Campbell Industrial Park.

Enclosed please find a copy of the FAA "Determination of No Significant Hazard" you requested during our phone conversation today.

As indicated in the FAA ruling, our stack is not expected to have a significant impact on air navigation in the Barbers Point area. We plan to discuss this fact in the EIS as you request.

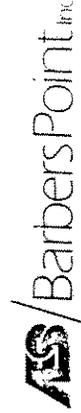
Please do not hesitate to call with any other questions or comments you may have.

Yours truly,

*Eric L. Miller*

Eric L. Miller  
Asst. Project Director

Enclosure



1000 Bishop Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 548-6386 • Fax: (808) 548-4111



United States Department of the Interior  
**FISH AND WILDLIFE SERVICE**  
 PACIFIC ISLANDS OFFICE  
 P.O. BOX 50167  
 HONOLULU, HAWAII 96850

ES Room 6307

DEC 7 1986

Mr. Eric Miller  
 Assistant Project Manager  
 AES/Barbers Point, Inc.  
 1000 Bishop Street, Suite 810  
 Honolulu, Hawaii 96813

Re: Environmental Assessment for the Proposed Barbers Point  
 Coal-fired Cogeneration Facility, Oahu

Dear Mr. Miller:

We have reviewed the referenced Environmental Assessment and offer the following comments for your consideration.

Three plants listed as endangered species are found in the Barbers Point area. These include the Ewa Plains 'akoko (*EUPHORBIA SKOTISBERGII* variety *kalaaloana*), *ko'olua'ua* (*Abutilon menziesii*), and *Achyranthes totondata*. We recommend that botanical surveys of the proposed project site and conveyer route be conducted to determine the possible presence of these endangered plants. If these endangered plants are found at the project site or along the conveyer route, we recommend that the facility or conveyer route be modified to avoid these resources.

Saline groundwater would be used as the non-potable water source for the proposed facility. Wastewater from the facility would be re-injected back into the ground for disposal. Potential impacts to groundwater and nearshore water quality from the underground injection of saline wastewater should be discussed in the draft Environmental Impact Statement (EIS).

The endemic hypogeal shrimp 'opae ula (*Halocaridina rubra*) has been found in limestone sinkholes that intercept the water table in the Barbers Point area. We recommend that a survey be conducted of suitable sinkholes in areas which may be affected by the injection wells. If suitable sinkholes are present, the draft EIS should discuss potential impacts to these endemic shrimps from the modification of groundwater quality from the underground injection of wastewater.

Re: Barbers Point Cogeneration Plant, Oahu  
 We appreciate the opportunity to comment.

Sincerely yours,

*Ernest Kosaka*  
 Ernest Kosaka  
 Field Office Supervisor  
 Environmental Services

8.1.2



# United States Department of the Interior

GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION  
677 Ala Moana Boulevard, Suite 415  
Honolulu, Hawaii 96813



December 7, 1988

Mr. Eric Miller  
Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Subject: Environmental Assessment-Barbers Point Cogeneration Project

We have reviewed the subject Environmental Assessment and offer the following comments:

1. Page 1-13, 1.6.2 Cooling System  
Drilling logs are available for 10 wells in the area. The depth of these wells ranges from 40 to 300 feet. Of these wells, only one (1806-07) has any significant thickness of clay. In this well, the clay lies at depths of 165-200 feet and 245-255 feet. We believe that the clay layers thin significantly in a shoreward direction. An assumption that a less permeable stratum exists everywhere in the project would not be correct. What is the depth of the deeper coralline aquifer that is to be used for injection?
2. Page 1-13, 1.6.3  
What effect will the treated waste streams have on the deep coralline aquifer, and on the near shore coastal waters.
3. Page 1-18, 1.6.9  
Runoff from excess rainfall on the storage piles of coal, limestone and ashbellers is to be routed to runoff (settling) basins before discharging directly into the injection well. What is the anticipated quality of this water after settling, and what would be the impact of this part of the injection stream on the receiving aquifer and near shore water?

Please contact Kiyoshi Takasaki or Johnson Yee at 541-2653 if you wish to discuss this further. We appreciate the opportunity to review the assessment.

Sincerely,  
  
William Meyer  
District Chief

# U.S. Department of Labor

Occupational Safety and Health Administration  
Honolulu Area Office  
300 Ala Moana Blvd., Room 5122  
Honolulu, Hawaii 96850  
Reply to the Attention of:

December 5, 1988

Mr. Eric Miller  
Asst. Project Director  
AES/Barbers Point Inc.  
1000 Bishop Street, Suite 810  
Honolulu, HI 96813

Dear Mr. Miller:

I am responding to your letter of November 10, 1988 regarding the construction of the coal-fired cogeneration project.

You should be aware that most of the occupational safety and health enforcement in Hawaii comes under the Division of Occupational Safety and Health, State Department of Labor and Industrial Relations. You should contact them regarding issues which they are responsible for regulating.

The jurisdiction of Federal OSHA would be limited to any marine construction work and to any longshoring operations during construction and operation of the plant. Any facilities for loading or unloading vessels afloat must conform with the requirements of 29 CFR 1917 and 1918. I am enclosing copies of the Federal standards for construction (applies to marine construction only) and the standards for the longshoring/marine terminals.

Please let me know if you have any questions.

Sincerely,  
  
Thomas K. Marple  
Area Director

Enclosure  
Copy sent to: Perry White, Belt Collins



US Department  
of Transportation  
**Federal Aviation  
Administration**

November 28, 1988

Mr. Eric Miller  
Asst. Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, #810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

We have reviewed the Environmental Impact Statement Preparation Notice (EISPN) for the AES Barbers Point Coal-Fired Cogeneration Project transmitted by your November 10, 1988, letter. Our only comment is that the proposed 250' stack would require a Notice of Construction under Federal Aviation Regulations Part 77. We also suggest contact be established with NWS Barbers Point for their input on the project.

Thank you for the opportunity to review this EISPN.  
Sincerely,

*David J. Welhouse*

David J. Welhouse  
Airport Engineer/Planner

Henry A. Sumida  
Airports District Office Manager

Copy sent to: Perry White, Bell Collins & Assoc.

8-12  
(s)

AIRPORTS DISTRICT OFFICE  
BOX 50244  
HONOLULU, HI 96850-0001  
Telephone: (808) 541-1243

JOHN WAIHEE  
GOVERNOR



State of Hawaii  
DEPARTMENT OF AGRICULTURE  
1428 So. King Street  
Honolulu, Hawaii 96814-2312  
December 6, 1988

YUKIO KITAGAWA  
CHAIRPERSON, BOARD OF AGRICULTURE  
SUZANNE D. PETERSON  
DEPUTY TO THE CHAIRPERSON

Mailing Address:  
P. O. Box 22159  
Honolulu, Hawaii 96822-0159

Mr. Eric Miller, Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street  
Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Subject: Environmental Impact Statement  
Preparation Notice (EISPN)  
AES Barbers Point Coal-Fired Cogeneration  
Project; Barbers Point, Oahu  
TMK: 9-1-14, 9-1-15  
Area: approximately 34 acres

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

The Environmental Impact Statement for the subject project should include an identification of the adverse impacts resulting from the operation of the generating station on the Hawaii Meat Company feedlot operation (situated southeast of the proposed generating station site).

Thank you for the opportunity to comment.

Sincerely,

*Yukio Kitagawa*  
YUKIO KITAGAWA  
Chairperson, Board of Agriculture



cc: OEQC



STATE OF HAWAII  
DEPARTMENT OF HEALTH

P. O. BOX 3378  
HONOLULU, HAWAII 96813

JOHN C. LEWIN, M.D.  
DIRECTOR OF HEALTH

IN REPLY, PLEASE REFER TO:  
EPHSD

January 3, 1989

Mr. Eric Miller  
Assistant Project Director  
AES/Barbers Point, Inc.  
1000 Bishop St., Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Subject: Environmental Impact Statement Preparation Notice (EISPN) AES Barbers  
Point Coal-Fired Cogeneration Project

Thank you for allowing us to review and comment on the subject EISPN. We provide the following comments:

Noise

Construction activities must comply with the provisions of Title 11, Administrative Rules Chapter 43, Community Noise Control for Oahu.

- a. The contractor must obtain a noise permit if noise levels from construction activities are expected to exceed the allowable levels of the rules.
- b. Construction equipment and onsite vehicles requiring an exhaust of gas or air must be equipped with mufflers.
- c. The contractor must comply with the conditional use of the permit as specified in the rules and conditions issued with the permit.

Water Pollution

Runoff from settling basins (designed to control a 10-year, 24-hour rainfall event) is exempt from the National Pollutant Discharge Elimination System (NPDES) regulations. Therefore, a NPDES permit is not required.

Air Pollution

An Authority to Construct (ATC) application has been submitted and is currently being reviewed.

Drinking Water

The Department of Health (DOH) wishes to stress that a backflow prevention (BP) device (e.g., reduced pressure principle BP device) should be placed between the potable

Mr. Eric Miller  
January 3, 1989  
Page 2

water system and the service water system. A reduced pressure BP device should also be placed before the wastewater treatment plant.

Wastewater Disposal

All wastewater systems must comply with Chapter 11-62. The size of the domestic wastewater flow will ultimately determine the applicable requirements for the treatment units. The environmental impact statement (EIS) should address all EPA effluent guidelines and standards for applicable industrial categories and compare them against the facility's wastewater flow characteristics to help facilitate review by the DOH.

Hazardous Waste

The EIS should identify and address potential hazardous waste generated by the production process itself or activities related to the cleaning of equipment.

Although bottom and fly ash from coal burning are generally exempt from federal hazardous waste regulations, other technical reports reveal a possible concern for EP-toxicity characterization. Application projects significant volumes of bottom/fly ash (70,000 tons/year). The EIS should identify handling/treatment of this subject.

Underground Storage Tank

The EIS should clarify that underground storage tanks will not be utilized at this facility (only above ground tanks are mentioned).

Sincerely yours,

*Bruce S. Anderson*  
BRUCE S. ANDERSON, Ph.D.  
Deputy Director for  
Environmental Health

*By City and Perry Public. See the date*



STATE OF HAWAII  
DEPARTMENT OF HUMAN SERVICES  
HAWAII HOUSING AUTHORITY  
P. O. BOX 17007  
HONOLULU, HAWAII 96817

EXECUTIVE DIRECTOR

IN REPLY REFER

TO

88:PLNG/570A JT

November 29, 1988

Mr. Eric Miller  
Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Re: Environmental Assessment/EIS Preparation  
Notice for the Proposed AES Barbers Point  
Coal-Fired Cogeneration Project

We have reviewed the subject report and have the following comments.

The Housing Finance and Development Corporation (HFDC) is the master land developer of an 830 acre parcel located to the northeast of the proposed cogeneration project site. The master plan for HFDC's Kapolei Village includes the development of approximately 5,000 housing units.

Due to the proximity of the cogeneration project to Kapolei Village, we believe the EIS should contain information on the project's impact on the ambient air quality in the Ewa area and more specifically, on Kapolei Village. The discussion on air quality should also consider the cumulative impacts from the proposed project as well as other proposed projects such as the Kapolei Town Center and H-POWER.

Thank you for the opportunity to comment.

Sincerely,

MITSUO SHITO  
Executive Director

cc: Winona Rubin, Department of Human Services



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

DEPT. HEAD  
LIBERT A. LANGRISH  
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LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 67  
HONOLULU, HAWAII 96809

Mr. Eric Miller - 2 - DOC. NO.: 4827E

Our Division of Aquatic Resources indicates that from the information presented, the proposed project appears not to have the potential for significant adverse impacts to aquatic resources. Therefore, we do not object to this proposal.

Please feel free to call me or Roy Schaefer of our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.

Very truly yours,  
*William W. Paty*  
WILLIAM W. PATY

DEC 28 1988

FILE NO.: 89-286  
DOC. NO.: 4827E

Mr. Eric Miller  
Assistant Project Director  
AES Barbours Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

SUBJECT: Environmental Impact Statement Preparation Notice  
AES Barbours Point Coal-Fired Cogeneration Project

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

Our Department's Historic Sites Section states that as in our previous comment, aerial photographs taken in 1970 indicate that the parcel had been graded and grubbed. We believe that therefore planning for future development of the parcel will not necessitate archaeological considerations, and that a "no effect" determination for historic sites is appropriate.

The Forestry and Wildlife Division points out that the subject project amendment is located on and/or immediately adjacent to two Federal and State listed endangered plant taxa, *Achyranthes rotundata* and *Euphorbia skottsbergii* var. *kalaeloana* and a rare shrub, *Myoporum sandwicense* var. *stellatum*, which is under review for listing as threatened and endangered. (Federal Register, September 27, 1985). The A. rotundata and possibly the other two plant taxa utilize rain and brackish water for their existence.

It is unclear how this project will affect these rare and endangered plants. Possible impacts may be physical location/site disturbance, water quality and quantity, atmospheric particulate emission/pollution, and steam emission. These needs should be addressed.



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HARBORS DIVISION

POST OFFICE BOX 1080 HONOLULU HAWAII 96813

8.1.2 15

EDWARD Y. HIRATA  
DIRECTOR

DEPUTY DIRECTORS:  
JOHN A. CARRANZA  
RONALD N. HIRANO  
DANNY KOCH  
JEANNE K. SCHULTZ

IN REPLY REFER TO

November 29, 1988

HAR-EP 2262

Mr. Eric L. Miller  
Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Environmental Impact Statement Preparation  
Notice - AES Barbers Point, Inc.'s Proposed  
Coal-fired Power Plant

Thank you for your letter of November 10, 1988 to the  
Director of Transportation, Mr. Edward Y. Hirata on the subject  
project.

We have circulated your request for DOT input to the  
appropriate Harbors and Highways Division personnel for their  
comments and recommendations and will be forwarding our responses  
as soon as possible.

If you have any questions, please call Mr. Howard Miura of  
our Harbors Planning Section at 548-2559.

Very truly yours,

Dan T. Koch  
Deputy Director for Harbors

Copy sent to: Perry White, Belt Collins



# OFFICE OF STATE PLANNING

Office of the Governor

STATE OF HAWAII GOVERNOR

STATE CAPITAL, HONOLULU, HAWAII 96813 TELEPHONE (808) 548-3873

Ref. No. P-8988

December 6, 1988

Mr. Eric Miller  
Assistant Project Director  
AES/Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Subject: Environmental Impact Statement Preparation Notice (EISPN)  
for AES Barbers Point Coal-Fired Cogeneration Project

We have reviewed the subject document and offer the following comments.

The EISPN indicates that the boilers are expected to generate approximately 70,000 tons of fly ash and bed ash per year. Two possible means of disposing of the material are being considered. The first alternative is to sell it locally for use in cement, concrete, and other construction materials. Any portion not sold will be pelletized, i.e., formed into pellets for ease of handling and disposal, and temporarily stored on site. Given the close proximity of the proposed project to the open ocean, the Draft Environmental Impact Statement (DEIS) should identify where and how these pellets will be stored, whether any precautionary measures have been designed to avoid accidental spills, and the potential impacts which may result if accidental spills were to occur.

The EISPN also states that dust suppression using water mixed with a chemical additive wetting agent, will be sprayed at the transfer points of the overland conveyor system. In addition, water or a nontoxic surfactant may be applied as a dust control measure to coal and limestone storage piles. Because the overland conveyor system and storage piles will be open and exposed to the environment, the DEIS should discuss the potential impact of runoff on the harbor's receiving waters. Also, a description of the proposed project's drainage system should be included.

The DEIS should also identify each of the wastewater chemical constituents that will be injected into the ground for disposal purposes. Special consideration should be given to identifying concentrations of any toxic or other harmful substances, such as heavy metals, which may infiltrate and contaminate the groundwater and ocean.

Mr. Eric Miller  
Page 2  
December 6, 1988

The DEIS should also discuss possible noise impacts associated with off-loading coal, use of the coal/limestone conveyor belt, and other potential noise generators. Future residential and resort development in the area could lead to noise conflicts if not properly mitigated.

The potential impacts on air quality should also be thoroughly addressed.

Thank you for the opportunity to review and comment on the EISPN. If you have any questions, please feel free to contact our Hawaii Coastal Zone Management office at 548-3961.

Sincerely,

  
Harold S. Masumoto  
Director



STATE OF HAWAII  
 OFFICE OF HAWAIIAN AFFAIRS  
 1600 KAPIOLANI BLVD., SUITE 1500  
 HONOLULU, HAWAII 96814  
 (808) 548-8460  
 (808) 545-2442

January 5, 1989

Mr. Kamaki A. Kanahahele, III  
 Administrator  
 Office of Hawaiian Affairs  
 State of Hawaii  
 1600 Kapiolani Blvd., Suite 1500  
 Honolulu, Hawaii 96814

Subject: Comments on your response to the Barbers Point EISPN

December 9, 1988

Mr. Eric Miller  
 Asst. Project Director  
 AES/Barbers Point, Inc.  
 1000 Bishop Street, Suite 810  
 Honolulu, Hawaii 96813

Subject: EISPN: AES/Barbers Point Coal-Fired Cogeneration Project Ewa, O'ahu

Dear Mr. Miller:

Thank you for sending our office a copy of the environmental impact statement preparation notice for this project.

Please send our office a copy of the archaeological survey report.

Sincerely,

*Kamaki A. Kanahahele*  
 Kamaki A. Kanahahele, III  
 Administrator

KAK:EN:kjr

C-88-0014

Dear Mr. Kanahahele:

Thank you for your December 9, 1988 response to the EIS preparation notice for the Barbers Point electric generation project. In this response, you requested a copy of the archaeological survey report.

The historic sites section of the Department of Land and Natural Resources has stated on two separate occasions that 1970 aerial photographs indicate the parcel has been previously grubbed and graded. They have further stated that in light of this grading, the parcel will not necessitate archaeological considerations, and that a "no effect" determination is appropriate.

As a result of this determination, no archaeological survey has been undertaken at the site or is planned.

If you have any further questions or concerns, please do not hesitate to call me at 538-6346.

Yours truly,

*Eric L. Miller*

Eric L. Miller  
 Asst. Project Director

AES/BarbersPoint  
 1000 Bishop Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6346 • Telex: 538-6346 • Fax: 538-6346



DEPARTMENT OF FINANCE  
**CITY AND COUNTY OF HONOLULU**  
HONOLULU HAWAII 96813



FRANK FAS  
MAIL

LINDA L. SMITH  
DIRECTOR  
Glen S. Nonaka  
DEPUTY DIRECTOR

Mr. Eric Miller  
Page 2  
January 23, 1989

2. Underground Storage Tanks

- a. Will the underground storage tanks comply with new Federal regulations governing these tanks? What specific regulations will these tanks be subject to?
  - b. What monitoring devices will be installed for leak detection?
3. Access To Property
- a. Will a traffic study be conducted to determine impact of the property access on the proposed street, Kaomi Loop?
  4. Location of Site
  - a. Has the project identified if it is within a shoreline management permit area? This was not listed on page 3-3.
  - b. Have surrounding property owners been notified of the proposed project, site plan and the implementation timetable?
  - c. How will the project impact the operations of the neighboring properties and uses thereof?

We appreciate the opportunity to comment on this matter. Please notify us of the timetable for issuance of the draft Environmental Impact Statement and include us for comment on said document.

Cordially,  
  
LINDA L. SMITH  
Director of Finance

LLS:jf

*Ex - Copy from Perry folder*

January 23, 1989

Mr. Eric Miller  
Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street  
Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

The Department of Finance is responding to your request for comments on the Environmental Impact Statement Preparation Notice for the AES Barbers Point Coal-Fired Cogeneration Project. Regrettably, this request did not come to our attention until after the 30-day response period. I trust these comments will still be useful as you develop the EIS.

We are concerned about a number of possible impacts of this project in our capacity as custodian of City-owned lands next to the facility and in our capacity of handling liability claims which may arise from this project. In particular, we believe the following points must be addressed in the draft EIS:

1. Air Quality Impacts Of Open Coal and Limestone Storage Area
  - a. What specific change in ambient air quality will be created by the location of the project, particularly with open coal and limestone storage?
  - b. How will this change in air quality affect the standards set for the City's H-power project?
  - c. How will emissions from your project be monitored separate from emissions from the City's H-power facility?
  - d. What alternatives exist to open storage arrangements?

FRANK FAS  
MAIL

DEPARTMENT OF GENERAL PLANNING  
**CITY AND COUNTY OF HONOLULU**  
650 SOUTH KING STREET  
HONOLULU, HAWAII 96813



FRANK TAE  
MAYOR

DONALD A. CLEGG  
CHIEF PLANNING OFFICER  
GENE CONKELL  
DEPUTY CHIEF PLANNING OFFICER

KK/DGP 11/88-4048

December 8, 1988

Honorable Edward Y. Hirata, Director  
Department of Transportation  
State of Hawaii  
869 Punchbowl Street  
Honolulu, Hawaii 96813

Dear Mr. Hirata:

Environmental Impact Statement Preparation Notice  
for the Proposed AES Barbers Point, Inc.,  
Cogeneration Project Situated in Ewa, Oahu

This is in response to your request for comments on the  
Environmental Impact Statement Preparation Notice for the  
proposed cogeneration project in Ewa.

The following points should be addressed in the preparation  
of the Draft Environmental Impact Statement:

1. Ewa Long Range Master Plan (Campbell Estate)  
The applicant should consider the project's  
compatibility with Campbell Estate's Master Plan for  
the area. Of particular concern is that the proposed  
conveyor facility be compatible with the planned  
Industrial uses by Campbell Estate.
2. Barbers Point Naval Air Station  
The proposed stacks may exceed the Navy's safety height  
criteria for the area surrounding the air station. The  
Navy should be consulted on this matter.
3. Water System  
The water needs of the proposed development and its  
impact on the water resources in Ewa should be  
discussed.

Honorable Edward Y. Hirata, Director  
Department of Transportation  
Page 2  
December 8, 1988

4. Environmental Characteristics

The project's impact on air quality and noise levels  
should be evaluated. The cumulative air quality impact  
of the existing uses in the industrial park, the  
proposed H-power project and the proposed cogeneration  
plant should be considered.

Thank you for giving us an opportunity to comment on this  
matter.

*Donald A. Clegg*  
DONALD A. CLEGG  
Chief Planning Officer

DAC:js

cc: AES/Barbers Point, Inc.

DEPARTMENT OF LAND UTILIZATION  
**CITY AND COUNTY OF HONOLULU**

800 SOUTH KING STREET  
HONOLULU HAWAII 96813 • (808) 527-4431



FRANK F. JARVIS  
MAYOR

JOHN P. WHALEN  
DIRECTOR  
SPECIAL SERVICES  
SECTION

LULL/88-7810(BWM)

December 8, 1988

Mr. Eric Miller  
Assistant Project Director  
AES Barbers Point Inc.  
1000 Bishop Street  
Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Environmental Impact Statement  
Preparation Notice (EISPN)  
AES Barbers Point Coal-Fired  
Cogeneration Project

This letter is in response to your request for consultation comments. As you know, the Department of Land Utilization (DLU) has already been consulted on this project, and has already met with you and your associates on July 1, 1988 and September 29, 1988, to discuss the City's permit requirements for your project. We have thus reviewed the Draft Environmental Assessment (EA) you submitted to DLU (dated September 1988) and the condensed version of the EA you submitted with the EISPN (dated October 1988).

Our comments are based on the assumption that you will be utilizing these two documents as the basis for your Draft EIS. Our comments are as follows:

1. Environmental Compliance

Environmental compliance under Chapter 343, HRS will also satisfy the environmental compliance requirements for processing a Special Management Area Use Permit (SMP) under Chapter 33, ROH.

Mr. Eric Miller  
Page 2

2. SMP Precedes All Other Permits

Under State law, Chapter 205A, HRS, the SMP represents the first permit that an applicant must seek in connection with a development contained in a Special Management Area (SMA).

3. Discussion of Alternatives

Alternate methods of energy production should be discussed. Also, alternate sites for locating the cogeneration project should be discussed.

Thank you for the opportunity to comment. If you have any questions regarding these comments or the processing of the SMP, call Bennett Mark of the Environmental Affairs Branch at 527-5038. For questions regarding the Height Waiver, call Robert Bannister at the Zoning Adjustments Branch at 527-5025. For questions regarding subdivision of the parcel, call Robert Moore at the Land Design Branch at 523-4255. For questions regarding the State Special Use Permit and Conditional Use Permit (Type 1), call Calvin Ching at the Zoning District Changes Branch at 527-5374.

Very truly yours,

JOHN P. WHALEN  
Director of Land Utilization

JPW:s1  
0246N

DEPARTMENT OF PARKS AND RECREATION  
**CITY AND COUNTY OF HONOLULU**  
680 SOUTH KING STREET  
HONOLULU, HAWAII 96813



FRANK F. FASI  
MAYOR

HIRAM K. KAWAKA  
DIRECTOR  
WALTER M. OLAMA  
DEPUTY DIRECTOR

November 29, 1988

Mr. Eric Miller  
Assistant Project Director  
AES/Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Subject: Environmental Impact Statement Preparation Notice  
Point Coal-Fired Cogeneration Project.

The proposed coal-fired cogeneration plant will lie 1,500 feet north of Barbers Point Beach Point Park. Please explore the possibility that beach park users, which include campers, will be affected by wind-driven fumes or coal ash fallout from the plant.

Thank you for allowing us the opportunity to review the environmental assessment for this project.

Sincerely,

*Hiram K. Kawaka*  
HIRAM K. KAWAKA, Director

HKK:ej

8/12  
DEPARTMENT OF TRANSPORTATION SERVICES  
**CITY AND COUNTY OF HONOLULU**  
HONOLULU MUNICIPAL BUILDING  
680 SOUTH KING STREET  
HONOLULU, HAWAII 96813



FRANK F. FASI  
MAYOR

JOHN E. HIRTEK  
DIRECTOR

JOSEPH M. MAGALDI, JR.  
DEPUTY DIRECTOR

TE-7538  
PLI.1363

December 9, 1988

AES/Barbers Point, Inc.  
1000 Bishop Street  
Suite 810  
Honolulu, Hawaii 96813

Attention: Mr. Eric Miller  
Assistant Project Director

Gentlemen:

Subject: Environmental Impact Statement Preparation Notice  
AES Barbers Point Coal-Fired Cogeneration Project  
TMK: 9-1-14

This is in response to your letter dated November 10, 1988.

We have reviewed the Environmental Impact Statement Preparation Notice that was submitted and recommend that the Environmental Impact Statement address the project's impact on the surrounding street system and mitigating measures, if any.

Yours truly,

*John E. Hirten*  
JOHN E. HIRTEK

CAHU CIVIL DEFENSE AGENCY  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET  
 HONOLULU, HAWAII, 96813  
 PHONE 522-4121



November 29, 1988

Mr. Eric Miller  
 AES Barbers Point, Inc.  
 1000 Bishop Street, Suite 810  
 Honolulu, Hawaii 96813

Dear Mr. Miller:

We have reviewed your Environmental Assessment for the Barbers Point Cogeneration Project, as requested. As indicated on the attached map, nearly all of your proposed processing site is within a tsunami inundation zone. Evacuation planning for both the tsunami and tropical cyclone (hurricane and tropical storm) hazards should therefore be accomplished as operating procedures are developed.

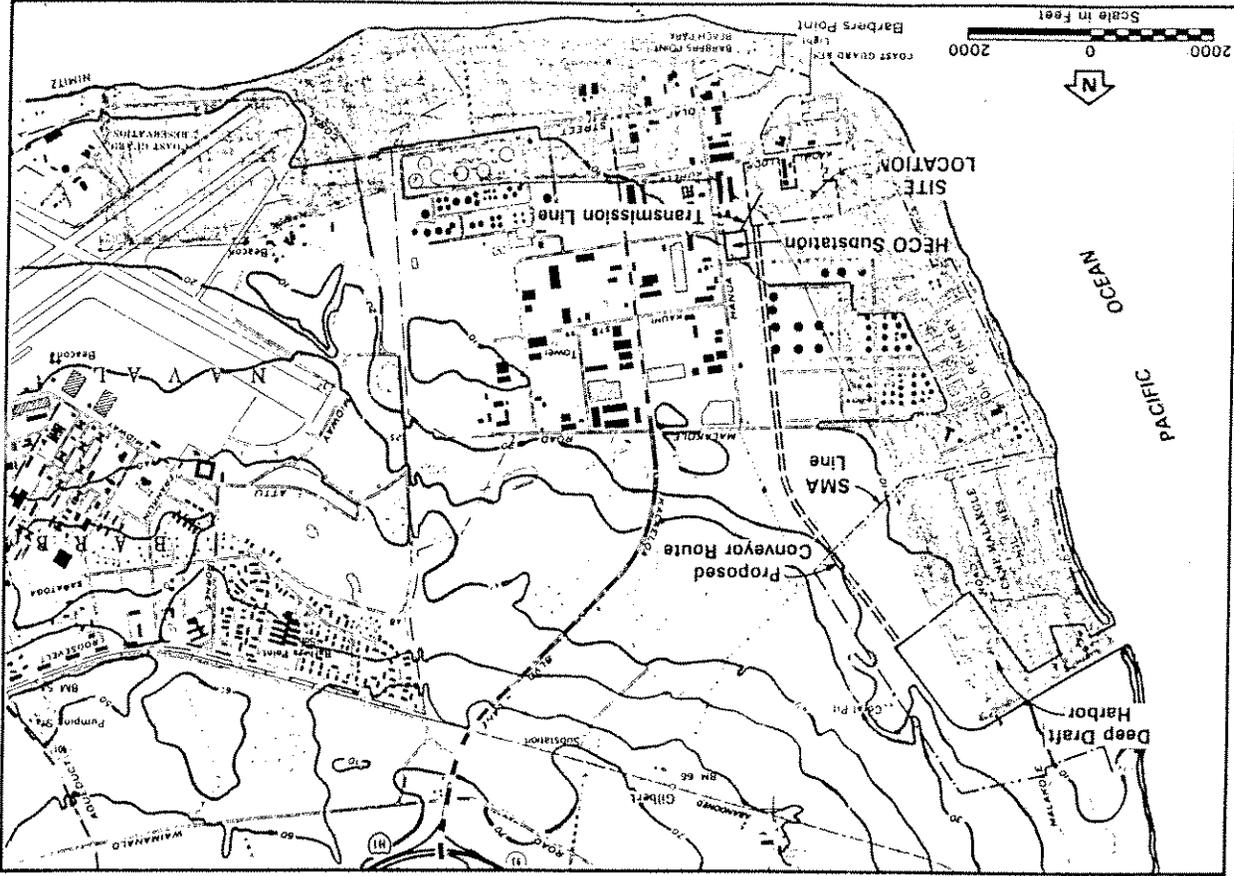
If you have any questions, please call Mr. Frank Apel, my Plans and Operations Officer, at 527-5367.

Sincerely,

GEORGE L. KEKUNA  
 Deputy Director Designate of  
 Civil Defense  
 City and County of Honolulu

Enclosure

PROJECT LOCATION  
 Figure 1-3



102688  
 ENVIRL

1-8

POLICE DEPARTMENT  
CITY AND COUNTY OF HONOLULU

1425 SOUTH KINGSTON AVENUE  
HONOLULU, HAWAII 96814-1425



LEONARD G. GIBB  
CHIEF  
POLICE DEPARTMENT  
HONOLULU, HAWAII

FRANK P. FASH  
MAJOR

KN-LC

November 28, 1988

Mr. Eric Miller, Assistant Project Director  
AES Barbers Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

Subject: Environmental Impact Statement Preparation Notice  
AES Barbers Point Coal-Fired Cogeneration Project

We have reviewed the EIS preparation notice for the above project and wish to offer the following comments.

A traffic analysis would help us to minimize hazardous traffic conditions in problem areas. The following information would enable our department to take a proactive approach to ensure traffic safety in the project area.

1. Traffic conditions that will result from the completed project.
2. Traffic conditions during the construction phase of the project.
3. Recommended measures to mitigate any foreseeable problem areas.

Thank you for the opportunity to comment.

Sincerely,  
DOUGLAS G. GIBB  
Chief of Police

BY   
RONALD SOUZA  
Assistant Chief of Police  
Support Services Bureau

December 6, 1988

Pick Scudder  
Conservation Council for Hawaii  
Oahu Chapter  
P. O. Box 2923  
Honolulu, Hawaii 96802

Subject: Environmental Impact Statement Preparation Notice  
AES Barbers Point Coal-Fired Cogeneration Project

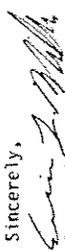
Dear Mr. Scudder:

AES Barbers Point, Inc. (AES-BP) proposes to construct and operate a 146 megawatt, fluidized bed/coal-fired co-generation facility in Campbell Industrial Park, Ewa, Oahu. Electrical power produced by the facility will be sold to the Hawaiian Electric Company, while process steam will be sold to the Chevron Hawaiian Refinery. The project will also involve construction of a 1.5 mile-long conveyor that will transport coal and limestone from Barbers Point Deep Draft Harbor to the power plant and a short 138 KV power transmission line between the power plant and a Hawaiian Electric Company substation on Hanua Street. Current plans call for the power plant to begin operation by mid-1992.

On October 31, 1988, we asked the State Department of Transportation for permission to use State-owned land within Barbers Point Deep Draft Harbor for the conveyor system. Following its review of the request, the Department filed an Environmental Impact Statement Preparation Notice (EISP/N) with the State Office of Environmental Quality Control (OEQC). The decision to require an EIS was announced in the November 8, 1988 edition of the OEQC Bulletin. A copy of the EISP/N and the environmental assessment are enclosed for your use.

We are currently preparing the environmental impact statement (EIS) for the project. You can help us focus on those areas which are of greatest concern by indicating in writing the questions, issues, and topics relating to your areas of jurisdiction, responsibility, special knowledge, or interest that you believe should be addressed. We would appreciate it if you would also indicate the reasons you believe the requested data and/or analyses are important. If applicable, it would also help if you would indicate the ways this information will be used in the decision-making process. The more specific you are, the greater the likelihood that the EIS will provide the information you desire.

As you may know, you are given a 30 day period in which to respond. We would very much like, however, to finish drafting the EIS by year end. Your prompt reply will assist us in accomplishing this and will insure that we have sufficient time to adequately address your concerns. If you have any questions regarding the project or the kinds of input which would be most helpful, please call me at 538-6346.

Sincerely,  
  
Eric Miller  
Asst. Project Director  
AES/BarbersPoint, Inc.

Enclosure

1000 Bishop Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6346 • Telex: 68813



# CONSERVATION COUNCIL for HAWAII

A CITIZENS ORGANIZATION PROMOTING ENVIRONMENTAL HEALTH AND EDUCATION,  
CONSERVATION AND MANAGEMENT OF HAWAII'S NATURAL RESOURCES

December 2, 1988

Mr. Perry J. White  
Belt Collins and Associates  
660 Ala Moana Blvd., Suite 200  
Honolulu, HI 96813

Dear Mr. White:

Re: Barbers Point Cogeneration Project

The Conservation Council for Hawaii, Oahu Chapter wishes to be a consulted party on the proposed Barbers Point Cogeneration Project.

Please provide us with a copy of the environmental assessment/notice of determination so that CCH-Oahu can review it and submit comments.

Thank you for your attention on this.

Yours truly,

Rick Scudder

State Board of Air Quality  
P.O. Box 203  
Honolulu, Hawaii 96822

Big Island Chapter  
P.O. Box 127  
Hilo, HI 96721

Kauai Chapter  
P.O. Box 2222  
Lihue, HI 96766

MauI Chapter  
P.O. Box 2222  
Maui, HI 96766



LIFE  
OF  
THE  
LAND

Dec. 8, 1988

①

Dear Sirs:

Life of the Land requests that the following concerns be addressed in the Environmental Impact Statement for the Barbers Point Cogeneration Project:

① Disposal of Ash -  
remnants of burn materials will contain heavy metals and also Dioxin, one of the most toxic substances known to man. Hawaiis ground water and ocean must be absolutely protected from any chance of leakage, seepage, spillage, during natural catastrophe or accident, or normal conditions. We recommend proper disposal in a hazardous waste facility, with all precautions being taken to insure containment of all toxic substances.

② Protection of Air Quality -  
Must protect Hawaiis pristine air. We recommend the latest technology be used to comply fully with state and federal requirements, with no UAVIAMES or WAUVEUS.

19 Niihopa Place, Honolulu, Hawaii 96817. Tel. 595-3903

Thank you,  
David Hill  
Secretary, Life of the Land

**SIERRA CLUB, HAWAII CHAPTER**  
P.O. BOX 11070 HONOLULU, HAWAII 96828  
(808) 946-8494



Mr. Perry White  
Belt Collins and Assoc.  
880 Ala Moana Blvd. Suite 200  
Honolulu, HI 96813

December 6, 1988

Re: Barbers Point Cogeneration Project Draft EIS

The Hawaii Chapter of the Sierra Club wishes to be a consulted party in the EIS process of the AES Coal fired generator Project at Barbers Point.

Sierra Club has a policy favoring conservation as a first (and highly necessary) response to growing energy demand. Conservation is the cleanest, most economical and near-term solution for Oahu.

Sierra Club has stated its position against a deepwater cable project transporting geothermally generated electricity from the Big Island to Oahu. Included is a copy of that position. We therefore want to closely examine one alternative that might obviate the cable.

We look forward to reviewing the draft EIS and wish these concerns be addressed fully:

- 1. WHAT IS THE POTENTIAL FOR LARGE SCALE ENERGY CONSERVATION BY THE LARGE USERS OF ELECTRICITY ON OAHU I.E. MILITARY, RESIDENTIAL, INDUSTRIAL AND COMMERCIAL USERS?

COAL

Sierra Club participated in the PUC rate hearing of October 20, 1988 where the coal source was identified as Indonesian. Can that source change and, if so, what procedure will there be to let the public know?

What is the heavy metal content of this coal and is it toxic or hazardous? If so what mitigation measures will be taken to keep it out of the smoke stack?

Please characterize the problems with coal dust for this project and detail how its adverse impacts will be mitigated. What percentage or quantities of coal dust will escape the conveyor belt vacuum system?

What will be the kinds of particulate matter escaping the project area and what mitigation measures will be taken?

Page 2 Sierra Club

FLUIDIZED BED COMBUSTION TECHNOLOGY

What conditions would necessitate the inclusion of ammonia to remove nitrous oxides (NOX)?

WASTES FROM THE PROJECT

What will be the disposal of the ash and waste products?

WATER REQUIREMENTS

What are the water requirements? What volumes of water will be needed for cooling?

Will there be any heat pollution from the reinjected water?

Where will the limestone come from and what are the environmental impacts of mining that?

GREENHOUSE EFFECT

What will this facility contribute to the "greenhouse" effect? Is the company still receptive to the idea of revegetating Kahoolawe or planting forested trees as mitigation?

While the Honolulu Group of the Sierra Club would normally be the entity reviewing and commenting on this EIS process, we have agreed that the Chapter level has the volunteers with experience on energy issues and should be the responder.

Please forward communications and drafts to Nelson Ho, Regional Vice-President, P.O. Box 690 Mountain View, HI 96771. ph (808) 966-6278.

Thank you,

*Nelson Ho*  
Nelson Ho

for the Chapter Conservation Committee

- cc. Debra Shirashi
- Scldf Honolulu
- Barbara Boyle
- Ed Stevens
- Gary Anderson



SIERRA CLUB, HAWAII CHAPTER  
P.O. BOX 11070 HONOLULU, HAWAII 96828  
(808) 946-8494

SIERRA CLUB POSITION STATEMENT  
ON THE UNDERSEA ELECTRICAL TRANSMISSION CABLE

IT SHALL BE THE POSITION OF THE SIERRA CLUB, HAWAII CHAPTER, TO OPPOSE THE UNDERSEA ELECTRICAL TRANSMISSION CABLE PROJECT, WHICH IS PLANNED TO TRANSMIT 500 MW OF GEOTHERMAL GENERATED ELECTRICITY FROM THE ISLAND OF HAWAII TO OAHU. Adopted February 7, 1988.

- 1) The geothermal well-fields for the cable are upwind of the Hawaii Volcanoes National Park and Kahaula'e Natural Area Reserve. Large scale industrialization would have adverse impacts on Park wilderness values include noise, air, and light pollution.
- 2) Planned geothermal well-fields for the cable project could adversely impact the former Puna Forest Reserve and Wao Kele O Puna Natural Area Reserve, both of which have high natural values and are important for biodiversity.
- 3) The geologic and volcanic hazards in the vicinity of the cable routes and power plant areas are too prevalent to risk such a large portion of Hawaii's electrical generating capacity.
- 4) The at-sea cable is vulnerable and subject to disruption and damage by undersea landslides, rough sea bottom conditions, strong currents and the crushing pressure of Aleuuhaha Channel.
- 5) The proposed electrical transmission land route on Maui is adjacent to the Cape Kinau Natural Area Reserve and could have adverse environmental impacts. Nearshore impacts could adversely affect the reefs and Class AA waters at the landing sites on Oahu. On Hawaii, Maui and Oahu, the overland transmission routes have the potential to create visual impacts, electro-magnetic interference (280 kv), and land use conflicts along its entire corridor.

- 6) A long term commitment to a geothermal/cable form of energy development is taking away resources and opportunities for energy conservation and less environmentally damaging alternative energy options.
- 7) The first action taken by State government should be to implement full scale energy conservation on the island of Oahu. Large scale implementation of solar water heating, efficient appliance/tool retrofitting, efficient architectural design and co-generation should be implemented prior to any cable project.



SIERRA CLUB, HAWAII CHAPTER  
P.O. BOX 22897 HONOLULU, HAWAII 96822  
(808) 946-8494

ENERGY POLICY  
ADOPTED APRIL 24, 1983  
SIERRA CLUB HAWAII CHAPTER

It shall be the policy of the Sierra Club, Hawaii Chapter, to support energy conservation as a first priority for energy planning. We also support a balanced and environmentally benign approach to energy resource development in Hawaii

POSITIONS adopted April 24, 1983

1. Support the concept of renewable energy sources. This would promote resource use in a manner that would allow sustained long-term energy production.
2. Support the position that the necessary transition from fossil fuels to renewable energy sources be made with the preservation of environmental quality in mind.
3. Support the position that baseline studies for health, air and water quality be done and that adequate environmental standards be in place before proceeding with energy projects.
4. Support the position that communities and concerned citizens must have an early and direct role in the planning and decision making processes of energy development.
5. Support the position that energy producing projects should proceed only if they are not developed at the expense of the irreplaceable resources of Hawaii.
6. Support decentralized and diversified small scale energy production whenever possible.
7. Support the position that environmental degradation resulting from energy production or use is a subsidy and must be recognized as a social cost to be included in evaluating the feasibility of the energy form.



THE PELE DEFENSE FUND  
P.O. BOX 484 VOLCANO HAWAII 96783

Mr. Perry White  
Belt Collins and Assoc.  
680 Ala Moana Blvd. Suite 200  
Honolulu, HI 96813

December 8, 1988

REQUEST FOR CONSULTED PARTY STATUS  
ON THE MATTER OF AES BARBERS POINT, INC.'S  
BARBERS POINT COGENERATION PROJECT

PELE DEFENSE FUND wishes to be a party in and comment on the environmental impact statement process of this new to Hawaii coal fired generator project.

Included below are questions and concerns we would like addressed in the draft EIS.

SPECIFIC COMMENTS/QUESTIONS ON TEXT

The following specific comments/questions relate to the text at the page:paragraph noted:

- Page: Comment/Question:
- 1-9:2 What will the sulfur content be of the coal? Do they have the specific numbers yet?
- 1-9:3 Re: "The CFB technology is an environmentally advanced process..." "Need an independent assessment as part of the EIS related documentation. It is not enough for the proponent to make such a statement."
- 1-13:2 Re: "The cooling system will be integrated with the geology of the plant site." What does this really mean? Need specifics.
- 1-13:2 Re: Reinjection: Need a very thorough, independent evaluation of the geology of the plant site and surrounding area. Particularly they need to prove how much "less permeable" the capping strata may be.
- 1-13:3 Re: Minimization of leachate: how much will remain and how will it be controlled?

- 1-14: Re: Figure: what traps will be used to keep pollutants out of the ocean? Need at links 5, 18 or 21 and at 7.
- 1-15:1 Re: Runoff basins: the 10 year flood is too small; need to design for 50 or 100 year events! (1988 January revisited will come all too often in my opinion!)
- 1-15:2 Re: captured oil: how will it be stored and shipped to the recycling facility?
- 1-16:1 Re: storage of ash: where and how will it be stored "onsite"?
- 1-16:1 Re: shipment of ash back to the mine: what will the chemical characteristics be of the pelletized material? Will the process change the chemical content? If so, to what degree of toxicity?
- 1-16:2 Will the CIP substation be necessary only for this project? To what degree is this project growth inducing related to the substation? If it is only needed for this project, the substation impacts should be addressed in this EIS.
- 1-16:3 Re: steam delivery: how will the steam be delivered? The impacts should be covered in this EIS.
- 1-16:4 Re: "The bulk loader will serve all the bulk cargo users on the island." How will the loader be cleaned so that cargoes are not mixed? This should be addressed in the EIS.
- 1-17:1 Need additional details on the design and operations of the conveyor to be sure that all possible impacts are discussed.
- 1-18:4 Re: "Water or a nontoxic surfactant may be applied as a dust control measure."; what criteria will be used to decide when and how and what will be applied? Who will set and monitor criteria?
- 1-18:5 Re: fill: where will it be obtained? What will the impacts be of the fill and its delivery to the site?
- 2-1:1 Add "State Emergency Plans" to the list in para 1.
- 2-1:2 Add "Water Quality" to the list in para 2.
- 2-1:3 Ensure that the discussion of alternatives includes:  
Alternative technologies  
Alternative sites  
Alternative site layout and engineering  
Alternative operations  
Alternative decommissioning

**APPENDIX H**  
**ENVIRONMENTAL INFORMATION FORM**  
 (To Be Completed By Applicant)

Date Filed \_\_\_\_\_

**General Information**

1. Name and address of developer or project sponsor: \_\_\_\_\_
2. Address of project: \_\_\_\_\_  
 Assessor's Block and Lot Number: \_\_\_\_\_
3. Name, address, and telephone number of person to be contacted concerning this project: \_\_\_\_\_
4. Indicate number of the permit application for the project to which this form pertains: \_\_\_\_\_
5. List and describe any other related permits and other public approvals required for this project, including those required by city, regional, state and federal agencies: \_\_\_\_\_
6. Existing zoning district: \_\_\_\_\_
7. Proposed use of site (Project for which this form is filed): \_\_\_\_\_

**Project Description**

8. Site size.
9. Square footage.
10. Number of floors of construction.
11. Amount of off-street parking provided.
12. Attach plans.
13. Proposed scheduling.
14. Associated project.
15. Anticipated incremental development.
16. If residential, include the number of units, schedule of unit sizes, range of sale prices or rents, and type of household size expected.

**PRELIMINARY "INITIAL STUDY"**

Enclosed herewith is a copy of the standard Initial Study form used in California. I would recommend that they complete one of the forms for each of the project elements. That is, for each of the following six basic components of the over-all project:

1. Shipping and Littoral Zone impacts
2. Harbor operations impacts
3. Conveyor impacts
4. Site/site-activity impacts
5. Transmission line impacts
6. Waste handling (off-site) impacts

**RECOMMENDATION**

As we discussed, this information should be included in Fele Defense Fund's response to the Environmental Assessment. You should send to the FUC as well as to AES-BP. Ms. Courtes, I have sent a copy of this memo directly to AES-BP so that they can be working on the materials as soon as possible.

Please do not hesitate to contact me if you have any questions.

...

*James A. Roberts*

James A. Roberts, PhD  
 Geographer and Planner  
 540 Morris Way  
 Sacramento, CA 95864  
 Tel: 916-484-7124  
 Fax: 916-481-6779

17. If commercial, indicate the type, whether neighborhood, city or regionally oriented, square footage of sales area, and loading facilities.
18. If industrial, indicate type, estimated employment per shift, and loading facilities.
19. If institutional, indicate the major function, estimated employment per shift, estimated occupancy, loading facilities, and community benefits to be derived from the project.
20. If the project involves a variance, conditional use or rezoning application, state this and indicate clearly why the application is required.
- Are the following items applicable to the project or its effects? Discuss below all items checked yes (attach additional sheets as necessary).
- |  | Yes | No  |
|--|-----|-----|
| 21. Change in existing features of any bays, tidelands, beaches, or hills, or substantial alteration of ground contours. | --- | --- |
| 22. Change in scenic views or vistas from existing residential areas or public lands or roads.                           | --- | --- |
| 23. Change in pattern, scale or character of general area of project.  | --- | --- |
| 24. Significant amounts of solid waste or litter.  | --- | --- |
| 25. Change in dust, ash, smoke, fumes or odors in vicinity.  | --- | --- |
| 26. Change in ocean, bay, lake, stream or ground water quality or quantity, or alteration of existing drainage patterns. | --- | --- |
| 27. Substantial change in existing noise or vibration levels in the vicinity.  | --- | --- |
| 28. Site on filled land or on slope of 10 percent or more.   | --- | --- |
| 29. Use of disposal of potentially hazardous materials, such as toxic substances, flammables or explosives.              | --- | --- |
| 30. Substantial change in demand for municipal services (police, fire, water, sewage, etc.).                             | --- | --- |
| 31. Substantially increase fossil fuel consumption (electricity, oil, natural gas, etc.).                                | --- | --- |
| 32. Relationship to a larger project or series of projects.  | --- | --- |

Environmental Setting

33. Describe the project site as it exists before the project, including information on topography, soil stability, plants and animals, and any cultural, historical or scenic aspects. Describe any existing structures on the

site, and the use of the structures. Attach photographs of the site. Snapshots or polaroid photos will be accepted.

34. Describe the surrounding properties, including information on plants and animals and any cultural, historical or scenic aspects. Indicate the type of land use (residential, commercial, etc.), intensity of land use (one-family, apartment houses, shops, department stores, etc.), and scale of development (height, frontage, set-back, rear yard, etc.). Attach photographs of the vicinity. Snapshots or polaroid photos will be accepted.

Certification

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this initial evaluation to the best of my ability, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date \_\_\_\_\_ Signature \_\_\_\_\_  
 For \_\_\_\_\_

(Note: This is only a suggested form. Public agencies are free to devise their own format for initial studies.)

APPENDIX I

ENVIRONMENTAL CHECKLIST FORM

I. Background

1. Name of Proponent \_\_\_\_\_
2. Address and Phone Number of Proponent \_\_\_\_\_
3. Date of Checklist Submitted \_\_\_\_\_
4. Agency Requiring Checklist \_\_\_\_\_
5. Name of Proposal, if applicable \_\_\_\_\_

II. Environmental Impacts

(Explanations of all "yes" and "maybe" answers are required on attached sheets.)

- |   | Yes | Maybe | No |
|---|-----|-------|----|
| 1. Earth. Will the proposal result in:  |     |       |    |
| a. Unstable earth conditions or in changes in geologic substructures?   |     |       |    |
| b. Disruptions, displacements, compaction or overcovering of the soil?  |     |       |    |
| c. Change in topography or ground surface relief features?  |     |       |    |
| d. The destruction, covering or modification of any unique geologic or physical features?   |     |       |    |
| e. Any increase in wind or water erosion of soils, either on or off the site?   |     |       |    |
| f. Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay, inlet or lake? |     |       |    |
| g. Exposure of people or property to geologic hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards?   |     |       |    |

Yes    Maybe    No

2. Air. Will the proposal result in:

- a. Substantial air emissions or deterioration of ambient air quality? \_\_\_\_\_
- b. The creation of objectionable odors? \_\_\_\_\_
- c. Alteration of air movement, moisture, or temperature, or any change in climate, either locally or regionally? \_\_\_\_\_

3. Water. Will the proposal result in:

- a. Changes in currents, or the course of direction of water movements, in either marine or fresh waters? \_\_\_\_\_
- b. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff? \_\_\_\_\_
- c. Alterations to the course or low of flood waters? \_\_\_\_\_
- d. Change in the amount of surface water in any water body? \_\_\_\_\_
- e. Discharge into surface waters, or in any alteration of surface water quality, including but not limited to temperature, dissolved oxygen or turbidity? \_\_\_\_\_
- f. Alteration of the direction or rate of flow of ground waters? \_\_\_\_\_
- g. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations? \_\_\_\_\_
- h. Substantial reduction in the amount of water otherwise available for public water supplies? \_\_\_\_\_

1. Exposure of people or property to water related hazards such as flooding or tidal waves? \_\_\_\_\_

4. Plant Life. Will the proposal result in:

- a. Change in the diversity of species, or number of any species of plants (including trees, shrubs, grass, crops, and aquatic plants)? \_\_\_\_\_

	<u>Yes</u>	<u>Maybe</u>	<u>No</u>
b. Reduction of the numbers of any unique, rare or endangered species of plants?	---	---	---
c. Introduction of new species of plants into an area, or in a barrier to the normal replenishment of existing species?	---	---	---
d. Reduction in acreage of any agricultural crop?	---	---	---
5. <b>Animal Life.</b> Will the proposal result in:	---	---	---
a. Change in the diversity of species, or numbers of any species of animals (birds, land animals including reptiles, fish and shellfish, benthic organisms or insects)?	---	---	---
b. Reduction of the numbers of any unique, rare or endangered species of animals?	---	---	---
c. Introduction of new species of animals into an area, or result in a barrier to the migration or movement of animals?	---	---	---
d. Deterioration to existing fish or wildlife habitat?	---	---	---
6. <b>Noise.</b> Will the proposal result in:	---	---	---
a. Increases in existing noise levels?	---	---	---
b. Exposure of people to severe noise levels?	---	---	---
7. <b>Light and Glare.</b> Will the proposal produce new light or glare?	---	---	---
8. <b>Land Use.</b> Will the proposal result in a substantial alteration of the present or planned land use of an area?	---	---	---
9. <b>Natural Resources.</b> Will the proposal result in:	---	---	---
a. Increase in the rate of use of any natural resources?	---	---	---
10. <b>Risk of Upset.</b> Will the proposal involve:	---	---	---
a. A risk of an explosion or the release of hazardous substances (including, but not limited to, oil, pesticides, chemicals or radiation) in the event of an accident or upset conditions?	---	---	---

	<u>Yes</u>	<u>Maybe</u>	<u>No</u>
b. Possible interference with an emergency response plan or an emergency evacuation plan?	---	---	---
11. <b>Population.</b> Will the proposal alter the location, distribution, density, or growth rate of the human population of an area?	---	---	---
12. <b>Housing.</b> Will the proposal affect existing housing, or create a demand for additional housing?	---	---	---
13. <b>Transportation/Circulation.</b> Will the proposal result in:	---	---	---
a. Generation of substantial additional vehicular movement?	---	---	---
b. Effects on existing parking facilities, or demand for new parking?	---	---	---
c. Substantial impact upon existing transportation systems?	---	---	---
d. Alterations to present patterns of circulation or movement of people and/or goods?	---	---	---
e. Alterations to waterborne, rail or air traffic?	---	---	---
f. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians?	---	---	---
14. <b>Public Services.</b> Will the proposal have an effect upon, or result in a need for new or altered governmental services in any of the following areas:	---	---	---
a. Fire protection?	---	---	---
b. Police protection?	---	---	---
c. Schools?	---	---	---
d. Parks or other recreational facilities?	---	---	---
e. Maintenance of public facilities, including roads?	---	---	---
f. Other governmental services?	---	---	---
15. <b>Energy.</b> Will the proposal result in:	---	---	---
a. Use of substantial amounts of fuel or energy?	---	---	---

Yes        Maybe        No       

- b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)
- c. Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)
- d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

III. Discussion of Environmental Evaluation (Narrative description of environmental impacts.)

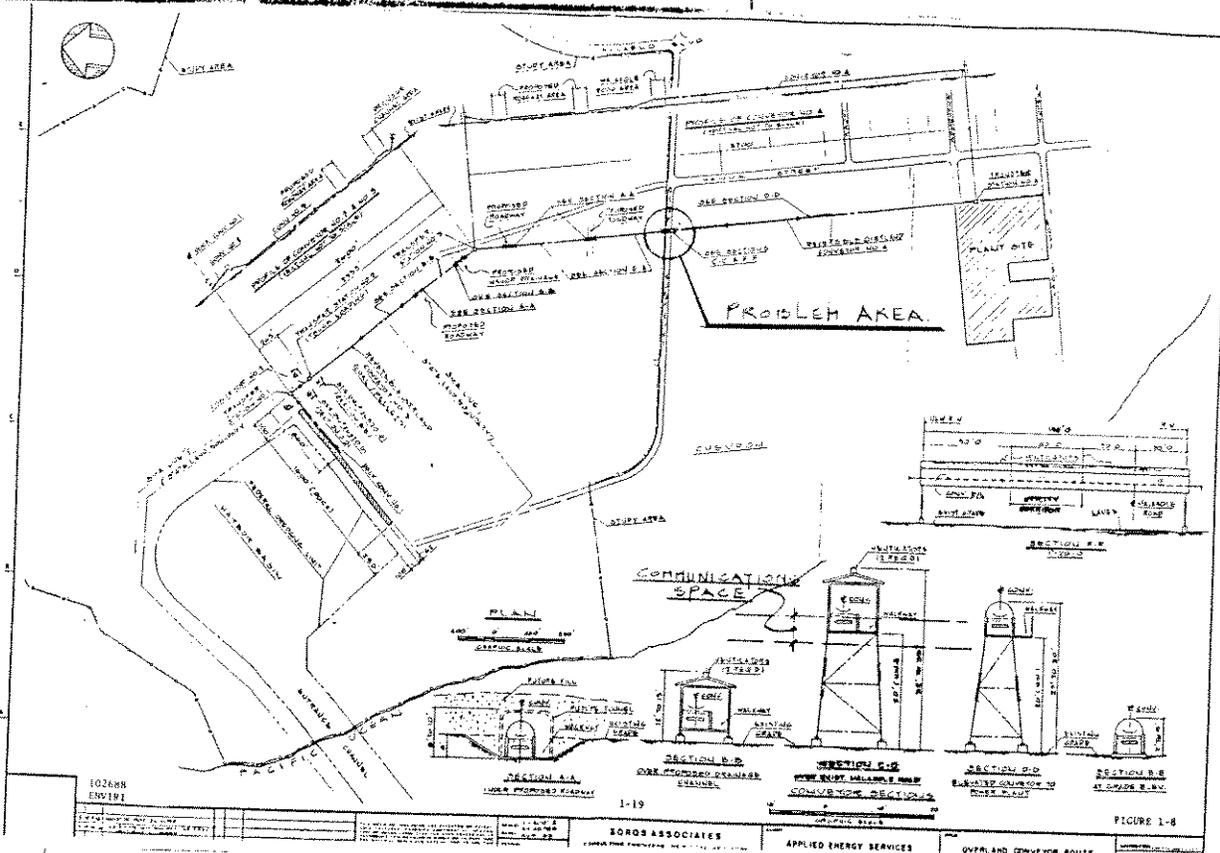
- IV. Determination (To be completed by the Lead Agency.)
- On the basis of this initial evaluation:
  - I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
  - I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A NEGATIVE DECLARATION WILL BE PREPARED.
  - I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Date \_\_\_\_\_ Signature \_\_\_\_\_ For \_\_\_\_\_

Yes        Maybe        No       

- b. Substantial increase in demand upon existing sources or energy, or require the development of new sources of energy?
- 16. Utilities. Will the proposal result in a need for new systems, or substantial alterations to the following utilities?
- 17. Human Health. Will the proposal result in:
  - a. Creation of any health hazard or potential health hazard (excluding mental health)?
  - b. Exposure of people to potential health hazards?
- 18. Aesthetics. Will the proposal result in the obstruction of any scenic vista or view open to the public, or will the proposal result in the creation of an aesthetically offensive site open to public view?
- 19. Recreation. Will the proposal result in an impact upon the quality or quantity of existing recreational opportunities?
- 20. Cultural Resources.
  - a. Will the proposal result in the alteration of or the destruction of a prehistoric or historic archaeological site?
  - b. Will the proposal result in adverse physical or aesthetic effects to a prehistoric or historic building, structure, or object?
  - c. Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values?
  - d. Will the proposal restrict existing religious or sacred uses within the potential impact area?
- 21. Mandatory Findings of Significance.
  - a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate

# ATTACHMENT



**GTE Hawaiian Tel**

November 18, 1988

Mr. Eric Miller  
 AES Barbers Point, Inc.  
 1000 Bishop Street, Suite 810  
 Honolulu, Hawaii 96813

Dear Mr. Miller:

**Environmental Impact Statement Preparation Notice (EISP/N)  
 AES Barbers Point Coal-Fired Cogeneration Project**

We have reviewed the Environmental Impact Statement Notice (EISP/N) dated November 10, 1988 for the Barbers Point Cogeneration Plant and have no objections to the project.

However, we would like to point out at this time the design conflict of the conveyor system with the existing communication lines at the Malakole Road crossing (see attached plan).

If you have any questions, please call me at 834-6221.

Sincerely,

*Walter M. Matsumoto*  
 Walter M. Matsumoto  
 Oahu Engineering and  
 Construction Manager

LK/SS/st(064)  
 attachment

P.O. Box 2466  
 Honolulu, Hawaii 96841  
 Telephone (808) 546-4611

8.1.2,  
 9.1.2

JAN - 3 - 89 TUE 16:26 SOROS

P.02

**GTE Hawaiian Tel**

PO Box 2200  
Honolulu, Hawaii 96811  
Telephone (808) 540-4511

26920  
FILE/PVC/WBS/6/ATTAC  
**RECEIVED**

December 27, 1988

SOROS ASSOCIATES CONSULTING ENGINEERS  
Port Development/Bulk Handling/Offshore Terminals  
465 Fifth Avenue  
New York, NY 10017-6104

JAN - 5 1989

SOROS ASSOCIATES

Attention: Mr. Weldon Smith

Dear Mr. Smith:

Overland Conveyor Route Plan & Sections

Reference your letter to Mr. Walter Matsumoto, dated on December 6, 1988 and Drawing P-26920-04.

Based on the drawing submitted to GTE Hawaiian Tel, conflicts between the Conveyor Belt structure and GTE Hawaiian Tel cable facilities will be encountered at Section F-F. We therefore recommend that the overhead facilities be rerouted underground and the following support structures be provided for the relocation:

- 1) Provide two 4-inch conduits between the nearest pole on both sides of the proposed conveyor belt structure, at Section F-F as shown on the plan.
- 2) Install a 2' x 4' pulldown at the foot of each pole and depending on the distance between poles place a 2' x 4' pulldown every 200 feet.

The supporting structures mentioned above, shall be used only for telecommunication purposes, and does not include the requirements of the Hawaiian Electric Company. Please submit the revised plans for our review and provide the reference name of the poles near Section F-F.

The overhead facilities will be relocated by GTE Hawaiian Tel and all costs associated with the relocation work shall be borne by the customer.

Should there be any questions, please call me at (808) 834-6222.

Sincerely,

*Nelson M. Yr-Jezayry*  
Nelson M. Yr-Jezayry  
CEAC Supervising Engineer

MMY/vtn1675  
Attachment



January 25, 1989

Mr. Eric Miller  
Assistant Project Director  
AEC Barbers Point, Inc.  
1000 Bishop Street, Suite 610  
Honolulu Hawaii 96813

Dear Mr. Miller:

I recently learned of AES Barbers Point plans to locate a Coal-Fired Cogeneration Project at Campbell Industrial Park.

As an adjoining property owner, I am concerned about the possible adverse impacts of such a project on my facility and my employees. I understand the current site plans provide for open storage of coal and limestone in the northern section of the property. Due to prevailing wind conditions, the dust from such an open storage area would overwhelm my property and that of my neighbor, Gaspro. I have informed Gaspro that I understand this is part of your current site plan and they share my concern.

I request that I be given a specific opportunity to review and comment on the draft EIS. I further request that a briefing be arranged for my company, Gaspro and Hunomach. I further request that attention be directed to finding alternative covered storage arrangements for coal, limestone, and any other materials which would be stored in the open. I would also like an opportunity to comment on the plans for moving materials to your site and the impact that your processing systems will have on the air quality and water quality of all privately owned adjoining and neighboring properties.

I cannot over emphasize my belief that your facility poses serious incompatible uses to my property. As a manufacturer of expanded polystyrene products, I provide finished plastic goods to the food and medical industry. Cleanliness is a critical factor in our operations. I trust you can appreciate this and will take all possible steps to reconsider your site plan.

Superior,  
  
Paul E. Smith  
President

cc: State Environmental Quality Council  
Mr. John Werten, Department of Land Utilization  
Dr. John Lewis, State Department of Health  
(808) 648-5836 Campbell Industrial Park 91-102 B Kaimi Ln, Ewa Beach, Hawaii - 96707

POLYSTYRENE for insulation, construction, packaging, recreational products



Applied Energy Services, Inc.

Eric L. Miller  
Assistant Project Director

1/24/89

I spoke with Paul Smith on January 24 about his concerns. The cement plant causes them to shut down during Kona winds because of the dust.

He seems skeptical but willing to be convinced that we will not create a problem for him. I plan to get together with him when he is back in town at the end of February.

**RECEIVED**  
DEC 15 1988

BELT, COLLINS & ASSOCIATES



88-911-SB  
December 2, 1988

Mr. Perry J. White  
Belt, Collins & Associates  
680 Ala Moana Blvd., Suite 200  
Honolulu, HI 96813

Subject: November 8, 1988 EIS Preparation Notice  
AES Coal-fired Cogeneration Plant

Dear Perry:

I request to be a consulted party and to receive a copy of the Draft EIS for this project and any related documents.

Thank you. I hope to see you soon.

Sincerely,  
*James W. Frolich*  
James W. Frolich  
Senior Project Manager

JWF/kb

*12/16 - Cy sent after this date.*

## 7.7 ORGANIZATIONS AND INDIVIDUALS WHO PREPARED THE EIS

### Belt Collins & Associates

Perry J. White	Contributor/Project Manager
Sue Rutka	Contributor/Planner
Thomas F. Nance	Contributor/Hydrologist
Karon Uyechi	Graphics/Graphic Designer
Karl Miyajima	Graphics/Graphics Designer
Vina Lesuma	Word Processing

### AES-Barbers Point, Inc.

Eric L. Miller	Assistant Project Director
Janie Kessler	Alternatives and Economic Impacts

### Black & Veatch

Dave Lefevbre	Plant Design, Water Use & Constituents
Mike Pelan	Air Quality Impact Analysis
Staff	Noise Impact Analysis

### Other

Kenneth Nagata	Botanical Survey
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## 8.4 CONSULTED PARTIES' COMMENTS ON THE DRAFT EIS

### AGENCIES, ORGANIZATIONS, AND INDIVIDUALS RESPONDING TO STANDARD TRANSMITTAL LETTER WITH "COMMENTS"

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DEPARTMENT OF THE ARMY  
U. S. ARMY ENGINEER DISTRICT, HONOLULU  
BUILDING 230  
FT. SHAFTER, HAWAII 96858-5440

REPLY TO  
ATTENTION OF  
Planning Branch

April 6, 1989

BELT, COLLINS & ASSOCIATES

Dr. Marvin Miura  
Office of Environmental Quality Control  
465 South King Street, Room 104  
Honolulu, Hawaii 96813

Dear Dr. Miura:

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS) for the proposed AES-Barbers Point, Inc., Coal-Fired Cogeneration Facility, Ewa, Oahu. Our review comments on the EIS Preparation Notice (letter dated December 12, 1988) have been included in the DEIS (page 7-19) and are still applicable.

Sincerely,

*Kisuk Cheung*  
Kisuk Cheung  
Chief, Engineering Division

Copies furnished:

Hawaii State Department of Transportation  
Barbers Division  
79 South Nimitz Highway  
Honolulu, Hawaii 96813

Mr. Perry White  
Belt Collins & Associates  
680 Ala Moana Blvd, Suite 200  
Honolulu, Hawaii 96813

Mr. Eric Miller  
AES Barbers Point, Inc.  
1001 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

APR 13 1989 AES-6P

RECEIVED  
APR 7 1989

May 25, 1989

Mr. Kisuk Cheung  
Chief, Engineering Branch  
U.S. Army Corps of Engineers  
Department of the Army  
Building 230  
Fort Shafter, Hawaii 96858-5440

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

Dear Mr. Cheung:

Thank you for your April 6, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. Our responses to your comments are as follows.

As a result of comments received from reviewers of the Draft EIS, AES Barbers Point has become aware of concerns over the archaeological and paleontological remains present in sinkholes within the conveyor right-of-way depicted in the Draft EIS.

Following discussions with Dr. Alan Ziegler and Ms. Jane Hong, and with Dr. Joyce Bath of the State Historic Sites Section, the conveyor has been realigned so that it misses the area on the corner of Hanua Street and Malakole Road that has been suggested as a possible park site. A copy of our letter to the Department of Land and Natural Resources, describing the proposed resolution of issues relating to the sinkholes, is attached for your information.

No Batis maritima wetlands are present in the area that will be traversed by the realigned conveyor.

**AES/BarbersPoint** inc.

1000 Bishop Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6246 • Telecopier - (808) 538-3147

Mr. Kisuk Cheung  
May 25, 1989  
Page 2

May 4, 1989

The Flood Insurance Rate Map for the area was consulted in preparing Section 3.2 of the Draft EIS. It shows that the site is outside the tsunami inundation zone; however, the map does not define the flood hazard as a result of surface runoff. The Campbell Industrial Park storm drainage system was designed to City and County of Honolulu standards, and it is capable of handling normal runoff from the site. Because the land within the industrial park is quite flat, drainage is slow, and sand berms across the mouths of the drainage channels can restrict discharge from them during the early stages of storms. Because of this, the power plant site will be graded so that critical equipment and storage areas are elevated several feet above the top of the drainage channels. This will protect them from damage if the storm drainage system overflows.

Thank you again for the time that you and your staff spent reviewing the Draft Environmental Impact Statement. If you have any questions or would like additional information, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

Attachment 1  
Letter to Dr. Joyce Bath, State Department of Land & Natural Resources

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr Perry J. White, Belt Collins & Associates

Dr. Joyce Bath  
Archaeologist, Historic Sites  
Department of Land & Natural Resources  
State of Hawaii  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Subject: Realignment of AES Barbers Point Conveyor in Vicinity of Proposed Sinkhole Preserve and Park in Campbell Industrial Park

Dear Dr. Bath:

Thank you very much for taking the time to inspect our conveyor route in the area of the proposed sinkhole preserve. It is much easier to resolve these issues when we all have a common understanding of what is happening out at the site.

Based on our discussions on that trip, and further conversations with our conveyor consultant, we have realigned the conveyor as shown on the attached sketch.

The new conveyor alignment completely avoids the area north of Malakole Road that the Honolulu City Council has indicated an interest in incorporating into a future educational park. Because of the presence of the 40 to 50-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated in an archaeological/paleontological science reserve. However, we will elevate the conveyor within the preserve area and design the support structures so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that those sinkholes are not accidentally damaged by construction equipment.



Dr. Joyce Bath  
May 4, 1989  
Page 2

A topographic survey is now being undertaken of the revised conveyor route. Dr. Ziegler has agreed to accompany the survey team to help identify significant sinkholes requiring preservation. This survey, with the located sinkholes, will be submitted to your office for approval prior to any construction or grading of the site. Once approved by your office, we will avoid all sinkholes identified on this survey and any outside the survey area but within the projected sinkhole preserve.

It is our understanding that the sinkhole park/preserve area represents the only area of concern with respect to historic sites along the conveyor route or on the plant site.

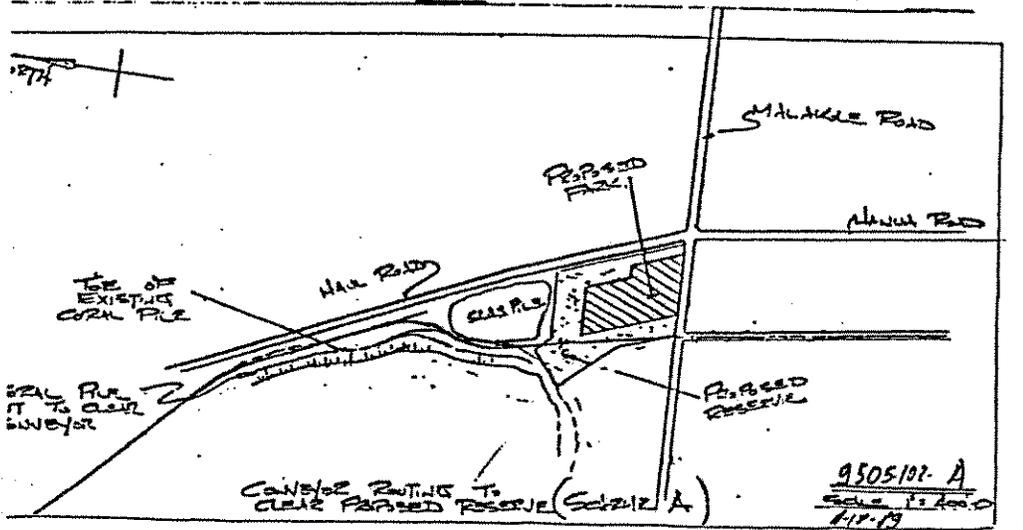
I hope this program will resolve any possible incompatibility between our conveyor and the proposed park/reserve. If you have any further questions or comments concerning this matter, please call me at 538-6346.

Sincerely,

Eric L. Miller  
Assistant Project Director

Attachment

cc: Perry White, BSA





DEPARTMENT OF BUSINESS AND ECONOMIC DEVELOPMENT

ENERGY DIVISION, 335 MERCHANT ST., 2ND FL., HONOLULU, HAWAII 96813 FAX: (808) 538-3243

89:10778-289

April 21, 1989

State Department of Transportation  
Harbors Division  
79 S. Mimitz Highway  
Honolulu, Hawaii 96813

Gentlemen:

Thank you for the opportunity to respond to the DEIS for AES-Barbers Point, Inc., Coal-Fired Cogeneration Facility.

The concerns in our letter dated November 30, 1988, were generally addressed in the DEIS with one exception. The DEIS did not compare coal, petroleum, and geothermal regarding air quality, solid waste generated, cost per kilowatt hour, and cost per installed kilowatt. These detailed comparisons are important to understand the relative impacts of this project with these other means to obtain baseload power.

Furthermore, the need for this project to satisfy projected demands does not adequately consider the effect that this project, in combination with the Kalaeloa project, would also have. Are both projects required to satisfy demand, or will there be excess capacity when both projects are completed? What would then be the effect of both these projects on the capability to bring the statewide geothermal/cable project on line? These impacts and how they are consistent with the State's major policy initiatives to achieve significant energy independence through the geothermal/cable project, should be discussed and considered thoroughly in the EIS.

Thank you for the opportunity to provide these comments.

Sincerely,

*Roger A. Ulveling*  
for Roger A. Ulveling

RAU/SOL:jn  
cc: Office of Environmental Quality Control  
AES Barbers Point, Inc.  
Beit Collins & Associates ✓  
Public Utilities Commission  
Division of Consumer Advocacy

May 25, 1989

Mr. Roger A. Ulveling, Director  
Department of Business and  
Economic Development  
State of Hawaii  
335 Merchant Street  
Honolulu, Hawaii 96813

Attn: Energy Division

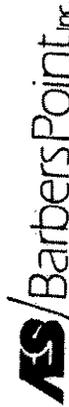
Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement (EIS)  
Your Reference: 89:10778-289

Dear Mr. Ulveling:

Thank you for your April 21, 1989, letter concerning the Draft Environmental Impact Statement for AES Barbers Point, Inc.'s (AES-BP), proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. Your letter concludes that the issues identified in your November 30, 1988, response to the request for comments on the EIS Preparation Notice were generally addressed in the Draft EIS. However, it notes that the DEIS "...does not compare coal, petroleum, and geothermal regarding air quality, solid waste generated, cost per kilowatt hour, and cost per installed kilowatt." Your letter also raises several questions concerning the proposed project's relationship to the Kalaeloa Power Plant project and asks for additional discussion of its impact on the State's major policy initiatives to achieve significant energy independence through the geothermal/cable project. Responses to these comments are presented below.

Comparison of Coal, Geothermal, and Petroleum

As you know, there are no geothermal resources on Oahu, and electrical power from the geothermal/cable project cannot be on line on



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Mr. Roger A. Ulveling  
May 25, 1989  
Page 2

Oahu until 1995. Since Hawaiian Electric Company (HECO) must have additional generating capacity by 1992, geothermal power is not a viable alternative to the coal-fired power plant proposed by AES-BP to meet the short-term needs of Oahu. Hence, it was not evaluated in the Draft EIS.

Petroleum-fired generating units are viable alternatives to the AES-BP project, and this alternative is discussed in Section 4.2.1 of the Draft EIS. In fact, HECO initially proposed to construct a seventh oil-fired unit at its existing Kahe Generating Station to meet the increasing demand for electrical power, but this alternative set aside when the company found it could meet its needs more efficiently and economically through purchase power contracts with Kalaeloa Partners and AES-BP.

Modeling results indicate that the adverse air quality effects of these petroleum-fired alternatives exceed those of the AES-BP project. Water quality effects are generally comparable, except that the Kahe Unit 7 project would have used ocean water for cooling, thereby increasing the thermal ocean discharge. In short, none of the fossil-fuel fired alternatives offer environmental advantages over the AES-BP project.

#### Relationship to Kalaeloa Power Plant and Geothermal/Cable Projects

This part of your letter contains two parts. The first states that the effect of the proposed Kalaeloa Power Plant project on the need for the project is not adequately addressed in the Draft EIS and asks that a discussion of this issue be included in the Final EIS. The second part asks that the Final EIS assess the project's effect on the State's efforts to increase Hawaii's energy independence by encouraging the geothermal/cable project.

With respect to the first issue, Table 3-1 and Figure 1-3 in the Draft EIS compare forecast electrical power demand with system capacity. Both assume that the Kalaeloa Power Plant will be on line

Mr. Roger A. Ulveling  
May 25, 1989  
Page 3

before the AES-BP project. They show that both projects are fully needed to satisfy the forecast demand prior to 1995.

With respect to the second issue, we believe that our project will not adversely affect the State's efforts to encourage the development of Hawaii's indigenous geothermal resource. The power that will be generated by the proposed AES-BP project is needed to meet the 1992 demand. As stated in the Draft EIS's discussion of alternatives (see Section 4.2.6), this is at least three years before power from Big Island geothermal sources could possibly be available on Oahu. Because of this, it appears that the AES-BP project will provide a short-term solution to Oahu's power needs rather than compete with geothermal development.

Thank you again for the time that you and your staff spent reviewing the Draft Environmental Impact Statement. If you have any questions, please call me.

Sincerely,  
  
Eric L. Müller  
Assistant Project Director

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

RECEIVED  
MAY 9 - 1989

JOHN WAINANE  
DIRECTOR OF HEALTH



SELT, COLLINS & ASSOCIATES, M.D.  
DIRECTOR OF HEALTH

STATE OF HAWAII  
DEPARTMENT OF HEALTH

P. O. BOX 3275  
HONOLULU, HAWAII 96821

April 28, 1989

In reply, please refer to:  
EPW-50/878

A0462MN

MEMORANDUM

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

From: Deputy Director for Environmental Health

Subject: Draft Environmental Impact Statement (DEIS) for  
AES-Barbers Point, Inc.  
Coal-Fired Cogeneration Facility, Ewa, Oahu, TNC 9-1-26; Por. 28

Thank you for the opportunity to review and comment on the subject DEIS. We have examined this document and have the following comments to offer:

Underground Injection Control (UIC)

1. The project site is located below the UIC line. Injection well activities such as proposed are generally allowed in these areas.
2. AES-Barbers Point, Inc. is currently applying for a UIC permit to operate the facility's injection wells. Approval to construct and test (not to operate) has been granted by the Department. The issuance of a UIC permit will be determined after the review of the injection test results and other data to be submitted.
3. We would like to point out that AES has been made aware through telephone conversations that the disposal of hazardous substances into the injection wells will not be permitted. Monitoring and sampling requirements addressing this issue will be incorporated into the UIC permit if a UIC permits is issued.

Drinking Water Program

We have determined that the Department's Administrative Rules, Title 11, Chapter 20, "Potable Water Systems," would be applicable to the conversion of the Hawaiian Electric Company's Wai'au Shaft from its present cooling use to a new potable source for the Board of Water Supply. Section 11-20-29 of Chapter 20 requires that a new source of potable water serving public water systems be approved by the Director of Health prior to its use. Such an approval is based

Dr. Marvin T. Miura  
April 28, 1989  
Page 2

primarily upon the submission of a satisfactory engineering report which addresses the requirements noted in Section 11-20-29. Essentially, it must be demonstrated that the proposed source is not subject to actual or potential contamination which may result in the water not complying with any primary drinking water regulation or may adversely affect human health.

Wastewater Disposal

We concur that a wastewater treatment works should be constructed to treat approximately 5,000 gpd of domestic waste flow generated from the project.

All technical details should conform with Chapter 11-67, Hawaii Administrative Rules, Department of Health, "Wastewater Systems" effective December 10, 1989. Plans and specifications of the treatment works must be submitted to the Department for review and approval.

Water Pollution

AES-Barbers Point, Inc. has submitted a NPDES permit application for their coalpile storage runoff.

Air Pollution

A revised Authority to Construct/PSD Application has been recently submitted and is currently being reviewed. The preliminary review indicates that the subject facility will incorporate the latest and best available control technologies for those pollutants emitted in significant amounts. The control technologies being proposed are limestone injection within a circulating fluidized bed for sulfur dioxide, thermal de-NO<sub>x</sub> system for nitrogen oxides, and a baghouse for particulate emissions.

The operation of the facility will be required to comply with both the federal and state ambient air quality standards, and the allowable PSD increments. A preliminary review of the project indicates that this facility, although located in a highly industrialized area of Campbell Industrial Park, will be able to comply with the aforementioned standards and increments based on preliminary air quality assessments.

WN:rm  
cc: Harbors Division, DOT  
Mr. Perry White, Belt Collins & Assoc. ✓  
Mr. Eric Miller, AES-Barbers Point, Inc.

BRUCE S. ANDERSON, Ph. D.

Dr. Bruce S. Anderson, Ph.D.  
May 25, 1989  
Page 2

Drinking Water Program

We understand that the Waiiau Shaft must be certified before it may be used as a potable water source.

Wastewater Disposal

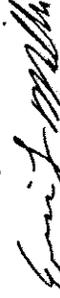
Plans and specifications for the wastewater treatment facilities will be submitted to the DOH for review and approval.

Air Pollution

As indicated in your letter, the Authority to Construct and Prevention of Significant Deterioration (PSD) applications are currently being reviewed by your department and the Environmental Protection Agency. We are pleased that your preliminary review indicates that the project incorporates the latest and best available control technologies and that it will comply with both the federal and state ambient air quality standards and the allowable PSD increment.

Thank you again for the time you and your staff spent reviewing the Draft Environmental Impact Statement. We expect to continue working closely with the Department of Health as the various permits are processed. If you have any questions or would like additional information, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

May 25, 1989

Dr. Bruce S. Anderson, Ph.D.  
Deputy Director for  
Environmental Health  
Department of Health  
State of Hawaii  
P. O. Box 3378  
Honolulu, Hawaii 96801

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement  
Your Reference: A0462WN

Dear Dr. Anderson:

Thank you for your April 28, 1989, letter concerning the Draft Environmental Impact Statement for AES Barbers Point, Inc.'s, proposed coal-fired cogeneration facility. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. Item-by-item responses to your comments are as follows.

Underground Injection Control

- (1) Thank you for confirming that the project is below the underground injection control (UIC) line and that injection wells such as those proposed are generally allowed.
- (2) AES Barbers Point expects to initiate its well drilling and testing program shortly. The results will be submitted to the Department of Health (DOH) as soon as they are available.
- (3) We are aware that hazardous wastes may not be disposed of into the injection wells.



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

DEPT.

LIBERT A. LANGRISH  
NIMBLE TUCKERSON  
RUSSELL N. FURUKAWA

AGRICULTURE DEVELOPMENT  
AGRICULTURAL RESOURCES  
CONSERVATION AND  
ENVIRONMENTAL AFFAIRS  
RECREATION AND  
RESOURCES IMPROVEMENT  
FORESTRY AND WILDLIFE  
LAND MANAGEMENT  
PLANNING AND  
WATER AND LAND DEVELOPMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 81  
HONOLULU, HAWAII 96809

REF: OCEA-SOR

FILE NO.: 89-497  
DOC. NO.: 5515E

MAR 21 1990

MEMORANDUM

TO: The Honorable Marvin T. Miura, Director  
Office of Environmental Quality Control

FROM: William W. Paty, Chairperson  
Board of Land and Natural Resources

SUBJECT: Draft E.I.S. - AES Barbers Point, Inc., Coal-Fired  
Cogeneration Facility, Ewa, Oahu  
TRK: 9-1-26: por. 28

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

Our Department's Historic Sites Section notes that section 3.6, Historic, Paleontologic, and Archaeologic Resources, correctly reflects our previous comments in which we stated that as the parcel has been previously graded and grubbed, we believed that the project would have "no effect" on significant historic sites. However, the conveyor belt corridor was inadvertently overlooked in these comments, which applied strictly to the parcel.

There has been no archaeological survey along the portion of the corridor south of Malakole Road. North of Malakole Road, the corridor may impact some known archaeological/paleontological sinkhole sites. The City Council has expressed interest in the preservation of these particular sites as a future educational park. North of these sites to the harbor, the conveyor belt corridor crosses areas where other archaeological sites have been previously recorded.

We would recommend archaeological survey of the conveyor belt corridor prior to construction. Such survey includes subsurface testing, analysis of any recovered archaeological materials, and a report which incorporates an evaluation of significance and, if appropriate, recommendations for mitigation.

Our Aquatic Resources Division comments that from the information presented, the proposed project appears not to have the potential for significant adverse impacts to aquatic resources. Therefore, we do not object to this proposal.

The Forestry and Wildlife Division points out that adjacent this project site, is the only place in the world 3 rare plants (Euphorbia skottsbergii, var. kalaeloana, Achyranthes rotundata, and Myoporum sandwicense var. stellatum) historically occurred on one land parcel. The first two species are officially listed as endangered species and are protected under federal and state endangered species laws. This is the only major reproductive colony of A. rotundata, whose long roots penetrate the coral substrate, with plants often growing in sink holes and crevices where brackish water is available in wet weather. It is unknown how deep their roots penetrate the substrate to obtain required moisture.

This draft E.I.S. only briefly mentions the endangered species colony next door and does not mention the rare Myoporum growing sympatrically with A. rotundata. It dismisses probable or possible impacts. The following need to be addressed in reference to these rare species:

1. Are federal monies being used in this project?
2. Pollution impacts to plants, including:
  - a. Water runoff, storm water drainage system, sediments;
  - b. Water taken and returned to limestone aquifer beneath site. What is the range, height, depth, and distance of area affected with water which is hotter, saltier, and may have possible pollutants: How will this affect the plants and ground water near surface;
  - c. Air quality - chemicals, pollutants and particulate matter and their ultimate affect on these plants given already high amounts affecting air quality by present industries;
3. Plants are immediately downwind of proposed site. Affects of "fallout" with rain and without rain;
4. Toxic and dangerous chemicals;
5. Fire; and
6. Proposed drainage systems which may affect surface ground moisture.

Honorable Marvin T. Miura

- 3 -

FILE NO.: 89-497

May 25, 1989

Please feel free to call me or Roy Schaefer of our Office of Conservation and Environmental Affairs, at 548-7837, if you have any questions.



WILLIAM W. PATY

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

cc: Perry White  
Eric Miller

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Draft Environmental Impact Statement  
Your Reference: File No. 89-497/Doc. No. 5515E

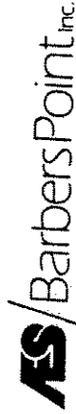
Dear Mr. Paty:

Thank you for your April 21, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s, proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. Item-by-item responses to your comments are as follows.

#### Historic Sites

The discussion of historic and archaeological site impacts contained in the Draft EIS was based, in part, on opinions expressed in the Department's "no effect" conclusion referenced in your letter. Following publication of the Draft EIS, it became apparent that the Department's previous comments were applicable only to the power plant site. As soon as this was known, the situation was discussed with Mr. Alan Ziegler, the archaeologist who has been most active in efforts to establish an archaeological/paleontological preserve in the area, and with Dr. Joyce Bath of the DLNR's Historic Sites Section.

On Saturday, April 15, 1989, Mr. Perry White of Belt Collins & Associates and I accompanied Dr. Bath on a field trip to Campbell



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Industrial Park. During the trip we walked the conveyor route and discussed appropriate means of avoiding adverse impacts on the archaeological and paleontological resources present there. Subsequently, we discussed the issue with representatives of the James Campbell Estate, which owns the land on which the sinkholes are located, and with the project's conveyor consultants. Based on these discussions, we have concluded that the conveyor can be realigned as shown on the attached map.

The new conveyor alignment completely avoids the area north of Malakole Road that the Honolulu City Council has indicated an interest in incorporating into a future educational park. Because of the presence of the 30- to 40-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated in an archaeological/paleontological science reserve. However, AES Barbers Point has agreed to keep the conveyor elevated in this area and to design the support structures for the conveyor so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that those sinkholes are not accidentally damaged by construction equipment.

Please note that the portion of the conveyor route south of Malakole Road is within an existing roadway that contains no archaeological or other historic remains. As confirmed by Dr. Bath during our April 15th field trip, there are no sinkholes or archaeological remains within the area between the proposed science reserve and the harbor.

In view of the foregoing consultation, realignment, and other mitigation measures, we believe that the additional archaeological field work suggested in your letter is no longer necessary. Based on my conversations with Dr. Bath and her review of a draft of this response, it is my understanding that she concurs with this.

### Endangered Plant Species

Your comment letter asks that the Final EIS expand on several issues relating to the proposed project's possible effect on three rare plants (*Euphorbia skottsbergii*, var. *kaaloana*, *Achyranthes rotundata*, and *Myoporum sandwicense* var. *stellatum*). It goes on to state that this is the only major reproductive colony of *A. rotundata* and that the Draft EIS only briefly mentions the endangered species colony and does not mention the rare *Myoporum* growing sympatrically with *A. rotundata*. Finally, the comment lists several issues that need to be addressed in reference to these rare species. The specific comments, and our responses to them, are presented below.

(1) Comment. Are federal monies being used for this project?

Response. No, they are not.

(2) Comment. How will project-related pollution affect the plants, including:

a. Water runoff, storm water drainage system, sediments;

b. Water taken and returned to the limestone aquifer beneath [the] site. What is the range, height, depth, and distance of [the] area affected with water which is hotter, saltier, and may have possible pollutants. How will this affect the plants and groundwater near the surface.

c. Air Quality - chemicals, pollutants, and particulate matter and their ultimate effect on these [rare and endangered] plants given already high amounts affecting air quality by present industries.

Response. As indicated in Section 3.2.3 of the Draft EIS, storm-water runoff from the proposed plant will be disposed of into the existing storm drainage channels bordering the facility. It will flow from there to the ocean. Runoff from the coal, limestone, and ash pellet storage piles will be collected and temporarily held in

settling basins to remove suspended solids, i.e., sediment, and will then be injected with the plant cooling water except for rainfall events in excess of a 10 year, 24 hour flood. As these events occur so infrequently by definition, they will not substantially increase the sediment load of the runoff; in fact, the collection of routine rainfall from the basins may actually reduce sediment loads below their present levels. The collected sediment will be removed periodically from the settling basins and burned in the power plant. It follows that stormwater runoff from the proposed facility will not adversely affect rare plant species.

Warm water from the facility will be disposed of into a lower layer of the limestone aquifer beneath the site. That aquifer is hydrologically separated from the surface water table. Hence, there is no mechanism through which this discharge could affect plants on the surface.

Myoporum is no longer under consideration as a rare or endangered species. Mr. Kenneth Nagata, the botanist who conducted the botanical surveys for this project, reports that the nearest cluster of Euphorbia skottsbergii is near the Hawaii Raceway Park; this is approximately a mile from the AES Barbers Point power plant site and outside the zone within which the proposed facility could substantially alter water quality. This leaves Achyranthes as the only one of the three plant species that might be affected.

Mr. Nagata reports that the majority of the individuals in the Achyranthes colony are located at elevations that are 4-5 feet above the water table. Since their longest roots are on the order of 1-2 feet long and since capillary action raises water no more than a few inches in the sandy soils of the Ewa Plain, it appears as though at least the majority of the plants in the Achyranthes colony do not tap the water table to meet their moisture requirements. This conclusion is consistent with the fact that plants very similar to the Achyranthes are found on low-lying coral atolls where no fresh or brackish groundwater is present. Thus, changes in the salinity of the groundwater that are expected to occur as a

result of pumping for H-POWER and the AES Barbers Point project are not expected to adversely affect the colony.

There is, of course, no species-specific information available on the tolerance of Achyranthes to different levels of air pollutants. However, the levels that are forecast are far below those at which measurable adverse effects on other plant species have been recorded. Moreover, since the project would have relatively little effect on air pollutant concentrations and since there is no evidence of existing stress, there is no evidence that the Achyranthes will be harmed.

(3) Comment. The plants are immediately downwind of the proposed site. How would they be affected by "fallout" from the proposed facility with and without rain?

Response. See the last part of the preceding response.

(4) Comment. How would toxic and dangerous chemicals from the proposed facility affect the plants?

Response. No chemicals would be released into the air or water by the facility in levels sufficient to be toxic or dangerous to the plants for which you expressed concern.

(5) Comment. Will there be a fire hazard associated with the proposed facilities that could adversely affect the plants?

Response. The proposed facility is well removed from the rare plants mentioned in your letter. Moreover, there is nothing in the operation of the power plant which would constitute a significant fire threat.

(6) Comment. How will the proposed drainage systems affect surface ground moisture used by the plants?

Response. As indicated in the preceding items and in Section 3.7.1 of the Draft EIS, the project will utilize the existing storm drainage

Mr. William W. Paty  
May 25, 1989  
Page 6

system. Consequently, it is not expected to affect surface ground moisture.

Thank you again for the time that you and your staff spent reviewing the Draft Environmental Impact Statement. If you have any questions or would like additional information, please call me.

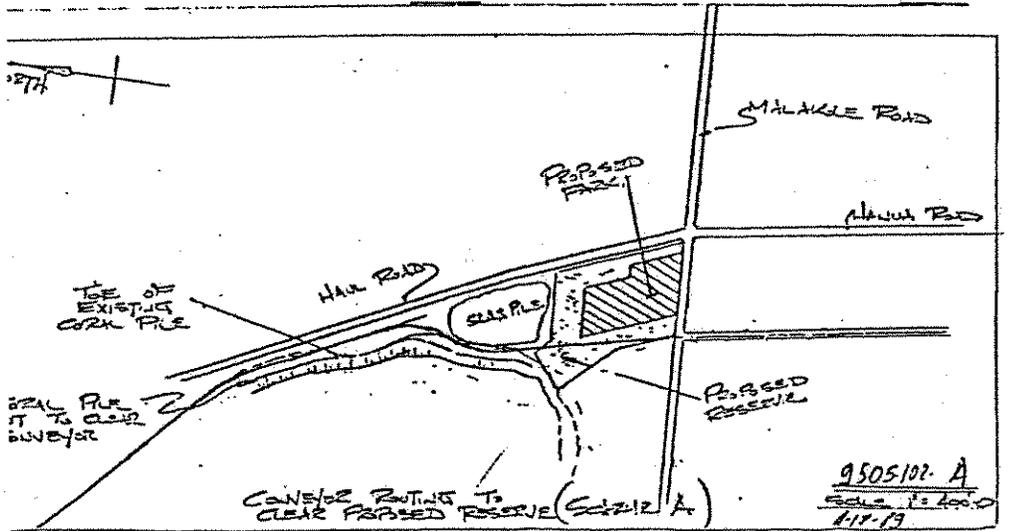
Sincerely,



Eric L. Miller  
Assistant Project Director

Attachment 1  
Map showing conveyor realignment

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates





May 25, 1989

Mr. Edward Y. Hirata  
May 25, 1989  
Page 2

As you know, the James Campbell Estate still has title to the Malakole Road right-of-way, and it is our understanding that the title that will be transferred to the Department of Transportation will contain an easement for the conveyor. Hence, we do not anticipate a need to acquire an easement from the Department of Transportation.

**2. Comment.** The structure crossing on Malakole Road must meet current Federal and State design requirements such as structural strength, horizontal/vertical clearances, etc. The design plans regarding this crossing must be coordinated with our Highways Division.

**Response.** It is our intention to design and construct the conveyor in compliance with all Federal and State design standards. At present the design has not progressed beyond the 25 ft. vertical clearance, and a planned 150 ft. clear span. This span will bridge not only the current roadway, but the area reserved for a second road and the pipeline easement. Again, complete plans will be provided of the overpass design as soon as they are available and prior to any construction.

**3. Comment.** The access road needed by maintenance personnel for emergency repairs or regular maintenance work is not discussed in the Draft EIS.

**Response.** The "pipe" conveyor design we have chosen to use eliminates the need for transfer stations. The enclosed design of the conveyor eliminates the chance of spillage. As a result of these two factors, the maintenance road is no longer needed and is not planned. Maintenance access will be provided by a walkway along the conveyor within the fenced corridor; periodic gates in the fencing will allow maintenance personnel access to the conveyor.

**4. Comment.** Preventive measures such as safety barriers/fences along the route to prevent trespassing and vandalizing of the conveyor system equipment and appurtenances are not discussed in the Draft EIS.

**Response.** Fencing such as a 6 ft. chain link or equivalent will be provided whenever the conveyor runs at grade. In sections where the

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

Dear Mr. Hirata:

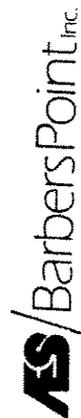
Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement  
Your Reference: HAR-EP 3883

Dear Mr. Hirata:

Thank you for your April 28, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s proposed coal-fired cogeneration facility submitted to your Harbors Division. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. Responses to your comments are listed below.

**1. Comment.** All work to be done within the highway rights-of-way requires the review and approval of our Highways Division. This applies to Malakole Road, which will soon be under our jurisdiction.

**Response.** Thank you for bringing this to our attention. We are aware that Highways Division will need to review our plans for the Malakole Road overpass prior to construction. Detailed design work on the conveyor has not progressed to the point that specific work plans are available for submission. We will provide that information and obtain required Highways Division approval before any construction begins.



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## Characteristics of Pipe Conveyor

Mr. Edward Y. Hirata  
May 25, 1989  
Page 3

conveyor is elevated, fencing will be provided around the support bents to restrict access. These safety precautions will be reviewed by our insurance carriers with regard to protection from liability from unauthorized entry.

5. Comment. Construction related impacts such as air (dust & fumes), noise and traffic that are generated by the West Beach Resort Development, Kapolei Village Development and the Harbor Construction Expansion, etc.

Response. As indicated by the comment, other ongoing construction in Ewa will also be producing noise, air quality, and traffic impacts while the AES Barbers Point project is being constructed. These are discussed in the Draft EIS where they are relevant to an evaluation of the proposed project's impacts.

Thank you again for the time that you and your staff spent reviewing the Draft Environmental Impact Statement. If you have any questions or would like additional information, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

Enclosure  
Conveyor design

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

### 1. TOTALLY ENCLOSED CONVEYANCE

Due to the enclosed nature of the Pipe Conveyor system, scattering, dropping or leaking of materials is eliminated thus making this system pollution free.

Since the belt is in pipe shape on the return side as well, there is NO dropping of materials that may still adhere to the belt even after discharge.

Not only does the pipe shape prevent leakage of materials but also prevents foreign matter from getting in to pollute or mix with the transported materials.

### 2. CURVED TRANSPORT

Easy and economical layout through the advantages of curved transport.

Conventional systems call for multiple transfer points meaning more space and higher costs. Not with the Pipe Conveyor. The curved transport capability of the Pipe Conveyor system eliminates the need for those multiple transfer points doing away with potential trouble spots while cutting layout and design costs.

### 3. INCLINED TRANSPORT

With the steep-inclined transport capabilities of the Pipe Conveyor systems conveyor length may be reduced significantly thus further reducing costs.

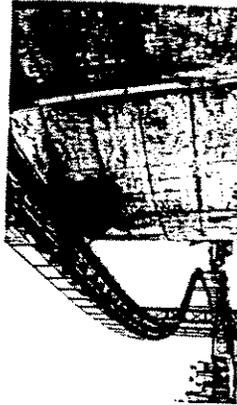
Due to increased friction with the pipe shape, angle inclination is larger and with the addition of fins steep inclined transport is made possible thus shortening conveyor length.

### 4. ARTICULATING TRANSPORT

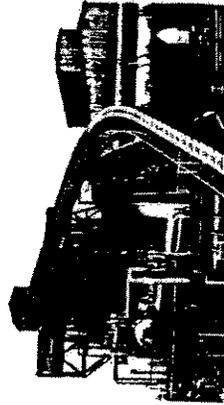
The articulating transport capability of the Pipe Conveyor makes it quite applicable for quarrying and land reclamation. A significant reduction in workforce and equipment may be achieved due to the nature of the system. Since alignment is not a requirement of the Pipe Conveyor system, shifting time, that is moving the system from one point to another, is greatly reduced.



Dia. 300 P.C. stringer type.



Dia. 200 P.C. curved transport Chile Hain Cement, Talmer



Dia. 160 P.C. installed steel works.



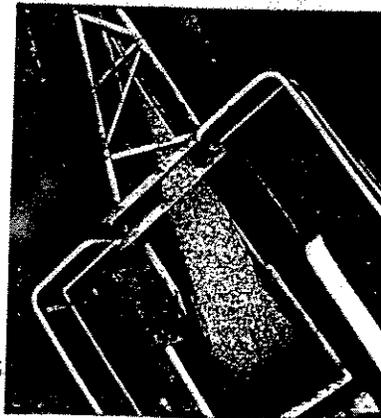
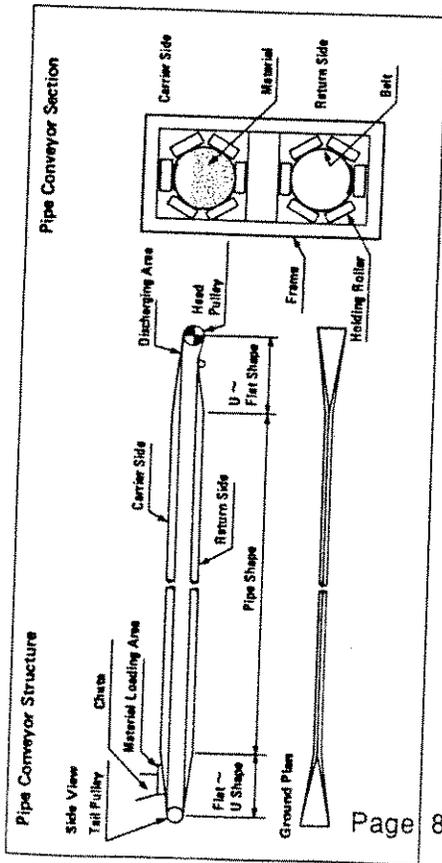
Dia. 250 P.C. in Electric Power Development, Japan.

### Total structure

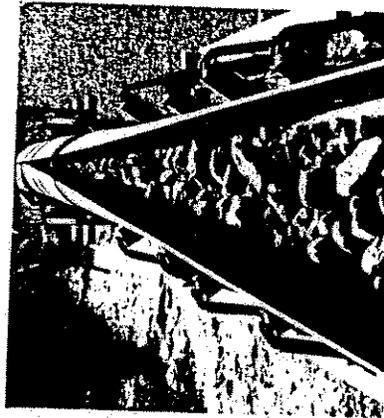
The belt goes from flat to U shape at the loading area then again forming into pipe shape enclosing materials for transport to the discharge area. At this point belt once again goes flat at the pulley releasing the materials then once more goes back into pipe shape for the return side providing a never ending operation.

### Structure of Frame

Belt is flat at head and tail pulleys. Rollers are arranged between the pulleys to maintain the pipe shape on both the "Carrier" and "Return" side. Belt edges overlap to help ensure continuity as well as securely enclosing the materials.



Head pulley part.



Tail pulley part.



# 12  
**RECEIVED**  
APR 6 1989

BELT, COLLINS & ASSOCIATES

May 25, 1989

Mr. Joseph K. Conant  
Executive Director  
State Housing and Finance  
Development Corporation  
1002 North School Street  
Honolulu, Hawaii 96817

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement  
Your Reference: 89:PLNG/1087B JT

Dear Mr. Conant:

Thank you for your March 31, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document and understand your concern for the cumulative effect that air emissions from the various sources located in Campbell Industrial Park might have on the residents of Kapolei.

The air quality impact analysis contained in the Draft EIS included the cumulative effects of the proposed AES Barbers Point cogeneration project and all existing sources, including H-POWER. Following publication of the Draft EIS, additional information concerning another proposed power generation facility (the Kalaeloa Power Plant located on a site near the Hawaiian Independent Refinery) became available. Analysis of this information indicates that the conclusions the Draft EIS reached concerning compliance with air quality standards are still valid even with emissions from the additional source.

In view of this conclusion, it does not appear that residents of the Kapolei area would be adversely impacted. This additional information will be included in the Final EIS.

**AES/BarbersPoint** Inc.  
1000 Bishop Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6346 • Teletypewriter - (808) 538-3147

89:PLNG/1087B JT

March 31, 1989

MEMORANDUM

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

FROM: Joseph K. Conant

SUBJECT: Draft EIS for the Proposed AES Barbers Point, Inc.  
Coal-Fired Cogeneration Facility

Thank you for the opportunity to review the subject draft EIS. Our comments are as follows.

It appears that the proposed project will not cause or contribute to any violation of Federal Ambient Air Quality Standards and will not cause the available Prevention of Significant Deterioration increment to be exceeded. However, what is the cumulative air quality impact of the proposed project and other proposed projects, namely H-POWER? Will the residents in the Kapolei area be adversely impacted?

JOSEPH K. CONANT  
Executive Director

cc: State Dept. of Transportation  
Mr. Perry White, Belt Collins & Assoc.  
Mr. Eric Miller, AES Barbers Point, Inc.

APR 13 1989 AES-BP

Mr. Joseph K. Conant  
May 25, 1989  
Page 2

Thank you again for the time that you and your staff spent reviewing the Draft Environmental Impact Statement. If you have any further questions or would like additional information, please call me at 538-6346.

Sincerely,



Eric Miller  
Assistant Project Director

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

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APR 5 1989

BELT, COLLINS & ASSOCIATES



STATE OF HAWAII  
OFFICE OF HAWAIIAN AFFAIRS  
1400 SUNDOWN BLVD., SUITE 1000  
HONOLULU, HAWAII 96813  
(808) 548-2000  
(808) 548-2000

April 3, 1989

C-L89-0044

Dr. Marvin Miura, Director  
Office of Environmental Quality Control  
465 South King Street, Room 104  
Honolulu, Hawaii 96813

SUBJECT: Draft EIS: AES Barbers Point, Inc./Coal-Fired Cogeneration Facility,  
Honolulu, O'ahu. THK: 9-1-26: por. 28

Dear Dr. Miura:

Thank you for sending our office a copy of the Draft EIS, and for the opportunity to comment.

Our office is concerned about the adverse effect this project will have on archaeological resources. These resources include previously identified sites within the boundaries of the Barbers Point Harbor Archaeological District which appear to be directly in the project's area of environmental impact as shown on the map in the Draft EIS. Even though the area has been bulldozed, archaeological resources with both research value and educational value are known to exist in the area. One of these is a sinkhole site that has been called "The Rusty Wire Site," and is known to contain fossil bird bones and the O'ahu species of opae'ula (red shrimp). See attached map. An archaeological survey should be conducted that identifies all such sites in the project area. The archaeological report should discuss what has been learned from previous studies in the project area, and make recommendations for further work taking into account what was learned, and not learned, from those studies. The report should also discuss the interpretive, educational values of the sites and the plans for a sinkhole park at the corner of the power line road (Hanua Street) and Malakole Road. With only the information provided in this Draft EIS, it is not reasonable to expect the reviewer to understand the impacts this project will have on archaeological resources.

We are also concerned about the impact this project will have on rare native Hawaiian plants. The proposed conveyor route crosses the 37-acre reserve parcel that was set aside during construction of the deep draft harbor for preservation of the 'Ewa Plains akoko. If the preservation plans have been changed, this should be explained. Other plants that have been seen in the area, and which may be affected by construction activities include maipilo and a variety of nalo only found in the Barbers Point area. See attached map. It is not possible to tell from the Draft EIS exactly where these rare plants exist in relation to the project area. Past experiences have shown that bulldozing and ground disturbing activities sometimes stray from the original

Dr. Marvin Miura, Director  
April 3, 1989  
Page 2

project area indicated in the EIS. Unless precautions are taken prior to construction, significant resources can be damaged or destroyed. Further botanical survey work should be done, and a plan devised for preserving and protecting the rare plants in the immediate vicinity.

The Draft EIS should contain a discussion of the cumulative impacts that development has had on rare plants and archaeological sites in the Barbers Point area, enough to give the reviewer a basis for understanding the significance of the remaining cultural resources in the area.

Sincerely,

*Richard K. Paglinawan*  
Richard K. Paglinawan  
Administrator

RKP:EN

Enclosures

cc: DOT/Harbors Division  
DLNR/Historic Sites  
Belt Collins & Associates  
AES Barbers Point, Inc.  
City and County of Honolulu/DLU  
U.H./Environmental Center  
U.H./Anthropology Department



Mr. Richard K. Paglinawan  
May 31, 1989  
Page 2

realigned so that it misses the site on the corner of Hanua Street and Malakole Road that has been suggested as a possible park. A copy of a letter to the Department of Land and Natural Resources describing the issue and the proposed resolution, and DLNR's acceptance of the proposal is attached for your information.

Red Shrimp

The possibility that sinkholes providing habitat for a species of opae'ula was identified during the preparation of the Draft EIS. In response to this information, a walk-through field survey was conducted in conjunction with a representative of the U.S. Army Corps of Engineers. No sinkholes containing water were found within the area that would be traversed by the conveyor, and it was determined that the proposed facility would not adversely affect these organisms.

Impact on 'Akoko

Your letter states that the conveyor route crosses a 37-acre reserve parcel that was set aside during construction of the Barbers Point Deep Draft Harbor for preservation of the Ewa Plains 'akoko. It goes on to ask if the preservation plans for this plant have been changed and to request that the EIS contain an explanation of this if it has occurred.

After receiving your letter I spoke with Ms. Ruby Mizue of the U.S. Army Corps of Engineers Operations Branch; Ms. Winona Char, the botanist who helped relocate the 'akoko plants that were within the area now occupied by the deep draft harbor; and with Mr. Richard Okumura of the State Department of Transportation Harbors Division. They indicated that the reserve referred to in your letter was a temporary one designed to protect the 'akoko until it could be relocated. The relocation has been completed, and the area has subsequently been graded. Since it no longer serves as habitat for the 'akoko, reserve status has been terminated.

Effect on Other Rare Plants

Your letter also mentions other rare native plants that could be affected by the proposed project, including maiapilo and a variety of

Mr. Richard K. Paglinawan  
May 31, 1989  
Page 3

naio found only in the Barbers Point area. It asks that further botanical work be done and a plan devised for preserving and protecting the rare plants in the immediate vicinity.

A recent botanical survey undertaken of the conveyor route by Mr. Kenneth Nagata revealed that no specimens of *Euphorbia skottsbergii* var. *kalaeloana*, *Achyranthes rotundata*, or *miapilo* were present in the conveyor route. A few naio are present (believed to be fewer than six in the general vicinity); however, as the conveyor will be elevated through the sections in which they are located, it is unlikely that they will be disturbed. In addition, Mr. Nagata has informed us that recent analysis by the Bishop Museum and the U.S. Fish and Wildlife Service has determined that the Barbers Point naio is taxonomically identical to other naio in the state and is not therefore considered rare or endangered. The letter received from Mr. Nagata concerning these issues has been attached for your information.

Thank you again for the time that you and your staff spent reviewing the Draft Environmental Impact Statement. If you have any questions or would like additional information, please call me at 538-6346.

Sincerely,

  
Eric L. Miller  
Assistant Project Director

Attachments

- (1) Letter, May 4, 1989, to Department of Land & Natural Resources
- (2) Letter, 14 April 1989, from Mr. Kenneth Nagata, Consulting Botanist
- (3) Department of Land & Natural Resources letter, May 23, 1989, to AES

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

May 4, 1989

Dr. Joyce Bath  
May 4, 1989  
Page 2

Dr. Joyce Bath  
Archaeologist, Historic Sites  
Department of Land & Natural Resources  
State of Hawaii  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Subject: Realignment of AES Barbers Point Conveyor in Vicinity of  
Proposed Sinkhole Preserve and Park in Campbell  
Industrial Park

Dear Dr. Bath:

Thank you very much for taking the time to inspect our conveyor route in the area of the proposed sinkhole preserve. It is much easier to resolve these issues when we all have a common understanding of what is happening out at the site.

Based on our discussions on that trip, and further conversations with our conveyor consultant, we have realigned the conveyor as shown on the attached sketch.

The new conveyor alignment completely avoids the area north of Malakole Road that the Honolulu City Council has indicated an interest in incorporating into a future educational park. Because of the presence of the 40 to 50-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated in an archaeological/paleontological science reserve. However, we will elevate the conveyor within the preserve area and design the support structures so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that those sinkholes are not accidentally damaged by construction equipment.

A topographic survey is now being undertaken of the revised conveyor route. Dr. Ziegler has agreed to accompany the survey team to help identify significant sinkholes requiring preservation. This survey, with the located sinkholes, will be submitted to your office for approval prior to any construction or grading of the site. Once approved by your office, we will avoid all sinkholes identified on this survey and any outside the survey area but within the projected sinkhole preserve.

It is our understanding that the sinkhole park/preserve area represents the only area of concern with respect to historic sites along the conveyor route or on the plant site.

I hope this program will resolve any possible incompatibility between our conveyor and the proposed park/reserve. If you have any further questions or comments concerning this matter, please call me at 538-6346.

Sincerely,

Eric L. Miller  
Assistant Project Director

Attachment

cc: Perry White, BSA

14 April 1989

Mr. Eric Miller  
AES Barbers Point  
1000 Bishop St. Suite 810  
Honolulu, HI 96813

Dear Mr. Miller,

This letter pertains to your concerns regarding the presence of certain native plants in the corridor I surveyed at Campbell Industrial Park. As stated in my previous report to you I did not observe any individuals of the two endangered species *Euphorbia skottsbergii* var. *kalaioana* and *Achyranthes rotundata* either in or near the corridor. No plants of *malapilo* (*Capparis sancti-chiliana* var. *zoharyi*) were observed but I did see several *naio* (*Myoporum sandwicense* var. *siellatum*). I was not specifically looking for *naio* and did not make a population census but I believe there are fewer than six in or around the corridor.

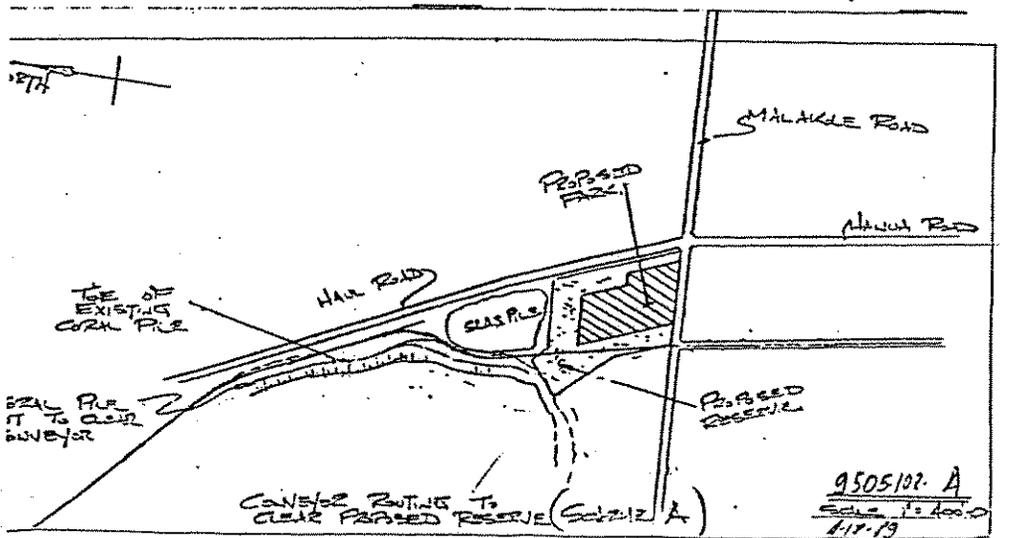
Neither the *malapilo* which is found on other islands as well as Oahu nor the Barbers Point *naio* which is restricted to the Ewa Plains, have ever been considered rare or endangered. The 1980 Federal Register lists *naio* as a Category 2 endangered species candidate, a non-critical category for plants which lack biological data for status determination. Furthermore, recent analysis has shown that it is taxonomically identical to any other *naio* in the state (D. Herbert, pers. comm.). It will therefore not be recognized as a separate taxon in the forthcoming Bishop Museum revision of the Hawaiian flora.

If you have further concerns regarding this issue please call on me.

Yours truly,

Kenneth M. Nagata  
BOTANICAL CONSULTANT  
PO Box 1657  
Kaliua-Kona, HI. 96745

*Mr. by forwarded Perry White, BPA*





STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 871  
HONOLULU, HAWAII 96808

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

DEPUTY

LIBERT C. LANDGRAF  
MAMAEU T. AOKIMORI  
RUSSELL N. FURUMOTO

AGRICULTURE DEVELOPMENT  
AQUATIC RESOURCES  
CONSERVATION AND  
ENVIRONMENTAL AFFAIRS  
COMPLIANCE AND ENFORCEMENT  
RESOURCES ENHANCEMENT  
CONTRACTS  
OFFICE OF THE ATTORNEY GENERAL  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

May 23, 1989

Eric L. Miller  
Applied Energy Services, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

SUBJECT: Realignment of AES Barbers Point Conveyor in  
Vicinity of Proposed Sinkhole Preserve and Park in  
Campbell Industrial Park

Thank you for your letter of May 3, 1989, which outlines the preservation measures you propose for this portion of the conveyor belt. We believe that these measures will result in "no adverse effect" to the sinkhole sites.

In addition to determining that there are no remaining sites between the northern edge of the proposed preserve and the harbor, our staff archaeologist checked the conveyor belt route between the plant site and Malakole Road. She verified that this sector of the route has already been modified by development. There will be "no effect" to significant historic sites in this area, nor in the section of the route from the north end of the proposed park to the harbor.

Sincerely,

RALSTON H. NAGATA  
State Parks Administrator and Deputy  
State Historic Preservation Officer



April 28, 1989

State Department of Transportation  
Harbors Division  
79 South Nimitz Highway  
Honolulu, Hawaii 96813

Gentlemen:

Subject: Draft Environmental Impact Statement for  
AES-Barbers Point, Inc., Coal-Fired Cogeneration  
Facility at Ewa, Oahu, TNR: 9-1-26: For. 28

Thank you for the opportunity to review and comment on the  
draft environmental impact statement (EIS) for the proposed  
cogeneration facility.

We have the following comments:

1. Pgs. 2, 3-4: The estimated average potable water use of 337,000 gallons per day (gpd) by the facility stated in the text differs from the 291,000 gpd average daily demand and 336,000 gpd peak daily demand figures the Board of Water Supply (BWS) is using in negotiations with Hawaiian Electric (HECO). As discussed with the EIS writer, the estimated average potable water demand will be revised in the text from 337,000 gallons to 291,000 gallons.
2. Pg. 1-4: All references to the ability of the "existing BWS facilities" to provide the potable water required by the project should be rephrased to indicate that only with the proposed additions can the BWS system provide service to the project on a permanent basis. Similarly, the statement, "However, the improvements being negotiated will be needed to serve other future development", also needs to be revised. It must be emphasized that this project is a part of the overall Ewa Plains development for which these improvements are required.

State Department of Transportation  
Page 2  
April 28, 1989

3. Pgs. 5, 6, 1-19 to 1-21, 3-5, 3-7, 3-10, 3-12, 3-13: Although it is implied, the discussion should clearly state the cooling water supply wells will be drafting from the same upper aquifer as the H-Power supply wells. Furthermore, the H-Power supply wells should be shown on Figure 3-1, Section AA, Across the Ewa Plain. Finally, the quantity of cooling water being withdrawn and wastewater being injected should be corrected so as to be consistent throughout the text.

If you have any questions, please contact Lawrence Whang at 527-6138.

Very truly yours,

KAZU HAYASHIDA  
Manager and Chief Engineer

cc: Mr. Perry White (Belt, Collins and Associates)  
Mr. Eric Miller (AES-Barbers Point, Inc.)

May 25, 1989

Mr. Kazu Hayashida  
May 25, 1989  
Page 2

Mr. Kazu Hayashida  
Manager and Chief Engineer  
Honolulu Board of Water Supply  
630 South Beretania Street  
Honolulu, Hawaii 96843

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

Dear Mr. Hayashida:

Thank you for your April 28, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. Responses to your comments are presented below.

(1) Pages 2.3-4. As indicated to Mr. Lawrence Whang of your office, the proposed project will consume an average of 291,000 gallons of water per day from the Board of Water Supply system. The Final Environmental Impact Statement will use that figure throughout.

(2) Pages 3-4. The EIS will be revised in accordance with your request. Specifically, Section 3.2.2 will read as follows:

*Estimated average potable use will be 291,000 gallons per day (GPD). A small amount of this, 4,000 to 5,000 GPD, will be for human consumption by the power plant's staff. The balance of the supply will be for industrial uses and landscape irrigation. Supply to the plant's demineralizer will be the largest component of industrial use.*

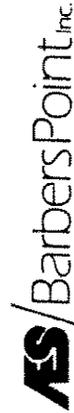
*A joint water agreement is currently being negotiated among the Board of Water Supply (BWS), the Hawaiian Electric Company, (HECO) and the James Campbell Estate. Key aspects of the negotiation are:*

- o *conversion of HECO's Waiiau Shaft from its present power plant cooling use to a new potable source for the BWS;*
- o *construction of connecting pipelines and related facilities from the shaft to the BWS system;*
- o *conversion of the shaft's present cooling function at the power plant to salt water sources;*
- o *participation by HECO and Campbell Estate in expanding the BWS' transmission capacity along Farrington Highway; and*
- o *water commitments from the BWS to Campbell Estate and HECO (on behalf of AES Barbers Point).*

*Over the short term, the water can be delivered to the power plant using existing facilities; however, additional transmission and storage facilities will be needed to serve the project on a permanent basis.*

(3) Pages 5, 6, 1-19 to 1-21, 3-5, 3-7, 3-10, 3-12, and 3-13. The fact that the wells for the proposed project will draw from the same aquifer as the H-POWER wells will be explicitly stated in the first paragraph on page 3-10. The inconsistencies are the result of a change in design shortly before the document was prepared, and we appreciate your calling them to our attention. The Final EIS will contain the correct figures.

Thank you again for the time that you and your staff spent

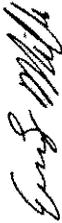


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Mr. Kazu Hayashida  
May 25, 1989  
Page 3

reviewing the Draft Environmental Impact Statement. If you have any questions or would like additional information, please call me.

Sincerely,



Eric L. Miller  
Assistant Project Director

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

DEPARTMENT OF GENERAL PLANNING  
CITY AND COUNTY OF HONOLULU  
650 SOUTH KING STREET  
HONOLULU, HAWAII 96813



FRANK F. FAR  
MAYOR

DONALD A. CLEGG  
CHIEF PLANNING OFFICER  
OSCAR CONNELL  
DEPUTY CHIEF PLANNING OFFICER

March 21, 1989

RH/DGP 3/89-931

State Department of Transportation  
Harbors Division  
79 Southimitz Highway  
Honolulu, Hawaii 96813

Gentlemen:

AES Barbers Point, Inc.,  
Coal-Fired Cogeneration Facility  
Draft Environmental Impact Statement

This is in response to your request for comments on the subject Draft Environmental Impact Statement (EIS). We have reviewed the Draft EIS and have the following comments.

Section 2.2.2., page 2-7, of the Draft EIS should be modified to indicate that the Planning Commission recommended the adoption of the amendment to add a symbol for an energy generation facility to the Ewa DP Public Facilities Map.

Sections 3.2.4.4, and 3.4.5, discuss the water and air quality impacts of the proposed coal-fired cogeneration facility. It may be appropriate to include the cumulative impacts of known proposals such as the H-Power project and the Kalaeloa Cogeneration Plant.

Sincerely,

*Donald Clegg*  
DONALD A. CLEGG  
Chief Planning Officer

DAC:ft

cc: OEQC  
MR. Perry White, Belt Collins & Associates  
MR. Eric Miller, AES Barbers Point, Inc.

ADD 1 9 DEPT AEG-AP

May 25, 1989

Mr. Donald A. Clegg  
Chief Planning Officer  
Department of General Planning  
City & County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement  
Your Reference: RH/DGP 3/89-931

Dear Mr. Clegg:

Thank you for your March 21, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s, proposed coal-fired cogeneration facility. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. Item-by-item responses to your comments follow.

Section 2.2.2. Status of the Development Plan Amendment Request

AES Barbers Point, Inc., has been notified that on March 8, 1989, the Honolulu City Council amended the Ewa Development Plan (DP) to show an energy generation facility symbol for their project on the Ewa DP Public Facility Map. The text of the EIS will be amended to reflect this recent action by the City Council.

Sections 3.2.4.4 and 3.4.5: Cumulative Effect

The Draft EIS's evaluation of potential water quality effects already takes into consideration other existing and future water uses at Campbell Industrial Park, including those by H-POWER and the proposed Kalaeloa Cogeneration Facility.



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Mr. Donald A. Clegg  
May 25, 1989  
Page 2

### 3.4.5.2 Additional Air Quality Impacts

A recent application to construct a 200 MW combined cycle, oil-fired turbine, steam-electric generating facility has been submitted to the State of Hawaii Department of Health by Kalaeloa Partners, LP. This facility will also be located in Kalaeloa Industrial Park (CIP). Ambient air quality analyses provided as a part of their air permit application demonstrate that Kalaeloa alone or in conjunction with the existing sources and the AES Barbers Point facility will not cause or contribute to an exceedance of the NAAQS or the applicable Prevention of Significant Deterioration (PSD) increments.

The discussion of air quality impacts in the Draft EIS includes emissions from the H-POWER refuse-to-energy facility, but the modeling does not account for emissions from the Kalaeloa Cogeneration Plant. This is because the air permit application for the Kalaeloa project has not yet been finalized. Preliminary information is available, however, and the cumulative impact discussion contained in attachment 1 will be included in the Final EIS.

To illustrate this fact, Kalaeloa maximum impacts were added directly to the combined impacts of the background pollutant levels, the existing CIP sources, and the AES impacts. This approach assumes that the maximum impacts from both projects occur at the same location. Based on this most conservative approach, the NAAQS are maintained at all times. This approach is conservative because the maximum impact points for the Kalaeloa facility and the AES Barbers Point facility in fact do not coincide. Adding the two together overstates the actual effect of the combined projects.

Kalaeloa PSD increment impacts were also added directly to the PSD increment consumption totals to predict the total PSD impacts. The PSD increments were not exceeded with the exception of the 24-hour TSP increment. However, this increment was previously shown in the AES and Kalaeloa applications to be in excess of the Class 11 increment prior to the addition of the AES or Kalaeloa projects, and at the point of increment exceedance, neither project makes any contribution to the violation. Therefore, neither project causes or contributes to the exceedance.

Sincerely,



Eric L. Miller  
Assistant Project Director

Attachment 1  
Section 3.4.5.2, Discussion of Additional Air Quality Impacts

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

DEPARTMENT OF LAND UTILIZATION  
CITY AND COUNTY OF HONOLULU

430 SOUTH KING STREET  
HONOLULU, HAWAII 96813 • PHONE 523-4432

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APR 12 1989

BELT, COLLINS & ASSOCIATES



FRANK P. FAB  
MAYOR

JOHN P. WHALEN  
DIRECTOR

BENJAMIN B. LEE  
DEPUTY DIRECTOR

88/EIS-6(BUN)  
89/SRA-29

April 11, 1989

Mr. Edward Y. Hirata, Director  
State of Hawaii  
Department of Transportation  
c/o Harbors Division  
79 South Mimitz Highway  
Honolulu, Hawaii 96813

Dear Mr. Hirata:

Review of Draft EIS  
AES Barbers Point, Inc.,  
Coal-Fired Cogeneration Facility  
Ewa, Oahu  
TMK: 9-1-26; For. 28

Thank you for the opportunity to review the Draft EIS. Our comments and questions are as follows:

- Section 3.7.2.2, Impact on Existing Fauna  
The U.S. Fish and Wildlife Service (USFWS) raised some concerns regarding the endemic hypogaeal shrimp o'pae ula (*Halocaridina rubra*) found in limestone sinkholes, and the effect that saline and heated wastewater injected underground might have on them. Has the presence of endemic shrimp been investigated and its location mapped? If any exist, how will these endemic shrimp be affected?
- Sinkholes and Wetlands  
The Department of Army Corps of Engineers (COE) mentions that the filling of sinkholes and wetlands may require a Department of Army permit. If any sinkholes or wetlands occur within the vicinity of the project, their locations should be shown on a map, and the effects upon them described.

APR 13 1989 AES-8P

Mr. Edward Y. Hirata, Director  
Page -2-  
April 11, 1989

3. Chapter 4, Alternatives

Alternative sites should be discussed. Why was the present site chosen for the coal-fired cogeneration facility?

4. Section 1.4.2.3, Waste Treatment and Disposal

The Department of Health expressed concern regarding whether the residual fly and bottom ash would exhibit qualities characteristic of a hazardous waste material. Specifically, a concern for the Extractive Procedure (EP) toxicity characteristic was noted. We suggest that the final EIS contain a discussion of the characteristics of the residual fly and bottom ash in terms of the standard tests used for evaluating hazardous waste materials.

5. Section 3.2.4.4, Anticipated Impacts of the Saline Water Supply and Disposal Scheme

The Draft EIS notes that the cooling water supply wells will remove 10.6 MGD from the upper limestone aquifer, and that this removal is greater than the aquifer's freshwater recharge rate. Therefore, seawater intrusion and a consequent rise in aquifer salinity will occur.

Although the Draft EIS indicates that the change in salinity is not significant for this saline groundwater resource, and that the value of this groundwater resource is primarily for cooling and fire protection, it is still unclear how this increase in salinity will affect the potable groundwater resources further inland. A discussion of the effects of the increased salinity of the aquifer on potable groundwater further inland should be discussed. Specifically, how will the Pearl Harbor groundwater control area be affected by this action?

If you have any questions regarding these questions and comments, please call Bennett Mark of our Environmental Affairs Branch at 527-5038.

Very truly yours,

*John P. Whalen*

JOHN P. WHALEN

Director of Land Utilization

JFW:ik  
0318N/8

cc: CEQC

Perry White, Belt Collins & Associates ✓  
Eric Miller, AES, Barbers Point, Inc.

May 25, 1989

Mr. John P. Whalen  
May 25, 1989  
Page 2

Mr. John P. Whalen, Director  
Department of Land Utilization  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement  
Your Reference: 88/EIS-6(BWM) and 89/SMA-29

Dear Mr. Whalen:

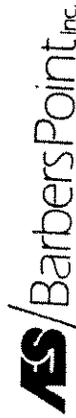
Thank you for your April 11, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s (AES-BP) proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. Item-by-item responses to your comments and questions are presented below.

1. Section 3.7.2.2. Impact on Existing Fauna

As noted in your letter, the endemic hypogean shrimp *Opaeula (Halocaridina rubra)* have been found in limestone sinkholes in the Barbers Point area. Because of previous grading, there are no sinkholes on the power plant site which reach the water table. A few sinkholes that reach the water table are present in the area between Malakole Road and the Barbers Point Deep Draft Harbor. However, a reconnaissance survey made in the company of Mr. Mike Lee of the Operations Branch, U.S. Army Corps of Engineers, showed that none of these would need to be filled or otherwise disturbed in order to construct the conveyor. Hence, no adverse impact to this resource is anticipated.

2. Sinkholes and Wetlands

No sinkholes which reach the water table would be filled as



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part of the project (see item 1, above), and no wetlands would be filled.

3. Chapter 4. Alternatives

The following text addressing alternative sites will be added to Chapter 4 as Section 4.3.

*A number of criteria were used in evaluating potential sites for the proposed cogeneration facility. The most important requirements were:*

- o A minimum usable area of 25 to 30 acres.
- o Existing I-2 zoning.
- o Adequate infrastructure (roads, water, sewer, etc.).
- o Access to non-potable groundwater for use in cooling.
- o Proximity (no more than one-third of a mile) to an industrial user who would accept a minimum of 30,000 pounds per hour of process steam. This is needed so that the project will be rated as a "Qualifying Facility" under the Public Utilities Regulatory Act (PURPA) and the Federal air quality regulations. Only two potential users, the Chevron Refinery and the Hawaiian Independent Refinery, are present in Campbell Industrial Park.
- o Reasonable proximity to the bulk unloading facilities being developed at the Barbers Point Deep Draft Harbor, with preference given to areas that could be linked to the harbor using a conveyor.
- o An ability to increase emissions without violating air quality regulations, including the Prevention of Significant Deterioration increment.
- o Proximity to the Hawaiian Electric Company's power transmission system.

- o Freedom from significant natural resources that would preclude or otherwise constrain development.
- Campbell Industrial Park is the only location which has sufficient I-2 zoned land and reasonable proximity to the harbor unloading facilities. Because of this, AES-BP quickly narrowed its search to that area. The need to have the project on-line by 1992 meant that it was not practical to consider sites which did not already have the necessary Development Plan Land Use Map and Zoning designations; hence, the search was restricted to parcels within the existing I-2 Zone.

HIRI, one of the two potential users of the steam, has already negotiated a tentative steam purchase contract with Kalaeloa Partners, Inc., developers of the Kalaeloa power plant. This left the Chevron refinery as the only potential steam customer. This further restricted the area that AES-BP could consider to within one-third mile of the Chevron facility. All of the parcels within this area were evaluated by AES-BP, and discussions were held with representatives of the James Campbell Estate and Chevron to determine their availability.

The results of the screening shows that a portion of the parcel leased by Hawaii Project Management, Inc., is the only area available that satisfies these locational requirements. Land on the southwestern corner of the intersection of Malakole Road and Hanua Street was found to be even better from a functional viewpoint, but it is owned by Chevron and is reserved for expansion of their existing refinery; hence, it was not available to AES-BP.

At the time of the initial screening, the Hawaii Project Management, Inc., parcel had not yet been subdivided; hence, all possible locations within the parcel were evaluated. When investigations showed that the makai portions of the property were encumbered by flood zones, the presence of endangered plant species, and other factors, the present location was selected.

4. Section 1.4.2.3. Waste Treatment and Disposal

A test burn of the Indonesian coal is planned for the near future and we plan to undertake the full range of tests as the ash becomes available. Toxicity tests have been performed on ash for our other circulating fluidized-bed projects in construction and the ash was found to be nonhazardous. Available analyses of the raw coal suggest very strongly that ash will also prove nonhazardous. A discussion of this will be added to the Final EIS.

5. Section 3.2.4.4. Anticipated Impacts of the Saline Water Supply and Disposal Scheme

This comment addresses two separate, but related, issues.

- o The extent to which the project will affect the quality of potable water further inland.
- o The action's effect on the Pearl Harbor Groundwater Control Area.

Effect On Potable Water Further Inland. As indicated in the Draft EIS, the limestone aquifer on the Ewa Plain contains saline water. The only potable water is found in the underlying basalt aquifer which is physically and hydrologically isolated from the overlying basalt.

The available evidence indicates that the aquiclude separating the limestone from the underlying basalt is very good (i.e., there is very little water movement between the two). Moreover, the hydrologic gradient insures that if leakage were to occur, it would involve fresh water from the basalt aquifer moving from the underlying basalt upwards into the overlying limestone aquifer. Also, the proposed injection wells will still be several hundred feet from the basalt aquifer, and so no potential for puncturing the aquiclude is present. Consequently, no potential for adverse impact on potable water exists.

Pearl Harbor Groundwater Control Area. The project site is within the Pearl Harbor Groundwater Control Area; hence, with-

Mr. John P. Whalen  
May 25, 1989  
Page 5

drawals are subject to the approval by the State Water Commission.

At present, withdrawal limits have been established only for the basalt aquifer, which will not be affected by the proposed project. A recent consultant report to the Water Commission has recommended that withdrawals from some portions of the limestone aquifer also be limited in order to preserve its value for irrigation and other non-potable uses. However, the report concluded that no restrictions are needed for the area that would be affected by cooling water withdrawals for the AES-BP project. This conclusion is based on the fact that the high salinity of the groundwater in this portion of the aquifer makes it valuable only for cooling, a function unrelated to salinity.

Thank you again for the time that you and your staff spent reviewing the Draft Environmental Impact Statement. If you have any further questions or would like additional information, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

DEPARTMENT OF PUBLIC WORKS  
**CITY AND COUNTY OF HONOLULU**  
 850 SOUTH KING STREET  
 HONOLULU, HAWAII 96813



FRANK P. FARI  
 MAYOR

SAM CALLEJO  
 DIRECTOR AND CHIEF ENGINEER  
 ENVY 89-45

March 31, 1989

Dr. Marvin T. Miura, Ph.D.  
 Office of Environmental Quality Control  
 465 South King Street, Room 104  
 Honolulu, Hawaii 96813

Dear Dr. Miura:

Subject: Draft Environmental Impact Statement (DEIS)  
 AES Barbers Point, Inc., Coal-Fired Cogeneration  
 Facility  
 TMK: 9-1-26:por. 28

We have reviewed the subject DEIS and have the following comments:

1. We have no objections to the proposed coal-fired cogeneration facility.
2. The State Department of Health should be consulted on the use of the on-site package plant and injection disposal system.
3. We have no drainage comments at this time.

*Sam Callejo*  
 SAM CALLEJO,  
 Director and Chief Engineer

cc: Belt Collins & Assoc. (Perry White)  
 AES Barbers Point, Inc. (Eric Miller)  
 State Department of Transportation

DEPARTMENT OF TRANSPORTATION SERVICES  
**CITY AND COUNTY OF HONOLULU**  
 HONOLULU MUNICIPAL BUILDING  
 850 SOUTH KING STREET  
 HONOLULU, HAWAII 96813

**DELEGATIVE**  
 APR 25 1989  
 BELT COLLINS & ASSOCIATES



FRANK P. FARI  
 MAYOR

JOSEPH M. MAGALDI, JR.  
 Acting Director  
 TE-1545  
 P.L.L. 1507

April 19, 1989

Office of Environmental Quality Control  
 State of Hawaii  
 465 South King Street, Room 104  
 Honolulu, Hawaii 96813

Gentlemen:

Subject: AES Barbers Point, Inc.  
Environmental Impact Statement

This is in response to your request for our review and comments on the above project.

We have reviewed the above mentioned Environmental Impact Statement and concur that the existing street system can accommodate the additional traffic generated by the proposed project.

Sincerely,  
  
 JOSEPH M. MAGALDI, JR.

cc: Belt Collins and Associates  
 AES Barbers Point, Inc.

RECEIVED #14  
APR 10 1989

POLICE DEPARTMENT  
CITY AND COUNTY OF HONOLULU

BELT, COLLINS & ASSOCIATES



May 25, 1989

KN-LK

April 6, 1989

Mr. Dan T. Kochi  
Deputy Director  
State Department of Transportation  
Harbers Division  
79 South Nimitz Highway  
Honolulu, Hawaii 96813

Dear Mr. Kochi:

Subject: AES Barbers Point, Inc., Coal-Fired Cogeneration Facility, Ewa, Oahu, IMA: 9-1-26; POF: 28

We have reviewed the draft environmental impact statement for the above project and would like to offer the following comments.

In the interest of traffic safety, we recommend the use of signs and markers to adequately caution the public during the construction of this project. The use of special duty officers can also help to mitigate traffic problems that may occur.

The above suggestions are especially applicable to the Kalaeloa Boulevard/Malakole Road intersection where the peak-hour service performance level is forecasted to decrease.

Thank you for the opportunity to comment.

Sincerely,

DOUGLAS G. GIBB  
Chief of Police

*[Signature]*  
By JOSEPH AVEIRO  
Assistant Chief of Police  
Support Services Bureau

CC: Office of Environmental Quality Control  
Mr. Perry White  
Mr. Eric Miller

13 REC'D AES-8P

Chief Douglas G. Gibb  
Honolulu Police Department  
City and County of Honolulu  
1455 South Beretania Street  
Honolulu, Hawaii 96814

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement  
Your Reference: KN-LK

Dear Chief Gibb:

Thank you for your April 6, 1989, letter concerning the Draft Environmental Impact Statement for AES Barbers Point, Inc.'s, proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document.

The contractor for the project will employ standard signs and markers to adequately warn the public of the presence of unusual vehicular activity during the construction of the project. For the most part, the facility's location off heavily traveled streets is expected to minimize traffic problems and the need for special duty officers. The traffic volume expected at the Kalaeloa Boulevard/Malakole Road intersection are well within the norm for this type of roadway; hence, AES Barbers Point does not currently anticipate the need for special traffic control provisions at that location.

However, some aspects of the project, such as the need to erect the proposed conveyor across Malakole Road, will require special assistance, and trained personnel (possibly including off-duty police officers) will be provided to facilitate the safe movement of traffic.



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Chief Douglas G. Gibb  
May 25, 1989  
Page 2

If you have any questions or would like additional information,  
please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

**CITY COUNCIL**  
CITY AND COUNTY OF HONOLULU  
HONOLULU, HAWAII 96813 / TELEPHONE 533-4000

LEIGH-WAI DOO  
COUNCIL MEMBER

April 17, 1989

Mr. Perry White  
Belt Collins & Associates  
860 Ala Moana Blvd., Suite 200  
Honolulu, Hawaii 96813

RE: PATH OF CORAL CONVEYOR FOR THE COGENERATION  
PLANT NEXT TO THE EWA SINK HOLES

Dear Mr. White:

It has come to my attention that the coal conveyor that would run from Campbell Harbor to the proposed Cogeneration Plant would run through the future site of a Science Reserve dedicated to the preservation of sink holes, which are important site containing archaeological and paleontological remnants.

The first draft of your company's Environmental Impact Statement states on page 3-45, "There are no archaeological resources on the power plant site, or within the conveyor right-of-way." It goes on to say that DLNR concluded that the project "...would have no effect on significant historical sites, and would not require further archaeological surveys." In September of 1988, City Council passed Resolution 88-130 requesting DLNR to conduct research on Oahu sink holes. Responding the this Resolution, DLNR Chairperson William Paty noted in a November '88 letter to City Council support for "...acquisition of an area containing sink holes and a representative sample of other types of Ewa Plain archaeological sites." He added: "[w]e believe an appropriate goal would be active preservation - i.e., development of an archaeological park."

Mr. Perry White  
April 17, 1989  
Page 2

Because of the archaeological and paleontological importance of the future site of the Science Reserve, I am opposed to the coal conveyor easement running through that site. As illustrated on the enclosed map, I would urge that the developer modify the conveyor right-of-way to preserve the Science Reserve of the sink holes.

Sincerely,

LEIGH-WAI DOO  
Councilmember

LWD/RH: kn  
Enclosure



The Honorable Leigh-Wai Doo  
May 31, 1989  
Page 2

May 31, 1989

The Honorable Leigh-Wai Doo  
Councilmember  
City Council  
City and County of Honolulu  
Honolulu, Hawaii 96813

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

Dear Councilmember Doo:

Thank you for your April 17, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s, proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate your interest in the project and hope you agree that the following measures will adequately protect the sinkholes.

#### Background

The discussion of impacts on historic, archaeological, and paleontological remains contained in the Draft EIS was based on opinions expressed by the Historic Sites Section of the State Department of Land and Natural Resources (DLNR) in its response to the EIS Preparation Notice. Following publication of the Draft EIS, it became apparent that the Department's previous comments were applicable only to the power plant site, not to the conveyor route. As soon as this was known, the situation was discussed with Mr. Alan Ziegler, the archaeologist who has been most active in efforts to establish an archaeological/paleontological preserve in the area, and with Dr. Joyce Bath of the DLNR's Historic Sites Section.

On Saturday, April 15, 1989, Mr. Perry White of Belt Collins & Associates and I accompanied Dr. Bath on a field trip to Campbell Industrial Park. During the trip we walked the conveyor route and discussed appropriate means of avoiding adverse impacts on the archaeological and paleontological resources present there. Subsequently, we discussed the issue with representatives of the James Campbell Estate, which owns the land on which the sinkholes are located, and with the project's conveyor consultants. Based on these discussions, we have concluded that the conveyor can be realigned as shown on the attached map.

#### Revised Conveyor Alignment

The new conveyor alignment shown in Attachment 1 completely avoids the area north of Malakole Road that the Honolulu City Council has indicated an interest in incorporating into a future educational park. Because of the presence of the 30- to 40-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated into an archaeological/paleontological science reserve. However, AES Barbers Point has agreed to keep the conveyor elevated in this area and to design the support structures for the conveyor so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that neither the sinkholes nor the valuable paleontological remains which they contain are accidentally damaged by construction equipment.

I believe the measures outlined above will insure that the proposed project will not jeopardize the sinkholes in the vicinity of the proposed conveyor. Dr. Joyce Bath from the Department of Land and Natural Resources, State Historic Sites Section has indicated in the attached letter that she concurs in this judgment.

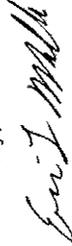
**AS**/BarbersPoint Inc.

1000 Bishop Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6346 • Telexcopier -- (808) 538-3147

The Honorable Leigh-Wai Doo  
May 31, 1989  
Page 3

If you have any further questions or would like additional information, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

Attachments

- (1) AES letter, May 4, 1989, to Department of Land & Natural Resources
- (2) DLNR letter, May 23, 1989 to AES

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

May 4, 1989

Dr. Joyce Bath  
Archaeologist, Historic Sites  
Department of Land & Natural Resources  
State of Hawaii  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

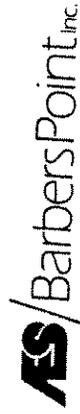
Subject: Realignment of AES Barbers Point Conveyor in Vicinity of  
Proposed Sinkhole Preserve and Park in Campbell  
Industrial Park

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1000 Bishop Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6346 • Telexcopier - (808) 538-3147

Dr. Joyce Bath  
May 4, 1989  
Page 2

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It is our understanding that the sinkhole park/preserve area represents the only area of concern with respect to historic sites along the conveyor route or on the plant site.

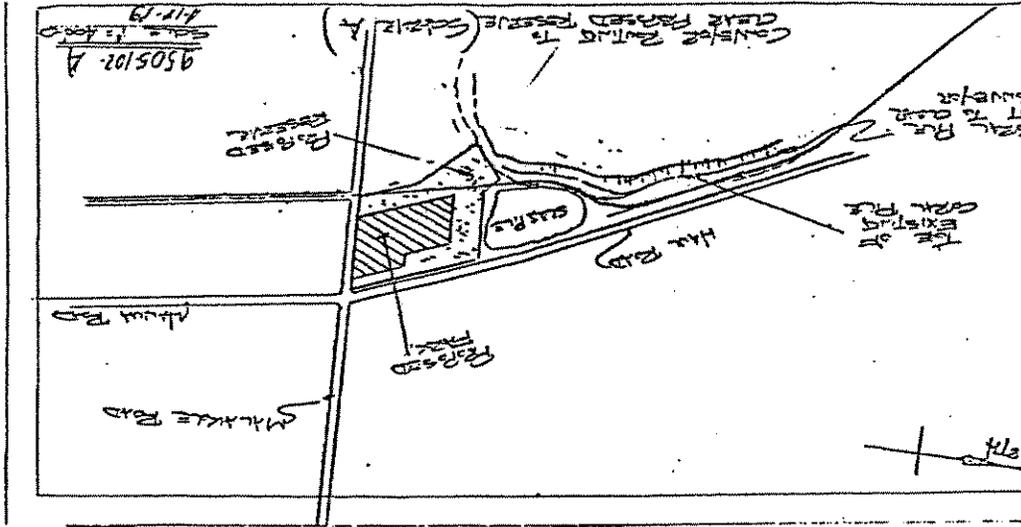
I hope this program will resolve any possible incompatibility between our conveyor and the proposed park/reserve. If you have any further questions or comments concerning this matter, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

Attachment





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

- DEPUTIES
- LIBERT K. LANDGRAF
- WAMABU FAGOMORI
- RUSSELL N. FURUMOTO
- AGRICULTURE DEVELOPMENT PROGRAM
- AQUATIC RESOURCES
- CULTURAL AFFAIRS
- ENVIRONMENTAL AFFAIRS
- CONSERVATION AND RESOURCES ENFORCEMENT
- FORESTRY AND WILDLIFE
- LAND MANAGEMENT
- STATE PARKS
- WATER AND LAND DEVELOPMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621  
HONOLULU, HAWAII 96813

May 23, 1989

Eric L. Miller  
Applied Energy Services, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

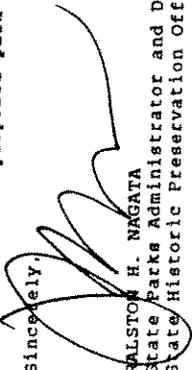
Dear Mr. Miller:

SUBJECT: Realignment of AES Barbers Point Conveyor in  
Vicinity of Proposed Sinkhole Preserve and Park in  
Campbell Industrial Park

Thank you for your letter of May 3, 1989, which outlines the preservation measures you propose for this portion of the conveyor belt. We believe that these measures will result in "no adverse effect" to the sinkhole sites.

In addition to determining that there are no remaining sites between the northern edge of the proposed preserve and the harbor, our staff archaeologist checked the conveyor belt route between the plant site and Malakole Road. She verified that this sector of the route has already been modified by development. There will be "no effect" to significant historic sites in this area, nor in the section of the route from the north end of the proposed park to the harbor.

Sincerely,

  
RALSTON H. NAGATA  
State Parks Administrator and Deputy  
State Historic Preservation Officer

*5/30 - Cy to Perry White, BCA*

ABS  
CITY COUNCIL  
CITY AND COUNTY OF HONOLULU  
HONOLULU, HAWAII 96813 / TELEPHONE 523-4000  
X 27

May 25, 1989

GARY GILL  
Councilmember

April 17, 1989

Mr. Perry White  
Belt Collins & Associates  
680 Ala Moana Blvd., Suite 200  
Honolulu, HI 96813

Re: Environmental Impact Statement for Steam and Electricity  
Cogeneration Plant Operated by Applied Energy Services-  
Barbers Point, Inc., at Campbell Industrial Park

Dear Mr. White:

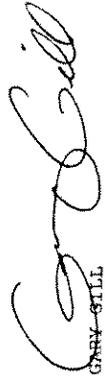
It has been brought to my attention that plans for the proposed cogeneration plant at Campbell Industrial Park include a conveyor belt carrying coal fuel from the Deep Draft Harbor docking facilities to the plant 1.5 miles to the South.

This belt will pass through an area that contains numerous ecologically and historically significant sinkholes richly laden with elements of fauna and flora of prehistoric Hawaii.

I strongly urge that the planners of this project re-evaluate the proposed route of the conveyor belt in a manner that will not jeopardize this precious natural resource.

Your time and consideration of my comments would be greatly appreciated.

Sincerely,



GARY GILL  
Councilmember

1989.0801

The Honorable Gary Gill  
Councilmember  
City Council  
City and County of Honolulu  
Honolulu, Hawaii 96813

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

Dear Councilmember Gill:

Thank you for your April 17, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s, proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate your interest in the project and hope you agree that the following measures will adequately protect the sinkholes.

**Background**

The discussion of impacts on historic, archaeological, and paleontological remains contained in the Draft EIS was based on opinions expressed by the Historic Sites Section of the State Department of Land and Natural Resources (DLNR) in its response to the EIS Preparation Notice. Following publication of the Draft EIS, it became apparent that the Department's previous comments were applicable only to the power plant site, not to the conveyor route. As soon as this was known, the situation was discussed with Mr. Alan Ziegler, the archaeologist who has been most active in efforts to establish an archaeological/paleontological preserve in the area, and with Dr. Joyce Bath of the DLNR's Historic Sites Section.

 AES/BarbersPoint Inc.  
1000 Bishop Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6346 • Telecopier--(808) 538-3147

The Honorable Gary Gill  
May 25, 1989  
Page 2

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Revised Conveyor Alignment

The new conveyor alignment shown in Attachment 1 completely avoids the area north of Malakole Road that the Honolulu City Council has indicated an interest in incorporating into a future educational park. Because of the presence of the 30- to 40-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated into an archaeological/paleontological science reserve. However, AES Barbers Point has agreed to keep the conveyor elevated in this area and to design the support structures for the conveyor so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that neither the sinkholes nor the valuable paleontological remains which they contain are accidentally damaged by construction equipment.

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The Honorable Gary Gill  
May 25, 1989  
Page 3

If you have any further questions or would like additional information, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

Attachments

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cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

May 4, 1989

Dr. Joyce Bath  
May 4, 1989  
Page 2

Dr. Joyce Bath  
Archaeologist, Historic Sites  
Department of Land & Natural Resources  
State of Hawaii  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Subject: Realignment of AES Barbers Point Conveyor in Vicinity of  
Proposed Sinkhole Preserve and Park in Campbell  
Industrial Park

Dear Dr. Bath:

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I hope this program will resolve any possible incompatibility between our conveyor and the proposed park/reserve. If you have any further questions or comments concerning this matter, please call me at 538-6346.

Sincerely,

Eric L. Miller  
Assistant Project Director

Attachment

cc: Amy Lubitz, BSA

JOHN WEAVER  
DIRECTOR OF HAWAII



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

IRVING  
LURET E. LANDGRAF  
MAYNARD TAGOMORI  
RUSSELL K. FURUKIMOTO

AGRICULTURE DEVELOPMENT  
ADULTIC RESOURCES  
CONSERVATION AND  
RECREATION  
CONSERVATION AFFAIRS  
CONSERVATION ENFORCEMENT  
CONSERVATION PLANNING  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 851  
HONOLULU, HAWAII 96813

May 23, 1989

Eric L. Miller  
Applied Energy Services, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

SUBJECT: Realignment of AES Barbours Point Conveyor in  
vicinity of Proposed Sinkhole Preserve and Park in  
Campbell Industrial Park

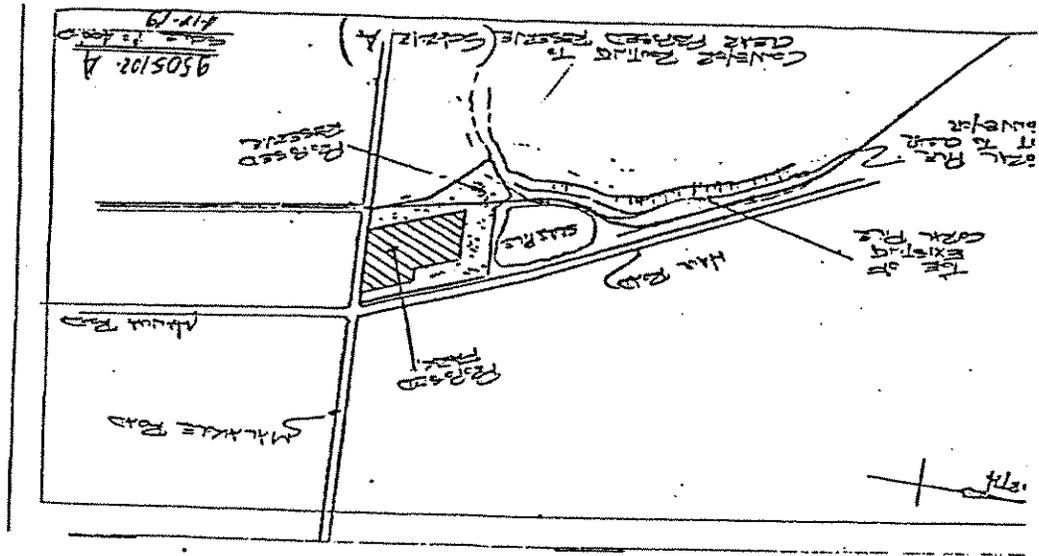
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Sincerely,

HALSTON H. NAGATA  
State Parks Administrator and Deputy  
State Historic Preservation Officer

5/30-Cy to Amy White, BCA



RECEIVED  
MAY 4 1989  
CITY COUNCIL

CITY AND COUNTY OF HONOLULU, HAWAII  
HONOLULU, HAWAII 96813 / TELEPHONE 523-4000

NEIL ABERCROMBIE  
COUNCILMEMBER

May 25, 1989

April 17, 1989

Mr. Perry White  
Belt Collins & Associates  
860 Ala Moana Blvd, Suite 200  
Honolulu, Hawaii 96813



Thank you for this opportunity to comment on the draft environmental impact statement for the proposed steam and electrical cogeneration plant to be built and operated by Applied Energy Services at Campbell Industrial Park.

I am concerned that the proposed coal conveyor belt system could destroy valuable archeological resources if it passes through the prehistoric sink holes located in the area immediately north of Malakole Road. The preservation of these sink holes is a concern of the City. Preservation has been supported by the Board of Parks and Recreation, and by the City Council in resolution 88-476.

I would urge that the final environmental impact statement note the presence of the sink holes and advise selection of a route for the conveyor belt that avoids destruction of these sites. This will allow plans to proceed for development of a "sinkhole park" to preserve and display this unique resource.

Sincerely,



Neil Abercrombie  
Councilmember

The Honorable Neil Abercrombie  
Councilmember  
City Council  
City and County of Honolulu  
Honolulu, Hawaii 96813

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

Dear Councilmember Abercrombie:

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**AES**/BarbersPoint Inc.

1000 Bishop Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6346 • Telecopier - (808) 538-3147

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Sincerely,



Eric L. Miller  
Assistant Project Director

Attachments

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cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

May 4, 1989

Dr. Joyce Bath  
Archaeologist, Historic Sites  
Department of Land & Natural Resources  
State of Hawaii  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Subject: Realignment of AES Barbers Point Conveyor in Vicinity of  
Proposed Sinkhole Preserve and Park in Campbell  
Industrial Park

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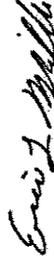
Dr. Joyce Bath  
May 4, 1989  
Page 2

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Sincerely,



Eric L. Miller  
Assistant Project Director

Attachment

cc: Amy White, AEA

JOHN RAHICE  
Director of Parks



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

MEMBERS

LINSEY K. LANGRISH  
MANABU TAGOMORI  
RUSSELL N. FURUKOTO

INDUSTRY DEVELOPMENT  
AGRICULTURE  
AQUATIC RESOURCES  
CONSERVATION AND  
ENVIRONMENTAL AFFAIRS  
CONSERVATION  
CONSERVATION ENFORCEMENT  
CONSERVATION  
LAND ACQUISITION  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 357  
HONOLULU, HAWAII 96809

May 23, 1989

Eric L. Miller  
Applied Energy Services, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

SUBJECT: Realignment of AES Barbets Point Conveyor in  
Vicinity of Proposed Sinkhole Preserve and Park in  
Campbell Industrial Park

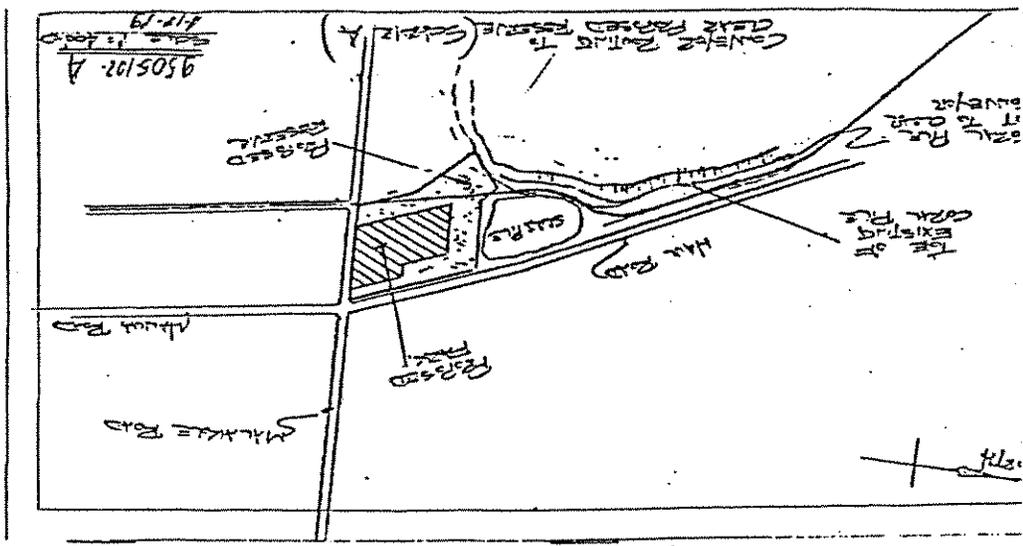
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Sincerely,

*[Signature]*  
RALSTON H. NAGATA  
State Parks Administrator and Deputy  
State Historic Preservation Officer

5/30-Cy to Amy White, BCA



245 North Kukui Street, Honolulu, Hawaii 96817, Telephone (808) 337-5888

# AMERICAN LUNG ASSOCIATION of Hawaii

The Christmas Seal People™

State Department of Transportation  
Harbors Division  
79 S. Nimitz Highway  
Honolulu, Hawaii 96813

April 24, 1989

Gentlemen:

Subject: Draft Environmental Impact Statement for the  
AES Barbours Point, Inc. Coal-fired Cogeneration  
Facility

We have reviewed the subject EIS with particular attention to the sections addressing air quality and offer the following comments:

1. Page 3-29, paragraph 3.4.2.2: The text states that "all current Federal and State ambient air quality standards have been met from 1982 to the present."

Since there has been no TSP monitoring in the Campbell Industrial Park area since 1985, one cannot be certain that the State's TSP standard has not been violated. There is a long history of TSP violations in that area; thus, it is likely that they continue to occur.

2. Page 3-31, Table 3-14: The concentrations units of grams per cubic meter (g/m3) should be micrograms per cubic meter (ug/m3).

3. Page 3-39, paragraph 3.4.5.5: The text states that NOx increment consumption is 1.6% of available when Table 3-19 indicates that it is 6.4%.

3. Page 3-40, Table 3-18: The extremely low contributions of the proposed AES project to ambient air quality as presented in this table certainly cannot represent the maximum impact of the facility itself. What and where are the maximum concentrations generated by the AES facility?

4. Page 3-41, Table 3-19: The extremely low contribution of the proposed project to increment consumption does not represent maximum increment consumption by the AES facility. What and where is the maximum increment consumption by the plant itself?

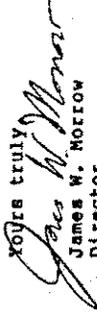
With all the NOx sources in the CIP area, why is the "existing source consumption" shown as zero (0)?

State Department of Transportation  
April 24, 1989  
Page 2

5. There is no indication in the EIS that any air quality monitoring was carried out. Given the size of this facility, why was no monitoring done? Especially in the case of NO2 where no data have been available since 1976, how could a major source such as this be permitted without establishing current air quality by monitoring?

6. On the positive side, the control technologies being proposed for SOx, NOx, and particulates are all excellent.

Pursuant to Chapter 343, HRS, and Chapter 200, EIS Rules, we trust that these comments will be thoroughly addressed prior to acceptance of this EIS.

Yours truly,  
  
James W. Morrow  
Director  
Environmental Health

JMN:ct  
LB912

cc: OEOC  
Environmental Center  
P. White, BCA  
E. Miller, AES

Mr. James W. Morrow  
May 25, 1989  
Page 2

May 25, 1989

TSP monitoring data is not available, the PM<sub>10</sub> data can be used to estimate the ambient particulate impacts. Typically TSP is roughly twice the PM<sub>10</sub> figure. If this conversion is used, modeling still does not indicate any violations of ambient or prevention of significant deterioration (PSD) standards. In accordance with your second comment, however, the text will also be revised to state that air quality modeling of existing sources indicates that air quality standards are currently being met. As you know, Environmental Protection Agency (EPA) procedures call for the modeling to be based on reported emission rates. To the extent that some sources exceed their permitted levels, it is possible that violations may still be occurring. However, this is an enforcement issue that cannot be dealt with by an applicant for a PSD permit.

Mr. James W. Morrow  
Director, Environmental Health  
American Lung Association of Hawaii  
245 North Kukui Street  
Honolulu, Hawaii 96817

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Draft Environmental Impact Statement

Dear Mr. Morrow:

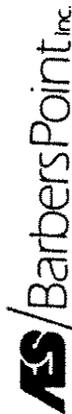
Thank you for your April 24, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. Your comments were thoughtful and well expressed. Our responses to them are as follows:

1. **Comment.** Page 3-29, paragraph 3.4.2.2: The text states that "all current Federal and State Ambient Air Quality Standards have been met from 1982 to the present."

Since there has been no TSP monitoring in the Campbell Industrial Park area since 1985, one cannot be certain that the State's TSP standard has not been violated. There is a long history of TSP violations in that area. Thus, it is likely that they continue to occur.

**Response.** Your comment is correct. The TSP monitoring was discontinued in 1985 in favor of developing a database for PM<sub>10</sub>, the replacement standard for particulate emissions. Thus, while

2. **Comment.** Page 3-31, Table 3-14: The concentrations units of grams per cubic meter (g/m<sup>3</sup>) should be micrograms per cubic meter (mg/m<sup>3</sup>).
- Response.** Thank you for correcting the units in this table. The symbol for "micro" was lost in the translation from one word-processing format to another. It will be corrected in the Final EIS.
3. **Comment.** Page 3-39, paragraph 3.4.5.5: The text states that NO<sub>x</sub> increment consumption is 1.6% of available when Table 3-19 indicates that it is 6.4%.
- Response.** Table 3-19 is correct; the NO<sub>x</sub> consumption of the project amounts to 6.4% of the available increment. This is based on a consumption of 1.6 micrograms per cubic meter out of a total available increment of 25 micrograms per cubic meter. The text will be corrected to agree with the table.
- 3a. [There were two items marked "(3)" in your letter.] **Comment.** Page 3-40, Table 3-18: The extremely low contributions of the proposed AES project to ambient air quality as presented in this table certainly cannot represent the maximum impact of the

AES/BarbersPoint Inc.

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facility itself. What and where are the maximum concentrations generated by the AES facility?

**Response.** Your observation is correct. The figures reported in Table 3-18 of the Draft EIS represent the contribution of the AES facility to the points with the highest pollutant concentration for the specified pollutants and averaging periods. These are different from the points that would be most affected by the AES Barbers Point project alone. The second block of Table 3-14 presents the maximum impacts of the facility, though not the location. A table showing the greatest change in pollutant concentrations and their UTM coordinates resulting from the AES Barbers Point project are attached to this letter.

4. **Comment.** Page 3-41, Table 3-19: The extremely low contribution of the proposed project to increment consumption does not represent maximum increment consumption by the AES facility. What and where is the maximum increment consumption by the plant itself?

With all the NOx sources in the CIP area, why is the existing source consumption shown as zero (0)?

**Response.** Again, you are correct. The figures reported in Table 3-19 of the Draft EIS represent the contribution of the AES facility to the points with the highest increment consumption for the specified pollutants and averaging periods. These are different from the points that would be most affected by the AES Barbers Point project alone. As the project must demonstrate compliance with both PSD and NAAQS, the table of maximum emissions attached in reference to question 3 applies equally to both NAAQS and PSD standards.

The increment consumption by existing sources is shown as "zero" because AES Barbers Point is the first applicant to file a permit since the imposition of a PSD increment for NOx.

H-POWER's application was filed prior to the effective date of the NOx increment standards, and so is considered a baseline source.

5. **Comment.** There is no indication in the EIS that any air quality monitoring was carried out. Given the size of this facility, why was no monitoring done? Especially in the case of NO2 where no data have been available since 1976, how could a major source such as this be permitted without establishing current air quality by monitoring?

**Response.** With regard to NOx monitoring, the project contributes only 1.6 mg/m3 at its maximum impact point. As you may know, if an applicant contributes less than 14 mg/m3 at its maximum impact point, no ambient monitoring is required under EPA regulations.

With regard to TSP monitoring, as mentioned in the response to your question (1), TSP monitoring was discontinued in 1985 in favor of PM10, even though the state has not replaced its TSP standard with one for PM10 as done by the EPA. EPA and the Hawaii State Department of Health (DOH) have indicated, however, that the current PM10 monitoring data is sufficient for the processing of our application.

SO2 monitoring has continued to the present within Campbell Industrial Park, and is considered representative of the areas impacted by our facility by the EPA and DOH.

6. **Comment.** On the positive side, the control technologies being proposed for SOx, NOx, and particulates are all excellent.

**Response.** Thank you for the comment on the control technologies. It is the project's goal to provide power to our utility customers while minimizing any associated environmental impacts.

Based on our discussion of these responses on May 4, it is my understanding that they satisfactorily address the comments contained

Mr. James W. Morrow  
 May 25, 1989  
 Page 5

POLLUTANT IMPACTS  
 FROM THE BARBERS POINT COGENERATION PLANT

in your letter. If this is not correct, or if you would like to discuss the project further, please call me.

Sincerely,

  
 Eric L. Miller  
 Assistant Project Director

Attachment:

Table showing maximum project impacts

cc: Office of Environmental Quality Control, State of Hawaii  
 Department of Transportation, State of Hawaii  
 Mr. Perry J. White, Belt Collins & Associates

Pollutant	Averaging Time	Concentration ug/m <sup>3</sup>	Location	Year	Day/Time
CO	1-hour*	112.3	592.25 km East	1970	273/23
	8-hour*	61.3	2362.00 km North	1968	344/24
SO <sub>2</sub>	3-hour*	148.3	592.75 km East	1968	22/21
	24-hour*	33.5	2362.00 km North	1967	350/01
	Annual	4.4	592.00 km East	1971	-
		2356.00 km North	-	-	-
NO <sub>2</sub>	Annual	1.6	592.00 km East	1971	-
	2356.00 km North	-	-	-	
TSP	24-hour*	18.6	591.75 km East	1967	153/01
	Annual	6.1	2356.00 km North	1968	-
PM <sub>10</sub>	24-hour	18.6	591.75 km East	1967	153/01
	Annual	6.1	2356.00 km North	1968	-
Pb**	Quarterly	0.3	592.50 km East	1967	4th Qtr.
		2356.75 km North	-	-	

\* Impacts are highest, second highest concentrations  
 \*\* Pb impacts are based on a conservative estimation of highest, second highest 24-hour impact.



**SIERRA CLUB, HAWAII CHAPTER**

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1100 Alakea Street, Honolulu, Hawaii 96813  
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April 20, 1989

Belt Collins & Associates  
680 Ala Moana Blvd., Suite 200  
Honolulu, HI 96813

ATTN: Mr. Perry White

RE: AES-Barbers Point, Inc. Draft EIS (3/3/89)

Dear Mr. White:

"AES") Draft Environmental Impact Statement (hereinafter dated March 3, 1989 which was prepared by Belt Collins & Associates, the Sierra Club, Hawaii Chapter, points out the following deficiencies in said EIS:

I. Statement of NEED Is Deficient.

A. Statement of Future NEED for Electricity Is Overstated.

1. Although AES has provided actual electricity use figures which show an annual growth rate for electricity demand of 0.5%, AES's projection of a 2.2% annual growth rate in demand appears to be an exaggeration to CREATE a need for its project. The actual use figures for 1976 through 1986 show that from 1979 through 1986, Oahu demand for electricity increased from 953 megawatts to 986 megawatts, a 3.4% rise in 8 years, or 0.5% annually.

Accordingly, AES's projected future demand for electricity at an annual rate of 2.2% is exaggerated. The 2.2% hypothetical rate appears to be an attempt to CREATE a need for capacity where such need does not in fact exist. AES's EIS needs to incorporate a more rational growth rate, such as 0.5%, not a hypothetical and speculative rate which appears to have scant basis other than that HECO supports it. HECO's support does not VALIDATE the 2.2% figure, particularly where such figure is not historically based. AES's EIS needs to utilize a demand growth rate projection that more accurately reflects actual trends and which is historically supportable.

AES-Barbers Point, Inc.  
April 20, 1989  
page 2

B. Claimed 30% Reserve Rule Is Overstated.

1. AES's claim that its project is NEEDED to permit HECO a minimum 30% reserve in generating capacity is misleading since based upon an insupportable 2.2% annual increase in future demand.

2. Even assuming for the sake of argument that such a 30% reserve is desirable to HECO, no need for AES's additional capacity will exist if future demand does not increase at AES's predicted 2.2% annual rate.

3. The actual use figures for the eleven years from 1976 through 1986 indicate that demand for electricity increased at the average rate of .88% annually. The annual growth rate during the most recent eight years (1979 through 1986) was even slower - just 0.5% annually.

Utilizing a .88% annual growth rate, Oahu electricity demand would reach 1057 megawatts by 1994. With Kalaheo Partners' Phases I and II on-line, HECO's 1994 capacity would be 1,457 megawatts, a healthy 38% (400 megawatts) reserve. Thus even if HECO needed to maintain a 30% reserve in capacity, it would readily meet its reserve needs in 1994 and beyond if demand increased at the rate of .88% annually.

3. It is also questionable whether HECO considers 30% reserve capacity to be an actual "rule" or merely an "ideal." AES's projections indicate that in 1989, HECO is operating with a mere 16.8% reserve capacity. It seems unlikely that HECO would operate with such a slim reserve if it was a "rule" that it have 30% reserve capacity at all times. AES's EIS needs to address HECO's actual employment of a 30% reserve capacity "rule".

C. Whether AES Is A True "Co-generation" Facility Is Questionable.

1. Although AES conclusively refers to its system as a "qualifying" co-generation facility, it is questionable whether AES is a true co-generation facility within the intent and purpose of the Federal Public Utility Regulatory Act of 1978.

2. AES's neighbor, Kalaheo Partners, is a true co-generation facility because it generates steam as a by-product of its process. Its gas combustion turbines' hot exhaust gases heat water via in-line steam generators. Kalaheo Partners will generate 260,000 pounds per hour of superheated steam (905 degrees F. at 1108 psi) and 97,000 pounds per hour of saturated

steam (322 degrees F. at 90 psi) to be used by PRI in its oil refining process.

3. On the other hand, AES's coal burning facility generates electricity by heating water into steam which drives steam turbines. An infinitesimal portion of this steam (30,000 pounds per hour) is slated for the Chevron oil refinery. However, this amount is less than 9% of the volume of steam which Kalaheoa Partners is providing to PRI, which raises questions as to whether Chevron really needs AES's steam or whether AES is giving Chevron a nominal amount of steam (which Chevron doesn't need) at little or no cost in order to appear to be a true "co-generation" facility. AES's EIS needs to candidly disclose Chevron's actual need for AES's steam and the financial details of AES's arrangement with Chevron with regard to the providing of steam.

D. AES Misleadingly Claims Expertise In CFB Technology.

1. Despite AES's claim that "it is particularly strong in the field of coal-fired fluidized bed combustion units", AES's own chart (p. 1-12) indicates that AES doesn't even have any coal CFB power plants on-line to date. Its first coal CFB plant is scheduled to start-up in 1989 in Thames, Connecticut.

2. Moreover, AES has developed only three other power plants to date, one using natural gas, one using oil and one using coal (without CFB technology). Thus AES has no track record of successfully or economically implementing coal CFB power plants, contrary to its claims. AES's EIS needs to accurately state its lack of expertise in implementing CFB power plants.

II. Statement of Environmental Impacts Is Deficient.

AES's statement of environmental impacts is deficient in several respects, particularly with respect to the problems of potable water use, environmental pollution of the ocean, parks, and neighbors from coal, limestone, and ash particulates, fines and dust, and wastewater pollution of the lower aquifer.

A. AES Understates Environmental Impact of Coal, Limestone and Ash Particulates, Fines and Dust.

AES's claim that environmental pollution from its coal, limestone and ash will be negligible is an inaccurate understatement.

1. Particulates And Fines (Dust) Will Have Significant Environmental Impact.

a. AES proposes to consume 660,000 tons per year of low sulfur coal and 40,000 tons of limestone, which will be off loaded from ships docking at the Barbers Point Deep Draft Harbor. AES estimates that 15 ship landings per year will be required to supply AES.

b. AES claims that its coal specifications severely limit the amount of "fines" present.

c. AES further proposes that a 1.5 mile conveyor be constructed to transport the coal (and limestone) from the harbor to AES's plant. AES proposes that the conveyor will be "fully enclosed" where it crosses Malakole Road, "preventing fugitive dust and materials loss" (p. 3-51). In other parts of its EIS, AES inconsistently states that the conveyor will be fully enclosed throughout its entire length. In the alternative, AES proposes 1,700 round trip truck trips between the harbor and its plant whenever a ship lands (25,500 round trip truck trips per year).

d. AES proposes to store the coal and limestone in uncovered piles, up to 40 feet tall, at its plant. AES claims that "wetting" with water and unidentified "non-toxic chemicals" will preclude coal dust and "fines" from escaping into the air.

e. There is little question that in unloading and loading, transportation by conveyor or truck, and storing in uncovered piles, coal dust and "fines" will escape into the air, into the ocean and onto the ground. No matter how carefully handled, wetted, or vacuumed, coal, limestone and ash dust, fines, and fugitives will inexorably escape, and the escape potential will increase in gusty winds. If just 0.1% of the 660,000 tons of coal escapes, it means 660 tons of coal dust, fines and particulates released into the environment annually, which could well prove disastrous to neighboring businesses which rely upon good air quality, to ocean water quality and sea life, and to the public welfare. AES's neighbors, such as Pacific Allied Products, a producer of polystyrene products, have expressed justifiable alarm at AES's proposal to utilize escape-prone materials which require considerable transport to and from AES's plant, furnace, storage piles, and which will be stored in the open.

f. AES's EIS needs to candidly address:

1. The exact configuration of its proposed conveyor and whether it will be hermetically enclosed throughout its entire length.
2. What ship unloading procedures will be utilized to eliminate the escape of dust, fines and particulates, and the quantum and make-up of escaped dust, fines and particulates annually.
3. What procedures will be utilized to prevent the escape of dust, fines and particulates in transporting coal, limestone and ash to and from (a) the conveyor, (b) the storage piles, and (c) the furnace, and the quantum and make-up of escaped dust, fines and particulates annually.
4. Coal dust, fines and particulates' flammability, toxicity, heavy metal and carcinogen content.
5. Limestone, gypsum, bottom and fly ash, ash pellets' flammability, toxicity, heavy metal and carcinogen content, particularly in light of the State Department of Health's indication that bottom and fly ash has been identified as a possible EP-toxicity concern.
6. The quantum and make-up of coal, limestone and ash pile run-off basin sediment, and storm water run-off from said piles (which will overflow into JCIP's storm drain system and thence into the ocean), particularly its toxicity, heavy metal and carcinogen content.

2. AES's EIS Deficiently Addresses Problem Of Ash Disposal.

AES claims that it will generate 100,000 tons of fly and bottom ash annually, which its coal supplier is contractually required to take back for storage at its mine (if no local market for the ash can be found). This amount of ash constitutes at least two shiploads. Even if AES's supply contract contains a provision, it strains credibility to believe that AES's supplier will actually live up to such an onerous requirement for a prolonged period of time. AES's EIS should therefore address alternative methods of disposal of 100,000 tons of ash per year in the event its Indonesian supplier declines to take back the ash.

B. AES's EIS Deficiently Addresses Injection of Waste Water Into Lower Aquifer.

AES states that wastewater will be injected into a claimed "lower aquifer" via three 190 foot deep pipes at the rate of 7,500 gallons per minute. The injected wastewater will contain quantities of the heavy metals mercury, lead, chromium, cadmium, arsenic and selenium. The sources of the heavy metals are the "cooling tower blowdown" and run-off from the coal, limestone and ash piles (making it reasonable to expect that the sediment from the pile run-off settling ponds will also be laden with heavy metals).

The wastewater which AES proposes to reinject into the "lower aquifer" may constitute hazardous waste under the federal Resource Conservation and Recovery Act of 1976 and Title 40 C.F.R. § 261.3, et seq. The Maximum Contaminant Levels for "Drinking Water Standard" may be exceeded. AES appears to view the "lower aquifer" as a convenient dumping ground for hazardous waste merely by virtue of the fact that it is too saline for any other practical use.

AES's EIS needs to fully address the hazardous waste nature of the reinjected wastewater and the proper procedures for disposal of the wastewater, particularly its heavy metal and other toxic contents.

C. AES's EIS Contains Misleading And Inaccurate Information As To Potable Water Use.

AES states that it needs 330,000 gallons of potable (drinking) water per day for generating steam. This is enough potable water to supply 825 single family dwellings. AES claims that its potable water requirements will be made available via joint agreements with the Board of Water Supply and HECO. HECO is to make available to the Board of Water Supply and HECO. HECO Wai'au wells in return for the Board of Water Supply water from its JCIP's allotment. AES further claims that the arrangement will actually INCREASE the amount of potable water available to the public. AES's assertions are false.

AES has failed to disclose that HECO made the same offer of its Wai'au well water to the Board of Water Supply to induce the Board of Water Supply to increase the water allotment to JCIP for the Kalaheo Partners Co-Generation facility, which facility will require from 458,000 to 627,000 gallons of potable water per day for its emissions reducing steam injection system and for generating steam for PRI. AES has failed to disclose that to date, the Board of Water Supply has declined to accept HECO's proposed

AES-Barbers Point, Inc.  
April 20, 1989  
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water "swap" because it considers HECO's Waiau wells to be "at risk" of contamination. Since HECO has been unable to swap its Waiau well water to obtain increased allocations for Kalaeloa Partners' facility, AES's claim that water "is being made available" to AES for the AES facility under the Waiau proposal is false.

The Kalaeloa Partners facility and the AES facility together will require 1,000,000 gallons of potable water daily. A million gallons of potable water can service over 2,500 single family dwellings. The State of Hawaii HPDC's Kapolei Village intends to develop 5,000 housing units on 830 acres immediately northeast of JCIP. The housing units will require some 2 million gallons of potable water, the supply of which is becoming increasingly scarce in the Ewa vicinity, particularly in light of recent reductions by the State Commission on Water Resources regarding sustainable yield and water allocations Pearl Harbor Water Management Area.

AES's EIS needs to address alternative sources of water for its generation of steam, including AES's own desalination of water taken from the upper aquifer. AES states that the upper aquifer has a salinity of just 5 to 6 parts per thousand to a depth of 15 feet, increasing to a salinity of 34 parts per thousand at a depth of 140 feet. Since AES is in the business of generating heat, steam and electricity, it is not unreasonable to expect AES to produce on its own the "extremely pure" water which it requires for its processes.

### III. AES's Project Fails To Further State Energy Goals.

Section 226-18 of the Hawaii State Plan makes it a State goal to increase Hawaii's energy self-sufficiency. Although AES claims that it meets this goal to a degree by providing an alternate source of energy (coal vs. oil), it is a distinction without a difference. Since Hawaii imports much of its oil from Indonesia, whether Hawaii depends upon Indonesia for oil or coal is inconsequential. If anything, dependence upon Indonesian coal is even less attractive than oil because while Hawaii already relies upon alternate sources of oil, there is no alternate supplier of coal which already services Hawaii.

AES devotes a substantial portion of its EIS to denigrating alternate energy sources and renewable energy sources. AES essentially concludes that all alternatives are non-viable, non-cost-competitive and should therefore be discounted. However, AES's own proposal fails to further the State's stated energy goals.

AES-Barbers Point, Inc.  
April 20, 1989  
page 8

For the foregoing stated reasons, the Sierra Club, Hawaii Chapter finds AES's draft EIS deficient. The noted deficiencies need to be adequately addressed in AES's final Environmental Impact Statement.

SIERRA CLUB, HAWAII CHAPTER

BY Lela N. Mendel  
ITS CONSERVATION CHAIR

cc: Office of Environmental Quality Control  
ATTN: Dr. Marvin T. Miura, Director

Ms. Lola N. Mench  
May 25, 1989  
Page 2

May 25, 1989

Ms. Lola N. Mench, Chairwoman  
Conservation Committee  
Sierra Club, Hawaii Chapter  
Honolulu Merchandise Mart, Room 330  
1100 Alakea Street  
Honolulu, Hawaii 96813

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

Dear Ms. Mench:

Thank you for your April 20, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s, proposed coal-fired cogeneration facility. We and the Department of Transportation appreciate the time that Sierra Club members spent reviewing the document and preparing the comments.

Point-by-point responses to your questions are presented below. I had discussed the substance of our responses with you at our May 4 meeting, and I hope you found them satisfactory. If you have any further questions, please call me.

I. STATEMENT OF NEED IS DEFICIENT

A. Statement of Future Need for Electricity is Overstated

This comment argues that AES has inflated the electrical power demand projections in order to create a need for its project where, in fact, none exists. It further asserts that HECO has colluded in establishing the forecast. For reasons outlined below, I do not believe these assertions are correct.

- (1) AES Barbers Point was not involved in preparing the forecasts that led HECO to negotiate a purchase power contract with it.

Those were prepared independently by HECO's Forecast Planning Committee and reviewed and approved by the State Public Utilities Commission. In preparing the forecasts, the Committee considers many factors, including economic activity, announced plans for new construction, observed changes in energy use patterns, the need to replace old and inefficient generating units, the need to maintain system reliability, and historical system peaks.

(2) Table 1-3 of the Draft EIS reports the forecast peak for 1988 as 1,067 megawatts. On December 5, 1988, HECO's system experienced a peak demand of 1,068 megawatts, one megawatt higher than the forecast. Please note that this 1988 figure is 11 megawatts higher than the 1,057 megawatts that you forecasted for 1984 using a growth rate of 0.88 percent per year. This is a good indication that the methods used by the Forecast Planning Committee are superior to a straight-line extrapolation from historical data.

B. Claimed 30 Percent Reserve Rule Is Overstated

**Comment.** The first four paragraphs of this comment are strongly related to Item I.A., and the preceding discussion applies to them as well. The fifth paragraph questions the reasonableness of the "30 percent reserve rule."

**Response.** As indicated by the first sentence in Section 1.2.3.2 of the Draft EIS, the "30-Percent Reserve Rule" is one of three planning criteria that HECO uses to assess the need for additional generating capacity. It is not a hard and fast line, but a guideline which, in combination with the other "rules," indicates when it is appropriate to add generating capacity to the system.

As you correctly note, HECO has been running with less than a 30 percent reserve margin for some time now. During that time, portions of the island have experienced occasional brownouts and blackouts and the utility's maintenance activities have been constrained. This experi-

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ence indicates that reserve margins are unacceptably low, not that the reserve margin criteria should be lower than 30 percent.

C. Whether AES Is A True "Co-Generation Facility"

Comment. This comment contains two parts. The first questions whether AES's proposed facility is a true cogeneration facility within the intent and purpose of the Federal Public Utility Regulatory Act of 1978. The second part questions whether Chevron really needs the steam.

Response. The first part can be answered directly. On October 3, 1988, the Federal Energy Regulatory Commission (FERC) determined that the proposed power plant is a "qualifying facility," i.e., is a cogeneration facility.

The part of your question dealing with Chevron's "need" for the steam is more complicated, but the answer is relatively straightforward. AES Barbers Point has negotiated a contract with Chevron which calls for the purchase of 30,000 pounds per hour of steam from the facility. The steam is being sold, not given, to Chevron.

It is clearly true that Chevron has alternative means of obtaining the steam it needs to sustain its operations, but its willingness to enter into the contract indicates that the company believes it will derive economic benefit from the arrangement. Revealing the financial details of Chevron's contract with AES Barbers Point would provide the refinery's competitors proprietary information which could give them an unfair advantage. Because of this, Chevron has asked that the exact terms of the agreement not be revealed.

D. AES Misleadingly Claims Expertise in CFB Technology

This comment asserts that, contrary to statements in the Draft EIS, AES has no track record of successfully or economically implementing coal CFB power plants. It states that "the EIS needs to accurately state its lack of expertise in implementing CFB power plants."

Section 1.3.2 of the DEIS was not intended to mislead the public about AES's experience with (CFB) technology. If it had been, the detailed list of projects presented on page 1-12 would have been omitted. In response to your concern that the information presented might be misleading, the second paragraph under Section 1.3.2 will be revised to read as follows:

*Since it was established in 1981, Applied Energy Services, Inc., has obtained Public Utility Commission approvals of power contracts for approximately 1,600 megawatts of electric generating capacity. This is more than HECO's total generating capacity. The last six projects it has initiated have all utilized the same circulating fluidized bed technology incorporated in the facility proposed for Campbell Industrial Park. Not just a contractor or developer, AES owns and operates its cogeneration plants; this ongoing involvement gives it a vested interest in the long-term efficiency and reliability of its projects. AES's power plant experience to date includes the following:*

II. STATEMENT OF ENVIRONMENTAL IMPACTS IS DEFICIENT

A. AES Understates Air Quality Impacts

(1) This comment asserts that, contrary to the analysis presented in the Draft EIS, particulate and fine dust will have a significant adverse environmental impact. It states that "no matter how carefully handled, wetted, or vacuumed, coal, limestone, and ash dust, fines, and fugitives will inexorably escape, and the escape potential will increase with gusty winds." The comment notes that: "AES's neighbors...have expressed justifiable alarm at AES's proposal to utilize escape prone materials which require considerable transport to and from AES's plant, furnace, storage piles, and will be stored in the open."

Subparagraph "f" asks that the Final EIS "candidly address" a number of issues. These, together with our responses to them, are presented below:

f.1. The exact configuration of the proposed conveyor and whether it will be hermetically sealed throughout its entire length.

**Response.** AES intends to use a "pipe conveyor" to transport coal and limestone between the Barbers Point Deep Draft Harbor and the power plant site. A photograph of the type of conveyor that will be employed is presented in Figure 1-11 of the Draft EIS. It is impossible to "hermetically seal" any conveyor since they must be open at either end. However, the system that is being used does completely enclose the material for the entire length of the conveyor, eliminating the enroute escape of material. The Final EIS will note the choice of a pipe conveyor over conventional conveyor systems.

f.2. The ship unloading procedures that will be used to eliminate the escape of dust, fines, and particulate, and the quantum and make-up of the escaped dust, fines, and particulate.

**Response.** As described in the Draft EIS, coal and limestone destined for AES Barbers Point's power plant will be unloaded by Hawaii Pacific Industries, Inc. (HPI), using the general purpose bulk handling facilities that the company is currently developing in the Barbers Point Deep Draft Harbor. HPI has submitted an environmental assessment (EA) to the State Harbors Division concerning their operation. That EA was accepted and a "no significant impact determination" was issued on February 24, 1988. Plans provided by HPI indicate the following.

*The continuous ship unloader system consists of an enclosed bucket elevator with a horizontally positioned reclaiming section mounted on a counterweighted slewing mast. The horizontal and vertical portions of the bucket elevator form an integral part of the unloader. The material*

*reclaimed from the ships hold is conveyed directly from the horizontal to the vertical in a continuous manner; therefore, material transfer junctions which may create dust problems are eliminated. The unloading elevator is slewable through 360 degrees so that all of the area under the vessel hatch-wings can be reached and reclaimed.*

*The material from the elevator is transferred via an enclosed chute which allows for material transfer over the full slewing range of the elevator onto an enclosed, troughed belt conveyor located on the boom. The elevator and boom are connected to the traveling portal frame by means of a central slewing pylon and counterweight. The enclosure of all transfer areas minimizes the amount of fugitive dust which is easily controlled by dust collectors or dust suppression sprays.*

*From the boom conveyor the material is transferred by a chute and belt conveyor from which it is discharged onto the dock conveyors.*

f.3. The procedures that will be utilized to prevent the escape of dust, fines, and particulate from material storage and handling facilities on the power plant site, and the makeup of the particulate matter that will escape.

**Response.** The control methods that will be used to limit the escape of dust, fines, and particulate from the proposed facility are summarized in Table 3-15b of the Draft EIS. They range from enclosures with baghouses to pelletization to wetting. The same table also indicates the expected control efficiency and the total controlled emissions. The estimates are based on emission factors developed by the U.S. Environmental Protection Agency and reported in AP-42.

It is not possible to characterize the makeup of the emissions from each of these sources in the detail that you

requested. However, the following general discussion of them may provide some useful insights.

The small quantities of dust escaping despite the mitigation measures will be particles of coal and limestone utilized by the project. The attached analysis lists the typical make-up of these products.

f.4. Coal dust, fines, and particulates' flammability, toxicity, heavy metal, and carcinogen content.

**Response.** An analysis of the coal from our coal supplier is attached. Note that the trace element analysis represents the maximum allowed under the contract. Actual values are likely to be much lower.

f.5. The flammability, toxicity, heavy metal, and carcinogen content of limestone, gypsum, bottom and fly ash, and ash pellets, particularly in view of the State Department of Health's indication that bottom and fly ash have been identified as a possible EP-toxicity concern.

**Response.** An actual ash analysis is not available at this time, but a test burn of the Indonesian coal is planned in the near future. Once the ash has been tested, those results will be made available for review. Ash analyses have been performed for our other CFB projects already in construction and the ash was not found to be hazardous under the EP-toxicity or other tests. If the ash is found to be hazardous, AES will find an alternative coal which can produce nonhazardous ash.

f.6. Analyses of the settling pile runoff and sediment.

**Response.** Table 3-3 of the Draft EIS provides water quality data for the coal, limestone, and ash pile runoff being reinjected. Overflow from the piles would contain the same constituents at the same, or more likely lower, concentrations.

The sediment is simply coal, limestone and ash, and would have the same constituents as the raw analyses.

(2) **Comment.** This comment asserts that the Draft EIS's assessment of ash disposal is inadequate. It bases this on its author's doubt that the coal supplier would live up to the terms of its contract. Hence, it asks that the Final EIS address alternative methods of disposing of the ash.

**Response.** This comment incorporates a number of incorrect assumptions. The first is that the ash is a dangerous material that will be difficult to dispose of. This is not the case. Laboratory tests of the ash from our CFB projects have shown that it does not constitute a "hazardous material" as defined by the U.S. Environmental Protection Agency. This, as well as the fact that potential constructive uses for the ash (far in excess of that produced by the facility) have been identified on Oahu, leads AES to believe that ash disposal will not be a problem.

The second incorrect presumption is that AES's coal supplier will find the contract provisions requiring it to accept the ash "onerous" and will abrogate them. The coal supply contract referred to in the Draft EIS is with a joint venture of British Petroleum and CRA, Ltd., a large combined Australian company. The venture's large financial resources, as well as the fact that the ash is not a hazardous material, make it extremely unlikely that ash disposal will become the problem you seem to envision.

If, for the sake of argument, one assumed that the supplier did refuse to accept the ash, the contract would be voided and AES would be free to negotiate a new contract with a supplier that would accept it.

B. The EIS's Evaluation of the Injection of Wastewater Into the Lower Aquifer is Inadequate

**Comment.** This comment asserts that:

- o The wastewater which AES proposes to reinject into the "lower aquifer" may constitute hazardous waste under the Federal Resource Conservation and Recovery Act of 1976 and Title 40, C.F.R. 261.3, 215eq.;
- o The wastewater may exceed the maximum contaminant levels allowed in drinking water; and
- o AES has not fully addressed the implications of the waste water disposal.

**Response.** The anticipated quantity and quality of the injected wastewater are presented in Table 3-3 of the Draft EIS. A comparison of these data with the existing standards shows that it does not qualify as "hazardous waste" under the Federal Resource Conservation and Recovery Act of 1976 and Title 40, C.F.R. 261.3, 215eq.

It is not clear what significance you attach to the fact that the wastewater from the facility would exceed the potable drinking water standards since the water would be injected into an exempt aquifer, i.e., one that is not a potential drinking water source. Moreover, it is misleading to imply that the project is a major source of these contaminants, since most concentrations are due primarily to the prevailing quality of the intake water from the limestone aquifer and to the concentrating effect of evaporative losses from the cooling tower.

**C. AES's EIS Contains Misleading and Inaccurate Information As To Potable Water Use**

**Comment.** This comment claims that the Draft EIS's discussion of potable water sources fails to state that the Board of Water Supply has declined to accept HECO's proposed water exchange because it considers HECO's Waiau wells to be "at risk" of contamination. It asserts that it is, therefore, inappropriate to conclude that the Board of Water Supply will make water available to AES. Based on this position, it concludes that the EIS needs to address alternative sources of water for its generation

of steam, including the desalination of water taken from the upper aquifer.

**Response.** To the best of our knowledge, the Board of Water Supply (BWS) has not rejected the proposed water exchange. Section 3.2.2 of the Draft EIS states that "a joint agreement is currently (emphasis added) being negotiated among the BWS, HECO, and Campbell Estate." That statement was true at the time the Draft EIS was published, and telephone conversations with representatives of HECO, the Board of Water Supply, and the Campbell Estate indicate that, as of this date, it is still true.

At the same time, your statement that use of the Waiau tunnel water is not assured is correct. An agreement between the Board of Water Supply and HECO or between the Board of Water Supply, HECO, and the Campbell Estate needs to be executed before this will be true; some long-term assurance of the quality of the source may be required to obtain the BWS's approval.

If the proposed agreement is consummated in something like its present form, the 4- to 5-million gallons per day Waiau Tunnel flow, which is now used exclusively for cooling purposes and then discharged into Pearl Harbor, will be added to the BWS's total supply. Under the proposed agreement, some of this will be earmarked for the AES Barbers Point and Kalaeloa power plants, some may be designated for use by the Campbell Estate, and the balance will be used to satisfy other BWS or HECO needs. The tunnel flow far exceeds the combined needs of the AES and Kalaeloa power plants, insuring that substantial amounts will remain for other uses.

**III. AES'S PROJECT FAILS TO FURTHER STATE ENERGY GOALS**

**Comment.** This comment asserts that the EIS "denigrates" alternate energy sources and renewable energy sources. It also states that the AES fails to accurately report that its project fails to further the State's goal of increasing Hawaii's energy self-sufficiency. Both assertions are incorrect.

**Response.** First, the DEIS does not "denigrate" any alternate energy source. It simply concludes that the alternative energy sources are either more expensive, not yet technically proven for commercial scale operation, unsuited to baseload power generation, or impossible to implement in time to forestall the need for the project proposed by AES Barbers Point.

Second, while we agree that diversifying the fossil fuel sources available to the island is not as desirable as developing indigenous energy sources, we strongly believe that it is better than continuing to rely on petroleum based fuels, the only fuel other than coal that will be available in sufficient quantities over the short term. This is significant because it means that HECO must rely upon them to meet its 1992 power generation requirements.

**Conclusion**

I hope the information provided above and in our meetings adequately addresses the concerns raised in your comment letter. If you would like to discuss the project further, please feel free to call me.

Sincerely,



Eric L. Miller  
 Assistant Project Director

Attachment 1  
 Anticipated Coal and Limestone Quality

cc: Office of Environmental Quality Control, State of Hawaii  
 Department of Transportation, State of Hawaii  
 Mr. Perry White, Belt Collins & Associates

ANTICIPATED COAL QUALITY

PINANG COAL

Total Moisture	13.5%	
Proximate Analysis (Air Dry Basis)		
Moisture	10.0%	
Ash	7.0%	
Volatile Matter	37.5%	
Fixed Carbon	45.5%	
Total Sulphur	0.4%	
Calorific Value		kcal/kg
Gross Air Dry	6250	
Gross As Received	6000	
Net As Received	5750	
Hardgrove Grindability Index	45	
Ash Fusion Temperature		0 deg. C
Reducing Atmosphere		0. deg. C
Deformation	1150	
Spherical	1210	
Hemispherical	1310	
Flow	1350	
Oxidizing Atmosphere		0. deg. C
Deformation	1200	
Spherical	1250	
Hemispherical	1350	
Flow	1400	
Ash Analysis		
SiO <sub>2</sub>	37.0%	
Al <sub>2</sub> O <sub>3</sub>	20.0%	
Fe <sub>2</sub> O <sub>3</sub>	16.8%	
CaO	8.8%	
MgO	5.8%	
TiO <sub>2</sub>	0.6%	
Na <sub>2</sub> O	2.8%	
K <sub>2</sub> O	0.9%	
Mn <sub>3</sub> O <sub>4</sub>	0.1%	
P <sub>2</sub> O <sub>5</sub>	0.5%	

S03	6.8%
Swelling Index	1
Chlorine	<0.01%
Ultimate Analysis	
MgO	8% max.
TiO2	1% max.
K2O	2% max.
Na2O	3.5% max.
Combination of K2O and Na2O	5% max.
S03	1% max.
P2O5	1% max.
Trace elements (ppm in coal)	
Lead content	34. max.
Beryllium content	1.5 max.
Fluorine content	7.5 max.
Cadmium content	0.35 max.
Manganese content	35 max.
Magnesium content	0.5 max.
Molybdenum content	3. max.
Selenium content	0.1 max.
Vanadium content	30. max.
Chromium content	12.5 max.
Arsenic content	6. max.
Mercury content	0.3 max.
Nickel content	25. max.

ANTICIPATED LIMESTONE QUALITY

Calcium Carbonate	95% min.
Magnesium carbonate and inert materials	3% max.
Moisture content	2% max.
Delivered size	98% less than 20 mm
Fines	15% max.

ALAN C. ZIEGLER, Ph.D.  
Zoological Consultant

45-636 Lulu Place  
Kine'ohu, Hawaii 96744

14 April 1989

Mr. Calvin Ching  
Zoning District Changes Branch  
C & C Department of Land Utilization  
650 S. King Street  
Honolulu, Hawaii 96813

Dear Mr. Ching,

Thank you very much for the most helpful information you gave me this afternoon in our telephone conversation concerning the status of a State Special Use (or similar) Permit for which Applied Energy Services-Barbers Point, Inc., has applied in regard to their proposed routing of a conveyor belt through Agricultural-zoned land within Campbell Industrial Park.

My concern involves the possible impact of the conveyor belt on a remnant area of sink holes in the area immediately west of the "Poverline Road" and north of Malakole Road. A number of us who have visited and studied this sink hole area during the past several years hope that it can eventually be saved as a combination Park and Science Reserve, described and mapped in the attached MEMORANDUM of 8 November 1988, which was prepared at the request of Mrs. Jane Hong, Chair, City and County Board of Parks and Recreation.

A copy of pertinent testimony dated 3 January 1989 supporting City Council Resolution 88-476 urging study and acquisition of such sink hole areas is also attached for your possible interest.

I hope it may be possible to be sent any documents normally available to the public regarding the Permit mentioned above, and to be informed of the date of any public hearing relating to it. Thank you very much for your attention in this matter--and continued best of fortune in everything!!

Sincerely,

*Alan C. Ziegler*

Alan C. Ziegler

encls.

ALAN C. ZIEGLER, Ph.D.  
Zoological Consultant

45-636 Lulu Place  
Kine'ohu, Hawaii 96744

DATE: 3 January 1989

TO: Committee on Human Services, Neil Abercrombie, Chair  
SUBJECT: Testimony on City Council Resolution 88-476: Relating to Study and Acquisition of O'ahu Sink Holes

Telephone:  
(808) 247-5318

I would like to offer this testimony in general support of the Resolution. Last September, the Council passed Resolution 88-330, which primarily requested the State Department of Land and Natural Resources (DLNR) to conduct research on O'ahu sink holes. Responding to this earlier Resolution, DLNR Chairperson William Paty noted in his letter of early November to the Council that, although such study was certainly desirable, some research had already been done on sinkholes, and there were other types of archaeological sites that seemed in greater need of study. And in this regard he is probably correct.

Mr. Paty did, however, end his letter with a statement supporting the acquisition of an area containing sink holes and a representative sample of other types of Eva plain archaeological sites. In regard to this area, he added: "I do believe an appropriate goal would be active preservation - i.e., the development of an archaeological park."

I am in complete agreement with the preceding two quoted statements. The only sink holes in the State are apparently located on O'ahu. Here (notwithstanding a reference to the Kahuku area in Mr. Paty's letter), as far as I am aware, they are restricted to the emergent coral reef section that underlies the southwestern corner of the island, bounded by Pearl Harbor, Barber's Point, and Kahe Point, with an occasional sink appearing along the shore north to the vicinity of Wai'anae.

Although there were once thousands of sink holes in this reef area, I would estimate, in the last 15 years, greater than 90% of these have been destroyed by development, and most or all of the ones remaining are vulnerable to destruction by future construction projects. The greatest present problem is not to survey and study the few remaining sink holes before they are destroyed, but to permanently save a representative sample of these irreplaceable repositories of Hawaiian paleontological and archaeological materials so that they will always be available to everyone for educational and scientific purposes.

Fortunately, there is one such area of sink holes eminently suited--and still available--for such preservation. This excellent coral-reef sink hole aggregation, located in Campbell Industrial Park, is described and mapped in the attached 28 November 1988 MEMORANDUM, along with details of a possible public park and reserve that could be established there.

Thus, in regard to Resolution 88-476, I respectfully suggest that consideration might be given to deleting the portion of the request regarding research on sinkholes, and to slightly rewording the rest of the request so that the major thrust of the Resolution then becomes DLNR acquisition of the Campbell Industrial Park site mentioned above.

Thank you very much for the opportunity to present this testimony!

ALAN C. ZIEGLER, Ph.D.  
Zoological Consultant

45-536 Linds Place  
Kaneohe, Hawaii 96744

Telephone:  
(808) 247-5118

M E M O R A N D U M

DATE: 21 November 1988  
TO: Interested Folks  
FROM: Alan C. Ziegler

SUBJECT: Proposed Sinkhole Park at Campbell Industrial Park,  
'Ewa, O'ahu

The purpose of the proposed park is twofold: (1) to provide a landscaped picnic and rest area for employees of Campbell Industrial Park firms and the general public, and (2) to preserve an invaluable group of limestone sinkholes and their contained prehistoric bird bones for educational and scientific purposes.

The area involved, approximately eight acres in extent and zoned Agricultural, is a presently unused and unimproved remnant of a much larger area that the owner, Campbell Estate, set aside for stockpiled coral reef rubble dredged in construction of the nearby Deep Draft Harbor.

Although a wide swath through the central portion of this area has been bulldozed and the ancient raised reef and its sinkholes there covered with soil, on the exposed limestone surface of the remaining area, the openings of perhaps as many as 50 sinkholes of at least a yard in diameter--as well as a number of smaller sinkholes in earlier stages of development--are still evident.

The flask-shaped sinkholes, the deeper of which are up to at least ten feet, resulted from millennia of rainwater solution of the 120-thousand-year-old emerged coral reef, with concurrent partial filling by wind- and water-borne soil, with concurrent the Hawaiian Islands, such sinkholes have been found only in the southwestern portion of O'ahu.

In conjunction with Environmental Impact Statement studies carried out since the mid-1970's, excavations of the sinkhole deposits by several groups of university and museum scientists have yielded numerous scattered bones of a variety of extinct and extant native bird species, including such prehistoric birds as a flightless goose and rail, a long-legged bird-catching owl, and a Hawaiian eagle.

(MEMO: Sinkhole Park, A. C. Ziegler, 21 November 1988, page 2.)

In the last few years, with the permission of Mr. Walter Yoshimitsu, Campbell Estate Industrial Properties Manager, supervised educational field trips including sample excavations of bird bones have been taken by The Kanehameha Schools' Hui Lama, Hawaii Audubon Society, and Hawaii Nature Schools' Hui as by some City Council members, their staff, and media representatives. A DOE-sponsored tour for Leeward teachers is scheduled for next January, and the Moanalua Gardens Foundation has recently also expressed interest in a similar educational opportunity for its docents.

As shown on the attached map, the entire proposed park project would include both a central improved "Park", and a peripheral "Reserve" area. The Park portion would consist largely of a grassed lunch and leisure area with shade trees and accompanying picnic tables and benches (---there presently being no such inviting "green area" publicly available in this heavily industrialized area).

A small portion of the Park near its entrance, however, would be left unlandscaped as an educational device to show an area of small developing sinkholes in the exposed limestone reef substrate, as well as to allow examination (through a wire safety cover) of a fully developed sinkhole or two. The remaining unfilled sinkholes in this central area would have their ground openings covered by coral-reef boulders, both for safety reasons and to permanently mark their locations for possible future investigative purposes.

A prominently placed interpretive display board in the Park, would explain the original formation of the sinkholes, the buildup of their soil deposits, and their role in preserving the remains of the various kinds of birds that had died in them through many thousands of years, with a representative sample of identified excavated bones also shown.

The Reserve area--surrounding the Park on three sides and serving as a buffer zone between the adjoining abandoned industrial dumps, coral stockpile, and heavily used "Powerline Road"--would be fenced all around. It would remain unimproved, with its sinkholes left open and the several types of native, Polynesian, and historically introduced trees and smaller plants currently present allowed to continue to grow naturally.

Access to this Reserve area would be through normally locked gates for purposes of scheduled educational field trips and sinkhole excavations by school classes, local and visiting natural history groups, and university or other scientific researchers.

ALAN C. ZIEGLER, Ph.D.  
Zoological Consultant

45-636 Lulu Place  
Kaneohe, Hawaii 96744

Telephone:  
(808) 247-5318

3 April 1989

Mr. Eric Miller  
Applied Energy Services,  
Barber's Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller,

Thank you very much for the most useful information you provided me during our telephone conversation of earlier today regarding the Draft EIS for the Barber's Point Cogeneration Project, more specifically the proposed route of the covered conveyor immediately north of its passage over Malakole Road, in the vicinity of Hanua Street and "Powerline Road".

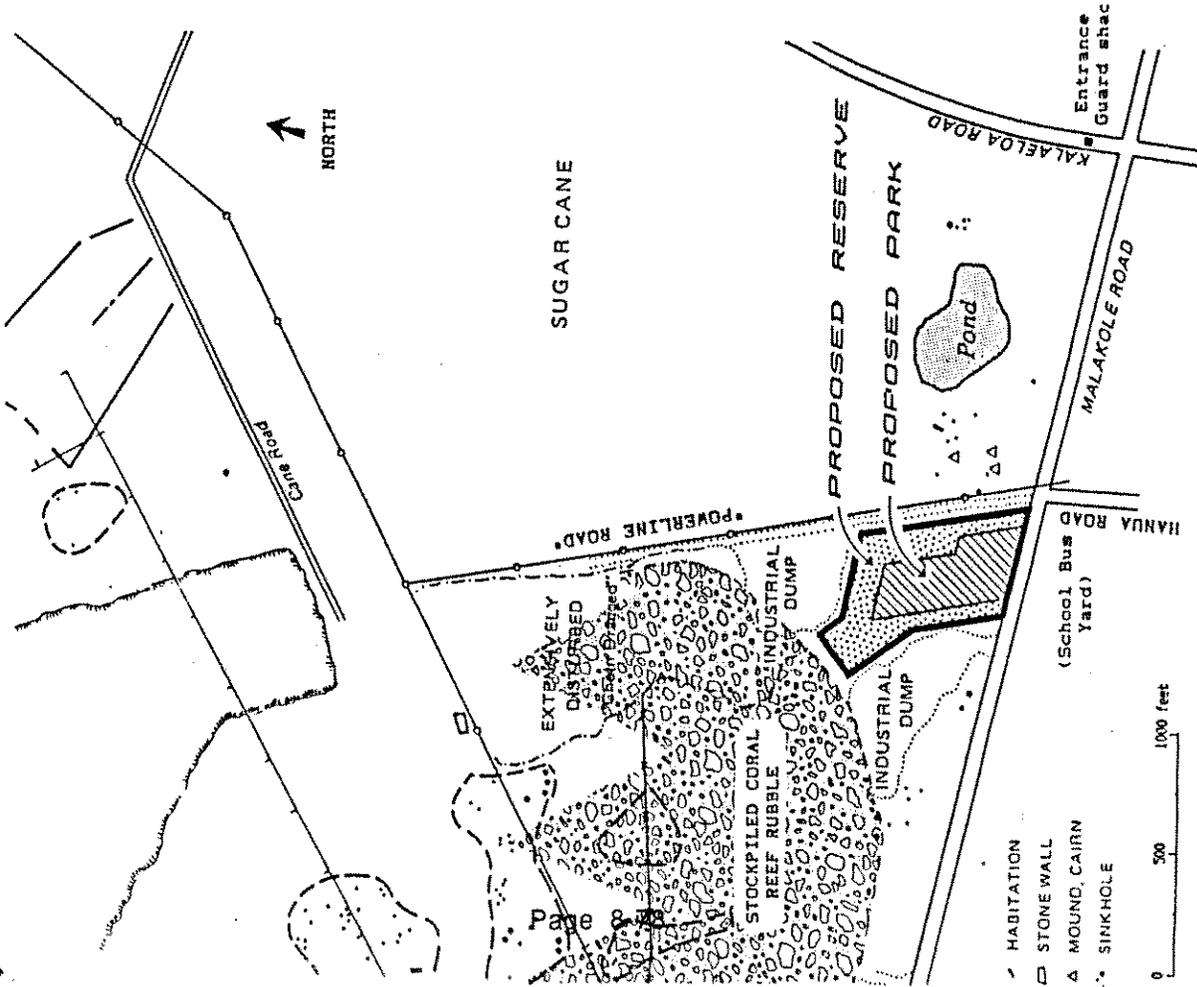
For your possible interest I have enclosed here a copy of a 21 November 1988 MEMORANDUM, prepared at the request of Mrs. Jane Hong, Chair, City and County Parks Advisory Board, regarding a possible future Park and Science Reserve in the area of fossil bird bone sink holes that will apparently be traversed by the proposed Cogeneration Project conveyor. There is also a copy of my testimony of 3 January 1989 given in support of Council Resolution 88-476 relating to study and acquisition of such educationally valuable sink holes. (I have also provided Mr. Perry White of Belt Collins and Associates, who originally referred me to you, copies of the same materials for possible use in preparation of the final EIS.)

I hope that it might be possible to meet with you either tomorrow or soon thereafter to compare and mark the pertinent maps together to see if there could be problems in assuring "peaceful coexistence" of the conveyor and a possible bird sink park in the area, and how best to alleviate any that might potentially arise.

Again, many thanks for all of your assistance. As I mentioned on the phone, the field trips are still on for this coming Saturday and Sunday mornings beginning at 9:00 a.m. at the Campbell Industrial Park guard shack on Kalaiea Blvd., and we would be most happy to have you along if you would care to see and try a short dig in the sink holes. All the best!!

Sincerely,  
*Alan C. Ziegler*  
Alan C. Ziegler

encls.



Base map from Bishop Museum data;  
amalgamations by A.C. Ziegler, Nov. 1988

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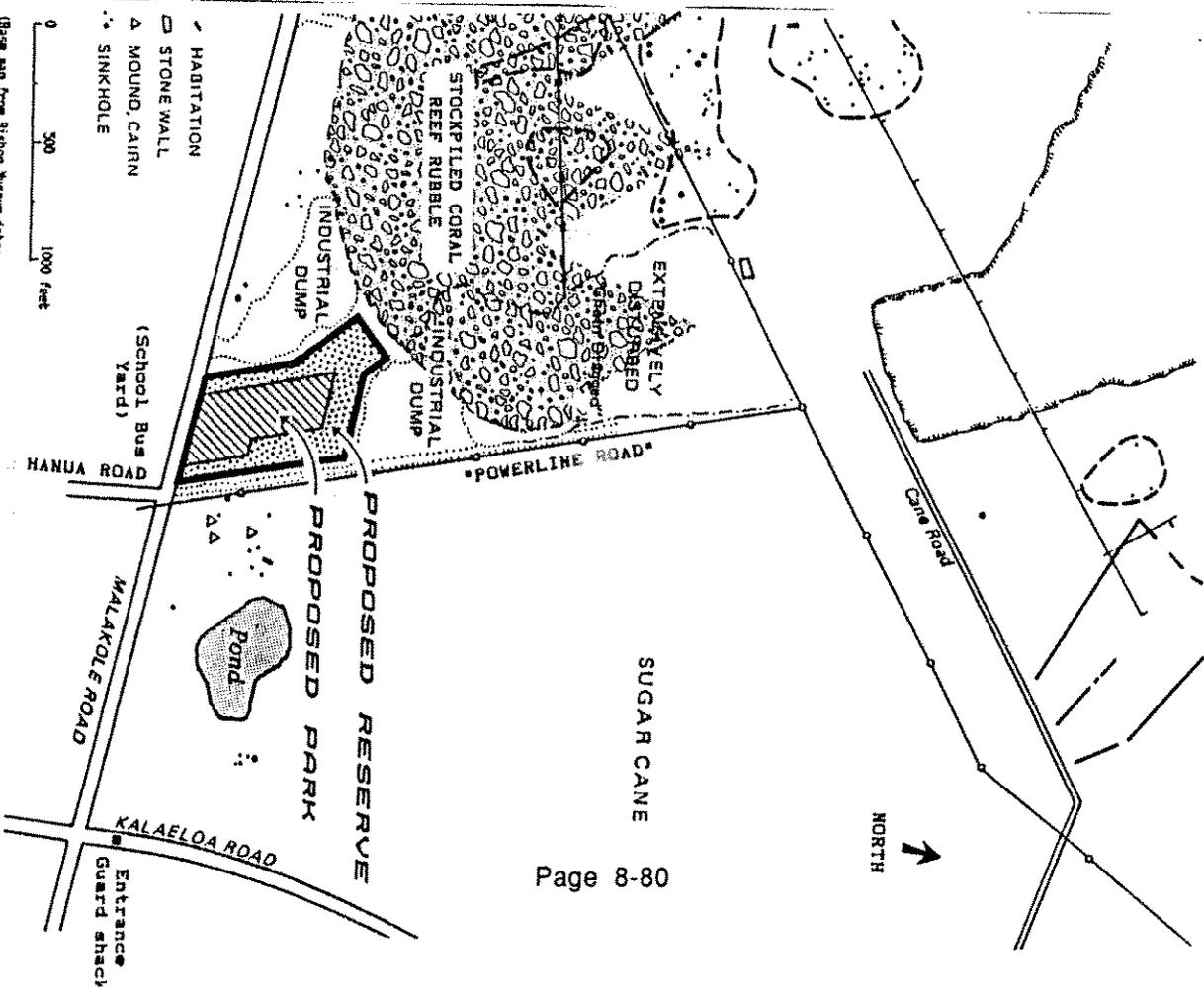
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• • •



Base map from Bishop Museum data; annotations by A. C. Ziegler, Nov. 1988

ALAN C. ZIEGLER, Ph.D.  
Zoological Consultant

45-636 Lulu Place  
Kaneohe, Hawaii 96744

Telephone:  
(808) 247-5318

DATE: 3 January 1989

TO: Committee on Human Services, Neil Abercrombie, Chair

SUBJECT: Testimony on City Council Resolution 88-476: Relating to Study and Acquisition of O'ahu Sink Holes

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ALAN C. ZIEGLER, Ph.D.  
Zoological Consultant

45-636 Lulu Place  
Kaneohe, Hawaii 96744

Telephone:  
(808) 247-5318

M E M O R A N D U M

DATE: 21 November 1988

TO: Interested Folks

FROM: Alan C. Ziegler

SUBJECT: Proposed Sinkhole Park at Campbell Industrial Park,  
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ALAN C. ZIEGLER, Ph.D.  
Zoological Consultant

45-636 Luia Place  
Kāne'ohe, Hawai'i 96744

Telephone:  
(808) 247-5318

5 April 1989

Mr. Eric Miller  
Applied Energy Services,  
Barber's Point, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawai'i 96813

Dear Mr. Miller,

Thank you very much for the most useful information you provided me during our telephone conversation of earlier today regarding the Draft EIS for the Barber's Point Cogeneration Project, more specifically the proposed route of the covered conveyor immediately north of its passage over Malakole Road, in the vicinity of Hanua Street and "Powerline Road".

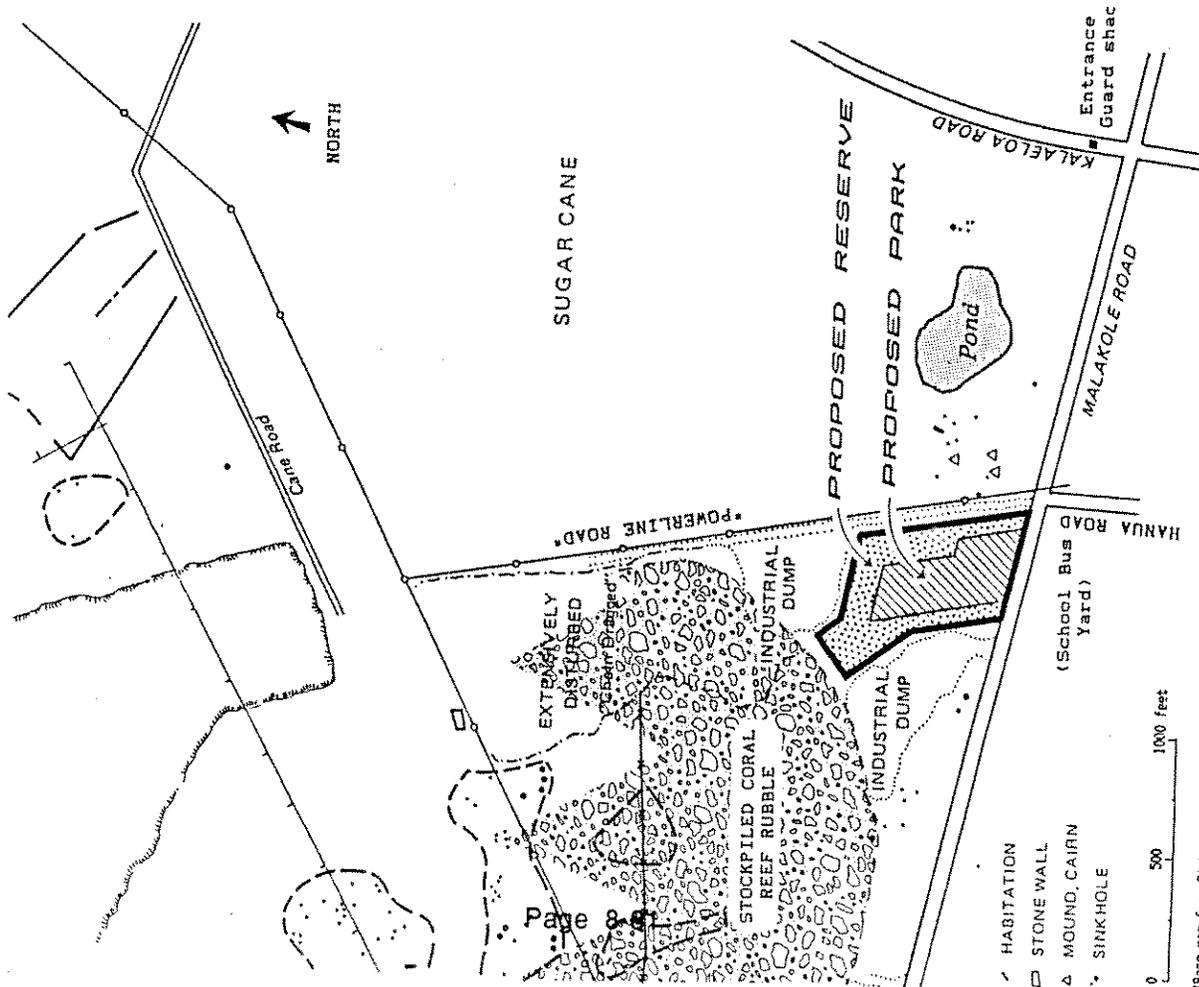
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Again, many thanks for all of your assistance. As I mentioned on the phone, the field trips are still on for this coming Saturday and Sunday mornings beginning at 9:00 a.m. at the Campbell Industrial Park guard shack on Kalaeloa Blvd., and we would be most happy to have you along if you would care to see and try a short dig in the sink holes. All the best!!

Sincerely,  
*Alan C. Ziegler*  
Alan C. Ziegler

encls.



(Base map from Bishop Museum data; alterations by A.C. Ziegler, Nov. 1988)

May 31, 1989

Alan C. Ziegler, Ph.D.  
Zoological Consultant  
45-636 Liula Place  
Kaneohe, Hawaii 96744

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

Dear Dr. Ziegler:

Thank you for your April 15, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate your interest in the project and hope you agree that the following measures will adequately protect the sinkholes.

#### Background

The discussion of impacts on historic, archaeological, and paleontological remains contained in the Draft EIS was based on opinions expressed by the Historic Sites Section of the State Department of Land and Natural Resources (DLNR) in its response to the EIS Preparation Notice. Following publication of the Draft EIS, it became apparent that the Department's previous comments were applicable only to the power plant site, not to the conveyor route. As soon as you brought the sinkhole park issue to our attention, we met with you and Dr. Joyce Bath of the DLNR's Historic Sites Section to work out a modification to our conveyor that would avoid destroying these sinkholes.

Alan C. Ziegler, Ph.D.  
May 31, 1989  
Page 2

On Saturday, April 15, 1989, Mr. Perry White of Belt Collins & Associates and I accompanied Dr. Bath on a field trip to Campbell Industrial Park. During the trip we walked the conveyor route and discussed appropriate means of avoiding adverse impacts on the archaeological and paleontological resources present there. Subsequently, we discussed the issue with representatives of the James Campbell Estate, which owns the land on which the sinkholes are located, and with the project's conveyor consultants. Based on these discussions, we have concluded that the conveyor can be realigned as shown on the attached map.

#### Revised Conveyor Alignment

The new conveyor alignment shown in Attachment 1 completely avoids the area north of Malakole Road that you and the City Council have indicated an interest in incorporating into a future educational park. Because of the presence of the 30- to 40-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated into an archaeological/paleontological science reserve. However, AES Barbers Point has agreed to keep the conveyor elevated in this area and to design the support structures for the conveyor so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that neither the sinkholes nor the valuable paleontological remains which they contain are accidentally damaged by construction equipment.

On May 4 I wrote a letter to DLNR outlining this proposal. On May 23, Dr. Bath indicated that this approach would be acceptable.



May 4, 1989

Dr. Joyce Bath  
May 4, 1989  
Page 2

Dr. Joyce Bath  
Archaeologist, Historic Sites  
Department of Land & Natural Resources  
State of Hawaii  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Subject: Realignment of AES Barbers Point Conveyor in Vicinity of  
Proposed Sinkhole Preserve and Park in Campbell  
Industrial Park

Dear Dr. Bath:

Thank you very much for taking the time to inspect our conveyor route in the area of the proposed sinkhole preserve. It is much easier to resolve these issues when we all have a common understanding of what is happening out at the site.

Based on our discussions on that trip, and further conversations with our conveyor consultant, we have realigned the conveyor as shown on the attached sketch.

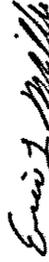
The new conveyor alignment completely avoids the area north of Malakole Road that the Honolulu City Council has indicated an interest in incorporating into a future educational park. Because of the presence of the 40 to 50-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated in an archaeological/paleontological science reserve. However, we will elevate the conveyor within the preserve area and design the support structures so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that those sinkholes are not accidentally damaged by construction equipment.

A topographic survey is now being undertaken of the revised conveyor route. Dr. Ziegler has agreed to accompany the survey team to help identify significant sinkholes requiring preservation. This survey, with the located sinkholes, will be submitted to your office for approval prior to any construction or grading of the site. Once approved by your office, we will avoid all sinkholes identified on this survey and any outside the survey area but within the projected sinkhole preserve.

It is our understanding that the sinkhole park/preserve area represents the only area of concern with respect to historic sites along the conveyor route or on the plant site.

I hope this program will resolve any possible incompatibility between our conveyor and the proposed park/reserve. If you have any further questions or comments concerning this matter, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

Attachment

cc: Penny White, BSA



May 25, 1989

Ms. Susan A. Kusunoki  
Manager, State Governmental Activities  
Hawaiian Independent Refinery, Inc.  
P.O. Box 3379  
Honolulu, Hawaii 96842

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

Dear Ms. Kusunoki:

Thank you for your April 24, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s (AES-BP), proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. As you know, AES-BP has had several telephone discussions and a meeting with members of the PRI staff concerning the issues outlined in your letter, and have made a considerable effort to see if they could be resolved to HIRI's satisfaction.

The efforts that AES-BP has made to insure that the proposed conveyor does not adversely affect access to the harbor are summarized below. They do not provide all of the benefits requested in your letter, but I believe they do insure that HIRI will not find it unduly difficult to continue to use the harbor for the occasional handling of oversized equipment.

Basis of Clearance Proposed for Conveyor Over Malakole Road

As stated in the Draft EIS, the proposed conveyor will provide approximately 25 feet of clearance over Malakole Road, not the 20 feet mentioned in your letter. This is 50 percent greater than the State Department of Transportation's 17-foot design standard, albeit somewhat less than the 40 feet requested in your letter. The 25-foot height

Ms. Susan A. Kusunoki  
May 25, 1989  
Page 2

was selected specifically to minimize potential adverse effect on Malakole Road traffic, and it matches the design clearance standard being used within the deep draft harbor itself.

Based on information provided by HIRI engineers, it appears that despite the above-standard clearance that is being provided, the proposed conveyor may limit HIRI's ability to transport oversized pieces of equipment between the harbor and its refinery along Malakole Road. Your engineers indicated that such movements have occurred very infrequently in the past and noted that it was impossible to estimate their future frequency, or even to say with certainty that they would occur at all. Nonetheless, I understand your desire to keep the option open.

Evaluation of Alternatives Suggested By HIRI

Your letter indicated that any adverse impact on the refinery's future maintenance and expansion programs could be avoided if the conveyor were designed so that:

- (1) It could be dismantled where it crosses Malakole Road; or
- (2) It crosses under the existing road; or
- (3) There is a clearance of at least 40 feet between the road surface and the bottom of the conveyor.

These are among the possible alternatives that were jointly identified at our meeting with PRI staff. Unfortunately, as explained below, our subsequent analysis has indicated that they are infeasible for technical and cost reasons.

**Dismantling.** As indicated at our meeting with your staff engineers, it is technically possible to cut the belt, raise the belt and conveyor structure out of the way, move the oversized load beneath the raised structure, then replace and rejoin the segment. However, after studying this proposal, our conveyor consultant has concluded that this





# Hui Lama o Kamehameha

A HIKING AND ENVIRONMENTAL SCIENCE CLUB  
KAMEHAMEHA SCHOOLS • KAPĀLAMA HEIGHTS

Belt Collins & Associates  
Mr. Perry White  
860 Ala Moana Blvd., Suite 200  
Honolulu, Hawai'i 96813

Dear Mr. White,

It has been brought to my attention that a Draft Environmental Impact Statement was issued describing a steam and electricity cogeneration plant to be built and operated by Applied Energy Services-Barbers Point, Inc., at O'ahu's Campbell Industrial Park. As presently proposed, a covered conveyor belt system to carry coal fuel from the Deep Draft Harbor to a plant 1.5 miles to the south will pass through an area of numerous sink holes containing faunal deposits of prehistoric bird bones which are extinct and extant.

On September 27, 1986, Hui Lama, an environmental science club at the Kamehameha Schools, was fortunate to explore and conduct an archaeological research project to recover fossil bird bones that were deposited from prehistoric times in the many sink holes located in the now proposed area for the conveyor belt construction.

There are very few accessible areas on O'ahu and in the state of Hawai'i where students can visit in order to study the geology of "karst topography" and to see how prehistoric and modern birds were trapped in these wet and dry sink holes and later recovered by paleontologists. In the same area of Barbers Point are also the remnants of Hawaiian archaeological sites that students can observe and to which my students had visited several years ago. At these locations, students come to a realization and understanding of the natural history of Hawai'i's endemic bird evolution and its relationship to the early Polynesian impact upon the natural environment. Examples of these areas at Barbers Point must be protected and conserved for their rich educational offerings for all citizens of Hawai'i.

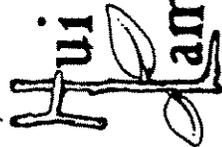
I strongly concur with the proposal as outlined by Dr. Alan Ziegler in his testimony to the City Council on Resolution 88-476: Relating to Study and Acquisition of O'ahu Sink Holes, to save this valuable sink hole site for a combination Park and Science Reserve.

Future students at all levels of education as well as the citizens who work and will be living in this community will enjoy and learn what my students have experienced in the study of sink holes and bird fossil bones of Hawai'i's historic past.

RECEIVED  
MAY 15 1989

BELT COLLINS & ASSOCIATES

HONOLULU, HAWAII 96817



# Hui Lama o Kamehameha

A HIKING AND ENVIRONMENTAL SCIENCE CLUB  
KAMEHAMEHA SCHOOLS • KAPĀLAMA HEIGHTS

HONOLULU, HAWAII 96817

Thank-you for your consideration of my concerns in this letter. Please contact me for further questions or any other contributions I could make to the final Draft Environmental Statement of the proposed coal fuel conveyor belt construction.

Sincerely,

Charles K. Burrows  
Hui Lama Advisor

encs.

Dr. Charles K. Burrows  
The Kamehameha Schools  
Kapalama Heights  
Honolulu, Hawai'i 96817

## THE 'EWA KARST

Ka Lae Loa, the long point, (Barbers Point) which reaches out to the southwest from Oahu's 'Ewa district, is an emerging coral reef, and is noteworthy as the largest natural area of this kind on Oahu. The geological term for this type of area is karst, which is a limestone area characterized by the development of solutional cavities, sinkhole caves, and underground streams.

Both prehistoric and historic observations of this area have been of a rough, barren, exposed area that was out of the way. It is supposed to be the place where human beings first landed on Oahu. These original settlers were called the *olohe*, a word which can be translated as "pale" or "white." Because of the many sinkhole caves in the area, the 'Ewa karst region was sometimes referred to as *ka-lua-oloho*, a word which can also mean "the barren pit."

A number of rare, endemic Hawaiian plants have been collected around Ka Lae Loa, but almost all of these are extinct in the area today. These plants include: an unnamed Hawaiian amaranth, the 'Ewa plains 'akoko, the *ko'olua'ula*, the Hawaiian pepperwort, a dwarf naupaka.

## ARCHAEOLOGICAL RESEARCH

More than a dozen separate archaeological projects have been conducted on the 'Ewa karst plain, but there are no readily available published reports on the results of these studies. The area has a wide range of site types, including coastal midden sites, small house sites and shelters, garden sites, human burial sites, fishing shrines, and sinkhole cave sites. The cave sites are perhaps the most interesting, because they often contain the bones of extinct, endemic Hawaiian birds. Thirty-two endemic species of land birds have been identified so far in cave deposits; including the *nene*: a large, flightless goose; an new kind of distinct Oahu goose; an Oahu hawk; a Hawaiian eagle; the coot and gallinule; a small Oahu rail; a large Oahu rail; an Oahu species of long legged owl; a giant crow; a crow with a high, arched bill; an Oahu thrush; the *elepaio*, the Oahu *o'o*; a new species of *o'o* found only on Oahu; the *Paila*; the Oahu Koa finch; the Oahu grosbeak finch; the giant Oahu grosbeak finch; the *o'u*; the ridge-billed finch; the *nukupu'u*; the Oahu warbler; the Oahu sickle-billed finch; the *amakihiki*; the *apanane*; the *i'iwi*; and four other species of finches. The study of such faunal deposits is a branch of archaeology called zoo-archaeology, and it is an important component

of archaeological research related to human ecology and cultural evolution. The faunal deposits also contain around 13 species of native Hawaiian land snails, including 9 extinct species.

## THE HUI LAMA PROJECT

The purpose of this investigation is to recover as many bird bones as possible. The project area is a small portion of Stockpile Area III which was used as a dumping ground for temporary storage of dredged coral rock during the construction of the Barbers Point Deep Draft Harbor. The area was the subject of three separate archaeological studies, and it was given archaeological clearance by both the Archaeological Research Center Hawaii and the Bernice Pauahi Bishop Museum. The area was completely bulldozed following the completion of the archaeological fieldwork in 1982. However, the coral stockpile, which reaches 50 ft. in height, did not completely cover Stockpile Area III, and there is a small corner area that is still exposed and where sinkhole caves are still accessible for study.

Hui Lama is a club at Kamehameha High School that focuses on hiking and camping and learning about Hawaii's natural history. It is affiliated with the Sierra Club's high school hikers program. The field crew for this project will consist of Hui Lama members, and a second reason for conducting this project is to give Hui Lama members a chance to take part in an archaeological research project.

The fieldwork will be conducted using appropriate field methods. Students will work in teams and be responsible for the excavation and recovery of bones from their respective cave sites. Insofar as possible, the fieldwork will be supervised by experienced archaeologists, who will be responsible for note taking, in order to save time. The deposits will be excavated using natural excavation units, approximately 1 m<sup>2</sup> in size, and in arbitrary 10 cm levels, except where natural levels or features are encountered. As much as possible, the digging will be done with hand trowels and the bones will be recovered as they are exposed. The dirt will also be sifted using 1/8 inch wire mesh, and both the fine fraction and the coarse fraction will be examined for bones. Soil samples will be taken at each site, in order to preserve samples for land snail analysis and other investigations that could be done in the future.

The main purpose of this project is just to recover bird bones before the few remaining sinkhole caves in Stockpile Area III are rendered inaccessible by construction at



May 25, 1989

Dr. Charles K. Burrows  
Hui Lama Advisor  
Lama O Kamehameha  
Kamehameha Schools  
Kapalama Heights  
Honolulu, Hawaii 96817

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

Dear Dr. Burrows:

Thank you for your April 28, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate your interest in the sinkholes and think you will be pleased by the steps we have taken to insure that they are not adversely affected by the proposed conveyor.

The discussion of impacts on historic, archaeological, and paleontological remains contained in the Draft EIS was based on opinions expressed by the Historic Sites Section of the State Department of Land and Natural Resources (DLNR) in its response to the EIS Preparation Notice. Following publication of the Draft EIS, it became apparent that the Department's previous comments were applicable only to the power plant site, not to the conveyor route. As soon as this was known, the situation was discussed with Mr. Alan Ziegler, the archaeologist who has been most active in efforts to establish an archaeological/paleontological preserve in the area, and with Dr. Joyce Bath of the DLNR's Historic Sites Section.

On Saturday, April 15, 1989, Mr. Perry White of Belt Collins & Associates and I accompanied Dr. Bath on a field trip to Campbell Industrial Park. During the trip we walked the conveyor route and discussed appropriate means of avoiding adverse impacts on the archaeological and paleontological resources present there. Subse-



1000 Bishop Street • Suite 810 • Honolulu, Hawaii 96813 • (808) 538-6346 • Telexcopier - (808) 538-3147

Dr. Charles K. Burrows  
May 25, 1989  
Page 2

quently, we discussed the issue with representatives of the James Campbell Estate, which owns the land on which the sinkholes are located, and with the project's conveyor consultants. Based on these discussions, we have concluded that the conveyor can be realigned as shown on the attached map.

The new conveyor alignment completely avoids the area north of Malakole Road that the Honolulu City Council has indicated an interest in incorporating into a future educational park. Because of the presence of the 30- to 40-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated into an archaeological/paleontological science reserve. However, AES Barbers Point has agreed to keep the conveyor elevated in this area and to design the support structures for the conveyor so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that neither the sinkholes nor the valuable paleontological remains which they contain are accidentally damaged by construction equipment.

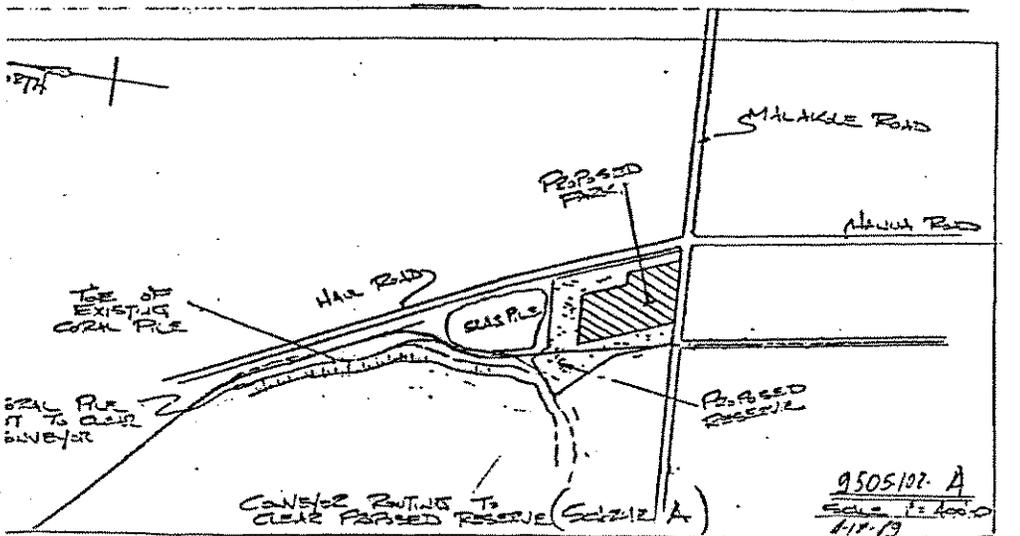
Thank you again for your interest in the project and for the time you took to express your concerns for the sinkholes. If you have any further questions or would like additional information, please call me at 538-6346.

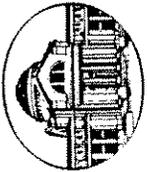
Sincerely,

Eric L. Miller  
Assistant Project Director

Attachment 1  
Map Showing Realigned Conveyor Route

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates





National Museum of Natural History • Smithsonian Institution  
WASHINGTON, D. C. 20560 • TEL. 202

U.S. GOVERNMENT PRINTING OFFICE  
MAY 1982

May 25, 1989

21 April 1990

Mr. Perry White  
Belt Collins & Associates  
860 Ala Moana Blvd., Suite 200  
Honolulu, HI 96813

Mr. Storrs L. Olson  
Curator, Division of Birds  
National Museum of Natural  
History - Smithsonian Institution  
Washington, D. C. 20560

Dear Sir,

With regard to the conveyor belt system that has been proposed for installation at Barbers Point in connection with an electricity generating plant, we would like to go on record as supporting any action that will preserve limestone sinks in this area, whether as part of a Park and Science Reserve or through other means. The limestone sinks at Barbers Point are of immense paleontological significance, as they have provided the only source of fossils documenting the prehistoric fauna of the island of Oahu. Too many of these sites, which are the valuable heritage of the people of Hawaii and of the world scientific community, have already been destroyed before they could be adequately studied. The preservation of remaining sites should receive the highest priority when planning any further development at Barbers Point.

Sincerely,

Storrs L. Olson  
Curator, Division of Birds

Helen F. James  
Museum Specialist

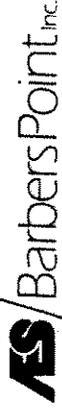
Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

Dear Mr. Olson:

Thank you for your April 21, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s, proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time you and Ms. James spent reviewing the document and preparing your comment letter.

The discussion of impacts on historic, archaeological, and paleontological remains contained in the Draft EIS was based on opinions expressed by the Historic Sites Section of the State Department of Land and Natural Resources (DLNR) in its response to the EIS Preparation Notice. Following publication of the Draft EIS, it became apparent that the Department's previous comments were applicable only to the power plant site, not to the conveyor route. As soon as this was known, the situation was discussed with Mr. Alan Ziegler, the archaeologist who has been most active in efforts to establish an archaeological/paleontological preserve in the area, and with Dr. Joyce Bath of the DLNR's Historic Sites Section.

On Saturday, April 15, 1989, Mr. Perry White of Belt Collins & Associates and I accompanied Dr. Bath on a field trip to Campbell Industrial Park. During the trip we walked the conveyor route and discussed appropriate means of avoiding adverse impacts on the archaeological and paleontological resources present there. Subsequently, we discussed the issue with representatives of the James Campbell Estate, which owns the land on which the sinkholes are located, and with the project's conveyor consultants. Based on these



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Mr. Storrs L. Olson  
 May 25, 1989  
 Page 2

discussions, we have concluded that the conveyor can be realigned as shown on the attached map.

The new conveyor alignment completely avoids the area north of Malakole Road that the Honolulu City Council has indicated an interest in incorporating into a future educational park. Because of the presence of the 30- to 40-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated into an archaeological/paleontological science reserve. However, AES Barbers Point has agreed to keep the conveyor elevated in this area and to design the support structures for the conveyor so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that neither the sinkholes nor the valuable paleontological remains which they contain are accidentally damaged by construction equipment.

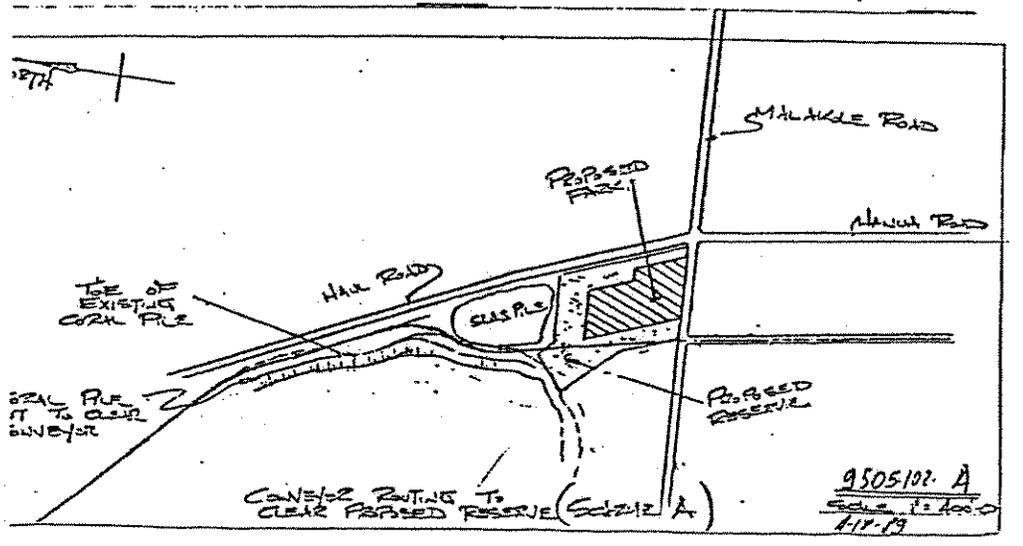
Please note that the portion of the conveyor route south of Malakole Road is within an existing roadway that contains no archaeological or other historic remains. As confirmed by Dr. Bath during our April 15th field trip, there are no sinkholes or archaeological remains within the area between the proposed science reserve and the harbor.

If you have any further questions or would like additional information, please call me at (808) 538-6346.

Sincerely,  
  
 Eric L. Miller  
 Assistant Project Director

Attachment 1  
 Map Showing Realigned Conveyor Route

cc: Office of Environmental Quality Control, State of Hawaii  
 Department of Transportation, State of Hawaii  
 Mr. Perry J. White, Belt Collins & Associates





April 3, 1989

Dr. Marvin T. Miura, Director  
Office of Environmental Quality Control  
465 South King Street  
Kekuaosoa Building, Room 104  
Honolulu, Hawaii 96813

Dear Dr. Miura:

Re: Draft Environmental Impact Statement  
AES Barbers Point, Inc. Proposed Coal-Fired Power Plant

We have reviewed the Draft Environmental Impact Statement (DEIS) for the AES Barbers Point, Inc. proposed coal-fired power plant. We are registering our objections to the location of the facility. We believe the Draft Environmental Impact Statement falls far short of the requirements set forth in Chapter 343 H.R.S. Further, based on the information contained in the DEIS, we must conclude that the proposed operations at the AES Barbers Point facility are incompatible with the use of three adjacent parcels of land. This letter explains the basis for our objections to the proposed facility location and identifies specific shortcomings with the DEIS.

#### Background

Pacific Allied Products, Ltd. is a kamaaina manufacturing facility located at Campbell Industrial Park. The company has been located in the Park since it opened in 1965. The company manufactures a wide variety of consumer products including packaging for the food handling industry and the medical industry. Needless to say, cleanliness is a critical factor in the manufacture of said products. The proposed location of the AES Barbers Point facility at a parcel directly adjacent to and upwind of Pacific Allied Products creates potentially serious environmental problems for our facility and could call into question whether Pacific Allied Products could continue to operate.

It should be noted that although Pacific Allied Products is directly impacted by the proposed AES Barbers Point facility, our firm was never consulted or notified of the AES Barbers Point project until we accidentally found out about the facility and contacted Mr. Eric Miller about our concerns.

(008) 692-2030 Campbell Industrial Park 91-102 B Kaomi Lp., Ewa Beach, Hawaii - 96707

POLYSTYRENE for insulation, construction, packaging, recreational products

#### Air Quality Impacts

The DEIS fails to adequately address air quality problems associated with the transportation, storage, burning and residue storage of materials which will be used at the site. These include coal, limestone and ash. Throughout the DEIS, reference is made to the use of a conveyor system or "in the event this proves impractical" the use of trucks. No where does the DEIS explain what constitutes "impractical" which would determine if trucks were used. Further, the DEIS does not address what would be the impact on ambient air quality and particulates if trucks were used.

No specific measures are provided of the increase in particulate counts which would be created by the conveyor system. Furthermore, page 1-26 says that the conveyor may be used by other Campbell plants to transport gypsum, cement, silica sand, and bulk grain. This causes grave concerns since there is no discussion in the DEIS of the air quality impacts from transport of these additional items. Furthermore, it is likely that airborne transport of these items by conveyor would have to be augmented by truck or tractor transport from the conveyor to the final destination. This would further aggravate the ambient air quality in and around Kaomi Loop and could prove disastrous for Pacific Allied's continued operation. We request that any conveyor system be limited to the use of AES Barbers Point materials exclusively.

Neither is any data provided on increased air particulates from outside storage of coal and limestone. The use of water sprays to "control the dust" as proposed in the DEIS are insufficient and unsatisfactory as already demonstrated by the experience of Hawaiian Cement in its efforts to control outside storage of limestone. The fact that AES would consider water sprays a satisfactory mitigating technique is particularly disturbing in light of the fact that emissions from facilities within Campbell, according to the DEIS, may exceed the available PSD increment for particulates. The fact that these outside storage areas would be directly upwind of two manufacturing firms who serve the food and beverage industry is especially disturbing and blatantly incompatible with the surrounding land use patterns.

As an alternative, the DEIS says "chemical sprays" may be used on the outdoor stockpiles of limestone and coal. No discussion is included of which chemicals might be used and what chemicals they would release into the air. Therefore, we are unable to determine from the DEIS if the cure would be worse than the problem they are trying to solve. We therefore request that the AES air quality permits not be issued until and unless AES Barbers Point consents to covered storage of all materials used at the site or agrees to relocate its facility to another site away from food, beverage, and medical related industries.

#### Water Quality Impacts

Location of the AES Barbers Point facility could adversely impact the quality of water used by Pacific Allied Products. Over 1 million gallons of water per year are used in the manufacture of consumer products at our facility. As stated previously, a number of these products are used by the food handling and medical industries. Many others, such as our cooler products, are used by households for food transport. Impurities in the local water system are removed or precipitated so that water can be used in our manufacturing facility.

We are concerned about the potential impact the AES Barber's Point facility will have on ground water in our area. Mention is made of a recycling facility for water from plant and equipment drains (page 1-21). However, no where is such a facility designated on the site maps nor is it mentioned or described elsewhere in the DEIS. Full recycling facilities should be a condition of plant permitting.

AES Barbers Point says they will use two existing drainage channels for surface runoff. At least one of these drainage channels runs directly alongside the property of Pacific Allied. Another runs into a public park used by Pacific Allied employees and the general public. The DEIS does not address the likely chemical composition of drainage water from the AES facility and the potential impacts this discarded water may have on adjoining property.

#### Conclusion

We object strongly to the statement on page 3-44 of the DEIS that none of the existing or future land uses are particularly sensitive to the activities that would take place on the proposed AES site. As the above comments indicate, location of the AES facility at its proposed site would be incompatible with and directly contrary to current land uses for our site and we believe the other two adjoining sites. AES has admitted that the location of the third adjoining facility, Honomach, impedes good facility design. Until the issue of incompatibility between the proposed AES facility and three long-standing current residents of the Park is addressed, we request that State and County Departments hold all applicable permits in abeyance.

#### Emissions Impacts

As the DEIS states on page three, the proposed AES Barbers Point facility is a "significant new source of sulfur oxides, nitrogen oxides, and particulates." Five regulated pollutants from the proposed facility exceed the 100 tons per year criteria. Lead, beryllium, and sulfuric acid mist exceed the emission criteria. Estimated emissions of carbon monoxide, nitrogen oxides and sulfur dioxide far exceed admissible levels as shown on page 3-28 of the DEIS. Prevailing winds would bring these emissions directly over Pacific Allied Products adversely impacting the air used in production operations and breathed by the personnel of our facility.

The DEIS proposes the use of fabric filters (page 1-19) to control emissions. Fabric filters have proven to be unreliable in similar applications because of the tendency for such filters to catch fire. As a result of these concerns, a nearby facility (the H-power plant) chose to use the more widely acceptable scrubber and electrostatic precipitator technology. We believe that scrubbers and electrostatic precipitators are the best available control technology (BACT) and should, at a minimum, be mandated for the AES Barbers Point facility if it is built.

#### Noise Impacts

The DEIS acknowledges that AES Barbers Point will create "substantial amounts of noise." The DEIS further acknowledges that it will not meet all applicable State and County noise standards as currently configured. However, the DEIS does not state which State and County noise standards it may not meet, what decibel levels will exceed said standards, which three geographic areas will be above the 70 dBA level, and what specific mitigating techniques will be used. Until these issues are addressed, we cannot adequately assess the short range and long-range impacts this facility may have on the health and safety of the employees of Pacific Allied Products.

We note on pages 3-20 and 3-21 that the 70 dBA level would reach our property line and the 65 dBA would cover most of our operating facility. Pacific Allied Products is a relatively quiet operation. Noise problems are of particular concern to us because the AES plant would be operated continuously thereby providing no periods of noise relief for Pacific Allied personnel.

May 25, 1989

Pacific Allied Products further requests that it be notified if a Type I Conditional Use Public Hearing is scheduled so that our concerns and objections may be heard.

Thank you for giving us an opportunity to comment on the DEIS.

Sincerely yours,



Paul E. Smith  
President

cc: Mr. Perry White, Belt Collins & Associates  
Mr. Eric Miller, AES Barbers Point Project  
Mr. John Whalen, Department of Land Utilization  
Dr. John Lewin, State Department of Health  
Mr. Nelson Ho, Sierra Club  
Mr. Rick Scudder, Conservation Council of Hawaii  
Councilmember Leigh Wai Doo  
Mr. Howard Rubin, Gaspro

Mr. Paul E. Smith  
President  
Pacific Allied Products, Ltd.  
91-102b Kaomi Loop  
Ewa Beach, Hawaii 96707

Dear Mr. Smith:

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement

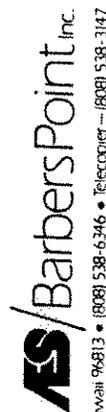
Dear Mr. Smith:

Thank you for your April 3, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s proposed coal-fired cogeneration facility. We and the Department of Transportation appreciate the time you and your staff spent reviewing the document. Item-by-item responses to your comments are as follows.

1. Comment. The EIS falls far short of the requirements set in Chapter 343, HRS. (Page 1, first paragraph, 3rd sentence)

Response. There is no overall substantiation of this assertion apart from the individual listing that follows. I hope the discussions which follow are satisfactory.

2. Comment. Cleanliness is a critical factor in the manufacture of Pacific Allied Products' products for the food handling and medical industries, and the proposed location of the AES Barbers Point facility creates potentially serious environmental problems for our facility. (Page 1, second paragraph)



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Mr. Paul E. Smith  
May 25, 1989  
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**Response.** Section 5.100 of the City & County of Honolulu Land Use Ordinance (LUO) states:

*"The intent of the I-1 Limited Industrial District is to provide areas for some of the industrial employment needs of rural and suburban communities. It is intended to accommodate light manufacturing, including handcrafted goods as well as "high technology industries" such as telecommunications, computer parts manufacturing, and research and development. Uses in this district are limited to those which have few environmental impacts and those which complement the development scale of communities they would serve."*

In contrast, the LUO states that the purpose of the I-2 Intensive Industrial District is:

*"...to set aside areas for a full range of industrial uses necessary to support the City."*

As you know, the James Campbell Industrial Park (JCIP) is zoned I-2, Intensive Industrial. AES Barbers Point's facility is consistent with this I-2 designation. Moreover, it serves an expressed public purpose. In view of this, the fact that the facility would meet existing federal, state, and city and county environmental standards (see below for further discussion), and the fact that there were already an oil refinery and other heavy industry within JCIP at the time you located there, we believe your objection to the proposed cogeneration project is unreasonable.

**3. Comment.** Our firm was never consulted or notified of the AES Barbers Point project until we accidentally found out about the facility and contacted Mr. Eric Miller (of AES Barbers Point) about our concerns. (Page 1, third paragraph)

**Response.** Several newspaper articles concerning AES Barbers Point's proposal have appeared in the Honolulu newspapers over the past year. An EIS Preparation Notice was published in the Office of Environmental Quality Control Bulletin on November 8, 1988. Represent-

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Page 3

tatives of AES Barbers Point met with you on Wednesday, March 16 and discussed many of the issues raised in your letter. It is unfortunate that you did not become aware of the project earlier, but it was not due to an attempt by the company to be secretive or to avoid full public discussion of the issues associated with the project.

**4. Comment.** The Draft EIS fails to adequately address air quality problems associated with the transportation, storage, burning, and residue storage of materials which will be used at the site. (Page 2, first paragraph)

**Response.** As a general statement, this is not correct. However, as indicated in the following items, the EIS's discussion of some of the issues raised in your letter deserves further elaboration. The Final EIS will contain expanded discussions of these items.

**5. Comment.** The Draft EIS is not sufficiently explicit in its discussion of the circumstances under which trucks would be used in lieu of a conveyor, and it does not adequately address the effect that their operation would have on ambient air quality and particulates. (Page 2, first paragraph, last sentence)

**Response.** At the time the Draft EIS was written, the use of a conveyor was contingent upon two factors. The first was the construction cost of the conveyor itself. The second was AES Barbers Point's ability to secure landowner and governmental approvals needed to construct and operate it. Since that time, the economic question has been resolved and it can now be said with some certainty that a conveyor will be used if the necessary landowner and governmental approvals are received. This means that trucks will only be used as the fundamental method of transporting materials between the harbor and the power plant site if the conveyor is disapproved.

Because of the low probability that truck transport will be employed, their effects on air quality were not addressed in the Draft EIS. Such a discussion has been added to the Final EIS, however. The analysis concludes that the use of trucks in lieu of a conveyor will increase the total particulate emissions from the project by about 10%.

Even with this increase, the project will not cause or contribute to any violations of air quality standards.

6. **Comment.** No specific measures of the increase in particulate count created by the conveyor system are provided. (Page 2, second paragraph, first sentence)

**Response.** This comment is incorrect. The conveyor that will be used will be the completely enclosed, continuous "pipe" design discussed in the Draft EIS; hence, no emissions will occur along the conveyor route. All emissions from the in-plant material handling system are included in the emission data contained in Table 3-15b, and were accounted for in the ambient air quality impact modeling.

7. **Comment.** There is no discussion in the Draft EIS of the air quality impacts associated with the transport of additional materials such as gypsum, cement, silica sand, and bulk grain. This discussion should include the transport of these materials from the conveyor terminus at the AES Barbers Point facility to their eventual destinations.

**Response.** As mentioned above, the enclosed pipe design completely encloses the material within the belt itself. This approach eliminates any possible dust emissions from the conveyor itself. This conclusion applies equally well to gypsum, silica sand, or other bulk materials. This conveyor design is routinely used for bulk transport where eliminating escaping dust is of primary concern.

With regard to the transfer of these additional materials to their final destinations, you are correct in asserting that the particulate impacts from these operations were not explicitly included in our analysis. However, the conveyor portion of this transport will not create any additional dust for the reasons discussed above, and as indicated on Table 3-15b, there are no annual particulate emissions from transfers after enclosure and dust collection by baghouses. The required permits for extensions of the conveyor are not being sought at this time and are likely to be undertaken by companies other than AES Barbers Point. In light of this, the discussion was included here and in the Draft EIS for general information purposes only. A more

comprehensive review of the impacts of any conveyor extensions will be provided at the time the necessary approvals are sought for these additions.

8. **Comment.** Data on increased air particulates from outside storage of coal and limestone is not provided.

**Response.** The statement is incorrect. The air quality impact analysis does include particulate emissions from the outside storage facilities (See, for example, items nos. 4, 8, 10, and 18 in Table 3-15b of the Draft EIS.)

9. **Comment.** Water sprays are not effective in controlling dust, as evidenced by the experience with Hawaiian Cement, and they should not be relied upon as an effective air pollution control strategy.

**Response.** In view of your experience with existing particulate emissions from the Hawaiian Cement facility, which is even closer to your facility than the proposed AES Barbers Point cogeneration plant, it is easy to understand your concern over possible adverse effects associated with the outside storage of materials.

It is our understanding that dust control sprays, enclosed chutes, and other measures proposed by AES Barbers Point are not routinely utilized at the Hawaiian Cement facility. The vast differences in the type of material handling systems employed by the two facilities make it difficult and inappropriate to use Hawaiian Cement as an indication of the impacts from our facility. The following discussion of the dust control measures employed by the project will be inserted into Section 3.4.6.3 of the Final EIS.

Table 3-15b of the Draft EIS shows in detail the types of dust control measures employed by the project. The removal efficiencies are based on Environmental Protection Agency (EPA) Publication AP-42 which specifies the expected control efficiency of individual technologies for use in air quality monitoring. Note that virtually all dust is recovered from the conveyors, transfers, crushers and other loading systems.

In addition to the controls applied to the movement of material into the plant, there are numerous operating procedures that will be utilized to control dust from the material storage piles. These procedures include compacting the surface of the piles with heavy equipment to minimize any loose material which could blow off of the pile and orienting the piles and recovery areas so as not to be in the direct line of wind. Finally, the routine consolidation and other nonessential movement of material can be limited during extreme wind conditions.

In addition to these operating procedures, water sprays and other surfactants are quite effective in controlling dust from material storage areas. Wet suppression on the material storage area controls at least 50% of the dust otherwise generated. More advanced control methods such as surfactants and crusting agents are also available and can control 90-100% of dust emissions.

Surfactants are nontoxic foams which bind to small particles and make them too heavy to be carried by wind. The surfactants are applied in an enclosed system before the material is placed on the pile and adhere immediately to the small particles. Thus, no free sprays of the surfactant are exposed to be carried by the wind.

Crusting agents (such as latex foams) are sprayed on the pile and form a hard surface resistant to rain and wind. The shell created by these agents last for up to one year between applications. Because they are long lasting, they can be applied during low wind conditions when carryover of the sprays will not occur.

Both products are nontoxic and approved for these applications by the EPA. A summary brochure has been attached which discusses some of these products.

The best combination of all the above options depends on numerous factors, including wind and rain conditions, the moisture content of the material as it arrives, and the volume of material at the site at any given time. These types of material storage areas are routinely located in developed areas (not infrequently adjacent to residential areas) with-

out adversely impacting adjacent landowners. Finally, the coal we will be receiving from Indonesia is very low in dust compared to many coals (including the coal assumed in developing Table 3-15b). The combination of this low dust coal and the numerous control options discussed above will achieve a high degree of dust control.

**10. Comment.** The proposed use of water sprays to control dust is particularly disturbing in view of the fact that emissions from facilities within (JCIP) already may exceed the prevention of significant deterioration (PSD) increment for these facilities.

**Response.** As discussed above, the project will utilize numerous highly effective dust control procedures. In addition, as indicated in the Draft EIS, the air impact modeling performed indicates that the project will not cause any increase in the number or magnitude of these violations.

Modeling, based on the maximum permitted emission rates from all projects in JCIP, including H-POWER and AES Barbers Point, indicates that all air quality standards are met on your plant site. The maximum particulate levels at your facility are predicted to be approximately 70% of the maximum PSD increment and ambient standards. It should be emphasized that these standards are set at a level to protect the most sensitive persons in the population (chronic asthmatics) from any adverse health impacts. If the result of this modeling is inconsistent with your experience, industries within the JCIP may be producing emissions in excess of their permitted levels.

**11. Comment.** Locating the proposed storage areas directly upwind of two manufacturing firms which serve the food and beverage industry is blatantly incompatible with surrounding land use.

**Response.** Ambient air quality standards, with which the proposed facility will comply, are designed to protect the most sensitive uses. Hence, there does not appear to be a sound scientific basis for your assertions. If you believe that Pacific Allied Products' operations require greater protection than that provided by adherence to State and Federal standards, the responsibility for providing the necessary filtra-

tion must rest with your company. If this is not possible, relocation to an area more suitable to your needs should be considered. Choice of a location with I-1 zoning, for example, would provide the level of protection you appear to be requesting in an I-2 District.

**12. Comment.** "Chemical sprays" are offered as an alternative means of controlling dust. The Draft EIS does not indicate which chemicals would be used and to what extent they would be released into the air. Hence, it is not possible to evaluate the extent to which they would affect nearby uses.

**Response.** Your comment is correct. The Draft EIS did not provide information on the types of surfactants that might be used to help control particulate emissions from the proposed facility. The discussion provided in the answer to question (9) will be added to the Final EIS.

**13. Comment.** Estimated emissions of carbon monoxide, nitrogen oxides, and sulfur dioxides far exceed admissible levels as shown on page 3-28 of the Draft EIS. Prevailing winds would bring these emissions directly over Pacific Allied Products, adversely affecting the air used in production operations and breathed by the personnel of our facility.

**Response.** This statement appears to be based on a misinterpretation of the information contained in Table 3-12 and is incorrect. The "significance" values given in the middle column of the table represent the levels which trigger a requirement for a PSD analysis, not admissible emission levels. Emission limits are reported in Section 3.4.4 of the Draft EIS.

**14. Comment.** Fabric filters have proven to be unreliable in similar facilities because of their tendency to catch fire. As a result of these concerns, the H-POWER plant chose to use the more widely acceptable electrostatic precipitators (ESPs) and scrubbers.

**Response.** Contrary to the statement made in your letter, fabric filters have not proven to be unreliable, and that is not the reason why ESPs and scrubbers were chosen for the H-POWER facility.

Fabric filters have proven extremely reliable in controlling dust, and are the preferred choice for circulating fluidized-bed boilers (CFB) both from a reliability and environmental control perspective. These filters remove over 99.9% of all dust particles and are also effective at removing trace metals and other compounds. ESPs function in a similar range of efficiency but are very sensitive to variations in fuel quality and ash particle loadings. Also, ESPs are exorbitantly expensive, energy intensive, and require more land than fabric filters. Fabric filters have been installed in over 20,000 MW worth of power plants and are considered a mature, reliable and environmentally advanced technology.

As a result of all these advantages, EPA has certified fabric filters as the preferred choice for CFB boilers in all circumstances and does not require that ESPs even be considered as an alternative.

Scrubbers do not remove particulates; in fact, they create particulates which must then be removed by a fabric filter or ESP. Scrubbers are one effective means of removing sulfur and other related compounds from the flue gas. The CFB technology utilized by AES Barbers Point removes sulfur just as effectively as scrubbers by burning the coal in the presence of limestone in the boiler. The limestone reacts with the sulfur to form gypsum (calcium sulfate), the material used in making wallboard. This technology removes 90-95% of the sulfur, a similar efficiency to that of wet scrubbers. Through this approach, AES Barbers Point also avoids the complex, difficult to maintain, and expensive equipment required by wet scrubbers. CFB technology has the additional advantages of requiring less fresh water and avoiding the large quantities of wet sludge produced by scrubbers--a difficult waste disposal problem on an island with limited landfill capacity.

ESPs were chosen for the H-POWER facility because at the time the facility was designed, that was the best technology available. Since that time, fabric filters have advanced to the point that they provide equivalent or better environmental performance, are substantially more reliable, and cost less to construct operate than ESPs.

Mr. Paul E. Smith  
May 25, 1989  
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Scrubbers were used because the boiler technology commonly utilized for burning municipal waste does not utilize limestone within the combustion zone and so requires clean-up of the flue gas after combustion.

**15. Comment.** The Draft EIS does not indicate which State and County noise standards it may not meet, what decibel levels will be above the 70 dBA level, and what specific noise mitigation measures would be used. This would adversely affect Pacific Allied Products' personnel.

**Response.** This assertion is incorrect. Section 3.3.4.2 of the Draft EIS indicates that the preliminary analysis conducted using the conceptual facility design and worst-case assumptions concerning operational patterns and ignoring sound attenuation by intervening structures, could result in a violation of the State's 70 dBA standard. (The City & County noise standards are expressed as octave band limits rather than in dBA.)

AES Barbers Point's facility must and will comply with the State noise standards. The Draft EIS indicated a variety of measures which are available to it to accomplish this goal. The optimal methods will be identified during the final design of the facility and incorporated in the construction plans.

**16. Comment.** The AES Barbers Point facility would adversely affect the quality of the water used by Pacific Allied Products. Full recycling facilities should be provided.

**Response.** The comment does not describe the manner in which you anticipate the AES Barbers Point facility will adversely affect the water used in your operation. As discussed in Section 3.2.4 of the Draft EIS, the available evidence indicates that such a causal link does not exist.

It is our understanding that the water used by your facility is drawn from the Board of Water Supply system. This water originates in the island's basal lens and is pumped from wells far from the project site. The water that would be used for cooling is from the upper layer

Mr. Paul E. Smith  
May 25, 1989  
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of the limestone aquifer, and its withdrawal and reinjection would not affect the basal lens.

**17. Comment.** We object strongly to the statement that none of the existing uses would be adversely affected by the proposed facility. The proposed project is incompatible with Pacific Allied Products' operation.

**Response.** The air quality impact analysis indicates that the proposed facility would comply with all existing ambient air quality and emission standards. Your letter does not demonstrate that the satisfactory operation of Pacific Allied Products' business requires air with higher quality than that; hence, we believe the conclusion reached in the EIS is correct.

Thank you again for the time that you spent reviewing the Draft Environmental Impact Statement. If you have any questions or would like additional information, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

Attachments

- (1) EPRJ article, "Fabric Filter Technology for Utility Coal-Fired Power Plants"
- (2) Brochure on surfactants

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates



<b>SUBJECTS</b>	Particulate control / SO <sub>x</sub> control / Air quality
<b>TOPICS</b>	Air pollution control Particulates Coal-fired boilers
<b>AUDIENCE</b>	Fabric filters Baghouses Technology assessment Generation operators / Environmental managers

## Fabric Filter Technology for Utility Coal-Fired Power Plants

A Series of Articles Reprinted From the *Journal of the Air Pollution Control Association*, January-June 1984

## Fabric Filter Technology for Utility Coal-Fired Power Plants

A Series of Articles Reprinted From the *Journal of the Air Pollution Control Association*, January-June 1984

This comprehensive series of articles published in 1984 offers new data from EPRI research on baghouse technology. In addition to discussing some of the unresolved issues affecting design and operation, the articles also consider reverse-gas and shake/deflate cleaning methods as well as RD&D plans.

### BACKGROUND

In 1973 the first full-scale baghouse was installed in a utility setting. Today more than 110 baghouses with a total of more than 20,000 MW of generating capacity are in operation, being designed, or under construction. Baghouses have demonstrated excellent success in controlling total, and fine-particulate matter, routinely filtering fly ash at collection efficiencies of 99.9% on pulverized-coal-fired utility boilers. Additionally, they have achieved stack opacities well below 5% (clear stack) and have produced outlet concentrations as low as 0.005 lb/10<sup>6</sup> Btu. Today, except in unique situations, only baghouses and electrostatic precipitators have sufficiently high collection efficiencies to satisfy primary emission control regulations.

### OBJECTIVE

To provide, in a concise and convenient form, current data on baghouse design and operating parameters.

### APPROACH

Research at two EPRI-operated 10-MW pilot plants filtering fly ash from low- and high-sulfur coals, laboratory investigations, and supporting field tests on full-scale units provided the data for six articles published in the *Journal of the Air Pollution Control Association* between January and June 1984. Since EPRI anticipates a continued growth in the use of baghouses, it has reprinted this comprehensive series on fabric filter technology for distribution to all member-utility coal-fired power stations and home offices.

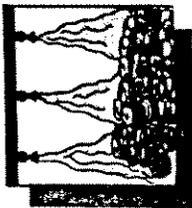
### KEY POINTS

The series includes the following six articles:

- "Utility Baghouse Design and Operation": This article discusses baghouse design and operation, utility boiler operation, fly ash characterization, and filtration mechanisms.

Prepared by  
Electric Power Research Institute  
Palo Alto, California

# AQUADYNE<sup>®</sup> FOAM SYSTEMS



## GENERAL DESCRIPTION

When a foaming agent is combined with water and air, the combination forms a micro-bubble that controls airborne dust with one-tenth the amount of water required with most surfactant systems. The expanded surface area of the foam provides greater contact with the airborne dust particles, because the foam has surface action wetting agent and water

in its formulation, the foam penetrates the dry dust particle making the particle too heavy to remain suspended in the air.

## ADVANTAGES

- Specially formulated for superior dust control performance
- Highly concentrated for economical usage
- Biodegradable
- Liquid - easy to use
- Compatible with other types of foam systems
- Safe - nonvolatile
- Ecological - eliminates pollution caused by airborne dust

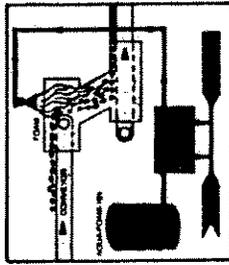
## APPLICATION

The Aquadome system is custom built to suit your needs. Controls can be provided for complete automation to allow the foam to be used only on running and loaded conveyor belts. The most advantageous point is to

add foam where the material is being transferred or moved. Conveyor systems for foam systems are available for the point of the inlet of crushers, dust collector discharge screw conveyors, feeder discharges and fly-ash discharges.

## AVAILABILITY

Aqua-foam is available in 55 gallon drums or bulk shipments. Different formulations are available to suit the needs of your present equipment or your Aqua-foam system.



# AQUADYNE<sup>®</sup> CRUSTING AGENTS



## GENERAL DESCRIPTION

Crusting agents when combined with water are sprayed on rail cars or coal piles to prevent loss of material due to wind or rain. The material when sprayed onto coal or other materials forms a crust approximately 1/4" thick and binds the outer layer together. This occurs within hours after the material is sprayed on. The crust

remains on the material for several months. The crust may be broken by the transferring of material through conveyor belt transfer points or by the wheels or tracks of the land moving equipment.

## ADVANTAGES

- Minimizes product loss in rail transit
- Greatly reduces environmental impact (wind and water erosion)
- Cost effective
- Safe - water based polymer
- Easy to apply

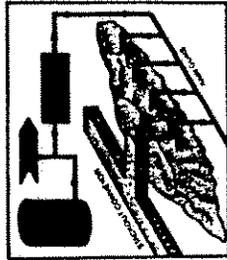
## APPLICATION

Complete custom systems are available from Aquadome for applying crusting agents. For rail cars, water and crusting agents are mixed through a small proportioning system and pumped through piping to the spray bar located over the moving rail car. For pile spraying, the crusting agent may be applied in several fashions.

The mix may be sprayed on the pile via a tank truck equipped with a high pressure spray pump or a series of stationary rain gun spray nozzles placed around the perimeter of the pile which will cover the entire pile surface.

## AVAILABILITY

The crusting agent is available in 55 gallon drums or bulk shipments. Different formulations are available to suit the needs of your material conditions and present equipment or your Aquadome system.





# University of Hawaii at Manoa

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Harbors Division  
State Department of Transportation  
79 South Nimitz Highway  
Honolulu, Hawaii 96813

Office of Environmental Quality Control  
465 South King Street, Room 104  
Honolulu, Hawaii 96813

April 24, 1989  
RE:0529

Dear Sirs:

Draft Environmental Impact Statement  
AES Barbers Point Inc., Coal-Fired Cogeneration Facility  
Ewa, Oahu

AES Barbers Point Inc. has signed a contract with Hawaiian Electric Company (HECO) committing it to construct a large coal-fired cogeneration facility (power plant) in Campbell Industrial Park. The power plant will be capable of supplying up to 180 megawatts of electricity to HECO and 30,000 pounds of steam per hour to the nearby Chevron Hawaiian Refinery. Major facility features include a 1.5 mile long conveyor to transport the coal; a power generation building housing the boilers, the steam turbines, and the generator; storage piles of coal, limestone, and the produced ash; a cooling tower; and injection wells. The Environmental Center has conducted a review of the Draft Environmental Impact Statement (EIS) with the assistance of Anders Daniels, Meteorology; John Burgess, Mechanical Engineering; Tom Giamballuca, Geography; and Randall Rush, Environmental Center.

### General Comments

Our reviewers have noted difficulties in verifying several facets of the proposed project due to the lack of substantiating documentation. In addition, a number of issues raised during the consultation phase appear to have been ignored or treated superficially in the Draft EIS. The most serious deficiencies are noted in the following comments. However, in view of the potential environmental impacts related to construction and operation of the proposed facility, and since the Draft EIS does not meet the content requirements specified in DOH Administrative Rules, Section 11-200-17, we suggest that a revised Draft EIS be prepared for this project.

A Unit of The University of Hawaii Research Center

AN EQUAL OPPORTUNITY EMPLOYER

### Quality

Table 3.16 correctly states that the Total Suspended Particulate (TSP) State Air Quality Standard (AQS) of 150 micrograms/cubic meters may only be exceeded once per year. However, this standard was exceeded 3 times in the last year it was monitored (1985). Thus, it would appear that the project will add to an already exceeded AQS level, yet the document states that "all State AQS are met" (p. 3-19). There is no modeling to substantiate this claim, and, in addition, no meteorological data are given on which to base a critique for PM-10.

In general, the meteorological assumptions in the Draft EIS are not consistently accurate. For instance, vertical mixing is probably limited by the radiation inversion that regularly develops in the area rather than by the trade wind inversion at 3-6 thousand feet characteristic of Lihue, Kauai.

Also there is no discussion of the land-sea breezes that can trap pollutants for days during low synoptic winds. Kona winds do prevail, occasionally for prolonged intervals and would blow pollutants inland to areas of new residential development.

Cited modeling (Section 3.4.2) appears to have been done for the years from 1968 to 1970. Why were years of adverse mixing conditions, (e.g. 1971, 1979) not included? In addition, the Draft EIS states that existing sources were modeled (Section 3.4.2), but no further information is provided to allow evaluation of the modeled calculations.

Some editing needs to be done on the table on page 3-29, which has a few figures located in the wrong columns.

### Noise Impacts

At present, Section 3.3.4.2, Operational Noise, fails to specify expected noise levels due to operation of the conveyor system along the region between the harbor and the plant.

The Summary of Proposed Noise Mitigation Measures, Section 3.3.4.3, notes that exhaust mufflers will be used on all internal combustion engines. There should be an additional provision that noise controls will meet State Vehicle Noise Regulations, regardless of whether the engines are moving or stationary.

"Quiet Fans" are specified for use within the cooling towers (Section 3.3.4.3). However, the term, "quiet," needs to be more precisely specified.

We strongly concur with the importance of using a high performance silencer on the boiler's induced draft fan exhaust ducts to eliminate pure tones created by the induced draft fan operation.

April 24, 1989

May 31, 1989

Injection Wells

Our reviewers were unable to verify the projected impacts of the discharged combined effluent (Section 3.2.4.4.) In general, it was felt that a great deal more information was needed to allow a comprehensive analysis of this aspect of the project. At a minimum, the bases for the estimated permeability coefficient, the dispersion anisotropy, and the head build-up are needed to substantiate the assertion of a lack of chemical and thermal impacts at the ocean interface. If dynamic modeling was used to arrive at the stated conclusions, what parameters and assumptions were employed, and how was the model constructed?

Archaeological Impacts

Although it is true, as DLNR has stated, that the surface in the area of the proposed project has been extensively disturbed, the area is well known for sinkholes, which are subsurface features of high scientific and archaeological value. Consequently, a science reserve and Sinkhole Park are being considered for the area by the Honolulu City and County Parks Advisory Board and the City Council. It appears that the proposed conveyor system would directly transect the proposed park. Alternative conveyor routes which avoid the proposed park and science reserve should be considered.

Natural Hazards

As pointed out by the Oahu Civil Defense Agency, the majority of the proposed facility is located within a tsunami inundation zone. What design contingencies have been made to prevent damage and loss of generating capacity in the event of a natural disaster of this sort?

We thank you for allowing us the opportunity to comment on this Draft EIS.

Yours truly,



John Harrison  
Environmental Coordinator

- cc: L. Stephen Lau
- Perry White
- Eric Miller
- Anders Daniels
- John Burgess
- Tom Giambelluca
- Randall Rush

Mr. John Harrison  
Environmental Coordinator  
Environmental Center  
University of Hawaii  
Crawford 317  
2550 Campus Road  
Honolulu, Hawaii 96822

Subject: AES Barbers Point, Inc. Coal-Fired Cogeneration Facility  
Comments on Draft Environmental Impact Statement  
Your Reference: RE-0529

Dear Mr. Harrison:

Thank you for your April 24, 1989, letter concerning the Draft Environmental Impact Statement (EIS) for AES Barbers Point, Inc.'s, proposed coal-fired cogeneration facility in Campbell Industrial Park. We and the Department of Transportation appreciate the time that you and other members of the University of Hawaii spent reviewing the document. At the same time, we must respectfully disagree with your contention that "a number of issues raised during the EIS consultation period appear to have been ignored or treated superficially in the Draft EIS," and that "the Draft EIS does not meet the content requirements specified in DOH Administrative Rules." Responses to the specific comments contained in your letter follow below.

A. Air Quality

(1) Comment. On the basis of monitoring data from 1985, it appears that the project will add to an already exceeded State Ambient Air Quality Standard, yet the Draft EIS states that "all State Air Quality Standards are met." Moreover, there is no modeling to substantiate this claim, and, in addition, no meteorological data are given on which to base a critique for PM-10.



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Response. As you stated in your letter, TSP levels in the vicinity of the proposed project have not been monitored since 1985. The monitoring was discontinued in order to convert the station to monitoring PM-10, the replacement particulate standard adopted by the Environmental Protection Agency (EPA). Because of discontinuance of TSP monitoring, existing ambient air quality levels were estimated using EPA approved dispersion models. This methodology is described in Section 3.4.3 of the Draft EIS and entailed compiling a comprehensive emission source inventory using the most recent data submitted to the Department of Health. As stated in the Draft EIS, the results of the modeling indicate that the proposed project would not result in or contribute to a violation of the State Ambient Air Quality Standards. The Final EIS will clarify the basis for the assertion that all air quality standards are currently being met.

The percent frequency of wind speed and direction are summarized in Table 3-11 of the Draft EIS. Because the document is intended for general circulation, it did not report the hour-by-hour data that was actually used in the modeling. Because of its bulk and the fact that it is of limited interest to most reviewers, such detailed data is not typically included in Draft EISs. As stated in Section 3.4.3.2 of the Draft EIS, the wind speed/direction data collected at the Barbers Point Naval Air Station between 1967 and 1971 was used for the analysis after being processed into the "CRSTR" format used by the models; the text will be revised to clarify the fact that 1967 and 1971 are included in the data set. A hard copy printout (or computer tape) containing this data is available from the National Climatological Center.

(2) Comment. In general, the meteorological assumptions in the Draft EIS are not consistently accurate. For instance, vertical mixing is probably limited by the radiation inversion that regularly develops in the area rather than by the tradewind inversion at 3-6 thousand feet characteristic of Lihue, Kauai.

Response. The Lihue data set years 1967-71 are the only available complete data set for modeling purposes. This data set has

been used in all previous air quality analyses of Campbell Industrial Park, including one funded by the EPA.

(3) Comment. There is no discussion of land-sea breezes that can trap pollutants for days during low synoptic winds. Kona winds do prevail, occasionally for prolonged intervals, and would blow pollutants inland to areas of new residential development.

Response. The data summarized in Table 3-11 of the Draft EIS reflect the fact that the tradewinds are not always present and that Kona and land-sea breeze patterns can direct pollutants towards inland areas. The brief discussion in paragraph 3.4.1.3 was not intended to replace the more complete picture provided by these data. The text of the Final EIS will note this.

(4) Comment. Cited Modeling (Section 3.4.3.2) appears to have been done for the years from 1968 to 1970. Why were years of adverse mixing conditions, (e.g., 1971, 1979) not included.

Response. Section 3.4.3.2 states that data collected between 1967 and 1971 was used in the modeling. This was intended to mean that five years of data collected from 1967 to 1971, inclusive, was used. The Final EIS will be revised to make it clear that five years of data, including data from the adverse mixing year of 1971, were employed.

(5) Comment. The Draft EIS states that existing sources were modeled (Section 3.4.2), but no further information is provided to allow evaluation of the modeled calculations.

Response. As indicated in the Draft EIS, baseline conditions were modeled using existing emission sources as part of the prevention of significant deterioration (PSD) analysis. As you know, developing the model inputs is a complex operation, and it did not appear to be appropriate to include a detailed description of it in the Draft EIS. However, the topic is addressed in the PSD application for the project. The complete application is available from the Department of Health.

(6) Comment. Some editing needs to be done on the table on page 3-29, which has a few figures located in the wrong columns.

Response. Thank you for calling attention to the misalignment of these columns. They will be corrected in the Final EIS.

#### B. Noise Impacts.

(1) Comment. The discussion of operational noise fails to specify expected noise levels due to operation of the conveyor system along the region between the harbor and the plant.

Response. The principal noise sources associated with the conveyor are located in the transfer stations at either end. Consequently, the discussion in the Draft EIS focused on these sources. The manufacturer of the "pipe conveyor" (which it is now known will be used) has provided data indicating that noise levels from intermediate portions of the conveyor will be barely audible as there are no intermediate transfers requiring motors or gearing, and the intermediate pulleys are enclosed ball bearings with permanent lubrication. As there is no noise producing equipment outside the plant site and harbor area, the conveyor will have no difficulty meeting existing noise standards.

(2) Comment. The Summary of Proposed Noise Mitigation Measures, Section 3.3.4.3, notes that exhaust mufflers will be used on all internal combustion engines. There should be an additional provision that noise controls will meet State Vehicle Noise Regulations, regardless of whether the engines are moving or stationary.

Response. The State Vehicle Noise Regulations are incorporated in the State Department of Health's Administrative Rules (Title 11, Chapter 42). These rules are intended to limit the maximum sound levels that can be emitted by vehicles using trafficways on the Island of Oahu; they are not applicable to stationary sources, such as diesel engine generators, that may be present on the power plant site. Moreover, because they differentiate between light and heavy trucks, between truck routes and non-truck routes, and between speeds, they cannot be readily translated into limits for stationary sources such as

those that will be present on the power plant site. Because of this, the vehicular noise limits are not being used as a design criteria for the proposed project. It will, of course, meet the noise limits specified in Title 11, Chapter 43, and in the City & County of Honolulu's Land Use Ordinance.

(3) Comment. "Quiet Fans" are specified for use within the cooling towers (Section 3.3.4.3). However, the term "quiet", needs to be more precisely specified.

Response. The term "quiet" refers to the NEMA "quieted" rating. To accomplish this, the number of blades and the efficiency of the blades are increased above typical equipment and allow the fans to operate at lower speeds, thus reducing the noise created.

#### C. Injection Wells

Comment. Our reviewers were unable to verify the projected impacts of the discharged combined effluent (Section 3.2.4.4). In general, it was felt that a great deal more information was needed to allow a comprehensive analysis of this aspect of the project. At a minimum, the bases for the estimated permeability coefficient, the dispersion anisotropy, and the head build-up are needed to substantiate the assertion of a lack of chemical and thermal impacts at the ocean interface. If dynamic modeling was used to arrive at the stated conclusions, what parameters and assumptions were employed, and how was the model constructed?

Response. The Draft EIS evaluates the effects of the proposed cooling water withdrawal and reinjection to the extent possible with the data now at hand. Additional information is needed to conduct the more comprehensive analysis that will be needed to obtain an underground injection permit for the project. Obtaining this information is the objective of the prototype source and injection well program that will be conducted for the second step of the Department of Health's injection well permit process. During those field tests, actual head build-ups will be measured in small-bore monitoring wells and in all nearby existing deep wells.

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The Draft EIS contains an approximation of drawdown (by the source wells) and build-up (by the injection wells) prepared, using groundwater flow equations for an unconfined aquifer for the supply wells and a confined aquifer for the disposal wells, permeability coefficients (as stated in the Draft EIS) computed from test data from the nearby H-POWER wells, and the assumption that flow to and away from these sources and disposal wells would be through an arc of 210 degrees. All of these assumptions are very conservative. (For example, data from the 1972 CONOCO tests and ongoing testing for the Kalaeloa power plant indicate that permeability is probably ten-fold higher than was assumed.)

Experience with numerous wells throughout the Hawaiian Islands indicates that the accepted mathematical formulas almost always overestimate actual drawdown when compared against actual field measurements, probably because the field-derived parameters used in math calculations are distorted by well face and near-field turbulence. The important point is that: (1) the calculations, which tend to be conservative, indicate that there will not be a problem and (2) field tests must and will be conducted to confirm this before the system is used. We do not believe it would be appropriate to do more extensive modeling until the results of the testing program are available.

Chemical and thermal effects at the "ocean interface" are very difficult to quantify. The precise location of the interface is not known; however, due to the depth of the receiving lower aquifer and the presence of an overlying aquiclude, the interface is expected to lie far offshore. The wastewater being disposed of is not hazardous and will be substantially diluted before entering the ocean. Once in the ocean, mixing will make the discharge untraceable. Because the heat will be discharged over a wide area, it will not produce a measurable change in ambient ocean water temperatures.

#### D. Archaeological Impacts

At the time the Draft EIS was prepared, AES Barbers Point was unaware of the interest in creating a science reserve and sinkhole park

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near the intersection of Hanua Street and Malakole Road. As a result of comments on the Draft EIS, the conveyor has been realigned. The route that is now proposed avoids the park, and no sinkholes will be filled. A more extensive discussion of this matter is contained in the attached letter to the State Department of Land and Natural Resources and their concurring response.

#### E. Natural Hazards

The map attached to the Department of Civil Defense's November 29, 1989, letter commenting on the EIS Preparation Notice for the proposed project is inaccurate. As indicated on the attached copy of the latest Flood Insurance Rate Map (FIRM) for the area (dated September 4, 1987), the project site is not within a tsunami inundation zone.

Thank you for the time that you and other members of the faculty spent reviewing the Draft Environmental Impact Statement. If you have any questions or would like additional information, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

#### Attachments

- (1) Letter to Dept. of Land & Natural Resources
- (2) Copy of portion of FIRM, Community Panel No.150001-0130-B
- (3) Dept. of Land & Natural Resources letter, May 23, 1989, to AES Barbers Point, Inc.

cc: Office of Environmental Quality Control, State of Hawaii  
Department of Transportation, State of Hawaii  
Mr. Perry J. White, Belt Collins & Associates

Dr. Joyce Bath  
May 4, 1989  
Page 2

May 4, 1989

Dr. Joyce Bath  
Archaeologist, Historic Sites  
Department of Land & Natural Resources  
State of Hawaii  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Subject: Realignment of AES Barbers Point Conveyor in Vicinity of  
Proposed Sinkhole Preserve and Park in Campbell  
Industrial Park

Dear Dr. Bath:

Thank you very much for taking the time to inspect our conveyor route in the area of the proposed sinkhole preserve. It is much easier to resolve these issues when we all have a common understanding of what is happening out at the site.

Based on our discussions on that trip, and further conversations with our conveyor consultant, we have realigned the conveyor as shown on the attached sketch.

The new conveyor alignment completely avoids the area north of Malakole Road that the Honolulu City Council has indicated an interest in incorporating into a future educational park. Because of the presence of the 40 to 50-foot high coral pile north of the proposed park and science reserve, it is necessary for the conveyor to pass over a corner of the area adjacent to the proposed park that Dr. Ziegler has recommended be incorporated in an archaeological/paleontological science reserve. However, we will elevate the conveyor within the preserve area and design the support structures so that no filling of sinkholes is required. Steel plates will be placed over sinkholes located near the support structures during the construction period to insure that those sinkholes are not accidentally damaged by construction equipment.

A topographic survey is now being undertaken of the revised conveyor route. Dr. Ziegler has agreed to accompany the survey team to help identify significant sinkholes requiring preservation. This survey, with the located sinkholes, will be submitted to your office for approval prior to any construction or grading of the site. Once approved by your office, we will avoid all sinkholes identified on this survey and any outside the survey area but within the projected sinkhole preserve.

It is our understanding that the sinkhole park/preserve area represents the only area of concern with respect to historic sites along the conveyor route or on the plant site.

I hope this program will resolve any possible incompatibility between our conveyor and the proposed park/reserve. If you have any further questions or comments concerning this matter, please call me at 538-6346.

Sincerely,



Eric L. Miller  
Assistant Project Director

Attachment

cc: Penny White, OCA

**PANEL 130 OF 135**

(SEE MAP INDEX FOR PANELS NOT PRINTED)



PANEL LOCATION

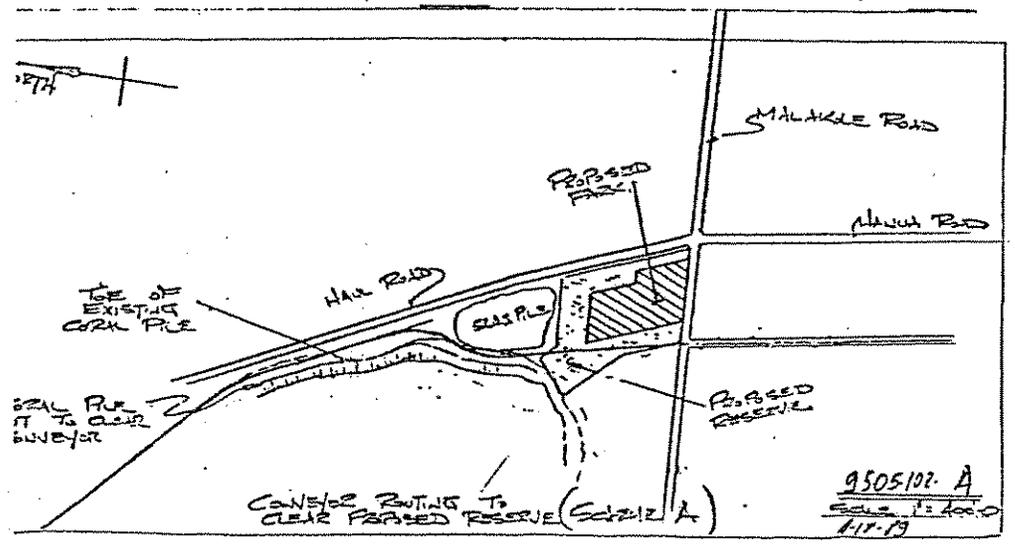
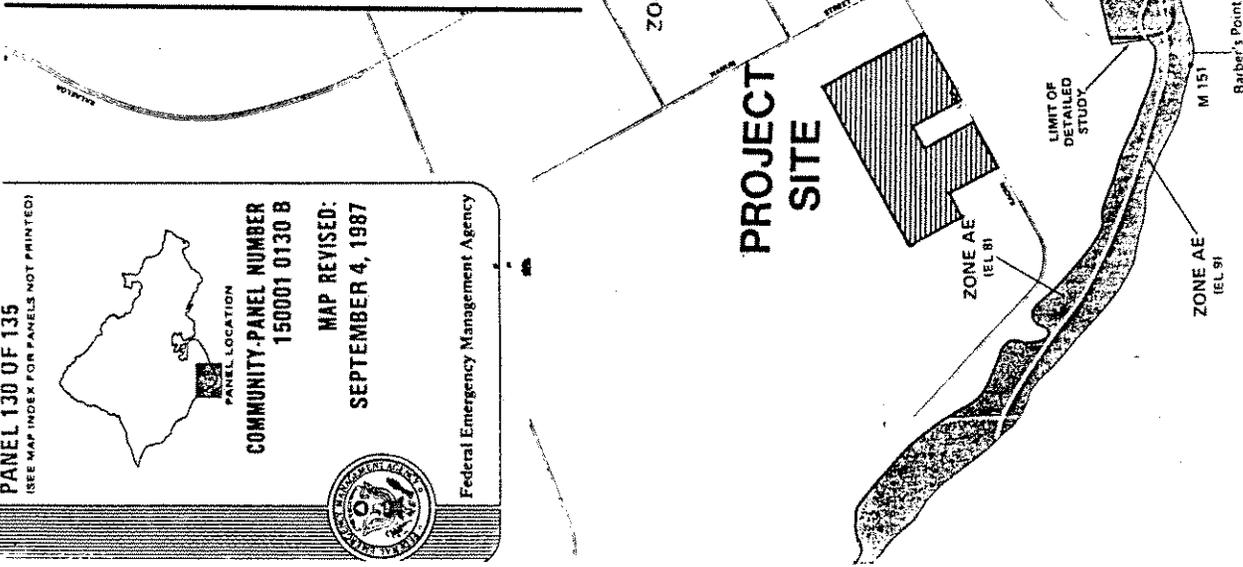
**COMMUNITY-PANEL NUMBER**  
150001 0130 B

**MAP REVISED:**  
SEPTEMBER 4, 1987



Federal Emergency Management Agency

- LEGEND**
- SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD**
- ZONE A No base flood elevations determined.
  - ZONE AE Base flood elevations determined.
  - ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
  - ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
  - ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
  - ZONE V Coastal flood with velocity hazard base action; no base flood elevations determined.
  - ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- OTHER FLOOD AREAS
  - ZONE X Areas of 300-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.
- OTHER AREAS**
- ZONE X Areas determined to be outside 300-year flood plain.
  - ZONE D Areas in which flood hazards are undetermined.





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

SERVICES  
LIBERT K. LAPORE  
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FORESTRY AND WILDLIFE  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 331  
HONOLULU, HAWAII 96809

May 23, 1989

Eric L. Miller  
Applied Energy Services, Inc.  
1000 Bishop Street, Suite 810  
Honolulu, Hawaii 96813

Dear Mr. Miller:

**SUBJECT: Realignment of AES Babbers Point Conveyor in  
Vicinity of Proposed Sinkhole Preserve and Park in  
Campbell Industrial Park**

Thank you for your letter of May 3, 1989, which outlines the preservation measures you propose for this portion of the conveyor belt. We believe that these measures will result in "no adverse effect" to the sinkhole sites.

In addition to determining that there are no remaining sites between the northern edge of the proposed preserve and the harbor, our staff archaeologist checked the conveyor belt route between the plant site and Malakole Road. She verified that this sector of the route has already been modified by development. There will be "no effect" to significant historic sites in this area, nor in the section of the route from the north end of the proposed park to the harbor.

Sincerely,

RALSTON H. NAGATA  
State Parks Administrator and Deputy  
State Historic Preservation Officer

*5/30 - Cy to Perry White, BCA*

## 8.5 ORGANIZATIONS AND INDIVIDUALS WHO PREPARED THE EIS

### Belt Collins & Associates

Perry J. White	Contributor/Project Manager
Sue Rutka	Contributor/Planner
Thomas F. Nance	contributor/Hydrologist
Karon Uyechi	Graphics/Graphics Designer
Karl Miyajima	Graphics/Graphics Designer
Vina Lesuma	Word Processing

### AES Barbers Point, Inc.

Eric L. Miller	Assistant Project Director
Janie Kessler	Alternatives and Economic Impacts

### Black & Veatch Engineers-Architects

David M. Lefebvre	Plant Design, Water Use & Constituents
Michael L. Pelan	Air Quality Impact Analysis
Staff	Noise Impact Analysis

### Other

Kenneth M. Nagata	Botanical Survey
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