Maurice A. Richard, Hawaii Regional
Development Manager
Puna Geothermal Venture
101 Aupuni Street, Suite 1014-B
Hilo, HI 96720

Dear Mr. Richard:

Geothermal Resource Permit Application (GRP 87-1)
Puna Geothermal Venture - 25 MW (net) Development
Kapoho, Hawaii TMK: 1-4-01: por. 2, 3, por. 19, & 58

The Planning Commission at its duly held meeting on
September 19, 1989, considered this Geothermal Resource Permit
Application and based on the following findings, approved the
project consisting of 10 integrated back-pressure steam turbine and
air-cooled binary cycle turbine power generating modules; up to 30
geothermal wells drilled from 6 well pads; brine and steam
pipelines, pollution control equipment; a brine surge tank and
holding pond; a switchyard; an office, warehouse, workshop, and
control buildings; access roads; and auxiliary facilities such as
air compressors, fire protection equipment, etc.:

1. The proposed geothermal development activities would not
have unreasonable adverse health, environmental, or socio-economic
effects on residents or surrounding property.

The project will occupy approximately 25 acres of surface
area within a dedicated 500-acre project area located within the
Kapoho Section of the Kilauea Lower East Rift Geothermal
Resource Subzone. Approximately 2.75 acres of land will be
cleared and leveled for each of 6 drill pads. Each drill site
will be engineered to support the drilling equipment and to keep
drilling effluent contained onsite and separate from any natural
drainage. Each well pad will have drilling mud pits; sumps with
gently sloped walls used to temporarily store drilling wastes
which typically consist of rock cuttings, waste drilling mud,
cement particles, lost-circulation material and other drilling mud additives, and other waste drilling liquids. The high porosity of the volcanic soils and rock in the site area results in rapid downward percolation of rainwater. Concrete pads and berms will be provided to contain possible spills in areas where chemicals are handled. Catch basins, culverts, ditches, and berms will be provided for drainage control.

There are no surface streams or ponds in the vicinity of the proposed drill sites. Ground water will be protected by cementing casing into the hole to depths below sea level.

Based upon biological surveys and monitoring of the Hawaiian Hawk, there are no endangered native species in the project site; however, other wildlife and natural resources will be affected by loss of habitat at the drill site and along any access roads that will be constructed. This habitat loss will be limited to what has been described as scrub vegetation and fallow fields where the primary vegetation is non-native weedy vegetation and abandoned papaya orchards.

Unabated geothermal emissions will be vented to the atmosphere during well cleanout and pipeline clearing. Noise will be generated during well drilling, construction, and operational phases of this project. The sites have been located in agricultural areas away from urban population concentrations. The sites will also be located to take advantage of existing topography and vegetation to muffle or block noise from the drilling operations. The drilling area will be within an area designated as a "hard hat" area. The general public will not be permitted within this area. Average drilling time for each well will be approximately 45 days, with up to five wells drilled at each well pad.

The socio-economic impacts of this activity would not be unreasonable. This project will provide a dependable source of electricity yet decrease dependence on imported petroleum products; provide more employment opportunities; increase personal income and public revenues; and further the informational base to support decisions leading to energy self-sufficiency. This project will support goals stated in the County's General Plan's Energy Element. The economic benefits and security implications of reducing Hawaii's dependence on imported fuels for energy production have been recognized for a long period of time at all levels of government. This has
resulted in a general policy of support for alternative energy research and development. The establishment of Geothermal Resource Subzones, where exploration and development are allowable activities, acknowledges the potential higher use of the lands in volcanic rift zones which are generally of marginal value for agriculture and other cultural uses. Indigenous geothermal resources will be developed for the general social and economic well-being of the residents of Hawaii.

2. The proposed geothermal development activities would not unreasonably burden public agencies to provide roads and streets, sewers, water, drainage, school improvements, and police and fire protection.

There should be negligible impact on public infrastructure and services. Personnel associated with the drilling and operations will be small in number. Most of the estimated 23 construction and 19 operations and maintenance jobs at the proposed project will be filled by local employees. Peak construction employment is estimated to be as high as 100. These people will utilize existing facilities and will not require additional services that are not already provided by the County.

Traffic through Pahoa will increase especially during construction. An estimated 35 vehicle round trips per day are expected during wellfield and power plant construction. During normal power plant operations, the traffic generated will fall to about 10 to 18 vehicle round trips per day. These added vehicle trips should not add significantly to the existing traffic levels of 2000 to 3600 vehicles per day at the intersection of the Pahoa to Kalapana Road (Hwy 130) and the Pahoa to Kapoho Road (Hwy 132).

Drilling and power plant operations will require no provisions from public agencies in the form of roads or streets, sewers, drainage, or school enlargement or improvements, and only the normally afforded police and fire protection will be expected. Any necessary access roads will be constructed by the applicant, and water for drilling will be purchased from the Department of Water Supply from their existing distribution system or the applicant will develop its own water supply.
This project will have its own fire protection system and will place minimal demands on the Hawaii County Fire Department. Fire extinguishers are standard equipment on drilling rigs to control fires associated with drilling operations. Water used in drilling can also be used to extinguish any fires that may develop. In addition, drilling muds can be pumped onto any fire that may develop in the vicinity of the rig.

At this time, cesspools are planned as the disposal method of approximately 200 gallons per day of domestic wastewater. This or an alternative disposal method will need to be approved by the State Department of Health.

3. There are reasonable measures available to mitigate the unreasonable adverse effects or burdens referred to above.

There are mitigation measures to ensure the integrity of the geothermal wells and to prevent blowouts; including the use of blowout prevention equipment that can rapidly choke off the flow of fluids from the well during drilling; the use of conservative safety factors in designing wells and wellhead equipment; the installation of two strings of steel casing cemented in place from the surface into the reservoir caprock; the use of premium grade casing materials and connections to strengthen the wellbore; special cement mixtures with high strength and insulating properties; and regular inspection procedures to test the integrity of the casing and equipment.

Hydrogen sulfide monitors will be operable at the drill site and at off-site locations. The applicant will comply with all federal, state, county, or local rules regarding environmental monitoring.

During drilling and power plant operations, noise levels will be monitored at several sites at and adjacent to the project, and mitigating measures including the relocation of affected individuals will be taken if noise levels exceed acceptable levels.

The drillers will receive safety instructions and instructions on how to contact emergency facilities in the area. Phone numbers for police, fire department, hospital, and other emergency services will be posted in a prominent place at
the drill rig, together with phone numbers for the drill supervisor, principal investigator, field manager, and appropriate state and county regulators.

As drilling will be conducted on a 24 hours-a-day, 7 days-a-week basis, the drill site will be lighted during the hours of darkness to permit continuous operations and to provide safe working conditions. The rig will be sited so as to be as unobtrusive as possible and will conform to all Hawaii outdoor lighting regulations. Copies of Hawaii Outdoor Lighting Regulations will be provided to the drilling contractor to insure compliance. After the rig is operational, a lighting survey will be made, and lights adjusted or shielded as necessary to cause the minimum impact.

The power plant site will be more than 2000 feet away from the residents in Lanipuna Gardens and Pohoiki Bay Estates and more than 3400 feet away from the residents in Leilani Estates. There are six residences within a half-mile and another 24 residences within a mile of the power plant site. The relatively close distance between the project and residents prompts the developer to employ the most effective air and noise emission measures.

During normal power plant operation, except for fugitive leaks, geothermal fluids including H2S will not be released to the atmosphere. During outages, steam will be released through rock mufflers after being treated to control the levels of H2S being emitted into the atmosphere. This abatement will keep the H2S concentration below levels known to cause health effects. H2S levels will be monitored to verify the predicted impacts of this project.

Also during normal power plant operation, noise levels will be reduced to meet the Planning Commission's guidelines. Attenuation includes employing engineering measures which range from cooling fan design and building material selection to siting the power plant within the saddle of the adjacent puu's, orientation of noise emission sources away from receptors, the use landscaping features such as vegetation and berms, etc. In addition noise levels in the community will also be monitored to verify the predicted impacts.

Based on the above, we have concluded that the proposed Geothermal Resource Permit Application has demonstrated that it is
consistent with the criteria for issuance of Geothermal Resource Permits as contained in Rule 12-6 of the Planning Commission Rules and Chapter 205-5.1(e), Hawaii Revised Statutes, subject to the following conditions:

1. This Geothermal Resource Permit grants approval for those uses and improvements described in the "Geothermal Resource Permit Application Amendment for the Puna Geothermal Venture Project," dated March 1989, except as amended, modified, or conditioned by this Geothermal Resource Permit. Except as otherwise described in this permit, no other uses are authorized by this permit, and any proposed other uses of the geothermal resource or improvements to the land, whether to be conducted by the permittee or a third-party under contract to, or other agreement with, the permittee, shall be subject to prior review and approval, consistent with the applicable Rules of Practice and Procedure of the Hawaii County Planning Commission. The Planning Director may, upon written request of the permittee, approve deviations from the project layout and uses permitted under this Geothermal Resource Permit if such amendments are consistent with the uses permitted and conditions of this Geothermal Resource Permit. No action pursuant to any such request for deviation by the permittee shall be taken without the written approval of the Planning Director. Amendments to the Geothermal Resource Permit and its conditions may be granted pursuant to Article 12-9 of the Rules of Practice and Procedure of the County of Hawaii Planning Commission.

2. The permittee, its successors, or assigns shall be responsible for complying with all of the stated conditions of approval of this Geothermal Resource Permit. Should the Planning Director determine that there is noncompliance with the Geothermal Resource Permit or its conditions, the permittee may be subject to enforcement of the Geothermal Resource Permit conditions and penalties pursuant to Sections 12-10 and 12-11 of Rule 12 of the Rules of Practice and Procedure of the County of Hawaii Planning Commission.

3. The permittee shall grant unrestricted access to the subject property(ies) to authorized governmental representatives or to consultants or contractors hired by governmental agencies for inspection, enforcement, or
monitoring of activities subject to or authorized by this Geothermal Resource Permit. A designated employee shall be available at all times for purposes of supplying information and responses deemed necessary by the authorized governmental representative in connection with such work.

4. During the period of construction of the project, or during the drilling or testing of any well, the permittee shall submit a weekly written status report to the Planning Department which shall include:

a. A brief description of the work undertaken during the previous week under the Geothermal Resource Permit;

b. A description of the work being proposed during the next week under the Geothermal Resource Permit; and

c. Any other information that the Planning Department may reasonably require which addresses the immediate environmental and regulatory concerns of the County of Hawaii or the requirements of the Geothermal Resource Permit.

5. The permittee shall submit a written semiannual status report to the Planning Department by February 15 (covering the preceding period of July 1 through December 31) and August 15 (covering the preceding period of January 1 through June 30) of each year. The status report shall include, but not be limited to:

a. A brief summary of the work undertaken during the current reporting period under the Geothermal Resource Permit;

b. A brief summary of the work being proposed over the next reporting period under the Geothermal Resource Permit;

c. The results and analysis of all environmental monitoring activities undertaken as required by this Geothermal Resource Permit;

d. A log of any complaints received by the project and the responses thereto; and
e. Any other information that the Planning Department may reasonably require which addresses the environmental and regulatory concerns of the County of Hawaii or the requirements of the Geothermal Resource Permit.

6. If any environmental monitoring data collected as required under this Geothermal Resource Permit indicates that project operations are creating, or have the immediate potential of creating, excessive health or environmental effects not otherwise permitted by this Geothermal Resource Permit, the permittee shall submit such data to the Planning Department within 48 hours of its identification.

7. The permittee shall maintain a record in a permanent form suitable for inspection and shall make such record available on request to the Planning Director or his designee. The record shall include:

a. Occurrence and duration of any start-up, shut-down, and operation mode of each geothermal well and/or facility;

b. Performance testing, evaluation, calibration checks, and adjustment and maintenance of the continuous monitor(s) that have been installed; and

c. All measurements reported in units compatible with applicable standards/guidelines.

8. Prior to the commencement of any grubbing or grading activity, the permittee shall:

a. Submit a metes and bounds description of all lands to be disturbed including but not limited to all roadways, well pads, steam gathering system corridors, injection system corridors, power plant site, and transmission line corridors to Planning Director;

b. Mark the boundaries of these sites to be disturbed in the field; and

c. Comply with all requirements of Chapter 10 Erosion and Sedimentation Control, Hawaii County Code (the County grading ordinance).
9. No construction or transportation equipment shall be permitted beyond the prescribed boundaries of the areas to be disturbed.

10. Prior to commencing any geothermal well drilling, testing, production, or injection activity approved under this Geothermal Resource Permit, the permittee shall submit to, and secure the approval of, the Planning Director of a hydrologic monitoring program. The program shall, at a minimum, provide for the quarterly monitoring of water levels and appropriate chemical species from existing wells completed within the shallow aquifer in those areas downgradient of the project area, including the Green Lake water supply, as well as from a well located within the project boundary and completed within the shallow aquifer. The monitoring, sampling, and analysis protocols shall be clearly defined in the program submitted to and approved by the Planning Director. The monitoring and sampling shall be conducted by a qualified contractor, and the samples analyzed by a qualified laboratory, selected by the permittee but subject to the approval of the Planning Director. The selected contractor and laboratory shall operate under contract to, and shall be funded by the permittee. The program shall monitor the shallow groundwater immediately prior to, and during, all periods of well drilling, testing, production, and injection activity approved under this Geothermal Resource Permit. The data obtained shall be submitted to the Planning Director in accordance with the requirements contained in this Geothermal Resource Permit for submittal of all collected environmental monitoring data. The County shall make random checks of the ground water supply no less than every two months.

11. If pollution of the shallow ground water is demonstrated to be occurring from the project construction, operation or maintenance activities as determined by the Planning Director in consultation with the Department of Water Supply and the Department of Land and Natural Resources, the permittee shall immediately take those measures necessary to eliminate the source of the pollution meeting with the approval of the affected agencies. If any geothermal production or injection well demonstrates that the integrity of the well casing is lost such that the shallow groundwaters are being, or may immediately be
polluted by the production or injection activity of that well, the permittee shall, as quickly as practical consistent with safety and prudent operating practices, cease the production or injection activity for that well, and the activity not resume for that well until adequate casing integrity is restored to the satisfaction of the Department of Land and Natural Resources.

13. In the event the Department of Water Supply determines that the existing Green Lake county water source becomes contaminated by the permittee's geothermal wellfield system, the permittee shall immediately provide alternative(s) to the water supply, including the hauling of water if necessary as a temporary alternative, which meet the approval of the County's Department of Water Supply and the State Department of Health.

14. Only nonhazardous drilling mud additives, as recognized on the "California Department of Health Services Drilling Mud Additives Used in Nonhazardous Drilling Muds and Fluids" list, shall be used during the drilling of the geothermal wells, and which list shall be on file with the County Planning Department.

15. All drilling mud solids and drill cuttings shall be discharged to and contained within the well pad sump. A disposal site or sites approved by the State Department of Health, prior to any disposal activity covered by this permit, shall be provided for sump contents and other waste materials to be disposed of from the drilling activity. All sumps/ponds shall be purged in a manner meeting with the approval of the State Department of Health. In the event there are no DOH requirements, the applicant and the Planning Department shall request for guidelines from the DOH for the purging of sumps and ponds. Said guidelines shall be available to the community.

16. All geothermal brines, steam condensate, and noncondensible gases produced during normal project operations shall be injected into the geothermal reservoir.

17. Prior to commencing any activity approved under this Geothermal Resource Permit on the project site, the permittee shall submit to, and secure the approval of, the Planning Director of an air quality and meteorological
monitoring program. The program shall include provisions for installation, calibration, maintenance and operation of recording instruments to measure air contaminant concentrations, the specific elements to monitored, the number of stations involved, and frequency of sampling and reporting. The Planning Director shall review and approve the submitted monitoring plan in consultation with and concurrence of the State Department of Health. The monitoring and sampling shall be conducted by a qualified contractor, and the samples analyzed by a qualified laboratory, selected by the permittee but subject to the approval of the Planning Director. The selected contractor and laboratory shall operate under contract to, and shall be funded by the permittee. The program shall monitor the air quality immediately prior to, and during, all periods of well drilling, testing, production, and injection activity approved under this Geothermal Resource Permit. The data obtained shall be submitted to the Planning Director in accordance with the requirements contained in this Geothermal Resource Permit for submittal of all collected environmental monitoring data.

18. The permittee shall apply "Best Available Control Technology" (BACT) for air emissions to all aspects of the project to minimize air quality impacts. BACT means the maximum degree of control for air quality concerns taking into account what is known to be practical and economically viable. BACT for each aspect of the project shall be determined by the Planning Director in consultation with other appropriate governmental agencies involved in the control or regulation of air quality from geothermal development projects. Such determination shall be made prior to issuance of any construction permit for that aspect of the project. BACT shall be subject to review by the Planning Director every five years, commencing with the date of approval of the Geothermal Resource Permit for the wellfield operations, and with the date of full power plant operation for the power plant.

19. The permittee shall control all project emissions of hydrogen sulfide during normal power plant operation so that the increase in the ambient hydrogen sulfide concentration due to these project emissions shall not exceed 5 ppb at or beyond the project boundary.
20. With regard to air emissions, the permittee shall submit to the County Civil Defense and the Planning Department a map and accompanying text that describes predetermined "worst case" impacted areas.

21. Prior to commencing any activity approved under this Geothermal Resource Permit on the project site, the permittee shall submit to, and secure the approval of, the Planning Director of a noise monitoring program designed to adequately ensure project compliance with the noise impact limitations contained in this Geothermal Resource Permit. The program shall include the monitoring of noise immediately prior to and during all periods of activity approved under this Geothermal Resource Permit. The monitoring and sampling shall be conducted by a qualified contractor, and the samples analyzed by a qualified laboratory, selected by the permittee but subject to the approval of the Planning Director. The selected contractor and laboratory shall operate under contract to, and shall be funded by the permittee. This program should also allow the correlation of any complaints of noise from the public with the level of measured noise, the meteorological conditions, and the type of operations which occurred at the site. The data obtained shall be submitted to the Planning Director in accordance with the requirements contained in this Geothermal Resource Permit for submittal of all collected environmental monitoring data.

22. The permittee shall apply "Best Available Control Technology" (BACT) for noise emissions to all aspects of the project to minimize project noise. BACT means the maximum degree of control for noise concerns taking into account what is known to be practical and economically viable. BACT for each aspect of the project shall be determined by the Planning Director in consultation with other appropriate governmental agencies involved in the control or regulation of noise from geothermal development projects. Such determination shall be made prior to issuance of any construction permit for that aspect of the project. BACT shall be subject to review by the Planning Director every five years, commencing with the date of approval of the Geothermal Resource Permit for the wellfield operations, and with the date of full power plant operation for the power plant.
23. The permittee shall notify the Planning Department and any resident within 3500 feet of the permittee's project boundary who has previously requested such notice, at least twenty-four (24) hours in advance of the open venting of each geothermal well and pipeline cleanout and 14 days before commencement of drilling. Initial notification to residents shall be made in writing, offering the opportunity to be placed on the notification list. Any other person may request to be on the list. The permittee shall notify the Planning Department immediately prior to the open venting of any geothermal well and pipeline cleanout. The permittee shall notify the Planning Department following completion of each geothermal well, prior to the demobilization of the drilling rig.

24. Until such time as noise regulations are adopted by the State or County, the permittee shall comply with the following guidelines which shall be enforced by the Planning Department:

a. During power plant and wellfield operations, the permittee shall not exceed a general noise level of 55 dBA during daytime and 45 dBA at night at the current nearest residence. For the purposes of these guidelines, "night" is defined as the hours between 7:00 p.m. and 7:00 a.m.;

b. The allowable noise levels may be exceeded by a maximum of 10 dBA; however, in any event, the generally allowed noise level should not be exceeded more than 10 percent of the time within any 20-minute period, and the permittee shall conduct all operations so as to minimize the occurrence, frequency, and duration of this impact noise;

c. The noise level guidelines specified above shall be waived only for the specified duration of authorized open geothermal well venting from all wells, steam pipeline cleanout periods, and the drilling and testing of wells from well pads E and F. During these authorized periods, BACT shall be applied. In addition, during the drilling and testing of wells from well pads E and F, the permittee shall meet a general noise level of 55 dBA during the day and 50 dBA during the night at the current nearest residence; and
For the purposes of these noise conditions, the nearest residence is hereby defined as: For three years following the date of granting of the Geothermal Resource Permit, that permanently occupied dwelling nearest the applicable noise emission point as of the date of the granting of this permit; for all following years, that permanently occupied dwelling nearest the applicable noise emission point.

e. Sound level measurements shall be conducted using standard procedures with sound level meters using the "A" weighting and "slow" meter response unless otherwise stated.

25. Pursuant to Article 12-8 of the Rules of Practice and Procedure of the County of Hawaii Planning Commission, prior to initiating construction of the project, the permittee shall submit the following to the Planning Director:

a. Copies of approved permits and other applicable approvals for the project from other county, state, or federal agencies as applicable;

b. Final plans or provisions for monitoring environmental effects of the project as required by this Geothermal Resource Permit or otherwise required to ensure compliance with County rules and the rules of the State Department of Health and Board of Land and Natural Resources and other permit-issuing agencies;

c. A final plan of action to deal with emergency situations which may threaten the health, safety, and welfare of the employees and other persons in the vicinity of the proposed project site; and

d. A final site plan and elevations of proposed temporary and/or permanent structures for the project.

26. Prior to commencing any activity approved under this Geothermal Resource Permit on the project site, the permittee shall submit to, and secure the approval of, the Hawaii County Civil Defense Director a final plan of action to deal with emergency situations which may threaten the
health, safety, and welfare of the employees and other persons in the vicinity of the proposed project site. The plan shall include but not be limited to, the following elements:

a. A description of the project facilities and operations, with site plans identifying areas of potential hazards, such as high pressure piping and the presence, storage and transportation of flammable or hazardous materials, such as lubrication or fuel oil, isopentane, hydrogen sulfide, and sodium hydroxide;

b. A description of emergency services available off-site to respond to any emergency;

c. A description of the current onsite chain of command and responsibilities of project personnel in the event of an emergency; and

d. A description of potential project emergency situations, such as loss of well control, chemical spills, hydrogen sulfide exposure, pipeline rupture, fires, contaminated solids, etc. identifying:

   (i) technical data on the nature of the hazard (for example, the concentrations of hydrogen sulfide in the various areas and the hazard associated with these concentrations, the corrosive characteristics of the abatement chemicals), or any data regarding the possible aerial extent of each potential emergency situation;

   (ii) the warning systems (such as hydrogen sulfide detectors) used to alert personnel of the hazard;

   (iii) the location and use of equipment used to control the hazard (such as fire protection equipment or isolation valves) or repair hazardous equipment (such as welding equipment or casing sleeves), and safety equipment for personnel (such as respiratory packs), including identification of the personnel trained in the use of that equipment; and
(iv) provisions for the monitoring, detection, and inspection of wells and plant facilities for the prevention of emergency situations.

e. Provisions to address natural hazards (such as lava flows, earthquakes, and storms) that identify warning systems, control options, steps for securing and shutting down the facility, personnel evacuation, and notification to appropriate agencies;

f. The location and capabilities of available medical services and facilities and plans for treating and transporting injured persons;

g. Evacuation plans, including meeting points, personnel rosters, and escape routes;

h. Training requirements for personnel, including procedures for emergency shutdown, handling of emergency equipment, spill prevention, first aid and rescue, fire fighting procedures, and evacuation training;

i. Provisions for periodic emergency preparedness drills for personnel;

j. Detailed procedures to be used to facilitate coordination with appropriate federal, state, and county officials during and after any emergency situation; and

k. Procedures to be used to identify and inform all residents within applicable distances of the project of the possible emergency situations, warnings, and responses in advance of commencement of project operations and the methods by which all individuals affected by a given emergency will be notified and evacuated, as necessary.

Copies of the emergency plan shall be made available to the public by the applicant.

27. Reports and records of emergency situations shall be submitted to the Planning Department upon occurrence of such emergencies.
28. Within 48 hours after an earthquake registering 6 or above on the Richter Scale and/or within 48 hours after an eruption has occurred, all wells within 10 kilometers of the epicenter or eruptive center, shall be examined for any physical changes which would alter its downhole integrity. A report of this examination shall be filed with the Planning Department within 48 hours of the examination.

29. In the event the Hawaii County Civil Defense Agency determines that an emergency situation resulted from the permitted geothermal activity, the permittee shall bear all costs of evacuation. The Hawaii County Civil Defense Agency shall be responsible for public and media notification and evacuation of members of the public in the event the Agency deems such action necessary as a result of an emergency situation.

30. Prior to the commencement of any surface disturbing activity, the permittee shall conduct an archaeological survey of those areas planned for surface disturbance not previously surveyed and submit the results of this survey to the Planning Department for review and approval.

31. If construction activities expose any cultural remains, the permittee shall immediately cease work in the area of the cultural remains and contact the Planning Department and the State Historic Preservation Office. As appropriate, a qualified archaeologist shall be retained by the permittee to implement any necessary mitigation measures and monitor further work. Work in the affected area shall not resume until such time that clearance is obtained from the Planning Department.

32. The lighting used shall not interfere with the operations at the observatories located on Mauna Kea. To meet this requirement, the permittee shall comply with the requirements of Chapter 14, Article 9 of the Hawaii County Code, relating to outdoor lighting.

33. All lights shall be at a minimum level consistent with the safety of operations and shall be shielded or directed away from surrounding residential or populated areas and not interfere with important biological resources in the area.
34. The permittee shall submit to, and secure the approval of the Planning Director of a detailed landscaping and siting plan. The siting plan shall show plan and elevational views of all proposed temporary and/or permanent structures for the project. The plan shall also show the site topography, natural features and proposed berms, planting schedules, tree sizes, heights (actual size of trees to be planted), type of irrigation system, etc. Installation of approved landscaping improvements shall be commenced within three weeks from the completion of construction of each well pad, access road, or other facility. The plan shall also include:

a. A landscaping maintenance program;

b. A line-of-sight analysis, being especially sensitive to views from surrounding residences, of the view planes from the site property lines, from the intersection of Leilani Avenue and the Pahoa-Pohoiki Road, for the intersection of the proposed access road and the Pahoa-Kapoho Road, from the intersection of Lauone Street and Hinalo Street in Lanipuna Gardens, and the intersection of the Kapoho-Kalapana Road and the access road to Vacationland; and

c. To the extent possible, the well sites and power plant shall be landscaped and sited to reflect the existing agricultural character of the area, and utilize native plantings.

35. To the extent compatible with engineering and aesthetic considerations, all exterior surfaces shall be rough texture, with no reflective metal, and no reflective glass surfaces oriented toward surrounding residential or populated areas within line of sight. The exterior of all project structures, including fluid conveyance pipelines, shall be painted in colors so as to blend in with the surrounding environment.

36. The permittee shall submit and secure approval of a revegetation/site reclamation plan meeting with the approval of the Planning Director in consultation with the Forestry Division of the Department of Land and Natural Resources. When construction is completed on any individual project site, or if the project area is
abandoned, all denuded areas on and around the project site shall be revegetated in accordance with this plan. Said plan shall include appropriate security to assure its implementation in a timely manner.

37. The permittee shall obtain and maintain those bonds required for project operations by the rules and regulations of the Board of Land and Natural Resources and the Department of Health.

38. The permittee shall obtain and maintain builder's risk and comprehensive liability insurance for project construction and operation activities.

39. The permittee shall notify each resident household within a radius of 3500 feet from any geothermal well at least twenty four (24) hours prior to, and again the morning of, any planned venting of that well. Each resident within this radius of 3500 feet shall be offered the opportunity to voluntarily leave the area during the well venting. The cost of such voluntary leaving, up to a maximum of $100.00 per resident or $200.00 per household, whichever is lesser, shall be borne by the permittee. Upon adequate demonstration to the permittee that any such resident is unable to pursue his normal, legitimate employment or business activity as a result of such voluntary leaving, the permittee shall reimburse that resident for that one day's lost income, in an amount not greater than $150.00.

40. Upon adequate demonstration to the permittee that any adverse alteration of the quality of the water has occurred as a result of venting to the atmosphere, the permittee shall immediately rinse the water catchment system and replace the stored water of any water catchment system within a radius of 3500 feet of any well. Upon adequate demonstration to the permittee that any agricultural crop damage resulted directly from any of the permittee's well venting operations, the permittee shall also provide compensation to the owner of agricultural operations located within a radius of 3500 feet of that well. In either situation, compensation will only be considered if the agricultural crops and water catchment system are inventoried and registered with the permittee prior to the venting. Other requests shall be considered by the permittee on a case-by-case basis.
41. The permittee shall establish and publish a telephone number for use by local individuals for the lodging of complaints or inquiries regarding status of operations. A designated representative of the permittee shall be available, 24 hours a day, to respond to any local complaints or inquiries.

42. Large vehicle deliveries to the project site shall be limited to daylight hours. For the purposes of this condition, daylight hours is defined as the hours between 7:00 a.m and 7:00 p.m. This condition shall not apply for vehicles responding to emergencies.

43. An extension of time for the performance of conditions within the permit may be granted by the Planning Director upon the following circumstances: 1) the non-performance is the result of conditions that could not have been foreseen or are beyond the control of the applicants, successors, or assigns and that are not the result of their fault or negligence; 2) granting of the time extension would not be contrary to the General Plan or Zoning Code; 3) granting of the time extension would not be contrary to the original reasons for the granting of the Geothermal Resource Permit; and 4) the time extension granted shall be for a period not to exceed one (1) year and 5) if the applicant should require an additional extension of time, the Planning Director shall submit the applicant's request to the Planning Commission for appropriate action.

44. All other applicable rules, regulations, and requirements, including those of the State Department of Health and the State Department of Land and Natural Resources shall be complied with.

45. The permittee shall obtain, and comply with the provisions of, permits to drill, modify use or abandon, as appropriate, from the State Board of Lands and Natural Resources for each geothermal well approved under this Geothermal Resource Permit.

46. The permittee shall obtain and comply with the provisions of, Underground Injection Control Permits, as appropriate, from the State Department of Health for all geothermal injection wells approved under this Geothermal Resource Permit. A copy of the UIC Permit and any conditions shall be available in the County Planning Department.
47. The permittee shall obtain, and comply with the provisions of, Authorities to Construct and Permits to Operate from the State Department of Health for all applicable project operations approved under this Geothermal Resource Permit.

48. The permittee shall secure all necessary approvals and clearances including Plan Approval pursuant to Chapter 25 of the Hawaii County Code, within one (1) year from the effective date of the Geothermal Resource Permit.

49. Construction shall commence within one (1) year from the date of receipt of Final Plan Approval.

50. The permittee shall submit a written semiannual status report to the Planning Commission on the permittee's best efforts to address/comply with the "Other Agreements and Recommendations" as contained in Section 5 of the final report on "Mediation of Geothermal Resource Permit Application 87-1" dated August 21, 1989, regarding but not limited to the collateral agreements and commitments the permittee made during the mediation process, and which the permittee considers to be contractual obligations subject to the issuance of a satisfactory Geothermal Resource Permit. The status report shall be submitted by February 15 (covering the preceding period of July 1 through December 31) and August 15 (covering the preceding period of January 1 through June 30) of each year.

51. Prior to the issuance of the first building/construction permit under this Geothermal Resources Permit (GRP) by the County of Hawaii, the State of Hawaii and the permittee shall each contribute towards a Geothermal Asset Fund or other appropriate existing fund for the purposes of geothermal impact mitigation efforts within the District of Puna. The permittee's initial contribution to the fund shall be a sum of $60,000, due within thirty (30) days after the effective date of this GRP permit, and annual sums of $50,000 due on or before the anniversary date of this GRP permit over a period of eight (8) consecutive years thereafter for a total of $460,000. Annual contributions thereafter shall be determined between the permittee and the State of Hawaii or $50,000 annually, whichever is greater. The State's initial annual contribution to the Geothermal Asset Fund shall be the net revenues derived from the resources generated by the HGP-A well, or a similar amount from other State funding sources.
less any allocations entitled to the Office of Hawaiian Affairs and operations and maintenance costs. In the event that future enabling legislation provides for a percentage of the State's geothermal royalties to be allocated to the County, upon concurrence with the County Council, said royalties may also be deposited to the fund. The administration and expenditure of assets from this Geothermal Asset Fund shall be in accordance with rules, regulations and procedures developed for that purpose by the County in accordance with Chapter 91, Hawaii Revised Statutes, and with participation of Puna residents or representatives thereof, which shall include, but not be limited to, provisions and criteria to enable the first priority of distribution for temporary or permanent relocation of those property owners who are found, in accordance with criteria established in the rules, to be adversely impacted by the activities authorized, provided that such relief is applied for within a period of one (1) year of the impact. A priority list of impact mitigation projects may be established by the County Council or agency designated by the Council in conjunction with Puna residents or designated representatives thereof, with the exception of upgrading existing subdivisions in the Puna District to current subdivision standards and specifications of the County of Hawaii. Should any other district(s) of the County of Hawaii be proved to be negatively impacted by activities authorized under this or any other subsequent GRP, that district shall receive a pro rata share of the fund assets as may be determined by the County Council or agency designated by the Council with expenditures to follow a prioritized schedule determined as outlined above. The rights granted to the permittee shall not be conditioned upon any contribution or further participation by the State in the fund nor with respect to the creation, management, and operation of the fund other than set forth above.

Sincerely,

Gary Mizuno, Chairman
Planning Commission

cc: Mr. Peter Adler
Mediation Parties (list)
DBED
DOA
DLNR/Honolulu
DOH
Mr. Ralph Matsuda