



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 621  
HONOLULU, HAWAII 96809

APR 28 1993

REF:WL-LC

DEPUTIES  
JOHN P. KEPPELER, II  
DONA L. HANAIKE  
AQUACULTURE DEVELOPMENT  
PROGRAM  
AQUATIC RESOURCES  
CONSERVATION AND  
ENVIRONMENTAL AFFAIRS  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

Ms. Jennifer Perry  
c/o Kapoho Community Association  
P.O. Box 553  
Pahoa, Hawaii 96778

Dear Ms. Perry:

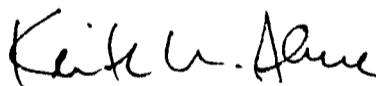
**Request for Well Abandonment Permits**

Thank you for your March 15, 1993 letter requesting copies of well abandonment permits for KS-1, KS-2, KS-7, and the plug and abandonment permit and program for KS-8.

Since the total number of copies requested is 10 (2 pages per document) and the fee per copy page is \$.50, please send us a check for \$5.00, payable to the Department of Land and Natural Resources. Upon receipt of your check, we will promptly fax the copies to you.

Should you have any questions, please contact Mr. Manabu Tagomori of the Division of Water and Land Development at 587-0230.

Very truly yours,

  
KEITH W. AHUE

*fax* *WL*



**DEPARTMENT OF BUSINESS,  
ECONOMIC DEVELOPMENT & TOURISM**

JOHN WAI  
Governor  
MUI HANNEMA  
Dir.  
BARBARA KIM STANTC  
Deputy Dir.  
RICK EGG  
Deputy Dir.  
TAKESHI YOSHIMIZU  
Deputy Dir.

Central Pacific Plaza, 220 South King Street, 11th Floor, Honolulu, Hawaii  
Mailing Address: P.O. Box 2339, Honolulu, Hawaii 96804 Telephone: (808) 546-2406 Fax: (808) 586-2377

DATE: MAR 15 1993

TO: YUKIO KITAGAWA FAX #: 973-6913 ✓ 973-9813

JOHN LEWIN 586-4444 ✓

WINONA RUBIN 586-4890

KEITH AHUE 586-9099

JACK KEPPELER [REDACTED] 587-0390

HAROLD MASUMOTO 587-2848 ✓

FROM: DAN ORODENKER PHONE #: 586-2531 FAX #: 586-2377 (808)

This transmittal has a total of 3 pages, including this cover page.  
If there is any problem with this transmittal, please call 586-2355.

RECEIVED  
93 MAR 19 A 6:13  
DIV. OF WATER &  
LAND DEVELOPMENT

**KAPOHO COMMUNITY ASSOCIATION  
P. O. BOX 553  
PAHOA, HI. 96778  
808-965-8699 (fax), 965-7299  
March 15, 1993**

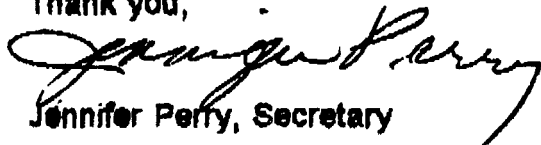
**Mr. Jack Keppler, Acting Director  
Department of Land and Natural Resources**

**via fax 587-0390**

**May I request a copy of the well abandonment permits for KS-7, KS-8, KS-1 and KS-2 for the Puna Geothermal Venture Project. If possible, please fax them to the above number, along with the bill. Hiram Young of your department already informed me that there are approximately 16 pages at .50 each.**

**Your immediate attention is greatly appreciated.**

**Thank you,**

  
**Jennifer Perry, Secretary**



## DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

JOHN WAIHEE  
Governor  
MUIF HANNEMANN  
Director  
BARBARA KIM STANTON  
Deputy Director  
RICK EGGED  
Deputy Director  
TAKESHI YOSHIMARA  
Deputy Director

Central Pacific Plaza, 229 South King Street, 11th Floor, Honolulu, Hawaii  
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804 Telephone: (808) 586-2400 Fax: (808) 586-2377

### AGENDA (Internal) HAMAKUA COAST COMMUNITY MEETING Laupahoehoe High School Cafeteria March 16, 1993 7:00 pm

- 7:00 - 7:05 I. Introduction/Aloha  
Mufi Hannemann
- A. Participant Introduction
  - B. Agenda
  - C. Meeting Objectives
    - 1. Closure of sugar issue
    - 2. Community Input
- II. Status/Discussion
- 7:05 - 7:10 A. Status of Negotiations (Harold Masumoto)
- 1. Housing
  - 2. Slaughterhouse
  - 3. Harvesting of remaining sugar

Page 2

- 7:10 - 7:30      B.    Status of Sugar Industry (HSM)
  - 1.    Data on costs
  - 2.    Data on return
  - 3.    Number of workers required
  - 4.    Economics of sugar production
  - 5.    Hamakua's ability to compete
  - 6.    State subsidization issues

7:30 - 7:50      C.    Questions and Answers

III. Federal Assistance

7:50 - 7:55      A.    Senator Inouye's Office

7:55 - 8:00      B.    Senator Akaka's Office

8:00 - 8:10      BREAK

8:10 - 8:50    IV. Community Forum

8:50 - 9:00    V. State Response

A. State and Federal Actions

B. State Responses to Community Needs

9:00            ADJOURNMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 621  
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APR 15 1993

REF:WL-LC

KEITH W. AHUE, Chairperson  
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER, II  
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT  
PROGRAM  
AQUATIC RESOURCES  
CONSERVATION AND  
ENVIRONMENTAL AFFAIRS  
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HISTORIC PRESERVATION  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

Ms. Jennifer Shishido  
Administrator  
State of Hawaii  
Division of Occupational Safety and Health  
Department of Labor and Industrial Relations  
830 Punchbowl Street  
Honolulu, Hawaii 96813

Dear Ms. Shishido:

Use of Explosives for Plugging and Abandonment  
of Wells KS-8, KS-1 and KS-2

In accordance with the Department of Land and Natural Resource's Administrative Rules, and under a permit granted by our department, Puna Geothermal Venture (PGV) began plug and abandon operations on the KS-8 well on April 13, 1993. The operations will include utilizing explosive perforating charges deep within the well. In the interest of safety and efficiency, PGV plans to conduct the abandonment operations in a continuous, 24-hour per day basis.

It is our understanding that PGV has requested a variance from your Division for use of explosives on a 24-hour basis. This is to inform you that the Department of Land and Natural Resources has no objection to your granting such a variance. PGV will need this variance to include wells KS-1 and KS-2 for subsequent operations.

Very truly yours,

KEITH W. AHUE



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 621  
HONOLULU, HAWAII 96809

REF:WL-LC

MAR 15 1993

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DONA L. HANAIKE

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STATE PARKS  
WATER AND LAND DEVELOPMENT

Mr. Steven Morris  
Vice President  
Puna Geothermal Venture  
745 Fort Street Mall  
Honolulu, Hawaii 96813

Dear Mr. Morris:

KS-2 Plug and Abandonment Program

Your proposed KS-2 (Kapoho State No. 2) Plug and Abandonment Program, dated December 29, 1992, submitted with Mr. Thomas Kizis' December 29, 1992 letter, is approved. The Geothermal Well Abandonment Permit for KS-2 is attached.

Please notify the Department, in writing, of the proposed start date for abandonment activities.

Should you have any questions on this matter, please contact Mr. Manabu Tagomori of the Division of Water and Land Development in Honolulu at 587-0230.

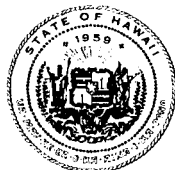
Very truly yours,

A handwritten signature in cursive script that reads "John P. Keppeler II".

JOHN P. KEPPELER II  
Acting Director

Enc.

c: Mr. Thomas Kizis  
bc: Mr. Eric Tanaka, DOWALD



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 621  
HONOLULU, HAWAII 96809

BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER, II  
DONA L. HANAIKE

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GEOHERMAL WELL ABANDONMENT PERMIT

Kapoho State No. 2 (KS-2)  
Kapoho, Puna, Hawaii

TO: Puna Geothermal Venture  
P.O. Box 30  
Pahoa, Hawaii 96778-0030  
(808) 965-6233

Your application, dated December 29, 1992, for a permit to abandon Geothermal Well Kapoho State No. 2, is approved.

Well Designation: Kapoho State No. 2  
Location: TMK 1-04-1:19, Kapoho, Puna, Hawaii (Well Pad B)  
Leased to: Kapoho Land Partnership  
Subleased to: Puna Geothermal Venture  
Operator: AMOR VIII Corporation  
Ground Elevation: 717 ft. +/- Above Mean Sea Level  
Total Measured Depth: 8,005 ft.

Approval is granted in accordance with the Department's Administrative Rules, Chapter 13-183, HAR, and under the following conditions:

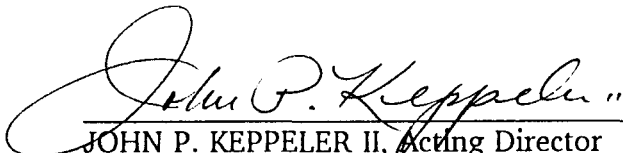
- (1) All work shall be performed in accordance with your KS-2 Plug and Abandonment, Revised Program, dated December 29, 1992, submitted with Mr. Thomas Kizis' letter of December 29, 1992, the Department's Administrative Rules (Chapters 13-183 and 13-184, HAR), and all other applicable Federal, State and County laws, ordinances, and regulations;
- (2) The permittee, his successors and assigns shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim or demand for property damage, personal injury and death arising out of any act or omission of the permittee, assigns, officers, employees, contractors and agents under this permit or relating to or connected with the granting of this permit;
- (3) Except for the surface plug, all cement used for the plugging operations shall contain a high temperature resistant admix as set forth in Section 13-183-83 (a), HAR. In addition, good quality, heavy drilling fluid shall be used to fill all portions of the well not plugged with cement;

GEOHERMAL WELL ABANDONMENT PERMIT

Kapoho State No. 2 (KS-2)

Page 2

- (4) Subsequent to plugging and abandonment operations, the casing shall be cut off at least six feet below ground surface and all concrete cellars and other structures (e.g., fencing) removed;
- (5) The permittee shall obtain the Chairperson's approval prior to any changes to the abandonment program;
- (6) A history of the well and an as-abandoned diagram of the well shall be filed within sixty days of the abandonment;
- (7) The permittee shall notify the Department, in writing, of the date of the start of work;
- (8) The bond covering the well shall remain in full force and effect until the well is properly abandoned and the site properly restored; and
- (9) This permit shall expire 365 days from the date of issuance.

  
\_\_\_\_\_  
JOHN P. KEPPELER II, Acting Director  
Department of Land and Natural Resources

MAR 15 1993

\_\_\_\_\_  
Date of Issuance

c: Land Board Members  
Hawaii County Planning Dept.  
DBEDT  
Dept. of Health  
OEQC, DOH

REF:WL-KO

SEP 7 1989

Dr. Harry J. Olson  
Hawaii Natural Energy Institute  
University of Hawaii at Manoa  
Holmes Hall 246  
2540 Dole Street  
Honolulu, Hawaii 96822

Dear Dr. Olson:

Thank you for your letter of August 21, 1989 advising the Department of Land and Natural Resources of your plans to conduct a down-hole temperature survey in Kapoho State Well 1-A located at Kapoho, Puna, Hawaii.

In answer to your inquiry as to whether any permits are required for the proposed temperature survey, our Department's Administrative Rules, Chapter 13-183, entitled "Rules on Leasing and Drilling of Geothermal Resources" does not require the issuance of a permit for such scientific monitoring purposes.

However, upon completion of such testing, please submit the results of the survey to our office.

Very truly yours,

  
WILLIAM W. PATY

MT:DN:DL:ko

*and  
Kapoho State 2*



# University of Hawaii



Center for Ocean Resources Technology  
JKK Look Laboratory, 811 Olomehane Street  
Honolulu, Hawaii 96813

August 21, 1989

Mr. Manabu Tagamori  
Deputy Director  
Commission of Water Management  
Department of Land and Natural Resources  
Kalanimoku Building #227  
1151 Punchbowl Street  
Honolulu, Hawaii 96809

RECEIVED  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
AUG 21 1989

RECEIVED  
AUG 21 1989 12:53

RECEIVED

Re: Temperature Measurements in Geothermal Wells

Dear Mr. Tagamori:

The University of Hawaii at Manoa (UHM) and the Pacific International Center for High Technology Research (PICHTR) are attempting to formulate a joint geothermal research program with a consortium consisting of the Japanese Ministry of International Trade and Industry (MITI), and four large Japanese industrial companies headed by Sumitomo Metal Industries, Ltd. The first phase of the program, in which UHM and PICHTR could achieve partnership status, involves the testing of a Down Hole Coaxial Heat Exchanger (DHCE), in an existing geothermal well in Hawaii. This program for geothermal research and development, if successful, has the potential to result in multi-million dollar annual funding for a period of four years, followed by the construction and operation of a pilot geothermal generating plant in Hawaii.

The KS-1A and KS-2 wells have been identified as the only wells in Hawaii that may meet the requirements of the DHCE program. Puna Geothermal Venture, the owner of these wells, has indicated willingness to discuss offering these geothermal wells for testing of the DHCE, providing that UHM obtains any permissions or permits, if necessary, for a temperature survey to determine if the wells have the required temperature levels and profiles for the contemplated research.

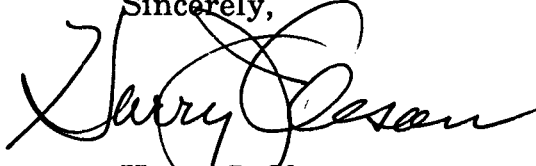
The KS-1A and KS-2 wells are currently shut-in and plugged to a depth of approximately 3,000 feet. Neither of the wells has appreciable wellhead pressure at present; and no flowing or venting would be involved during the temperature measurements. The temperature measurements would involve the opening of the

An Equal Opportunity Employer

wellhead valve and lowering a temperature probe to the top of the existing plug, retrieving the probe from the well, and closing the wellhead valve. The survey would be conducted by using either a thermister probe or a Kuster tool, and involve equipment that would fit into the back of a pickup truck or a small pickup trailer. The survey would be run during daylight hours as soon as possible, and would take a day or less to complete.

I have contacted Maurice A. Richard, PGV's Hawaii Regional Development Manager, for formal, written permission to take temperature measurements in the KS-1A and KS-2 wells, and would appreciate it if you would let me know if the Department of Land and Natural Resources will require a permit for the proposed temperature measurements. If I can provide any additional information, I would be pleased to meet with you or your staff to explain the measurements in more detail.

Sincerely,

A handwritten signature in black ink, appearing to read "Harry J. Olson". The signature is fluid and cursive, with a large loop at the end.

Harry J. Olson  
Spark M. Matsunaga Fellow in  
Geothermal Energy Research  
University of Hawaii at Manoa

D. 100

AUG 15 1988

Mr. Maurice A. Richard  
Regional Development Manager  
Crest Energy Systems, Inc.  
610 East Glendale Ave.  
Sparks, Nevada 89431-5811

Dear Mr. Richard:

We acknowledge receipt of your letter of July 19, 1988, requesting a 180-day extension of the Geothermal Well Modification Permit issued to Thermal Power Company for Espaho State No. 3.

In order to complete our review, would you please provide us with the following information.

- (1) Information and confirmation of the acquisition of Thermal Power Co. by Crest Energy Systems, Inc. and the transfer of responsibility from Thermal Power to Crest as the new designated operator for Pure Geothermal Venture (PGV).
- (2) Submittal of a performance bond as required by the Department of Land and Natural Resources' Chapter 183, or evidence which will confirm the legal transfer of the existing bond which currently identifies Thermal Power Co. as the principal party bound unto the State of Hawaii.
- (3) Current status of plans for development activities described in PGV's Second Amendment to the Plan of Operations approved by the Board of Land and Natural Resources on April 25, 1988.

Thank you for your cooperation.

Very truly yours,

WILLIAM V. PATY, Chairperson  
Board of Land and Natural Resources

MT:DN:DL:ko

October 7, 1987

Mr. Ralph A. Patterson  
Project Manager  
Thermal Power Company  
220 South King Street, Suite 1750  
Honolulu, Hawaii 96813

Dear Mr. Patterson:

In accordance with Section 13-183-6 of the Department of Land and Natural Resources' Administrative Rules on the Leasing and Drilling of Geothermal Resources, our Division will begin conducting bi-weekly inspections of geothermal wells--Kapoho State No. 1, 2, and 1-A.

Since vehicular access to the wells would facilitate inspection, we respectfully request a key to the access gate at the geothermal project site for use by our inspector on Hawaii, Mr. Morris Ota.

We look forward to your consideration and cooperation on this matter. Should you have any questions, please contact Mr. George Matsumoto at 548-7619.

Sincerely,

MANABU TAGOHORI  
Manager-Chief Engineer

DN:DL:dh



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
P. O. BOX 621  
HONOLULU, HAWAII 96809

COPY

WILLIAM W. PATY, CHAIRMAN  
~~SUSUMU OMO, CHAIRPERSON~~  
BOARD OF LAND & NATURAL RESOURCES  
LIBERT K. LANDGRAF  
~~LIBERT K. LANDGRAF~~  
DEPUTY TO THE CHAIRMAN

DIVISIONS:  
AQUACULTURE DEVELOPMENT  
PROGRAM  
AQUATIC RESOURCES  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

GEOTHERMAL WELL MODIFICATION PERMIT

Kapoho State 2  
Puna, Hawaii

TO: Thermal Power Co.  
220 South King Street, Suite 1750  
Honolulu, Hawaii 96814

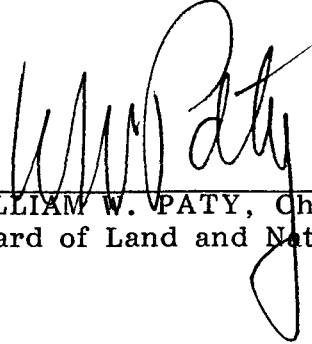
Your application dated June 3, 1987, for a permit to modify Kapoho State 2, Geothermal Well is approved:

Well Designation: Kapoho State 2  
Location: TMK 1-4-01:19, Kapoho, Puna, Hawaii  
Mining Rights: Kapoho Land Partnership, under State  
Mining Lease R-2  
Subleased to: Thermal-Amfac Joint Venture  
Operator: Thermal Power Co. (for Puna Geothermal Venture)  
Ground Elevation: 718± feet  
Total Depth: 7,670 feet

You are hereby granted permission to modify Kapoho State 2 Well with new casing and a new penetration of the geothermal reservoir by a directional drill hole beginning at a depth of 4,209 feet, having a bottom depth of 7,670 feet and extending 1,400 feet laterally from wellhead plumb, in accordance with the following conditions:

- (1) All work shall be performed as described in the Proposed Modification Program submitted with your application and in accordance with the Department's Administrative Rules (Chapter 183), and all other applicable Federal, State, and County laws, ordinances, rules and regulations.
- (2) The applicant shall submit in writing, the compass bearing of the proposed directional hole prior to commencement of drilling.
- (3) The applicant shall obtain the Chairperson's approval prior to the execution of any contemplated changes in the proposed drilling program.

- (4) The applicant shall submit a record of a wireline down-hole directional survey of the well from the surface to the total depth to the Department within 60 days after the well has been completed.
- (5) This permit shall expire 365 days from the date of issuance.



WILLIAM W. PATY, Chairperson  
Board of Land and Natural Resources

July 10, 1987  
Date of Issuance

December 21, 1982

Mr. Jere Denton  
Vice President  
Hawaii Project  
Thermal Power Company  
1600 Kapiolani Blvd., Suite 208  
Honolulu, Hawaii 96814

Dear Mr. Denton:

Geothermal Drilling Permit - Kapoho State No. 2

The Department of Land and Natural Resources approves your request, dated December 14, 1982, for a 180-day extension of the drilling permit for Kapoho State No. 2. The new expiration date is July 7, 1983.

Please be informed that all provisions of the original permit and the proposed casing lap repair and clean out well program are applicable through this extension period and that reasonable prior notice should be given our staff whenever any testing is to be conducted. Appropriate lead time is necessary for scheduling staff personnel to inspect the test activities.

Additionally, the following conditions are applicable to this permit:

- o The applicant shall comply with all valid requirements of all municipal, state and federal authorities and observe all municipal, state and federal laws and regulations pertaining to the lands and permittee's operations, which are now in force or which may hereafter be in force, including, but not limited to, all water and air pollution control laws, and those relating to the environment. The State of Hawaii, acting in its governmental capacity, may by regulation regulate the drilling, location, spacing, testing, completion, production, operation, maintenance and abandonment of a well or wells or similar activity as well as the construction, operation and maintenance of any other facilities in the exercise of its police powers to protect the public health, welfare and safety as provided in the regulations.

- o Pollution of the ocean and tidelands, rivers, or other bodies of water, and all impairment of and interference with bathing, fishing, or navigation in the waters of the ocean or any bay or inlet thereof is prohibited, and no brine, minerals, or any refuse of any kind from any well or works shall be permitted to be deposited on or pass into waters of the ocean, any bay or inlet thereof, rivers, lakes or other bodies of water, without specific written State authorization.
- o No substances which may be produced from any well drilled upon the lands shall be blown, flowed, or allowed to escape into the open air or on the ground in such a manner as to create a nuisance, which shall specifically include but not be limited to noise, air or other pollution, and other activities which disturb the occupier's or his Tenant's use of the lands. Subject to the foregoing, the applicant may bleed substances to the atmosphere so long as such operations are lawfully and prudently conducted in accordance with good geothermal drilling and production practices and are not otherwise in violation of the law.

Very truly yours,

*[Signature]*

SUSUMU ONO  
Chairman of the Board

ATC:ES:dk

Seen

Mr. Ralph A. Patterson, Jr.  
Hawaii Project Manager  
Thermal Power Company  
220 South King Street, Suite 1750  
Honolulu, Hawaii 96813

Dear Mr. Patterson:

Second Amendment Plan of Operations  
Geothermal Mining Lease R-2, Hawaii

Your second amendment to the Plan of Operations covered by State Geothermal Resource Mining Lease R-2, has been reviewed in accordance with the Department's Administrative Rules, Title 13, Chapter 183.

You are hereby granted approval of your proposed amendments to the Plan of Operations subject to all applicable statutes, ordinances, rules and regulations of the Federal, State and County governments, and the following conditions:

- (1) The applicant shall submit a detailed map showing the pipeline (10-inch steam and 3-inch brine) route from Well KS-1A to the HGP-A plant, including the proposed extension of the pipelines to Well KS-2.
- (2) The applicant shall notify the Department of any changes to the maintenance and operation of the existing air and noise monitoring program.
- (3) The applicant shall submit an as-built drawing of Well KS-2 and shall file with the Chairperson, an appropriate application for permission to modify the KS-2 well.
- (4) The applicant shall submit in a timely manner, all reports pertaining to the maintenance and operation of the plan and to revenues received by the HGP-A facility.
- (5) Prior to conducting any experimental well injection tests of geothermal fluids or gases, the applicant shall submit a subsequent amendment to the Plan of Operations to the Department for approval.

Mr. Ralph Patterson

-2-


April 25, 1987

- (6) The duration of the amended operations shall not exceed four (4) years from the date of approval.
- (7) All activities on the leased lands covered by State Geothermal Resource Mining Lease S-4692 shall be subject to the approval of the lessee.

Very truly yours,

WILLIAM W. PATY  
Chairperson of the Board

cc: Board Members  
Mr. Mike Shimabukuro  
County of Hawaii Planning Dept.



June 25, 1982

MEMORANDUM FOR THE RECORD

FROM: Ed Sakoda

SUBJECT: Geothermal Inspection Report -  
Thermal Power Co.

Thermal Power Co. has completed one phase of testing and is presently awaiting a skid-mounted separator for further testing of Kapoho State Well No. 2. According to Jere Denton of Thermal Power Co., plans call for flow testing of Kapoho State No. 1 during the week of July 12 and Kapoho State No. 2 for the week of July 19. Jere Denton is to notify DOWALD to confirm testing dates.



ED SAKODA

ES:ko

May 6, 1982

MEMORANDUM FOR THE RECORD

FROM: Ed Sakoda

SUBJECT: Geothermal Well Test - Kapoho State No. 2

On April 21, 1982, Dan Lum and I were observers at the testing of Kapoho State No. 2 geothermal well. The well was gradually "brought in" by slowly releasing the pressure through two bleeder valves. The main valve was then opened and the pressure released through the main system.

The noise muffling system consisted of piping the steam into a 15 feet deep rock-filled pit with a perforated pipe system. The system worked until abrasion by particles in the steam wore a hole in the elbow section of the pipe.

An H<sub>2</sub>S abatement system was hooked up to the steam discharge and used, although not needed because of little or no H<sub>2</sub>S from the well.

The well was flashed through the muffler for several hours until the hole was worn in the elbow bend. The steam was then vented directly through the well stack. The well was shut down in the evening.

On Thursday morning, the water level in the well had dropped and the well would not flow. Periodic water level measurements were taken to determine the rise or fall of the water level.

By Friday morning, pressure had built up in the well sufficiently to flash the well. A larger diameter stack was installed hoping to reduce the noise. It was noted that fine sand-sized particles were being blown from the well. The well was planned to be cleaned out for as long as possible - perhaps as much as six days.

ED SAKODA

ES:ko

May 6, 1982

MEMORANDUM FOR THE RECORD

FROM: Ed Sakoda

SUBJECT: Geothermal Well Test - Kapoho State No. 2

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An H<sub>2</sub>S abatement system was hooked up to the steam discharge and used, although not needed because of little or no H<sub>2</sub>S from the well.

The well was flashed through the muffler for several hours until the hole was worn in the elbow bend. The steam was then vented directly through the well stack. The well was shut down in the evening.

On Thursday morning, the water level in the well had dropped and the well would not flow. Periodic water level measurements were taken to determine the rise or fall of the water level.

By Friday morning, pressure had built up in the well sufficiently to flash the well. A larger diameter stack was installed hoping to reduce the noise. It was noted that fine sand-sized particles were being blown from the well. The well was planned to be cleaned out for as long as possible - perhaps as much as six days.



ED SAKODA

ES:ko

August 26, 1982

Mr. W. L. D'Olier  
Vice President, Exploration  
Thermal Power Company  
501 California Street  
San Francisco, California 94108

Dear Mr. D'Olier:

We acknowledge receipt of completion reports of Kapoho State -  
geothermal well required by Section 13-183-85 of Title 13, Administrative  
Rules.

Please be assured that the information will be kept confidential as  
specified by Section 13-183-62.

Very truly yours,

JUSURU ONO

JUSURU ONO  
Chairman of the Board

*Down CD*



**THERMAL POWER**  
COMPANY

RECEIVED

AUG 13 1982

TPC-HI

11 August 1982

Mr. Susumu Ono, Chairman  
Department of Land and Natural Resources  
State of Hawaii  
Kalanimoku Building  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Re: Completion Reports  
Geothermal Well: Kapoho State 2  
Geothermal Resources Mining Lease No. R-2  
Puna District, Hawaii

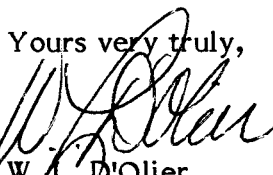
Dear Mr. Chairman:

Pursuant to Section 13-183-85 of Title 13, Administrative Rules, Thermal Power Company, as Operator and agent for the owners, Thermal-Dillingham-Amfac, hereby submits the completion reports for the captioned well.

Within this package are the following:

1. Well Summary Report.
2. Well History Report.
3. Static Wellbore Temperature Survey.
4. Wellbore Deviation Survey.
5. Licensed Surveyer (No. 1247) Report.
6. Drilling Log Report (Exlog-Smith).

Pursuant to Section 13-183-62, Thermal-Dillingham-Amfac submits these reports with the understanding that all information contained therein will be kept confidential for at least one year after receipt.

Yours very truly,  
  
W.L. D'Olier  
Vice President, Exploration

WLD/SSW/ikl  
Enclosures

cc: J. M. Denton  
HA-PU-BR-B01

601 California Street San Francisco California 94108 415-981-5700 Telex: 34387 NATOMAS SFO

DONALD JAMES MURRAY  
P. O. Box 863  
Residence: 935-9189

*Murray, Smith & Associates, Ltd.*

Hilo Hotel Office Annex  
Hilo, Hawaii 96720  
Telephone: (808) 935-9725

March 10, 1982

Ms. Jane Iffla  
Thermal Power Company  
601 California Street  
San Francisco, California  
94108

RECEIVED

MAR 12 1982

TPC

Re: "Kapoho State 2"  
Geothermal Well Site  
Kapoho, Puna, Hawaii  
Tax Map Key: 1-4-01:19

Submitted herewith please find the following:

1. Four (4) maps denoting Easements covering the "Kapoho State 2" Well Site (54,000 Square Feet or 1.2397 Acres) and "Road and Utility Easement" 30-Foot Wide (38,340 Square Feet or 0.8802 Acres).
2. Originals of legal descriptions covering "Kapoho State 2" Well Site and the Road and Utility Easement.
3. Topographic Maps of the "Kapoho State 2" Well Site denoting original contours and the extent of the graded portion.

Please review the enclosures and advise.

Very truly yours,

MURRAY, SMITH & ASSOCIATES, LTD.

*Donald James Murray*

Donald James Murray

encls.

DJM:hm

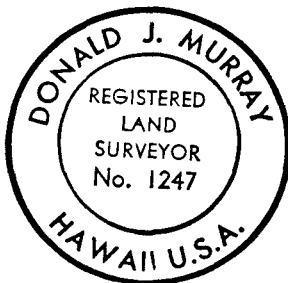
EASEMENT

"KAPOHO STATE 2"

Geothermal Well Site  
Within L.P. 8177 and R.P. 4497  
L.C. Aw. 8559 Apana 5 to C. Kanaina  
Kapoho, Puna, Hawaii

Beginning at a point at the south corner of this parcel of land, the coordinates of said point of beginning referred to Government Survey Triangulation Station "Kaliu" being 9,467.72 feet North and 10,894.47 feet East and running by azimuths measured clockwise from true South:

- |    |          |   |
|----|----------|---|
| 1. | 152° 33' | 180.00 feet;  |
| 2. | 242° 33' | 300.00 feet;  |
| 3. | 332° 33' | 180.00 feet;  |
| 4. | 62° 33'  | 300.00 feet to the point of beginning and containing an area of 54,000 Square Feet or 1.2397 Acres. |



MURRAY, SMITH & ASSOCIATES, LTD.

BY Donald James Murray  
Donald James Murray

Hilo, Hawaii  
March 3, 1982

EXHIBIT A

hm  
F.3829

*Murray, Smith & Associates, Ltd.*

REGISTERED SURVEYORS

HILO, HAWAII

P. O. BOX 863

OFFICE PHONE 935-9725

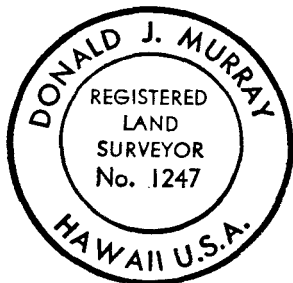
ROAD AND UTILITY EASEMENT

Within L.P. 8177 and R.P. 4497  
L.C. Aw. 8559 Apana 5 to C. Kanaina  
Kapoho, Puna, Hawaii

Beginning at a point at the southwest corner of this parcel of land, being also the easterly corner of Geothermal Well Site Easement "Kapoho State 1", the coordinates of said point of beginning referred to Government Survey Triangulation Station "Kaliu" being 8,828.60 feet North and 10,036.73 feet East and running by azimuths measured clockwise from true South:

- |     |              |  |
|-----|--------------|--|
| 1.  | 152° 58' 20" | 30.01 feet along Geothermal Well Site Easement "Kapoho State 1";   |
| 2.  | 244° 28' 50" | 381.40 feet;   |
| 3.  | 236° 10'     | 272.54 feet; thence along a curve to the left having a radius of 115.00 feet, the chord azimuth and distance being:  |
| 4.  | 204° 32' 30" | 120.60 feet;   |
| 5.  | 172° 55'     | 180.95 feet; thence along a curve to the right having a radius of 165.00 feet, the chord azimuth and distance being: |
| 6.  | 219° 20'     | 239.04 feet;   |
| 7.  | 265° 45'     | 85.87 feet;  |
| 8.  | 62° 33'      | 53.07 feet along Geothermal Well Site Easement "Kapoho State 2";   |
| 9.  | 332° 33'     | 9.89 feet along Geothermal Well Site Easement "Kapoho State 2";  |
| 10. | 85° 45'      | 40.98 feet; thence along a curve to the left having a radius of 135.00 feet, the chord azimuth and distance being:   |
| 11. | 39° 20'      | 195.58 feet;   |
| 12. | 352° 55'     | 180.95 feet; thence along a curve to the right having a radius of 145.00 feet, the chord azimuth and distance being: |
| 13. | 24° 32' 30"  | 152.06 feet;   |
| 14. | 56° 10'      | 274.72 feet;   |
| 15. | 64° 28' 50"  | 382.79 feet to the point of beginning and containing an area of 38,340 Square Feet or 0.8802 Acres.                  |

Hilo, Hawaii  
March 3, 1982



MURRAY, SMITH & ASSOCIATES, LTD.

BY

*Donald James Murray*  
Donald James Murray  
Registered Surveyor

hm

EXHIBIT A

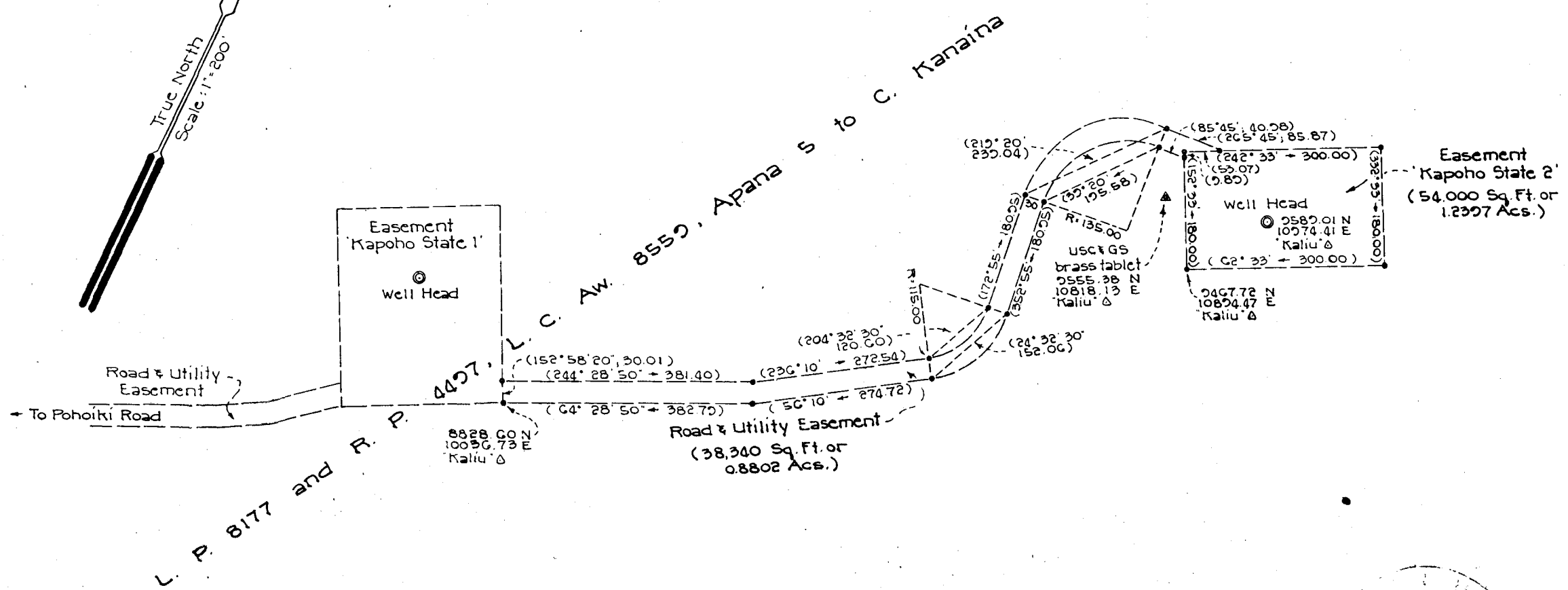
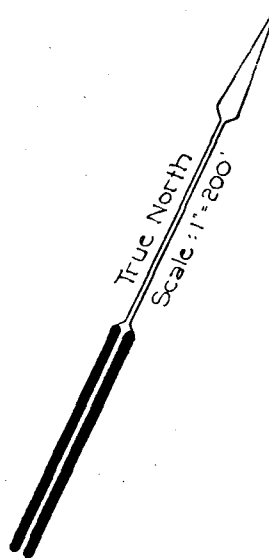
*Murray, Smith & Associates, Ltd.*

REGISTERED SURVEYORS

HILO, HAWAII

F. 3829 O. BOX 863

OFFICE PHONE 935-9725

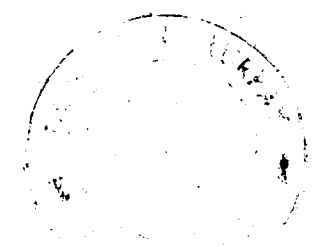


**EASEMENT**

**'KAPOHO STATE 2'**

Geothermal Well Site  
 Within L. P. 8177 and R. P. 4497,  
 L. C. Aw. 8550, Apana 5 to C. Kanaina  
 Kapoho, Puna, Island of Hawaii, Hawaii

Survey and Plan by Murray, Smith & Associates, Ltd.  
 P. O. Box 803 Hilo, Hawaii



THIS WORK WAS CHECKED BY ME  
 DE [unclear] [unclear]

*Donald James Murray*

EXHIBIT B

TMK 1-4-01-19  
 March 1, 1982

**PREVENTION OF  
ACCIDENTAL H<sub>2</sub>S EXPOSURE**

1. PROVIDED PROFESSIONAL ON-SITE SAFETY TRAINING FOR ALL WORKERS.
2. IN ALL FUTURE DRILLING OPERATIONS WILL PROVIDE PERIODIC PROFESSIONAL TRAINING FOR CREW AND WILL REQUIRE CONTRACTOR TO INCLUDE H<sub>2</sub>S SAFETY TOPICS AND DRILLS IN WEEKLY SAFETY MEETINGS.
3. HAVE REINFORCED SAFETY PRECAUTIONS FOR ENTERING WELLHEAD CELLAR.
4. OBTAINED ADDITIONAL LIGHTER FACE MASKS PLACEMENT ON RIG.
5. WRI HAS OBTAINED OSHA REQUIRED SAFETY EQUIPMENT.

PREVENTION OF VANDALISM  
ON WELL SITES

1. INSTALLING LIGHTS TO ILLUMINATE WELL PAD.
2. INSTALLED FENCES AROUND WELL HEADS INSIDE WELL PAD FENCE.
3. INSTALLING ALARM ON OUTER LOCATION FENCE.
4. REVISED EMERGENCY PLAN IN COORDINATION WITH COUNTY CIVIL DEFENSE.

## WELL SUMMARY REPORT - GEOTHERMAL

Operator <b>THERMAL POWER COMPANY</b>		Well name and number <b>KAPOHO STATE 2</b>			
Field <b>PUNA</b>		County <b>HAWAII</b>	Sec. <b>SEE SURVEY REPORT</b>	T. <b>SEE SURVEY REPORT</b>	R. <b>SEE SURVEY REPORT</b>
Location (property or section corner, or street center lines) <b>STATE GEOTHERMAL RESOURCES MINING LEASE R-2 KAPOHO, PUNA, HAWAII. (LICENCED SURVEYERS REPORT SHOWS EXACT LOCATION)</b>			Elevation of ground (feet) above sea level) <b>717.87'</b>		
Commenced drilling (date) <b>1-19-82</b>	Total depth (feet) <b>8005'</b>	Plugged depth (feet) <b>N/A</b>	Depth measurements taken from top of: <input type="checkbox"/> Derrick floor <input type="checkbox"/> Rotary table <input checked="" type="checkbox"/> Kelly bushing		
Completed drilling (date) <b>4-2-82</b>	Geologic formation and age at total depth <b>BASALT</b>		Which is <b>18</b> feet above ground.		
Commenced producing (date) <b>N/A</b>			Geologic marker(s) <b>NONE</b>		Depth (feet) <b>N/A</b>
Junk <b>NONE</b>		Geologic marker(s) <b>NONE</b>		Depth (feet) <b>N/A</b>	

DATE	STATIC TEST (Shut-in well head)		PRODUCTION TEST DATA									
	Temp °F	Press. psig	Total mass flow data				Separator data					
			lb/hr	Temp °F	Press. psig	Enthalpy	Orifice	Water lb/hr	Steam lb/hr	Press. psig	Temp °F	
3-31-82	448	605	305,000	387	230	--	--	--	--	--	--	--

### CASING RECORD (present hole)

Size of casing (A.P.I.)	Top of casing ft	Depth of shoe ft	Weight of casing lbs	New or second hand	Seamless or lapweld	Grade of casing	Size of hole drilled in	Volume of cement yd <sup>3</sup>	Depth of cementing if through perforations ft
30"	SURFACE	28'	-			-	-	-	
20"	"	68'	94			H40	26"	12	
13 3/8"	"	1313'	54.5, 61	ALL	SEAMLESS	K55	17 1/2"	408	N/A
9 5/8"	"	4209'	36, 40	NEW		K55, N80	12 1/4"	190	
7"	3891'	7816'	23, 26			K55, N80	8 1/2"	-	

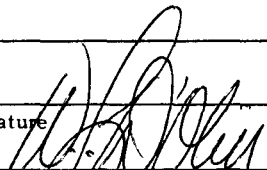
### PERFORATED CASING (size, top, bottom, perforated intervals, size and spacing of perforation and method)

7" liner top at 3891', bottom at 7216'.

Perforations below 4100' are 1/2" holes drilled on 3" centers and 10 rows.

Was analysis of effluent made? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Electric log depths <b>4216'</b>	Temperature depths <b>6916'</b>
---	-------------------------------------	------------------------------------

In compliance with Section 13-183-85 of Title 13, Sub-title 7; Chapter 183, Sub-chapter 12 of the Administrative Rules, of the Department of Land and Natural Resources, State of Hawaii, the information herewith is complete and correct as far as can be determined.

Name <b>W. L. D'Olier</b>	Title <b>Vice President, Exploration</b>
Address <b>601 California Street</b>	City <b>San Francisco, CA</b>
Zip Code <b>94108</b>	Telephone Number <b>415/981-5700</b>
Signature 	Date <b>11 August 1982</b>

## WELL SUMMARY REPORT - GEOTHERMAL

Operator <b>THERMAL POWER COMPANY</b>		Well name and number <b>KAPOHO STATE 2</b>			
Field <b>PUNA</b>		County <b>HAWAII</b>	Sec. <b>SEE SURVEY REPORT</b>	T. <b>SEE SURVEY REPORT</b>	R. <b>SEE SURVEY REPORT</b>
Location (property or section corner, or street center lines) <b>STATE GEOTHERMAL RESOURCES MINING LEASE R-2 KAPOHO, PUNA, HAWAII. (LICENCED SURVEYERS REPORT SHOWS EXACT LOCATION)</b>					Elevation of ground (feet) above sea level <b>717.87'</b>
Commenced drilling (date) <b>1-19-82</b>	Total depth (feet) <b>8005'</b>	Plugged depth (feet) <b>N/A</b>	Depth measurements taken from top of: <input type="checkbox"/> Derrick floor <input type="checkbox"/> Rotary table <input checked="" type="checkbox"/> Kelly bushing		
Completed drilling (date) <b>4-2-82</b>	Geologic formation and age at total depth <b>BASALT</b>		Which is <b>18</b> feet above ground.		
Commenced producing (date) <b>N/A</b>	Junk <b>NONE</b>		Geologic marker(s) <b>NONE</b>		Depth (feet) <b>N/A</b>

DATE	STATIC TEST (Shut-in well head)		PRODUCTION TEST DATA								
	Temp °F	Press. psig	Total mass flow data				Separator data				
			lb/hr	Temp °F	Press. psig	Enthalpy	Orifice	Water lb/hr	Steam lb/hr	Press. psig	Temp °F
3-31-82	448	605	305,000	387	230	--	--	--	--	--	--

CASING RECORD (present hole)									
Size of casing (A.P.I.)	Top of casing ft	Depth of shoe ft	Weight of casing lbs	New or second hand	Seamless or lapweld	Grade of casing	Size of hole drilled in	Volume of cement yd <sup>3</sup>	Depth of cementing if through perforations ft
30"	SURFACE	28'	-			-	-	-	
20"	"	68'	94			H40	26"	12	
13 3/8"	"	1313'	54.5, 61	ALL	SEAMLESS	K55	17 1/2"	408	N/A
9 5/8"	"	4209'	36, 40	NEW		K55, N80	12 1/4"	190	
7"	3891'	7816'	23, 26			K55, N80	8 1/2"	-	

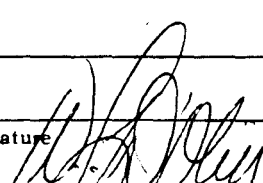
**PERFORATED CASING (size, top, bottom, perforated intervals, size and spacing of perforation and method)**

7" liner top at 3891', bottom at 7216'.

Perforations below 4100' are 1/2" holes drilled on 3" centers and 10 rows.

Was analysis of effluent made? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Electric log depths <b>4216'</b>	Temperature depths <b>6916'</b>
---	-------------------------------------	------------------------------------

In compliance with Section 13-183-85 of Title 13, Sub-title 7; Chapter 183, Sub-chapter 12 of the Administrative Rules, of the Department of Land and Natural Resources, State of Hawaii, the information herewith is complete and correct as far as can be determined.

Name <b>W. L. D'Olier</b>	Title <b>Vice President, Exploration</b>
Address <b>601 California Street</b>	City <b>San Francisco, CA</b>
Zip Code <b>94108</b>	Telephone Number <b>415/981-5700</b>
Signature 	Date <b>11 August 1982</b>

Route Slip

WATER RESOURCES & FLOOD CONTROL BRANCH

From: [Signature] Date: 4-27-82 File in: Kayoko

To	Initial	Please
<u>[Signature]</u>		See me
_____		Call
_____		Take action by _____
_____		Review & comment
_____		Draft reply by _____
_____		Type draft
_____		Type final
_____		Xerox _____ copies
_____		Mail
<u>[Signature]</u>		
<u>[Signature]</u>		
_____		For _____ Approval
_____		Signature
_____		Information
_____		
_____		

_____	Robert Chuck	_____	Jane Sakai	_____	Bill Koyanagi
_____	Takeo Fujii	_____	Elsie Yonamine	_____	Richard Jinnai
_____	James Yoshimoto	_____	_____	_____	Yoshi Shibuya

Jere Devton reported today that Kayoko 2 has improved its yield and some preliminary test data obtained. They're hoping that Kayoko #1 re-working will be completed and well ready for "blow-off" development and step testing next week. Then 30 day test planned. Do

10-7-10

DEPARTMENT OF LAND AND NATURAL RESOURCES

Division of Water and Land Development

RECEIVED  
DIVISION OF  
LAND MANAGEMENT

Approved by the Board of  
Land and Natural Resources  
at the meeting held on

MAR 24 4 20 PM '82

TO:

- Chairman
- Deputy to Chairman
- Board Member
- Deputy Attorney General
- Planning Office
- State Parks
- Aquatic Resources
- Forestry & Wildlife
- Land Management *WBFN 3/20/82*
- Aquaculture Dev. Program

FOR:

- Signature
- Approval
- Approval as to Form
- Approval & Transmittal to Governor
- Comment
- Recommendation
- Investigation & Report
- Appropriate Action
- Retention
- Return

REMARKS: Approval for further  
drilling of Kapeho #2

---



---

*WBFN*

*Bob*

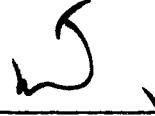
Signature  
 March 24, 1982

*WBFN*

FOR YOUR INFORMATION

3-15, 1982

I called Bill D'Olier today w/ preliminary OK  
to his request to drill to 840' on Keyhole Sheet #2.  
A letter will be forthcoming for the record,



Division of Water and Land Development  
Department of Land and Natural Resources  
State of Hawaii

Kapoh. Stile #2 du 8/1/82  
D'Kier, William

now 6300' - 8000' total depth max.  
water 1280°F

optimal 8000' total depth desired

ahead to this schedule  
feasible

drilling: 400 - 600' / day 8 3/4" hole  
below 6300'  
today.

W021 Reg 4

---

(415) 765-0249

Route Slip  
 WATER RESOURCES & FLOOD CONTROL BRANCH

From: \_\_\_\_\_ Date: \_\_\_\_\_ File in: \_\_\_\_\_

<u>To</u>	<u>Initial</u>	<u>Please</u>
_____	Manabu Tagomori	_____ See me
_____	Albert Ching	_____ Call
_____	Daniel Lum	_____ Take action by _____
_____	George Matsumoto	_____ Review & comment
_____	Nobu Kaneshiro	_____ Draft reply by _____
_____	Tom Nakama	_____ Type draft
_____	Paul Matsuo	_____ Type final
_____	Edwin Sakoda	_____ Xerox _____ copies
_____	Neal Imada	_____ Mail
_____	Joe Menor	<u>For</u> _____ Approval
_____	Mitchell Ohye	_____ Signature
_____	Kay Oshiro	_____ Information
_____	Doris Hamada	

---

_____ Robert Chuck	_____ Jane Sakai	_____ Bill Koyanagi
_____ Takeo Fujii	_____ Elsie Yonamine	_____ Richard Jinnai
_____ James Yoshimoto	_____	_____ Yoshi Shibuya
_____	_____	_____

---

Route Slip

WATER RESOURCES & FLOOD CONTROL BRANCH

From: [Signature] Date: 3-9-87 File in: Kapohohale 2

To Initial

Please

<u>[Signature]</u>	Manabu Tagomori	<input type="checkbox"/>	See me
<input type="checkbox"/>	Albert Ching	<input type="checkbox"/>	Call
<input type="checkbox"/>	Daniel Lum	<input type="checkbox"/>	Take action by _____
<input type="checkbox"/>	George Matsumoto	<input type="checkbox"/>	Review & comment
<input type="checkbox"/>	Nobu Kaneshiro	<input type="checkbox"/>	Draft reply by _____
<input type="checkbox"/>	Tom Nakama	<input type="checkbox"/>	Type draft
<input type="checkbox"/>	Paul Matsuo	<input type="checkbox"/>	Type final
<input type="checkbox"/>	Edwin Sakoda	<input type="checkbox"/>	Xerox _____ copies
<input type="checkbox"/>	Neal Imada	<input type="checkbox"/>	Mail
<input type="checkbox"/>	Randall Kurashige	<input type="checkbox"/>	For _____ Approval
<input type="checkbox"/>	Mitchell Ohye	<input type="checkbox"/>	Signature
<input type="checkbox"/>	Joe Menor	<input type="checkbox"/>	Information
<input type="checkbox"/>	Doris Hamada		

<input type="checkbox"/>	Robert Chuck	<input type="checkbox"/>	Jane Sakai	<input type="checkbox"/>	Bill Koyanagi
<input type="checkbox"/>	Takeo Fujii	<input type="checkbox"/>	Elsie Yonamine	<input type="checkbox"/>	Richard Jinnai
<input type="checkbox"/>	James Yoshimoto	<input type="checkbox"/>		<input type="checkbox"/>	Yoshi Shibuya

~~Manabu~~

Buddy Bowden, Only supervisor in Hilo, Thermal Power Co, called at 2:30pm to report that they plan to test the Blowout prevention equipment on ~~Long~~ Kapeho State 2 (?) around 11am tomorrow.

[Signature]

March 5, 1982


Mr. Roy C. Skinner  
Geothermal Operations  
Thermal Power Company  
601 California Street  
San Francisco, CA 94108

Dear Mr. Skinner:

This is to acknowledge receipt of the test results of the Blow Out Prevention Equipment installed on your Kapoho State 2 Well.

Thank you for keeping us informed of the progress of Kapoho State 2.

Very truly yours,

  
ROBERT T. CHUCK  
Manager-Chief Engineer

ES:ko  
cc: Mr. Steve Nishimoto



**THERMAL POWER**  
COMPANY

22 February 1982

Mr. Robert P. Chuck  
Manager, Chief Engineer  
Division of Water and Land Development  
P.O. Box 373  
Honolulu, Hawaii 96809

Dear Mr. Chuck:

The following are the test results of the Blow Out Prevention Equipment installed after setting the 13-3/8" casing on our Kapoho State 2 well:

Blind Rams tested to 1000 psi for 15 minutes; held O.K.

Pipe Rams tested to 1000 psi for 15 minutes; held O.K.

Hydrill tested to 400 psi for 15 minutes; held O.K.

Sincerely,

A handwritten signature in black ink, appearing to read 'Roy C. Skinner'.

Roy C. Skinner  
Geothermal Operations

RCS/ikl

State of Hawaii  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT  
P. O. Box 373  
Honolulu, Hawaii 96809

**MESSAGE**

**REPLY**

TO MR. ROBERT T. CHUCK - MANAGER-CHIEF ENGINEER

DATE

Subject: Geothermal Well

Kapoho State No. 2

DATE January 15, 1982

Thermal Power Company, Operator, and Water Resources International, Inc.,  
Drilling contractor, prepared road and location, moved in rig and generally completed  
mobilization. Well blessing and ground breaking ceremony conducted today. Drilling  
to commence on the 20th.

BY

SIGNED



19 JAN 15 1982  
DIVISION OF WATER & LAND DEVELOPMENT

State of Hawaii

DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT

P. O. Box 373

Honolulu, Hawaii 96809

**MESSAGE**

**REPLY**

TO MR. ROBERT T. CHUCK - MANAGER-CHIEF ENGINEER

DATE

Subject: Geothermal Well

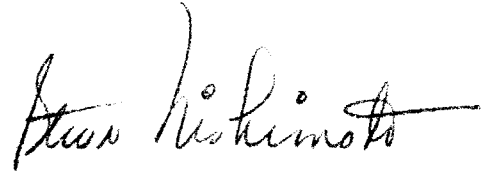
Kapoho State No. 2

DATE January 15, 1982

Thermal Power Company, Operator, and Water Resources International, Inc, Drilling contractor, prepared road and location, moved in rig and generally completed mobilization. Well blessing and ground breaking ceremony conducted today. Drilling to commence on the 20th.

BY

SIGNED



January 11, 1982

MEMORANDUM

TO: Mr. Steve Nishimoto  
VIA: Takeo Fujii  
FROM: Robert T. Chuck  
SUBJECT: Issuance of Geothermal Well Drilling Permit -  
For Information Only

Attached for your information is a copy of a geothermal well drilling permit issued to Thermal Power Co. to drill their second well (to be called Kapoho State 2) approximately 1500 feet distance from their first well, in accordance with the Geothermal Regulations.

The newly permitted Kapoho State 2 has a planned depth of approximately 8000 feet, and will be drilled similar to the Kapoho State 1 well.



ROBERT T. CHUCK

Attach.

Bob:

I'm assuming  
that all DLR  
division/office concern  
with insurance. If  
my assumption is  
wrong hold up  
relaying attached.

Bob

WATER RESOURCES & FLOOD CONTROL BRANCH

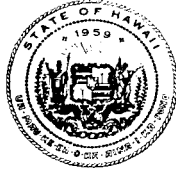
From: JS Date: 1/6 File in: \_\_\_\_\_

<u>To</u>	<u>Initial</u>	<u>Please</u>
_____	Manabu Tagomori	_____ See me
_____	Albert Ching	_____ Call
_____	Daniel Lum	_____ Take action by _____
_____	George Matsumoto	_____ Review & comment
_____	Nobu Kaneshiro	_____ Draft reply by _____
_____	Tom Nakama	_____ Type draft
_____	Paul Matsuo	_____ Type final
_____	Edwin Sakoda	_____ Xerox _____ copies
_____	Neal Imada	_____ Mail
_____	Joe Menor	<u>For</u> _____ Approval
_____	Mitchell Ohye	_____ Signature
_____	Kay Oshiro	_____ Information
_____	Doris Hamada	

_____ Robert Chuck	_____ Jane Sakai	_____ Bill Koyanagi
_____ Takeo Fujii	_____ Elsie Yonamine	_____ Richard Jinnai
_____ James Yoshimoto	_____	_____ Yoshi Shibuya
_____	_____	_____

- ✓ Jerry Danton like to get permit ASAP so he could begin moving rig to site #2 Monday (1/11)
- ✓ I told him we're checking w/ Div as instructed by SWS
- ✓ Jim call him Friday on status
- ✓ Ed - Pls walk to Div's & get response by Friday. W.

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT  
P. O. BOX 373  
HONOLULU, HAWAII 96809

DIVISIONS:  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

December 29, 1981

MEMORANDUM

TO: All Divisions *Conveyances*  
FROM: Robert T. Chuck  
SUBJECT: Issuance of Geothermal Well Drilling Permit  
for Kapoho State 2 Well, Puna, Hawaii

Do you have any objections to our Department issuing the attached geothermal well drilling permit for Kapoho State 2? If you have any questions, please call me at ext. 7533 or if you concur with the issuance of this permit, please sign below and return to us at your earliest convenience.

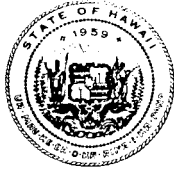
*James O. Okumura*  
for ROBERT T. CHUCK

DL:ko

No objections:

*James O. Okumura*

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



RECEIVED

31 DEC 30 AM 12

DIVISIONS:  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT

P. O. BOX 373  
HONOLULU, HAWAII 96809

PERSONNEL OFFICE  
DEPT. OF LAND & NAT. RES.

December 29, 1981

MEMORANDUM

TO: All Divisions *Personnel*

FROM: Robert T. Chuck

SUBJECT: Issuance of Geothermal Well Drilling Permit  
for Kapoho State 2 Well, Puna, Hawaii

Do you have any objections to our Department issuing the attached geothermal well drilling permit for Kapoho State 2? If you have any questions, please call me at ext. 7533 or if you concur with the issuance of this permit, please sign below and return to us at your earliest convenience.

*James O. Williams*  
for ROBERT T. CHUCK

DL:ko

No objections:

*James O. Williams*

RECEIVED

DEC 30 1981

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII

Division of  
AQUATIC RESOURCES



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISION OF WATER AND LAND DEVELOPMENT

P. O. BOX 373  
HONOLULU, HAWAII 96809

DIVISION OF AQUATIC RESOURCES

DIRECTOR	<input checked="" type="checkbox"/>	Referral Date
FISH CHIEF	<input checked="" type="checkbox"/>	Suspense Date
MARINE SEC.	<input type="checkbox"/>	Draft Reply
F.W. SEC.	<input type="checkbox"/>	Reply Direct
AFRC	<input type="checkbox"/>	Comments
SWFRO/LOFF	<input type="checkbox"/>	Information
SECRETARY	<input type="checkbox"/>	Copies To:
OFF. SERV.	<input type="checkbox"/>	Remarks:
FED. AID	<input type="checkbox"/>	

DIVISIONS:  
 CONSERVATION AND RESOURCES ENFORCEMENT  
 CONVEYANCES  
 FISH AND GAME  
 FORESTRY  
 LAND MANAGEMENT  
 STATE PARKS  
 WATER AND LAND DEVELOPMENT

December 29, 1981

MEMORANDUM

TO: All Divisions *Aquatic Resources*

FROM: Robert T. Chuck

SUBJECT: Issuance of Geothermal Well Drilling Permit for Kapoho State 2 Well, Puna, Hawaii

Do you have any objections to our Department issuing the attached geothermal well drilling permit for Kapoho State 2? If you have any questions, please call me at ext. 7533 or if you concur with the issuance of this permit, please sign below and return to us at your earliest convenience.

*James O. Shimizu*  
 for ROBERT T. CHUCK

DL:ko

No objections:

*Keiji To*

DEC 30 5 43:55  
 DIVISION OF AQUATIC RESOURCES

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



6 43 56

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT  
P. O. BOX 373  
HONOLULU, HAWAII 96809

DEC 30 1981  
PI 41  
STATE OF HAWAII

DIVISIONS:  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

December 29, 1981

MEMORANDUM

TO: All Divisions *fiscal*  
FROM: Robert T. Chuck  
SUBJECT: Issuance of Geothermal Well Drilling Permit  
for Kapoho State 2 Well, Puna, Hawaii

Do you have any objections to our Department issuing the attached geothermal well drilling permit for Kapoho State 2? If you have any questions, please call me at ext. 7533 or if you concur with the issuance of this permit, please sign below and return to us at your earliest convenience.

*for* *James O. ...*  
ROBERT T. CHUCK

DL:ko

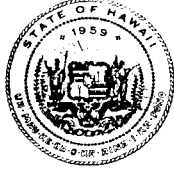
No objections:

*M. ...*  
\_\_\_\_\_

FISCAL OFFICE LOG # 184

Download

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



DIVISIONS:  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT  
P. O. BOX 373  
HONOLULU, HAWAII 96809

December 29, 1981

MEMORANDUM

TO: All Divisions *State Parks*  
FROM: Robert T. Chuck  
SUBJECT: Issuance of Geothermal Well Drilling Permit  
for Kapoho State 2 Well, Puna, Hawaii

Do you have any objections to our Department issuing the attached geothermal well drilling permit for Kapoho State 2? If you have any questions, please call me at ext. 7533 or if you concur with the issuance of this permit, please sign below and return to us at your earliest convenience.

*for* *James O. Okamoto*  
ROBERT T. CHUCK

DL:ko

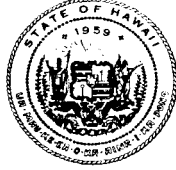
No objections:

*RSW*  
\_\_\_\_\_

DEC 31 1981  
5 49:55  
DEC 31 1981

✓

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT

P. O. BOX 373  
HONOLULU, HAWAII 96809

RECEIVED  
DECEMBER 7 2 11 44  
DIVISIONS:  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

December 29, 1981

MEMORANDUM

TO: All Divisions *Aquaculture Dev. Program*  
FROM: Robert T. Chuck  
SUBJECT: Issuance of Geothermal Well Drilling Permit  
for Kapoho State 2 Well, Puna, Hawaii

Do you have any objections to our Department issuing the attached geothermal well drilling permit for Kapoho State 2? If you have any questions, please call me at ext. 7533 or if you concur with the issuance of this permit, please sign below and return to us at your earliest convenience.

*James Oshiro*  
for ROBERT T. CHUCK

DL:ko

No objections:

*John L. Berlin*

RECEIVED



RECEIVED

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII

02 JAN 14 PM 4:17

'81 DEC 30 AM 10:10

DIVISIONS:  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

DEPT. OF LAND AND  
NATURAL RESOURCES

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT

P. O. BOX 373  
HONOLULU, HAWAII 96809

December 29, 1981

MEMORANDUM

TO: All Divisions *Conservation & Resource Enforcement*  
FROM: Robert T. Chuck  
SUBJECT: Issuance of Geothermal Well Drilling Permit  
for Kapoho State 2 Well, Puna, Hawaii

Do you have any objections to our Department issuing the attached geothermal well drilling permit for Kapoho State 2? If you have any questions, please call me at ext. 7533 or if you concur with the issuance of this permit, please sign below and return to us at your earliest convenience.

*for* *Robert T. Chuck*  
ROBERT T. CHUCK

DL:ko

No objections:

*Donna*  
Donna 1/8/82

19 19  
19 19

JAN 06 REC'D

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT  
P. O. BOX 373  
HONOLULU, HAWAII 96809

DIVISIONS:  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

DEC 13 10:47 AM '81  
RECEIVED

December 29, 1981

MEMORANDUM

TO: All Divisions *Forestry & Wildlife*  
FROM: Robert T. Chuck  
SUBJECT: Issuance of Geothermal Well Drilling Permit  
for Kapoho State 2 Well, Puna, Hawaii

Do you have any objections to our Department issuing the attached geothermal well drilling permit for Kapoho State 2? If you have any questions, please call me at ext. 7533 or if you concur with the issuance of this permit, please sign below and return to us at your earliest convenience.

*for* *James O. Williams*  
ROBERT T. CHUCK

DL:ko

No objections:

*[Signature]*

RECEIVED  
81 DEC 30 9:00  
DIVISION OF  
FORESTRY

December 23, 1981

Honorable Sidney M. Fuke  
Director  
Department of Planning  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720

Dear Mr. Fuke:

Attached for your information is a copy of a geothermal well drilling permit issued to Thermal Power Co. to drill their second well (to be called Kapoho State 2) approximately 1500 feet distance from their first well, in accordance with the Geothermal Regulations.

The newly permitted Kapoho State 2 has a planned depth of approximately 8000 feet, and will be drilled similar to the Kapoho State 1 well.

Very truly yours,

/s/ SUSUMU ONO

SUSUMU ONO  
Chairman of the Board

Attach.  
RTC:DL:ko

December 23, 1981

**MEMORANDUM**

TO: Mr. James Detor  
FROM: Susumu Ono  
SUBJECT: Issuance of Geothermal Well Drilling Permit -  
For Information Only

Attached for your information is a copy of a geothermal well drilling permit issued to Thermal Power Co. to drill their second well (to be called Kapoho State 2) approximately 1500 feet distance from their first well, in accordance with the Geothermal Regulations.

The newly permitted Kapoho State 2 has a planned depth of approximately 8000 feet, and will be drilled similar to the Kapoho State 1 well.

**/s/SUSUMU ONO**

SUSUMU ONO  
Chairman of the Board

Attach.  
RTC:DL:ko

December 23, 1981

Honorable Hideto Kono, Director  
Dept. of Planning & Economic  
Development  
State of Hawaii  
Kamamalu Building  
250 S. King Street  
Honolulu, Hawaii 96813

Dear Mr. Kono:

Attached for your information is a copy of a geothermal well drilling permit issued to Thermal Power Co. to drill their second well (to be called Kapoho State 2) approximately 1500 feet distance from their first well, in accordance with the Geothermal Regulations.

The newly permitted Kapoho State 2 has a planned depth of approximately 8000 feet, and will be drilled similar to the Kapoho State 1 well.

Very truly yours,

*S/S/*

SUSUMU ONO  
Chairman of the Board

Attach.  
RTC:DL:ko

December 23, 1981

Mr. George Yuen  
Director of Health  
Department of Health  
P. O. Box 3378  
Honolulu, Hawaii 96801

Dear Mr. Yuen:

Attached for your information is a copy of a geothermal well drilling permit issued to Thermal Power Co. to drill their second well (to be called Kapoho State 2) approximately 1500 feet distance from their first well, in accordance with the Geothermal Regulations.

The newly permitted Kapoho State 2 has a planned depth of approximately 8000 feet, and will be drilled similar to the Kapoho State 1 well.

Very truly yours,

/S/SUSUMUONO

SUSUMU ONO  
Chairman of the Board

Attach.  
RTC:DL:ko

December 23, 1981

Mr. William Sewake, Manager  
Department of Water Supply  
County of Hawaii  
P. O. *Box* 1820  
Hilo, Hawaii 96720

Dear Mr. Sewake:

Attached for your information is a copy of a geothermal well drilling permit issued to Thermal Power Co. to drill their second well (to be called Kapoho State 2) approximately 1500 feet distance from their first well, in accordance with the Geothermal Regulations.

The newly permitted Kapoho State 2 has a planned depth of approximately 8000 feet, and will be drilled similar to the Kapoho State 1 well.

Very truly yours,

SUSUMU ONO  
Chairman of the Board

Attach.  
RTC:DL:ko



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
P. O. BOX 621  
HONOLULU, HAWAII 96809

SUSUMU ONO, CHAIRMAN  
BOARD OF LAND & NATURAL RESOURCES  
EDGAR A. HAMASU  
DEPUTY TO THE CHAIRMAN

DIVISIONS:  
AQUACULTURE DEVELOPMENT  
PROGRAM  
AQUATIC RESOURCES  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT


December 23, 1981

MEMORANDUM

TO: BLNR Members  
FROM: Susumu Ono  
SUBJECT: Issuance of Geothermal Well Drilling Permit -  
For Information Only

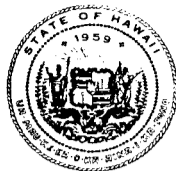
Attached for your information is a copy of a geothermal well drilling permit issued to Thermal Power Co. to drill their second well (to be called Kapoho State 2) approximately 1500 feet distance from their first well, in accordance with the Geothermal Regulations.

The newly permitted Kapoho State 2 has a planned depth of approximately 8000 feet, and will be drilled similar to the Kapoho State 1 well.

  
SUSUMU ONO  
Chairman of the Board

Attach.

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT

P. O. BOX 373  
HONOLULU, HAWAII 96809

DIVISIONS:  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

GEOHERMAL WELL DRILLING PERMIT  
Kapoho State No. 2

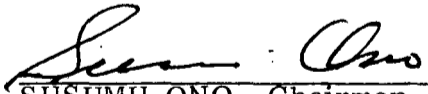
TO: Thermal Power Co.  
601 California Street  
San Francisco, California 94108

Your application, dated November 30, 1981, for a permit to drill a geothermal well as follows, on lands included in State of Hawaii, Department of Land and Natural Resources, Geothermal Resources Mining Lease No. R-2, is approved:

Well Designation: Kapoho State No. 2  
Location: TMK 1-4-01:19, Kapoho, Puna, Hawaii  
Leased To: Kapoho Land Partnership  
Subleased To: Thermal-Dillingham-Amfac Joint Venture  
Operator: Thermal Power Co.  
Drilling Contractor: Water Resources International  
Ground Elevation: 700 ft. +  
Total Depth: 8,000 feet -

You are hereby granted permission to drill the geothermal well described above and in your application in accordance with the Department's Administrative Rules, Chapter 183 of Title 13, and the following conditions:

- (1) All work shall be performed in accordance with the Drilling and Completion Procedures submitted with your application, the Department's Administrative Rules (Chapter 183), and all other applicable Federal, State, and County laws, ordinances, rules and regulations.
- (2) Item 7(e) of your submitted Drilling and Completion Procedures shall be performed after drilling has reached the depth of 750 feet + (30 feet below sea level) and the Department's representative shall be notified, with reasonable time allowed for travel to the site, to measure and/or verify the measurement of the static water level.
- (4) If there are any contemplated changes in the proposed drilling program, the operator shall obtain the Chairman's approval prior to the execution of any such contemplated changes of work.

  
SUSUMU ONO, Chairman  
Board of Land and Natural Resources

1/8/82  
Date of Permit

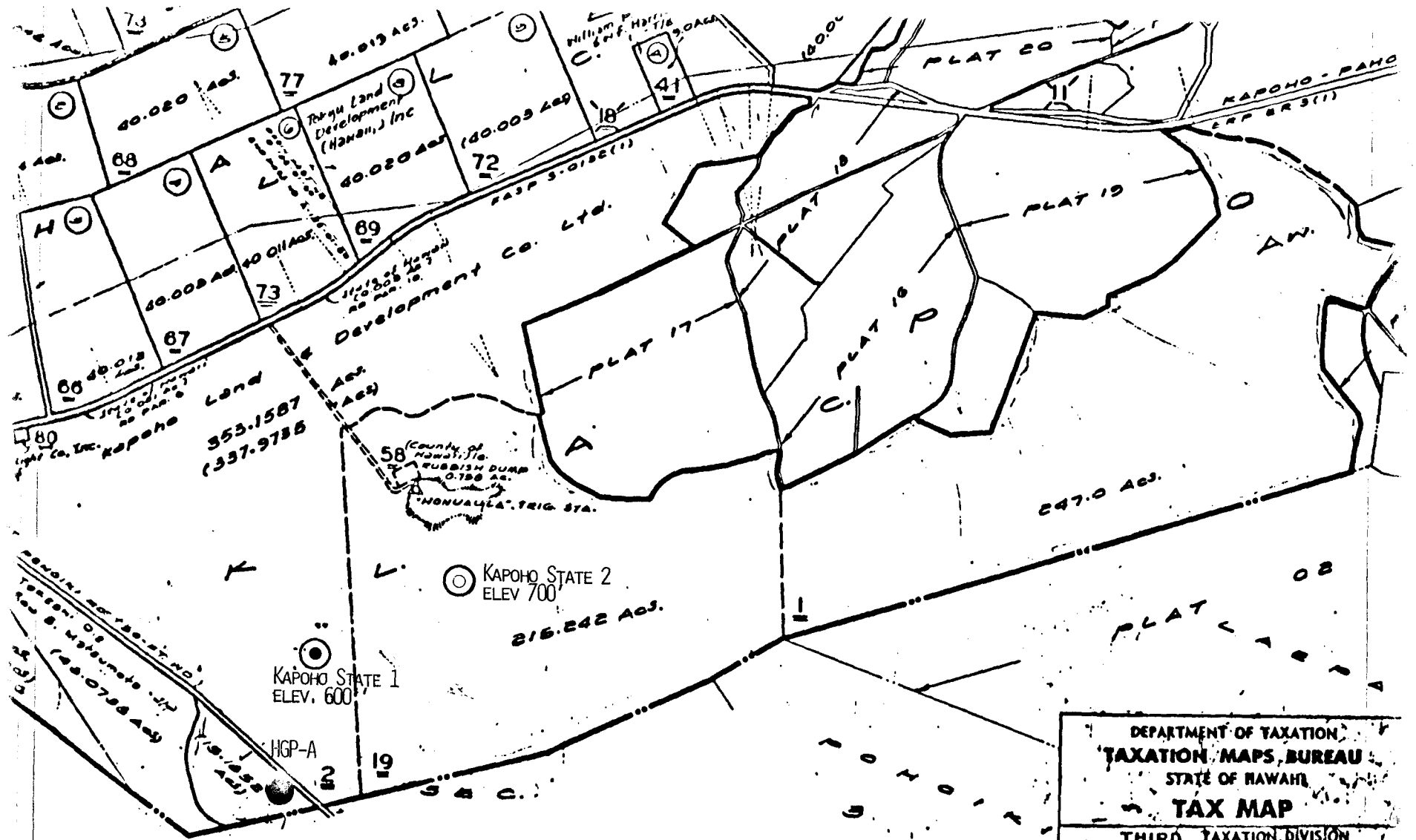


EXHIBIT "A"

DEPARTMENT OF TAXATION		
TAXATION MAPS BUREAU		
STATE OF HAWAII		
TAX MAP		
THIRD TAXATION DIVISION		
ZONE	SEC.	PLAT
1	4	01



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 621  
HONOLULU, HAWAII 96809

REF:WL-LC

APR 15 1993

KEITH W. AHUE, Chairperson  
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER, II  
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT  
PROGRAM  
AQUATIC RESOURCES  
CONSERVATION AND  
ENVIRONMENTAL AFFAIRS  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

Ms. Jennifer Shishido  
Administrator  
State of Hawaii  
Division of Occupational Safety and Health  
Department of Labor and Industrial Relations  
830 Punchbowl Street  
Honolulu, Hawaii 96813

Dear Ms. Shishido:

Use of Explosives for Plugging and Abandonment  
of Wells KS-8, KS-1 and KS-2

In accordance with the Department of Land and Natural Resource's Administrative Rules, and under a permit granted by our department, Puna Geothermal Venture (PGV) began plug and abandon operations on the KS-8 well on April 13, 1993. The operations will include utilizing explosive perforating charges deep within the well. In the interest of safety and efficiency, PGV plans to conduct the abandonment operations in a continuous, 24-hour per day basis.

It is our understanding that PGV has requested a variance from your Division for use of explosives on a 24-hour basis. This is to inform you that the Department of Land and Natural Resources has no objection to your granting such a variance. PGV will need this variance to include wells KS-1 and KS-2 for subsequent operations.

Very truly yours,

A handwritten signature in black ink, appearing to read "Keith W. Ahue", written in a cursive style.

KEITH W. AHUE



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT  
P. O. BOX 373  
HONOLULU, HAWAII 96809

KEITH W. AHUE, Chairman  
BOARD OF LAND AND NATURAL RESOURCES

DIRECTOR  
JOHN P. SEPPNER, II  
DOHA L. KANAIKE  
FISHCULTURE DEVELOPMENT  
FORESTRY  
AGRICULTURAL RESOURCES  
CONSERVATION AND  
ENVIRONMENTAL AFFAIRS  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONSERVATION  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
PROGRAM  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

### FACSIMILE TRANSMITTAL PAGE

Please deliver the following pages to:

Name: TOM KIZIS

Company: PGV

From: MANABU TAGOMORI

Date: 4-16-93 Time: \_\_\_\_\_

Message: LETTER TO JENNIFER SHISHIDO

RE: EXPLOSIVES

Total number of pages (including Transmittal Page): 2

\*\*\*\*\*

If you do not receive all of the pages legibly, please call back: (808) 587- 0228 119A

Sending Facsimile Number: (808) 587-0283

Receiving Facsimile Number: (808) 965 7254

MEMORY TRANS REPORT

\*\*\*\*\*

: STATE/DLNR/DOWRLD ( APR 16 7 93 07:50AM )

FILE NO.	FILE TYPE	DEPT. CODE	PAGES	RESULTS	GROUP	REMOTE TERMINAL IDENTIFICATION
105	SEND IMMEDIATE		2/2	OK		919657254

THIS FILE HAS BEEN CLEARED.

\*\*\*\*\*

# PUNA GEOTHERMAL VENTURE

A Hawaii Partnership

Post-It™ brand fax transmittal memo 7671		# of pages ▶ 2	
To	Mr. Tagomori	From	Tom Kizis
Co.	DLNR	Co.	PGV
Dept.		Phone #	965 6233
Fax #	587 0283	Fax #	965 7254

April 14, 1993

Mr. Manabu Tagomori  
Division of Water and Land Development  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, HI 96809

SUBJ: PLUG AND ABANDON OPERATIONS (KS-8/KS-1/KS-2)

Dear Manabu,

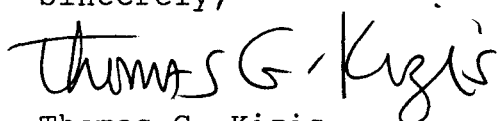
Under a permit issued by the Department of Land and Natural Resources (DLNR), Puna Geothermal Venture (PGV) began plug and abandon operations on the KS-8 well on April 13, 1993. The operations will include utilizing explosive perforating charges deep in the well. For reasons of safety and efficiency, PGV plans to conduct the abandonment operations in a continuous 24 hour operation. Because of this, some or all of the perforating work may be done at night. For this reason, PGV has requested from the Department of Labor and Industrial Relations, Division of Occupational Safety and Health (OSHA) a variance to use explosives on a 24 hour basis.

As a condition of issuing the variance, OSHA has asked for a letter from DLNR acknowledging your understanding of PGV's proposed operations and stating that you have no objection to the requested variance.

PGV is asking that the variance apply to plug and abandon operations for wells KS-1 and KS-2, which will commence immediately upon completion of well KS-8. We anticipate these operations to be complete in approximately eight (8) weeks.

Thank you for your prompt consideration of this matter. If you or your staff have questions, please call.

Sincerely,



Thomas G. Kizis  
Environmental Manager

MEMO: 21717.TK  
FILE: KS-08

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF LAND MANAGEMENT  
P. O. BOX 621  
HONOLULU, HAWAII 96809

DIVISIONS:  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

June 24, 1981

Thermal Power Company  
601 California Street  
San Francisco, California 94108

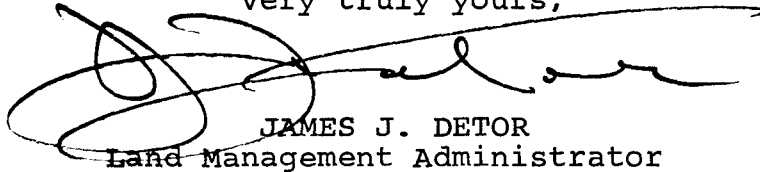
Attn.: Ms. Jayne Iffla

Gentlemen:

Subject: Geothermal Resources Mining Lease  
No. R-2

This will confirm our telephone discussion of  
this morning in which I informed you that your Well  
Indemnity Bond No. 567 7792 is acceptable.

Very truly yours,



JAMES J. DETOR  
Land Management Administrator

cc: Mr. R. Higashi  
Mr. G. Taguchi  
DOWALD

RECEIVED  
JUN 29 1981  
TPC

**GEOHERMAL RESOURCES WELL INDEMNITY BOND  
(\$250,000 Statewide Well Bond)**

**KNOW ALL MEN BY THESE PRESENTS:**

That we, Thermal Power Company, as principal; and NATIONAL FIRE INSURANCE COMPANY OF HARTFORD organized and existing under and by virtue of the laws of the STATE OF HAWAII and authorized to transact surety business in the STATE OF HAWAII, as surety, are held and firmly bound unto the State of Hawaii in the full and just sum of TWO HUNDRED FIFTY THOUSAND AND NO/100 DOLLARS (\$250,000.00) lawful money of the United States of America, to be paid to the said State of Hawaii, for which payment, well and truly to be made, we do hereby bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Signed, sealed, delivered and dated this 17th day of March, 1981.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT,

WHEREAS, said principal is about to acquire, drill, redrill, deepen, operate, maintain or abandon a geothermal resources wells in the State of Hawaii and is required to file this bond in connection therewith in accordance with Rule 9.4 of Regulation 8 of the Department of Land and Natural Resources, State of Hawaii.

NOW, THEREFORE, if said THERMAL POWER COMPANY, the above bounden principal, shall well and truly comply with all the provisions of said Regulation 8 and shall obey all lawful orders of the Chairman of the Board of Land and Natural Resources, or his representative, if not appealed to the Board of Land and Natural Resources, or upon affirmance thereof by the Board of Land and Natural Resources, if appealed thereto, and shall pay all charges, costs, and expenses incurred by the Chairman or his representative.

CORPORATION

STATE OF HAWAII, }  
City and County of Honolulu } ss.

On this 18th day of March, A. D. 1981, before me appeared  
Kazu Hiramoto

to me personally known, who, being by me duly sworn, did say that ~~they are~~ <sup>he is</sup> the  
Senior Vice President

respectively of Kazu Hiramoto

and that the seal affixed to the foregoing instrument is the corporate seal of said  
corporation and that said instrument was signed and sealed in behalf of said corpora-  
tion by authority of its Board of Directors, and the said Kazu Hiramoto

acknowledged said instrument to be the  
free act and deed of said corporation.

*Julius J. Jones*  
Notary Public, First Judicial Circuit,  
State of Hawaii.

My Commission Expires 12-20-81

STATE OF CALIFORNIA }  
County of Los Angeles } ss.

On this 17th day of March, 1981, before me, Carol G. Grasso,  
a notary public in and for the State of California with principal office in the County of Los Angeles,  
residing therein, duly commissioned and sworn, personally appeared Pamela L. Jacobs,  
known to me to be the person whose name is subscribed to the within instrument as the attorney-in-fact of the  
National Fire Insurance Company of Hartford,  
the corporation named as Surety in said instrument, and acknowledged to me that he subscribed the name of said corporation  
thereto as Surety, and his own name as attorney-in-fact.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County,  
the day and year in this certificate first above written.



*Carol G. Grasso*  
Notary Public

March 24, 1982

Mr. W. L. D'Olier  
Vice President - Exploration  
Thermal Power Company  
501 California Street  
San Francisco, California 94108

Dear Mr. D'Olier:

The Department of Land and Natural Resources approves your request to drill the Kapoho State No. 2 geothermal well from a total depth of 8,000 feet to 8,400 feet.

We understand that the final depth of the well may not be drilled to the maximum depth of 8,400 feet, but you would like to have the flexibility to do so should field conditions require you to drill deeper than the 8,000 feet limit specified in the drilling permit.

The Department appreciates your keeping us informed of the progress of the drilling and adhering to the provisions of the permit and the Department's rules on leasing and drilling for geothermal resources.

Very truly yours,

/s/ SUSUMUONO

SUSUMU ONO  
Chairman of the Board

TO Alan

DATE 2/17 TIME 2:45

**WHILE YOU WERE OUT**

M Buddy Bowden  
of Nelo Thermal Power  
Phone Mobile 594

TELEPHONED	<input type="checkbox"/>	PLEASE CALL	<input type="checkbox"/>
CALLED TO SEE YOU	<input type="checkbox"/>	WILL CALL AGAIN	<input type="checkbox"/>
WANTS TO SEE YOU	<input type="checkbox"/>	URGENT	<input type="checkbox"/>

RETURNED YOUR CALL

Message They will test Blow  
OUT preventors  
around noon tomorrow  
Steve not available.  
Too late to contact anyone

Operator

Alan

Route Slip  
**WATER RESOURCES & FLOOD CONTROL BRANCH**

From: \_\_\_\_\_ Date: \_\_\_\_\_ File in: Kajal. 10/10

To Initial

- \_\_\_\_\_ Manabu Tagomori
- \_\_\_\_\_ Albert Ching
- \_\_\_\_\_ Daniel Lum
- \_\_\_\_\_ George Matsumoto
- \_\_\_\_\_ Nobu Kaneshiro
- \_\_\_\_\_ Tom Nakama
- \_\_\_\_\_ Paul Matsuo
- \_\_\_\_\_ Edwin Sakoda
- \_\_\_\_\_ Milton Yamasaki
- \_\_\_\_\_ Randall Kurashige
- \_\_\_\_\_ Neal Imada
- \_\_\_\_\_ Joe Menor
- \_\_\_\_\_ Mitchell Ohye
- \_\_\_\_\_ Doris Hamada

Please

- \_\_\_\_\_ See me
- \_\_\_\_\_ Call
- \_\_\_\_\_ Take action by \_\_\_\_\_
- \_\_\_\_\_ Review & comment
- \_\_\_\_\_ Draft reply by \_\_\_\_\_
- \_\_\_\_\_ Type draft
- \_\_\_\_\_ Type final
- \_\_\_\_\_ Xerox \_\_\_\_\_ copies
- \_\_\_\_\_ Mail

For:

- \_\_\_\_\_ Approval
- \_\_\_\_\_ Signature
- \_\_\_\_\_ Information

---

_____ Robert Chuck	_____ Jane Sakai	_____ Bill Koyanagi
_____ Takeo Fujii	_____ Elsie Yonamine	_____ Richard Jinnai
_____ James Yoshimoto	_____	_____

State of Hawaii  
**DEPARTMENT OF LAND AND NATURAL RESOURCES**  
**DIVISION OF WATER AND LAND DEVELOPMENT**  
P. O. Box 373  
Honolulu, Hawaii 96809

**MESSAGE**

**REPLY**

TO MR. ROBERT T. CHUCK - MANAGER-CHIEF ENGINEER

DATE

Subject: Geothermal Well

Kapoho State No. 2

DATE February 10, 1982

The following conditions were observed:

- a. Size of hole drilled =  $17\frac{1}{2}$  inches
- b. Depth of hole drilled = 1315 feet
- c. Total casing installed = 1313 feet
- d. Size of casing installed =  $13\frac{3}{8}$  inches

Drilling contractor prepared pipe assembly for grouting of annular space.

RECEIVED  
FEB 16 11:25  
DIVISION OF WATER & LAND DEVELOPMENT

BY

SIGNED



State of Hawaii  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF WATER AND LAND DEVELOPMENT  
P. O. Box 373  
Honolulu, Hawaii 96809

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BY

SIGNED



Geothermal  
Well Dedication  
KAPOHO STATE #2  
HONUAILA DRILL SITE

Puna, Hawaii  
January 15, 1982  
10:00 am.

INTRODUCTION AND  
REMARKS ..... *Jere M. Denton*  
*Vice President and Manager, Hawaii Project*  
*Thermal Power Company*

WELL DEDICATION  
AND BLESSING ..... *Reverend Leon Stirling*

*Refreshments*

---

This exploratory geothermal well is being drilled  
by the Puna Geothermal Venture, composed of:

Thermal Power Company  
*A Subsidiary of Natomas Company*

Dillingham Corporation

Amfac, Inc.

Route Slip

WA R RESOURCES & FLOOD CONTRC BRANCH

From: \_\_\_\_\_ Date: \_\_\_\_\_ File in: \_\_\_\_\_

<u>To</u>	<u>Initial</u>	<u>Please</u>
___	___	Manabu Tagomori
___	___	Albert Ching
___	___	Daniel Lum
___	___	George Matsumoto
___	___	Nobu Kaneshiro
___	___	Tom Nakama
___	___	Paul Matsuo
___	___	Edwin Sakoda
___	___	Neal Imada
___	___	Joe Menor
___	___	Jon Kurio
___	___	Mitchell Ohye
___	___	Kay Oshiro
___	___	Doris Hamada

\_\_\_ See me  
 \_\_\_ Call  
 \_\_\_ Take action by \_\_\_\_\_  
 \_\_\_ Review & comment  
 \_\_\_ Draft reply by \_\_\_\_\_  
 \_\_\_ Type draft  
 \_\_\_ Type final  
 \_\_\_ Xerox \_\_\_ copies  
 \_\_\_ Mail  
 \_\_\_ Acknowledge receipt

For \_\_\_ Approval  
 \_\_\_ Signature  
 \_\_\_ Information

___	___	Robert Chuck	___	___	Jane Sakai	___	___	Bill Koyanagi
___	___	Takeo Fujii	___	___	Elsie Yonamine	___	___	Richard Jinnai
___	___	James Yoshimoto	___	___	_____	___	___	_____
___	___	_____	___	___	_____	___	___	_____

Kapoho State #2

19° 28' 55" Latitude

154° 53' 25" Longitude



LOG DOWN WELL STATIC

DEPTH FEET	TEMP. DEG. F	TEMP. GRAD.	SPINN CPS	LINE SPEED	REAL TIME
103.55	81.52		0.00	112.73	10:06:20
126.21	81.45	-0.0031	0.00	52.99	10:06:44
152.24	81.68	0.0088	3.11	86.31	10:07:06
178.32	83.77	0.0801	7.38	106.40	10:07:30
200.42	83.45	-0.0145	0.67	25.45	10:07:54
225.75	83.39	-0.0024	0.00	40.30	10:08:32
275.69	83.27	-0.0024	8.52	115.15	10:09:02
351.43	82.39	-0.0116	8.52	114.55	10:09:42
426.93	81.35	-0.0138	7.38	110.54	10:10:22
475.75	80.24	-0.0227	7.38	113.94	10:10:48
501.98	79.53	-0.0271	7.99	110.54	10:11:02
528.24	78.59	-0.0358	7.38	110.25	10:11:16
550.78	77.68	-0.0404	7.38	114.24	10:11:28
577.10	76.50	-0.0448	7.38	115.13	10:11:42
603.41	75.27	-0.0468	6.77	111.72	10:11:56
625.94	74.22	-0.0466	7.38	113.91	10:12:08
652.25	73.09	-0.0429	7.38	114.55	10:12:22
678.57	72.16	-0.0353	8.52	114.52	10:12:36
701.20	72.01	-0.0066	7.99	111.43	10:12:48
727.58	88.91	0.6406	7.38	111.72	10:13:02
750.12	107.80	0.8381	7.99	111.72	10:13:14
776.45	118.83	0.4189	7.99	111.13	10:13:28
802.80	119.06	0.0087	8.52	110.59	10:13:42
826.11	109.17	-0.4243	8.52	38.18	10:14:04
853.24	105.77	-0.1253	8.52	113.94	10:14:20
875.87	103.39	-0.1052	9.05	113.94	10:14:32
902.26	101.54	-0.0701	9.05	111.72	10:14:46
928.69	99.86	-0.0636	8.52	111.72	10:15:00
951.35	98.50	-0.0600	8.52	114.82	10:15:12
981.59	97.44	-0.0351	7.99	114.55	10:15:28
1000.57	97.01	-0.0227	7.99	115.43	10:15:38
1027.07	96.21	-0.0302	9.05	114.85	10:15:52
1053.63	95.03	-0.0444	9.05	115.15	10:16:06
1076.45	94.14	-0.0390	8.52	112.32	10:16:18
1103.08	93.41	-0.0274	9.05	116.04	10:16:32
1125.94	92.62	-0.0346	9.59	116.04	10:16:44
1152.65	91.79	-0.0311	9.59	113.20	10:16:58
1175.60	91.22	-0.0248	9.59	116.65	10:17:10
1202.41	90.70	-0.0194	9.05	116.06	10:17:24
1225.38	90.16	-0.0235	9.05	112.91	10:17:36
1251.76	89.33	-0.0315	8.52	114.24	10:17:50
1278.16	88.56	-0.0292	8.52	113.94	10:18:04
1300.83	88.02	-0.0238	9.05	111.72	10:18:16
1327.27	87.49	-0.0200	9.05	111.72	10:18:30

1353.75	87.02	-0.0177	8.52	114.55	10:18:44
1376.51	86.69	-0.0145	8.52	112.91	10:18:56
1403.08	86.32	-0.0139	8.52	111.76	10:19:10
1425.90	86.09	-0.0101	8.52	115.45	10:19:22
1452.52	85.87	-0.0083	9.05	115.15	10:19:36
1500.46	85.68	-0.0040	9.59	114.85	10:20:20
1553.65	85.67	-0.0002	9.59	112.32	10:20:48
1603.14	85.72	0.0010	9.59	115.45	10:21:14
1652.85	86.00	0.0056	9.59	116.06	10:21:40
1702.74	86.99	0.0198	6.77	112.94	10:22:06
1752.66	88.36	0.0274	6.77	116.67	10:22:32
1802.64	89.77	0.0282	6.16	116.97	10:22:58
1852.88	91.04	0.0253	6.16	114.68	10:23:24
1903.22	92.19	0.0228	6.77	117.58	10:23:50
1953.71	93.21	0.0202	7.38	117.88	10:24:16
2000.48	95.47	0.0483	7.99	118.48	10:24:40
2051.20	99.55	0.0804	9.59	115.57	10:25:06
2101.19	104.28	0.0946	9.59	116.06	10:25:32
2151.03	107.91	0.0728	10.12	116.36	10:25:58
2200.94	110.96	0.0611	9.59	113.20	10:26:24
2250.91	113.88	0.0584	9.59	116.67	10:26:50
2300.89	116.84	0.0592	9.59	116.97	10:27:16
2351.02	120.80	0.0790	9.59	113.53	10:27:42
2401.19	126.12	0.1060	9.59	116.97	10:28:08
2451.42	132.50	0.1270	9.59	117.27	10:28:34
2501.78	140.48	0.1585	9.59	114.98	10:29:00
2552.21	148.26	0.1543	9.59	114.98	10:29:26
2602.78	157.66	0.1859	9.59	118.18	10:29:52
2653.54	170.31	0.2492	9.59	115.27	10:30:18
2676.96	175.55	0.2237	42.12	118.48	10:30:30
2700.40	181.53	0.2551	21.85	118.48	10:30:42
2727.82	186.86	0.1944	29.85	118.79	10:30:56
2751.35	191.28	0.1878	12.25	115.00	10:31:08
2774.96	195.19	0.1656	40.52	119.09	10:31:20
2802.53	198.83	0.1320	17.59	119.39	10:31:34
2826.15	202.12	0.1393	32.52	120.00	10:31:46
2853.74	204.81	0.0975	10.12	119.39	10:32:00
2877.44	207.07	0.0954	10.12	117.04	10:32:12
2900.71	208.68	0.0692	9.59	116.97	10:32:24
2950.01	211.86	0.0645	10.12	114.09	10:32:50

LOG UP HOLDING 1,000 P.S.I. ON ANNULUS

DEPTH FEET	TEMP. DEG. F	TEMP. GRAD.	SPINN CPS	LINE SPEED	REAL TIME
-----	-----	-----	-----	-----	-----
2950.01	212.86	0.0438	0.00	0.00	10:46:48
2901.12	210.72	0.0652	6.16	-100.91	10:47:24
2850.34	207.41	0.0978	6.16	-101.38	10:47:54
2802.51	202.73	0.1323	6.16	-103.64	10:48:22
2751.18	195.94	0.1707	6.16	-103.94	10:48:52
2703.31	187.77	0.2206	6.77	-103.33	10:49:20
2651.99	176.45	0.2493	6.16	-103.64	10:49:50
2600.53	163.62	0.2198	6.77	-103.94	10:50:20
2552.43	153.05	0.1659	6.16	-104.85	10:50:48
2500.47	144.43	0.1602	6.77	-105.15	10:51:18

2451.60	136.60	0.1435	6.77	-106.29	10:51:46
2402.55	129.56	0.1155	6.77	-104.33	10:52:14
2353.47	123.89	0.0951	54.38	-106.36	10:52:41
2300.98	118.90	0.0638	5.55	-103.33	10:56:49
2250.05	115.65	0.0586	6.16	-103.33	10:57:19
2202.81	112.88	0.0642	5.55	-99.70	11:00:53
2150.02	109.49	0.0722	4.94	-97.24	11:01:25
2100.57	105.92	0.0808	5.55	-97.83	11:01:55
2050.93	101.91	0.0865	5.55	-99.31	11:02:25
2000.50	97.55	0.0655	5.55	-101.82	11:02:55
1953.34	94.46	0.0306	5.55	-99.90	11:03:23
1902.72	92.91	0.0215	5.55	-102.12	11:03:53
1852.05	91.82	0.0254	6.16	-102.12	11:04:23
1801.33	90.53	0.0262	5.55	-102.42	11:04:53
1750.55	89.20	0.0291	5.55	-102.42	11:05:23
1703.13	87.82	0.0259	5.55	-102.42	11:05:51
1652.19	86.50	0.0102	5.55	-103.33	11:06:21
1601.23	85.98	0.0022	5.55	-102.73	11:06:51
1550.16	85.87	0.0002	5.55	-102.73	11:07:21
1502.43	85.86	-0.0014	5.55	-103.33	11:07:49
1451.31	85.93	-0.0059	5.55	-103.03	11:08:19
1400.16	86.23	-0.0132	4.94	-103.33	11:08:49
1352.39	86.86	-0.0207	4.94	-103.33	11:09:17
1301.17	87.92	-0.0222	6.16	-103.03	11:09:47
1253.33	88.98	-0.0281	5.55	-103.33	11:10:15
1201.66	90.43	-0.0242	5.55	-105.45	11:10:45
1152.98	91.61	-0.0443	5.55	-105.69	11:11:13
1100.79	93.92	-0.0380	6.16	-106.60	11:11:43
1052.09	95.77	-0.0337	6.16	-102.56	11:12:11
1003.38	97.41	-0.0421	6.16	-105.45	11:12:39
951.09	99.61	-0.0701	6.16	-102.35	11:13:09
902.27	103.03	-0.1645	6.16	-105.99	11:13:37
852.48	111.22	-0.1039	4.94	-78.92	11:14:09
800.80	116.59	0.5951	7.38	-79.09	11:14:49
751.11	87.02	0.2804	4.33	-63.35	11:15:35
700.71	72.89	-0.0189	4.94	-64.71	11:16:35
650.99	73.83	-0.0259	0.67	-33.33	11:18:11
601.14	75.12	-0.0269	1.28	-58.82	11:19:45
550.51	76.48	-0.0253	3.11	-71.53	11:20:29
501.18	77.73	-0.0146	3.72	-79.80	11:21:09
401.40	79.19	-0.0118	7.99	-137.27	11:21:59
353.07	79.76	-0.0061	8.52	-136.06	11:22:21
303.57	80.06	-0.0004	7.99	-134.19	11:22:43
253.83	80.08	-0.0032	8.52	-133.60	11:23:05
204.14	80.24	-0.0157	7.99	-136.67	11:23:27
150.12	81.09	-0.0470	7.99	-131.53	11:23:51
101.17	83.39		4.94	-89.26	11:24:15

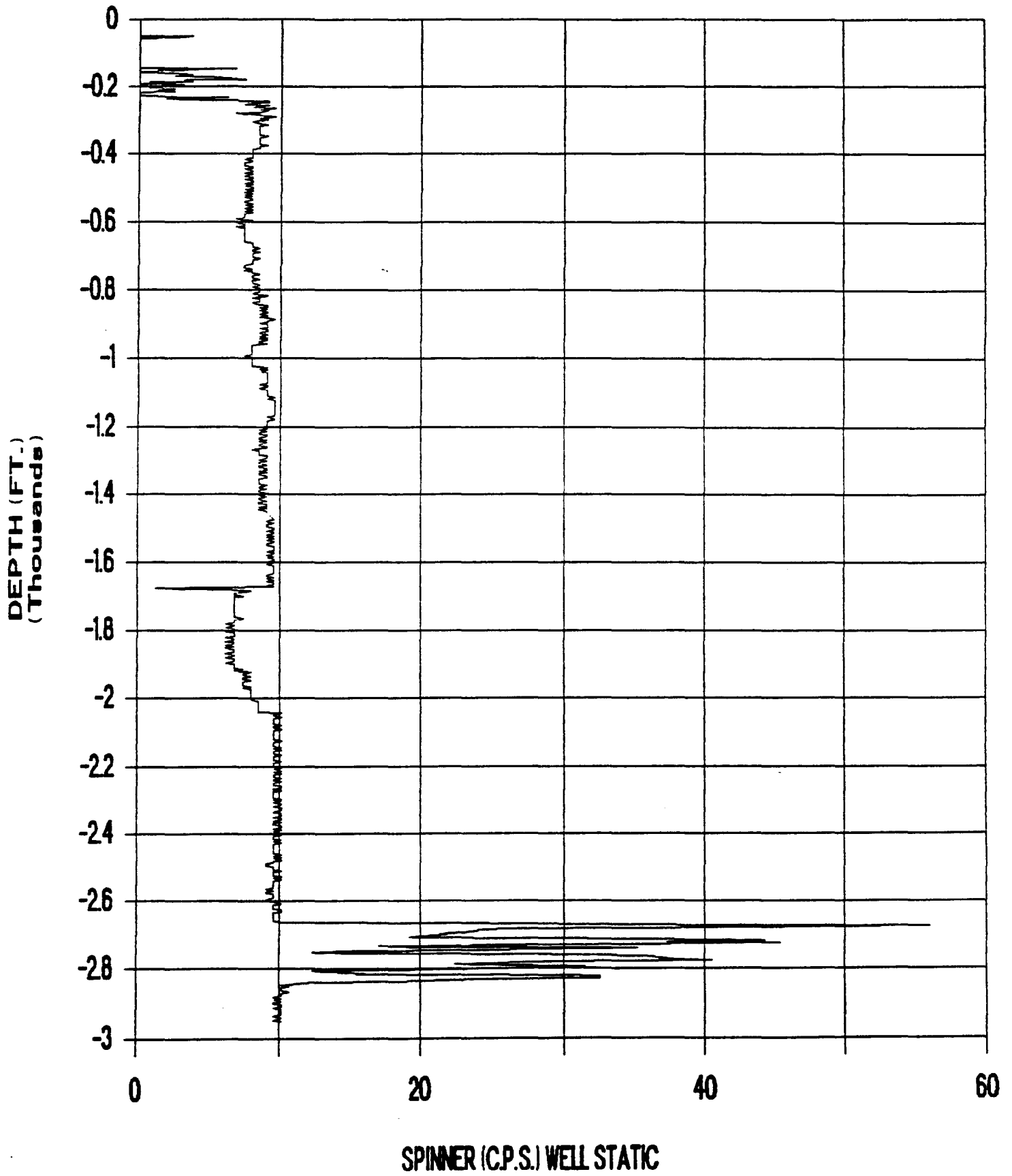
STATIONARY READING AT 2,346'

DEPTH FEET	TEMP. DEG. F	SPINN CPS	LINE SPEED	REAL TIME
-----	-----	-----	-----	-----
2346.05	121.45	293.28	0.00	10:53:56
2346.05	121.50	256.48	0.00	10:53:58
2346.05	121.56	169.56	0.00	10:53:59

2346.05	121.59	149.83	0.00	10:54:02
2346.05	121.60	159.97	0.00	10:54:03
2346.05	121.59	222.36	0.00	10:54:06
2346.05	121.57	204.22	0.00	10:54:07
2346.05	121.57	167.96	0.00	10:54:09
2346.05	121.57	149.83	0.00	10:54:12
2346.05	121.55	235.69	0.00	10:54:13
2346.05	121.55	312.48	0.00	10:54:16
2346.05	121.57	308.74	0.00	10:54:17
2346.05	121.59	303.94	0.00	10:54:19
2346.05	121.62	323.14	0.00	10:54:22
2346.05	121.62	315.68	0.00	10:54:23
2346.05	121.61	324.74	0.00	10:54:26
2346.05	121.60	320.48	0.00	10:54:27
2346.05	121.61	314.08	0.00	10:54:30
2346.05	121.63	322.61	0.00	10:54:32
2346.05	121.65	328.47	0.00	10:54:33
2346.05	121.65	342.34	0.00	10:54:36
2346.05	121.64	343.40	0.00	10:54:37
2346.05	121.64	337.54	0.00	10:54:39
2346.05	121.63	327.41	0.00	10:54:41
2346.05	121.63	292.21	0.00	10:54:43
2346.05	121.64	283.68	0.00	10:54:46
2346.05	121.63	266.62	0.00	10:54:47
2346.05	121.63	226.62	0.00	10:54:50
2346.05	121.64	148.23	0.00	10:54:51

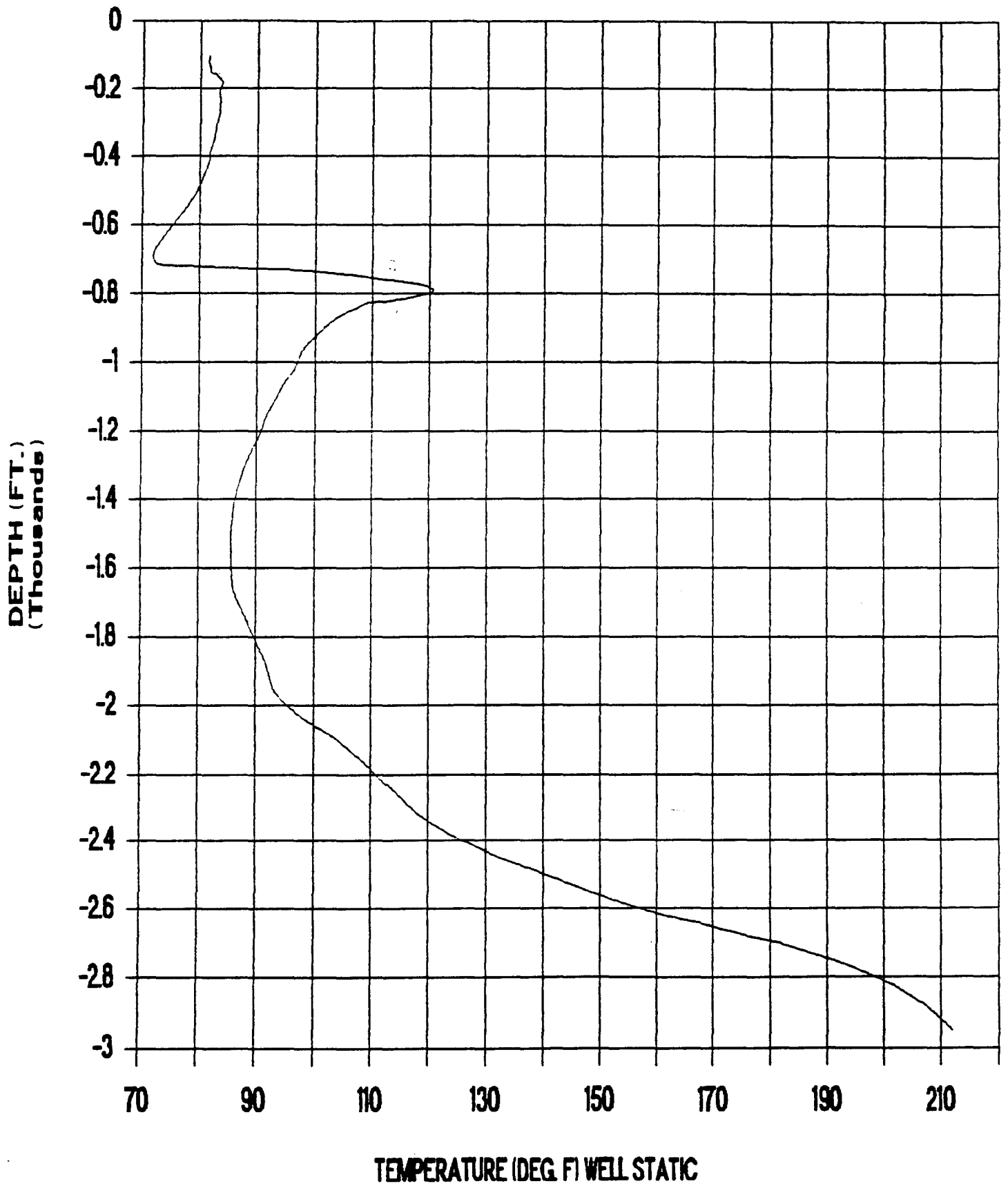
# PUNA GEOTHERMAL VENTURE WELL KS-2

SPINNER LOG DOWN @ 115 F.P.M 5-24-93



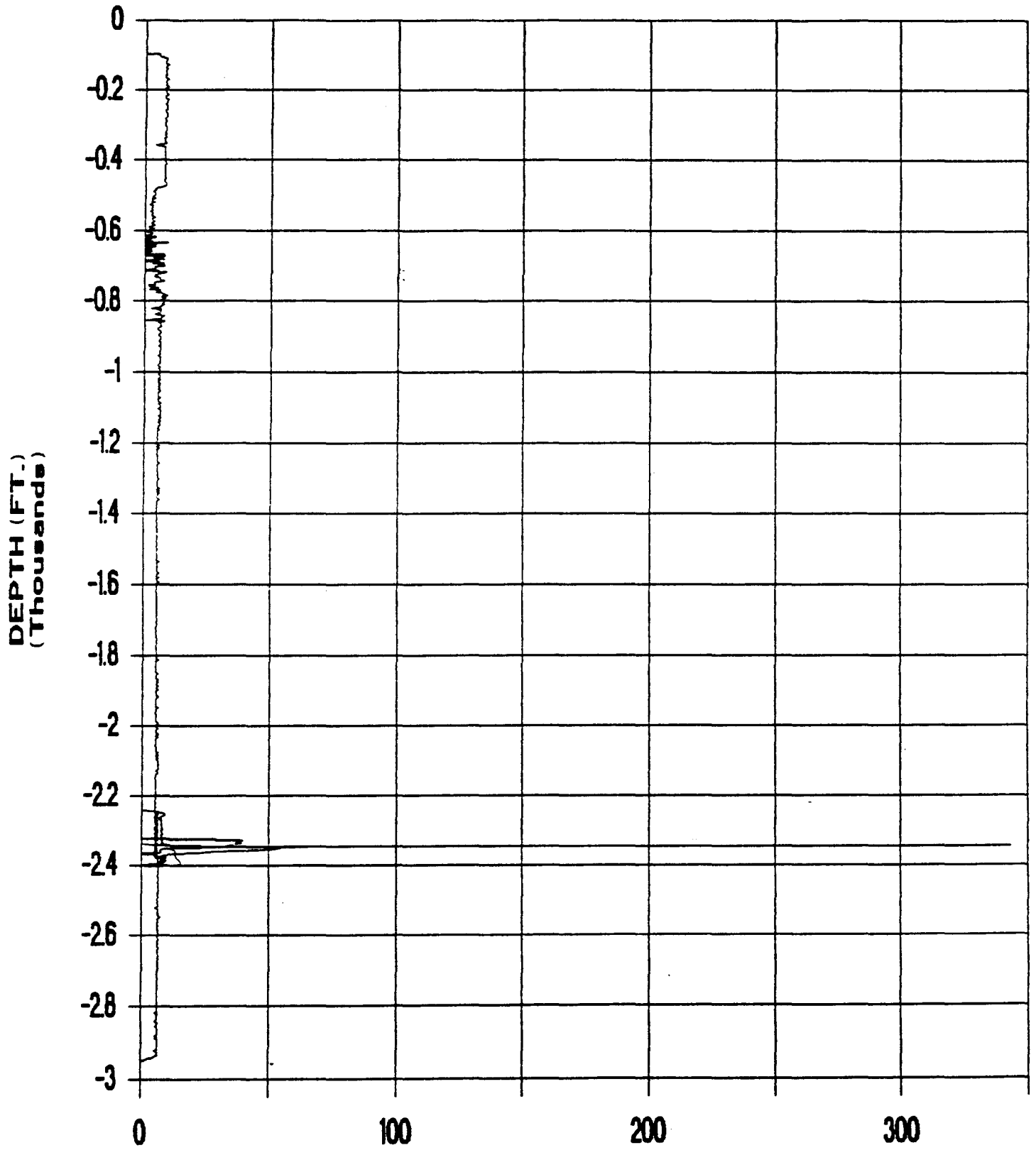
# PUNA GEOTHERMAL WELL KS-2

TEMPERATURE LOG DOWN 5-24-92



# PUNA GEOTHERMAL VENTURE WELL KS-2

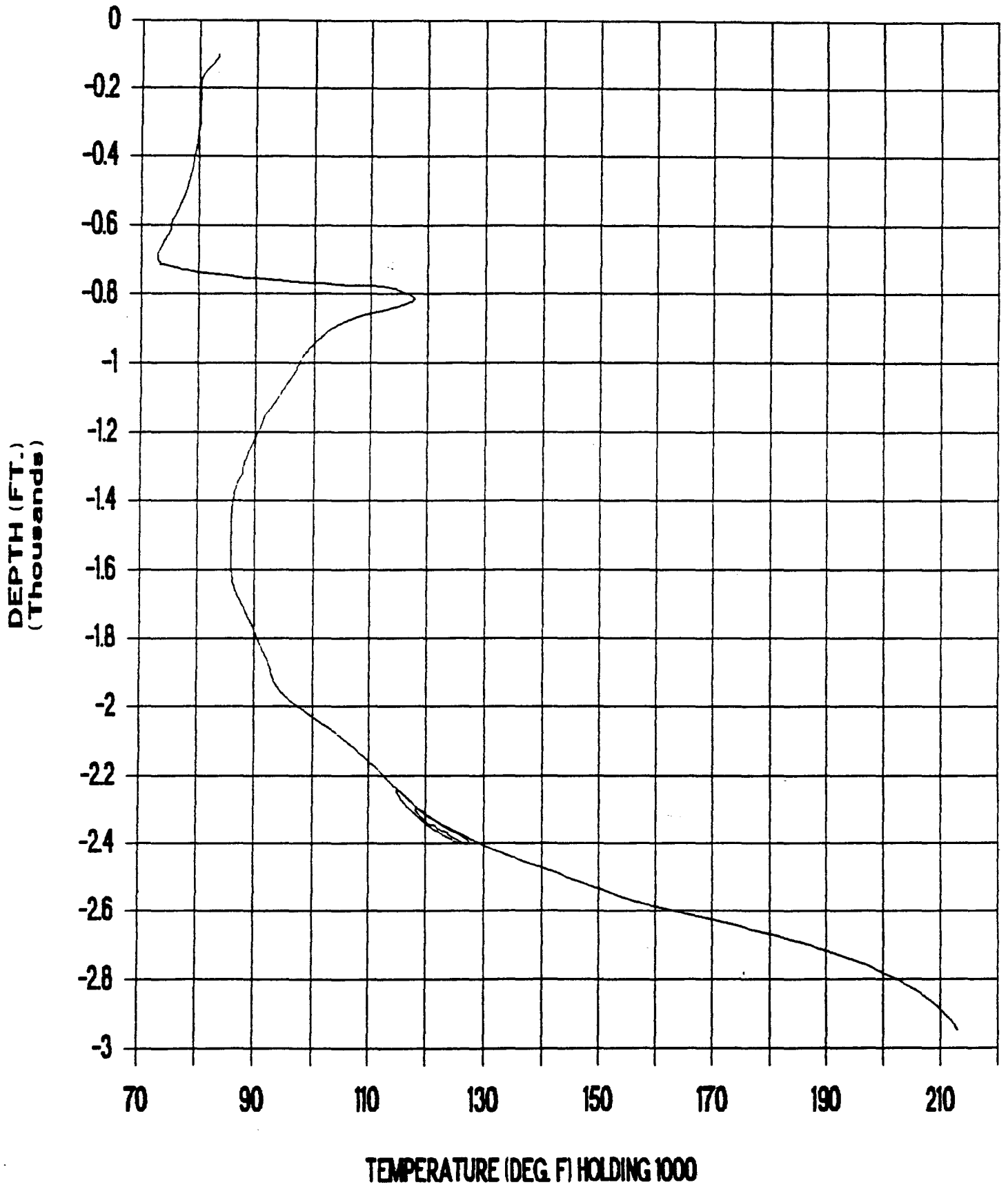
SPINNER LOG UP @ 115 F.P.M. 5-24-93



SPINNER (C.P.S.) WELL 1,000 P.S.I.

# PUNA GEOTHERMAL WELL KS-2

TEMPERATURE UP DOWN 5-24-92



# PUNA GEOTHERMAL VENTURE

A Hawaii Partnership

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License 00 JAN 24 1993  
File # 7

DEPARTMENT OF LAND AND NATURAL RESOURCES  
STATE OF HAWAII

June 22, 1993

Keith W. Ahue, Chairperson  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, HI 96809

SUBJ: KS-2 PLUG AND ABANDON COMPLETION REPORT

Dear Mr. Ahue,

Pursuant to the KS-1 PLUG AND ABANDONMENT PROGRAM approved by DLNR on March 15, 1993, Puna Geothermal Venture hereby submits the required completion report.

Should you or your staff have any questions, please contact me.

Sincerely,

*Thomas G. Kizis*  
Thomas G. Kizis  
Environmental Manager

c: M. Tagomori  
S. Morris  
G. Davidson  
Drilling  
Mesquite

*KS-2 well Record*

File: KS-2

KS-02 P & A HISTORY

LOCATION: 9,589' N & 10,974' E. OF THE KALIU BENCHMARK.  
ELEVATION: 712' ABOVE MSL. ALL DEPTHS FROM RKB, 25' ABOVE G.L.

05/23/93 Depth 8005'  
Moved in and rigged up Parker Drilling Company Rig #231 on KS-2.

05/24/93 Depth 8005'  
Rig on day rate at 0000 hours. Function tested blow out preventer equipment to 1500 psi, OK. Rigged up and ran spinner survey to 2984'. Survey showed no flow, indicating no Leaks. Pressure tested 9 1/2" casing to 1600 psi surface pressure. Had very slow bleed off through a leaking wing valve. Tripped in hole with 8 1/2" bit to the top of cement at 3001'. Conditioned mud in pits to 9.4 ppg.

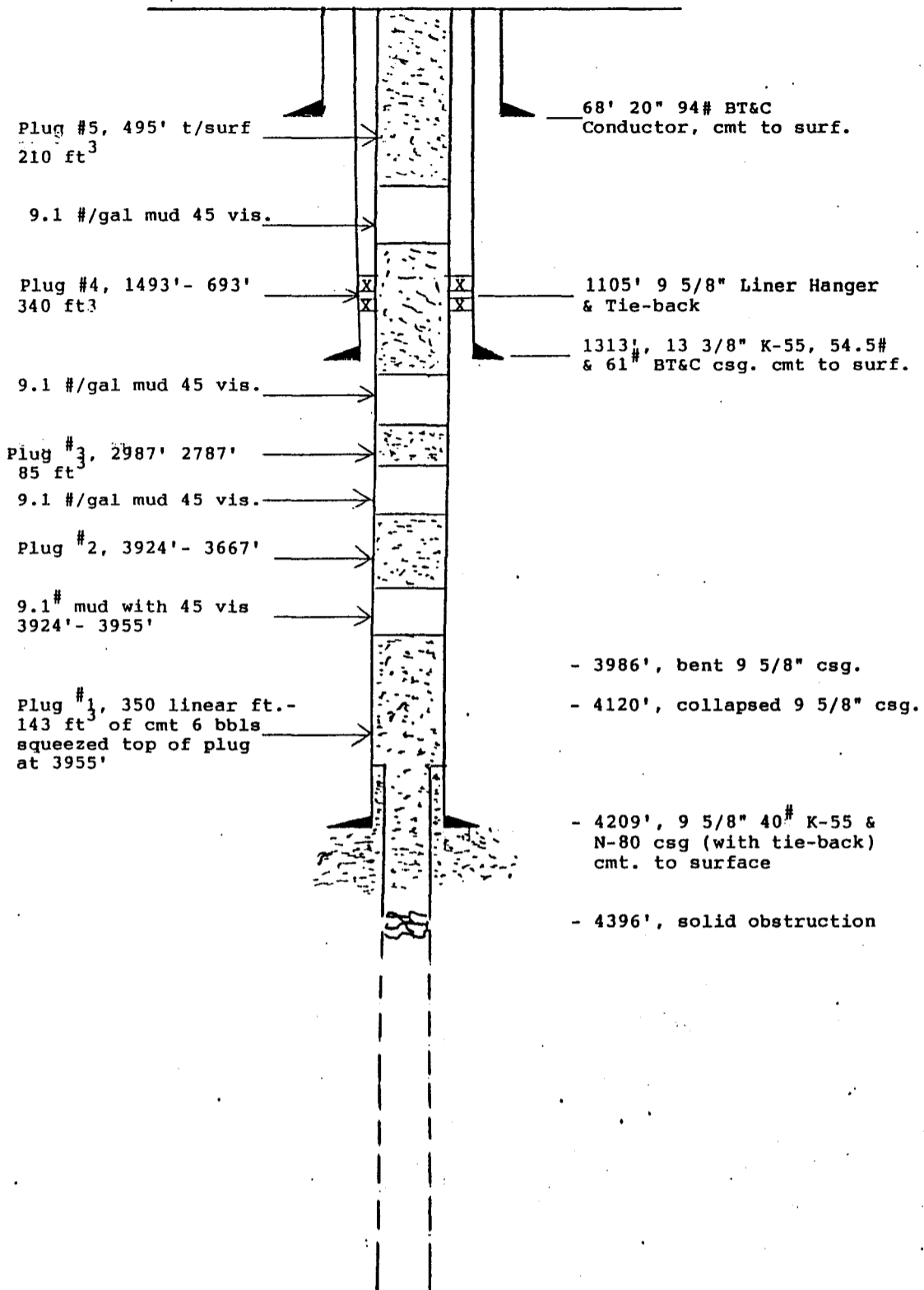
05/25/93 P.B. Depth 3955'  
Displaced 180 barrels water out of hole with 9.4 ppg mud. Had 40,000 ppm hydrogen, 500 ppm CO<sub>2</sub> and no H<sub>2</sub>S gas in the water. Cleaned out cement from 3001' to 3180'. Ran in hole to 3258'. Closed in well and displaced water out of casing into formation with mud from surface. Tripped in hole to 3986' and circulated through choke. Monitored gasses and abated H<sub>2</sub>S with 1/8 BPM caustic pumped by Howco into wing valve. Tripped for open ended drill pipe. Hit obstruction at 4120'. Circulated through choke. Monitored gasses, had no H<sub>2</sub>S and 400 ppm CO<sub>2</sub>. Rigged up Howco. Hung pipe at 4110'. Howco pumped 10 barrels water followed by 143 ft<sup>3</sup> Hawaiian cement premixed 40% SSA-1 and 0.65% CFR-3. Displaced with 2 barrels water and 20 barrels mud. Tripped out of hole 10 stands and squeezed away 11 1/2 barrels cement. Held 800 psi final squeeze pressure for 2 hours.

05/26/93 P.B. Depth Surface  
Ran in hole with open ended drill pipe to the top of cement at 3955'. Rigged up and ran pressure temperature survey to 3910'. Pressure was 2065 psia and temperature was 208°F. Had no cross flow or up flow. Circulated at 3995'. Halliburton pumped 10 barrels water followed by 110 cubic feet of Hawaiian cement premixed with 40% SSA-1 and 0.65% CFR-3. Displaced with 2 barrels of water and 20 barrels of mud. Pulled out of hole to 3267'. Waited on cement 4 hours. Ran in hole to top of cement at 3667'. Pulled to 2987'. Halliburton pumped 10 barrels of water ahead followed by 85 cubic feet Hawaiian cement premixed with 40% SSA-1, and 0.65% CFR-3. Displaced

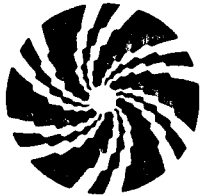
cement with 2 barrels water and 6 barrels mud. Pulled out of hole to 1493'. Waited on cement. Tagged top of cement at 2789' with wire line. Through open ended drill pipe at 1493', Halliburton pumped 10 barrels of water ahead followed by 340 cubic feet of Hawaiian cement premixed with 40% SSA-1 and 0.65% CFR-3. Displaced cement with 2 barrels of water and 2 barrels of mud. Pulled out of hole to 493'. Waited on cement. Tagged top of cement at 691' with wire line. Through pipe hung at 493' Halliburton pumped 10 barrels of water ahead followed by 210 cubic feet of Hawaiian cement premixed with 40% SSA-1 and 0.65% CFR-3. Displaced cement with 1 barrel of water. Pulled out of hole. Waited on cement Laid down drill pipe and tools. Nippled down Blowout prevention equipment.

05/27/93 P.B. Depth Surface  
Nippled down and cleaned pits. Released rig at 1200 hours 5/27/93. The P & A will be completed by cutting off the casing head, welding a plate on the casing and removing then backfilling the cellar.

KS-02 P & A  
KB = 25'



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90 OCT 19 A 7: 26

October 15, 1990  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
STATE OF HAWAII

RECEIVED  
90 OCT 29 A 6: 40  
DEPARTMENT OF WATER & LAND DEVELOPMENT

Mr. William Paty  
Chairperson  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, HI 96809

Subject: Puna Geothermal Venture  
Quarterly Well Monitoring Report

Dear Mr. Paty,

As requested by the Department of Land and Natural Resources (DLNR), Puna Geothermal Venture (PGV) respectfully submits the following quarterly well reports for Kapoho State 1, Kapoho State 1A and Kapoho State 2.

The results of the attached well reports indicate that the wellhead pressures for each of the PGV wells remained static during the previous three months. No H<sub>2</sub>S was detected at any of the wellheads. All master valves and side valves for the three wells were serviced, function tested, and found to be in good operating condition. If there are any questions, or if more information is required, please feel free to contact the PGV office in Hilo at 961-2786.

Sincerely,

Bill Teplow  
Field Manager

Attachment

cc: B. Clark w/encl.  
Z. Reiss w/encl.  
J. Sternfeld w/encl.

**PUNA GEOTHERMAL VENTURE CONSTRUCTION**

P.O. Box 1337 ● Hilo, Hawaii 96721-1337 ● Telephone (808) 961-2786 ● Facsimile (808) 935-5562

QUARTERLY WELL REPORT

KAPOHO STATE 2

Months Covered Under This Report: July, 1990 - September, 1990

Date	Pressure (psi)	Comments
July 02, 1990	3	
July 04, 1990	3	
July 08, 1990	3	
July 11, 1990	3	
July 15, 1990	3	
July 18, 1990	3	
July 22, 1990	3	
July 25, 1990	3	Pumped cellar
July 29, 1990	3	
August 03, 1990	3	
August 06, 1990	3	
August 10, 1990	3	
August 13, 1990	3	
August 17, 1990	3	
August 20, 1990	3	
August 24, 1990	3	
August 27, 1990	3	
August 31, 1990	3	
September 03, 1990	3	
September 07, 1990	3	
September 10, 1990	3	Pumped cellar
September 14, 1990	3	
September 17, 1990	3	
September 21, 1990	3	
September 24, 1990	3	
September 28, 1990	3	

# PUNA GEOTHERMAL VENTURE

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93 JAN 5 P 3: 27

92 DEC 31 A 9: 56

December 29, 1992

DIV. OF WATER & LAND DEVELOPMENT

COMMISSION ON WATER RESOURCE MANAGEMENT

*WC to reply Jph*

Mr. William Paty, Chairperson  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, HI 96809

SUBJECT: PROPOSED PLANS TO ABANDON WELLS KS-1 AND KS-2

Dear Mr. Paty,

As requested by staff from your Division of Water and Land Development on November 4, 1992, Puna Geothermal Venture (PGV) hereby submits plans to abandon wells Kapoho State 1 (KS-1) and Kapoho State 2 (KS-2) for your approval. These plans are pursuant to the requirements of Chapter 183 (Leasing and Drilling of Geothermal Resources), Subchapter 11, Sections 13-183-81 through 83.

We have been mandated to perform these abandonments as per your letter to PGV of December 13, 1991. We have subsequently requested an extension of time from the DLNR to complete these operations and have submitted the required change in plan of operation for your review and approval.

If your staff has any questions or would like additional information, please have them contact me.

DEPARTMENT OF LAND AND NATURAL RESOURCES

DOCUMENT NO. UAC OR ATTACHED WORKSHEET DATE: January 11, 1993

F	YR	APP	D	SRC/ OBJ	COST/ CTR	PROJECT	PH	ACT	AMOUNT	NAME/DESCRIPTION (WANG INPUT)
G	00	000	C	1022	0741				(1) 200.00	Puna Geothermal Venture
									(2)	
									(3)	
									(4)	
TOTAL										

REMARKS: LINE (1) KS-1 & KS-2, P&A Plan fees  
LINE (2)  
LINE (3)  
LINE (4)

01/11/93 \*0056\* CHECK 200.00

# PUNA GEOTHERMAL VENTURE

A Hawaii Partnership

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~~FILE~~ KS-02

92 DEC 31 09:55

COMMISSION ON WATER  
RESOURCE MANAGEMENT

*Cabinet 2  
File # 6*

December 29, 1992

Mr. William Paty, Chairperson  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, HI 96809

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If your staff has any questions or would like additional information, please have them contact me.

Sincerely,

*Thomas G. Kizis*

Thomas G. Kizis  
Environmental Manager

TGK/sls

cc: J. Lewin (DOH)  
S. Morris  
M. Tagamori (DLNR)  
Drilling File  
Files: KS-1/KS-2  
Memo: A:21540.TK

RECEIVED

93 MAR 1 P 2: 06

KS-2 P & A PROGRAM

12/29/92

DIV. OF WATER &  
LAND DEVELOPMENT

1. Move in and rig up a suitable workover unit.
2. Install and test BOPE above the 10" - 300 master valve.
  - A. BOPE will consist of pipe and CSO rams, annular preventor and stripper.
  - B. Have test witnessed by DLNR.
3. Rig up to drill out temporary suspension plug at the above shoe of the 7" casing.
  - A. Use Baker tanks and baroid 100 bbl mixing tank.
  - B. Use a 6" or smaller bit.
  - C. Cement is estimated to be from 2985' to 3175'.
  - D. Well schematic attached.
4. Be prepared to kill well while drilling cement and kill well after drilling cement. Keep well dead with water.
5. RIH to top of 7" perforated liner at approximately 3981' and POH.
6. RIH open ended to the 9-5/8" shoe at 4209'.
7. Displace a minimum of 200 lineal feet of cement with silica flour and retarders as required.
  - A. If necessary squeeze cement out of 9-5/8" shoe with surface pressure.
  - B. Tag cement after it sets.
8. Displace a minimum of 200 lineal feet of silica flour cement inside the shoe of the 9-5/8" casing. (Come at least 50' above the top of the 7" liner.)
  - A. Tag the plug after it sets.
  - B. Have plug setting and tagging witnessed by DLNR.

9. Pressure test casing
  - A. Fill well with fluid and apply pressure at wellhead to simulate cement plugs and mud hydrostatic pressure.
  - B. Hold pressure for 30 minutes.
  - C. If casing holds enough pressure to support mud and cement and no pressure drop occurs, set plug as follows: Mud from 3931' to 3000', cement to 2800', mud to 1500', cement to 828', mud to 250' and cement to 50'.
10. If casing does not hold pressure, tag the cement plugs in step 9 or circulate cement off the top of each plug as directed by DLNR representative.
11. Fill all open annuli solid with cement to the surface.
12. Rig down and move off.
13. Cut off casing at the bottom of the cellar.
14. Fill casing from 50' to surface with redi-mix cement and weld plate on top of cut off.
15. Remove cellar and restore surface location as near as practicable, to its original condition.

WELL STATUS REPORT  
EXISTING PRODUCTION WELLS  
PUNA GEOTHERMAL VENTURE SITE

The following is a summary of the current status of the existing production well located on the Puna Geothermal Venture designated project area. The well locations are shown in Figure 1.

1. KS-1 (Figure 2)

Production well KS-1 was plugged with cement by Thermal Power on April 26, 1983. The plug was set from a depth of 1750 feet to a depth of 2153 feet. The well is completed with a single 2000# master gate valve which is maintained in the closed position and is locked. Wellhead pressure is stable at 6 psi. The gas observed when the pressure is bled through the side valve contains no H<sub>2</sub>S.

2. KS-2 (Figure 3)

Production well KS-2 was plugged with cement by Thermal Power on March 29, 1983. The plug was set from a depth of 2984 feet to a depth of 3175 feet. The well is completed with a single 2000# master gate valve which is maintained in the closed position and is locked. There is no pressure at the wellhead.

3. KS-1A (Figure 4)

Production well KS-1A was plugged with cement by Puna Geothermal Venture on June 1, 1989. The plug was set from a depth of 3542 feet to a depth of 3692 feet. The well is completed with two 3000# master gate valves which are maintained in the closed position and are locked. There is no pressure at the wellhead.

4. KS-3 (Figure 5, 6)

Production well KS-3 was completed by PGV on January 23, 1991. The well was drilled to a measured depth 7406 feet. A 511' fish was left in the bottom of the hole. The well is currently shut in with water in the casing to the wellhead. The wellhead pressure is 5 psi. No gas cap has been observed to date.

5. Injection Well KS-7 (Figure 7, 8)

KS-7 was spudded on January 30, 1991. 13-3/8" K-55 54# BT&C casing was set and cemented to 1020 feet. During the drilling of the 12-1/4" hole, an unanticipated high temperature, high pressure zone was encountered in the 1500

## PUNA GEOTHERMAL VENTURE

Page 2

foot to 1678 foot interval. The hole bridged at a depth of 1277 feet. A cement plug was placed from 1277 feet to a depth of 740 feet. Drilling operations are currently suspended for this well with the rig on the hole and the BOP in place. Pressure and temperature in the casing and adjacent monitoring well MW-2 are being monitored daily. No H<sub>2</sub>S gas has been detected from either well.

6. Monitoring\Water Supply Well MW-1 (Figure 9)

MW-1 was completed by PGV on December 30, 1990 to a depth of 731 feet. A 75 hp submersible pump was installed and the well was put in service to supply water for production drilling operations and fire protection. The well is also sampled periodically as part of the Hydrologic Monitoring Program.

7. Monitoring Well MW-2 (Figure 10)

MW-2 was completed on January 21, 1991 to a depth of 646 feet. The well completed with 4" pipe which is perforated in the bottom 50 feet. The well is sampled periodically as part of the Hydrologic Monitoring Program.



# PGV WELL KS-2

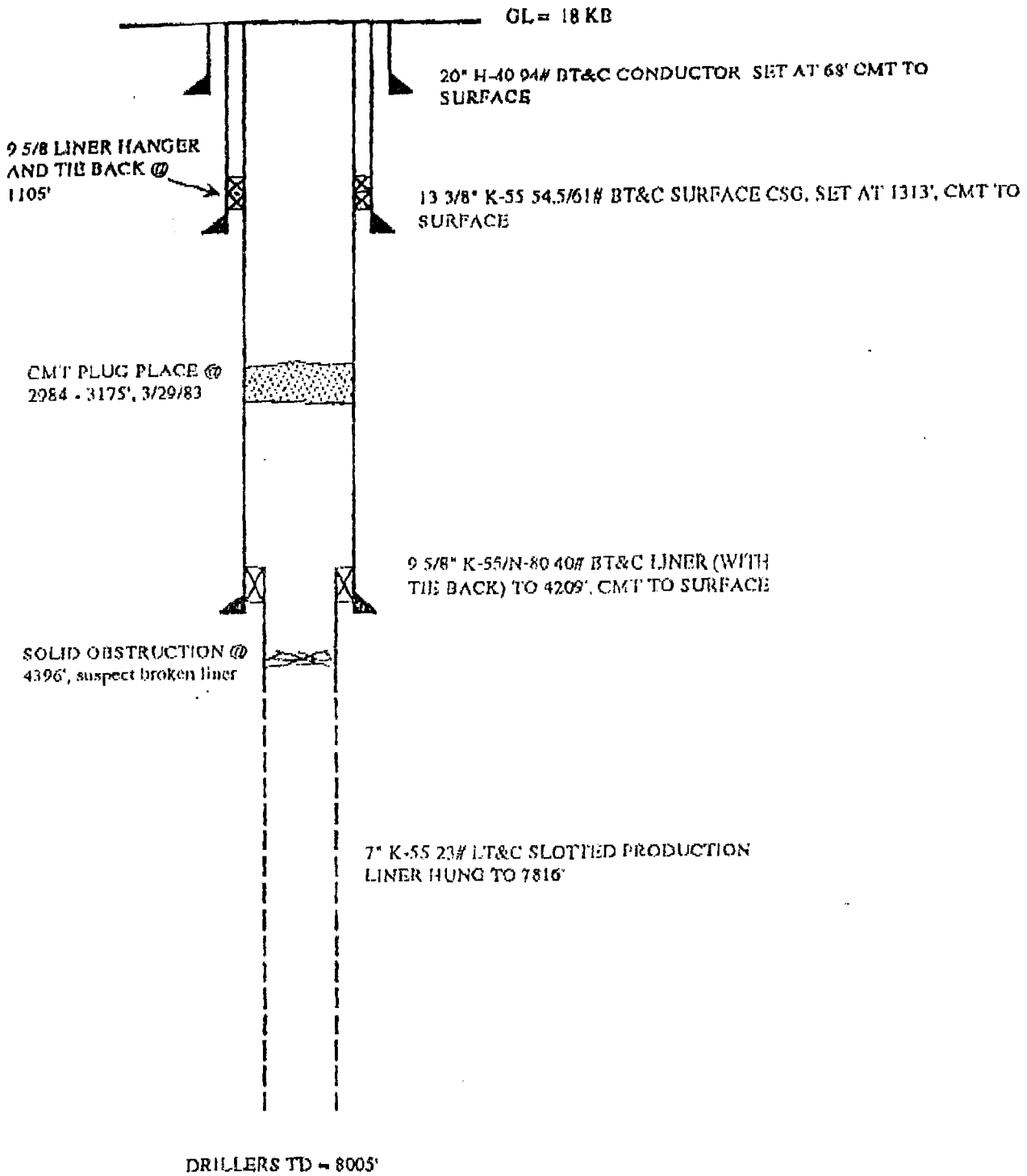


Figure 3

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24 October 1988

Mr. William Paty, Chairman  
Board of Land & Natural Resources  
Kalanimoku Building  
1151 Punchbowl Street #220  
Honolulu, HI 96813

## Lease/Drilling Bonds

Dear Mr. Paty:

Pursuant to State Administrative Rules Title 13, Chapter 183, Sections 34 and 68, we submit the attached bonds with Amor VIII Corporation as Principal and American Motorists Insurance Company as Surety. These new Amor VIII bonds will replace bonds previously submitted by Thermal Power Company

<u>Bonds</u>	<u>Ormat/Amor VIII</u>	<u>Thermal Power</u>
R-1 Performance bond	3SM 714 750 00	553 4472
R-2 Performance bond	3SM 714 751 00	553 4471
R-4 Performance bond	3SM 714 752 00	930 4593
Well Indemnity bond	3SM 714 749 00	567 7792

As always, if you have any questions regarding the above matter, or require additional information, please do not hesitate to call our office at 524-8940 through October 28th.

We are in the process of relocating our office to Hilo. After November 15, 1988 please forward any correspondence to us at:

Ormat Energy Systems, Inc.  
101 Aupuni Street Suite 1014-B  
Hilo, Hawaii 96720  
(808) 961-2184 Fax: 961-3531

Sincerely yours,

Maurice A. Richard  
Hawaii Regional  
Development Manager

encl  
MAR/cn:0034  
cc: M. Shimabukuro-DLNR

ORMAT ENERGY SYSTEMS, INC. 220 S. King St. #1750 Hon., HI 96813  
(808) 524-8940  
610 East Glendale Ave., Sparks, Nevada 89431-5811 • Telephone (702) 356-9111 • Facsimile (702) 356-9125 • Telex 170030

BOND NO. 3SM 714 749 00

Premium \$7,500.00 Per Yr

**GEOHERMAL RESOURCES WELL INDEMNITY BOND  
(\$250,000 Statewide Well Bond)**

**KNOW ALL MEN BY THESE PRESENTS:**

That we, Amor VIII Corporation, as principal, and American Motorists Insurance Co. organized and existing under and by virtue of the laws of the STATE OF Illinois and authorized to transact surety business in the STATE OF HAWAII, as surety, are held and firmly bound unto the State of Hawaii in the full and just sum of TWO HUNDRED FIFTY THOUSAND AND NO/100 DOLLARS (\$250,000.00) lawful money of the United States of America, to be paid to the said State of Hawaii, for which payment, well and truly to be made, we do hereby bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Signed, sealed, delivered and dated this 7th day of October, 1988.

**THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT,**

WHEREAS, said principal is about to acquire, drill, redrill, deepen, operate, maintain or abandon a geothermal resources wells in the State of Hawaii and is required to file this bond in connection therewith in accordance with Rule 9.4 of Regulation 8 of the Department of Land and Natural Resources, State of Hawaii.

NOW, THEREFORE, if said Amor VIII Corporation, the above bounden principal, shall well and truly comply with all the provisions of said Regulation 8 and shall obey all lawful orders of the Chairman of the Board of Land and Natural Resources, or his representative, if not appealed to the Board of Land and Natural Resources, or upon affirmance thereof by the Board of Land and Natural Resources, if appealed thereto, and shall pay all charges, costs, and expenses incurred by the Chairman or his representative, in respect of such well or the property or properties of said principal, or assessed against such well or the property or properties of such principal, in pursuance of the provisions of said Regulation 8, then this obligation shall be void; otherwise, it shall remain in full force and effect.

Amor VIII Corporation, ✓

By: [Signature]

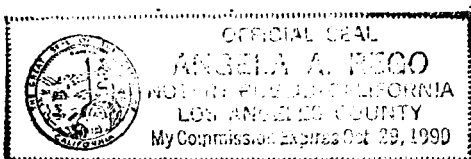
Approved as to forms:

STATE OF CALIFORNIA, )  
COUNTY OF Los Angeles ) SS.



On this 07 07 1988 day of October, 1988, before me Angela A. Rego personally appeared William J. Shupper

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument as the Attorney-in-Fact of AMERICAN MOTORISTS INSURANCE COMPANY, and acknowledged to me that he (she) subscribed the name of said company thereto as Surety, and his (her) own name as Attorney-in-Fact



[Signature]  
NOTARY PUBLIC



**POWER OF ATTORNEY**  
**Know All Men By These Presents:**

That the American Motorists Insurance Company, a corporation organized and existing under the laws of the State of Illinois, and having its principal office in Long Grove, Illinois, does hereby appoint \*\*\*\*\*  
**William J. Shupper of Los Angeles, California\*\*\*\*\***

its true and lawful agent(s) and attorney(s)-in-fact, to make, execute, seal, and deliver during the period beginning with the date of issuance of this power and ending December 31, 1988, unless sooner revoked for and on its behalf as surety, and as its act and deed: **Any and all bonds and undertakings provided the amount of no one bond or undertaking exceeds TWO MILLION DOLLARS (\$2,000,000.00)\*\*\*\*\***

**EXCEPTION: NO AUTHORITY is granted to make, execute, seal and deliver any bond or undertaking which guarantees the payment or collection of any promissory note, check, draft or letter of credit.**

This authority does not permit the same obligation to be split into two or more bonds in order to bring each such bond within the dollar limit of authority as set forth herein.

This appointment may be revoked at any time by the American Motorists Insurance Company.

The execution of such bonds and undertakings in pursuance of these presents shall be as binding upon the said American Motorists Insurance Company as fully and amply to all intents and purposes, as if the same had been duly executed and acknowledged by its regularly elected officers at its principal office in Long Grove, Illinois.

THIS APPOINTMENT SHALL CEASE AND TERMINATE WITHOUT NOTICE AS OF DECEMBER 31, 1988.

This Power of Attorney is executed by authority of a resolution adopted by the Board of Directors of said American Motorists Insurance Company on May 20, 1981 at Long Grove, Illinois, a true and accurate copy of which is hereinafter set forth and is hereby certified to by the undersigned Secretary as being in full force and effect:

"VOTED, That the Chairman of the Board, the Chairman, the President, or any Vice President, or their appointees designated in writing and filed with the Secretary, or the Secretary shall have the power and authority to appoint agents and attorneys-in-fact, and to authorize them to execute on behalf of the Company, and attach the seal of the Company thereto, bonds and undertakings, recognizances, contracts of indemnity and other writings, obligatory in the nature thereof, and any such officers of the Company may appoint agents for acceptance of process."


This Power of Attorney is signed, sealed and certified by facsimile under and by authority of the following resolution adopted by the Board of Directors of the Company at a meeting duly called and held on the 20th day of May, 1981:

"VOTED, That the signature of the Chairman of the Board, the Chairman, the President, any Vice President, or their appointees designated in writing and filed with the Secretary, and the signature of the Secretary, the seal of the Company and certifications by the Secretary, may be affixed by facsimile on any power of attorney or bond executed pursuant to resolution adopted by the Board of Directors on May 20th, 1981 and any such power so executed, sealed and certified with respect to any bond or undertaking to which it is attached, shall continue to be valid and binding upon the Company."

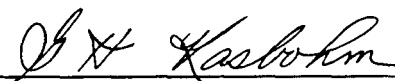
In Testimony Whereof, the American Motorists Insurance Company has caused this instrument to be signed and its corporate seal to be affixed by its authorized officers, this 8th day of August, 19 86.

Attested and Certified:

AMERICAN MOTORISTS INSURANCE COMPANY

  
R. H. Johnson, Secretary



By   
G. H. Kasbohm, Vice President

STATE OF ILLINOIS  
COUNTY OF LAKE SS

I, Olga W. Bennett, a Notary Public, do hereby certify that G. H. Kasbohm and R. H. Johnson personally known to me to be the same persons whose names are respectively as Vice President and Secretary of the American Motorists Insurance Company, a Corporation of the State of Illinois, subscribed to the foregoing instrument, appeared before me this day in person and severally acknowledged that they being thereunto duly authorized signed, sealed with the corporate seal and delivered the said instrument as the free and voluntary act of said corporation and as their own free and voluntary act for the uses and purposes therein set forth.



  
Olga W. Bennett, Notary Public

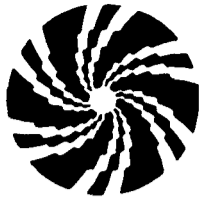
My commission expires: November 18, 1988

CALIFORNIA

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JUL 22 9 39 AM '88

July 18, 1988

DEPT. OF WATER &  
LAND DEVELOPMENT

STATE OF HAWAII

Mr. William W. Paty  
Chairman  
Board of Land and Natural Resource  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Paty:

In accordance with the Department of Land and Natural Resources Administrative Rules, Title 13, Chapter 183-65(7)(c), we are herewith requesting a 180-day extension of our modification permits for the well designated Kapoho State 2, on DLNR geothermal resources mining Lease R-2. A permit to modify Kapoho State 2 was issued by your office on July 10, 1987, based on the application filed by Thermal Power Company on June 3, 1987.

As outlined in the above mentioned permit application, Kapoho State 2 will be modified below 4200 feet by a deviated and directed wellbore in order to penetrate the geothermal reservoir over an expected longer producing interval. Following successful completion of the proposed modification, we propose to flow test the well to demonstrate its productive capacity.

We are scheduled in Honolulu beginning June 25, 1988 to visit with you, update you, and plan for a smooth ownership transition from Thermal Power to Ormat. Ormat looks forward to a long and successful relationship with you and the DLNR staff and we look forward to your positive response to this request for extension.

Sincerely yours,

Maurice A. Richard  
Regional Development Manager

MAR/lks

34874M

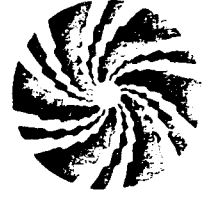
**ORMAT ENERGY SYSTEMS, INC.**

610 East Glendale Ave., Sparks, Nevada 89431-5811 • Telephone (702) 356-9111 • Facsimile (702) 356-9125 • Telex 170030

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DIVISION OF  
LAND MANAGEMENT  
OCT 14 10 09 AM '88



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23 OCT 17 AM : 43

6 October 1988  
DIV. OF WATER &  
LAND DEVELOPMENT

Mr. William J. Paty, Chairman  
Board of Land & Natural Resources  
Kalanimoku Bldg. #130  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Re: Geothermal Resources Mining Lease R-2  
Request for Extension of Geothermal Well Modification Permit, Kapoho  
State No. 2, - Response to DLNR Letter of 8/15/88.

Dear Mr. Paty:

The following is submitted in response to your request for additional information regarding the July 18, 1988 letter from Ormat Energy Systems, Inc. (Ormat) requesting a 180-day extension of the Geothermal Well Modification Permit issued to Thermal Power Company as Operator for the Puna Geothermal Venture (PGV), sublessee for DLNR Geothermal Resources Mining Lease R-2:

- (1) As indicated in our letter of August 2, 1988 to your office, Ormat has not actually purchased Thermal Power Company, but has purchased, through its wholly-owned subsidiaries AMOR VI Corporation and AMOR VIII Corporation, one hundred percent (100%) of the interests in PGV, the partnership which is named as sublessee of DLNR Geothermal Mining Lease R-2. This includes the purchase by AMOR VIII Corporation of all of Maxus Energy's (Thermal Power Company's parent company) interests in PGV, as well as the purchase by AMOR VI Corporation of those interests in PGV previously held by Amfac Energy. PGV intends on designating AMOR VIII Corporation as Operator for PGV, replacing Thermal Power Company, which no longer holds a working interest in the PGV project.
- (2) AMOR VIII Corporation expects to have a \$250,000 surety bond, as required by DLNR's Chapter 183 regulations, available for submittal to DLNR by the middle of October, 1988, when AMOR VIII will be designated as Operator. In addition, PGV anticipates the submittal of replacement \$10,000 lease bonds for each of PGV's DLNR Geothermal Mining Leases (R-1, R-2 and R-4), as required by DLNR's Chapter 183 regulations, at this same time.

**ORMAT ENERGY SYSTEMS, INC.** 220 S. King St. #1750 Hon., HI 96813  
(808) 524-8940  
610 East Glendale Ave., Sparks, Nevada 89431-5811 • Telephone (702) 356-9111 • Facsimile (702) 356-9125 • Telex 170030

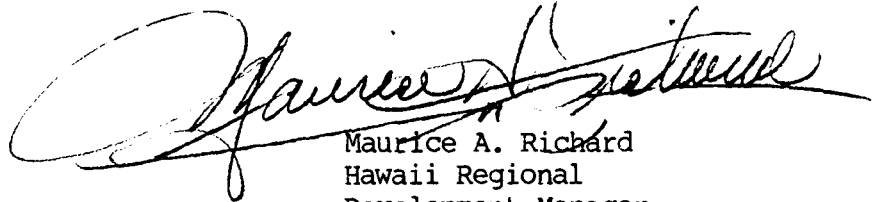
Mr. William J. Paty  
6 October 1988  
Page Two

- (3) At present, PGV is reviewing its proposal to redrill and test geothermal well Kapoho State No. 2 and to conduct long-term testing of geothermal well Kapoho State No. 1A to the HGP-A plant, as approved under the Second Amendment to the Plan of Operations, approved April 25, 1988. At the earliest, PGV would not actually commence either of these activities until at least January of 1989, or a time coincident with the granting of additional approvals by DLNR and other agencies for construction of the proposed PGV Project.

As stated in our letter of August 2, 1988, PGV intends on proceeding as quickly as possible with the development of the PGV Project, the 30 MW geothermal power plant and wellfield project generally described in PGV's Plan of Operation submitted to DLNR on December 8, 1986. Because of the recent purchase by Ormat subsidiaries of all the interests in PGV, PGV will soon be submitting an amendment to this Plan which will more accurately reflect the proposed design and operation of the PGV Project as revised by Ormat.

As always, if you have any questions regarding the above information, or require any additional information, please do not hesitate to call our office.

Sincerely yours,



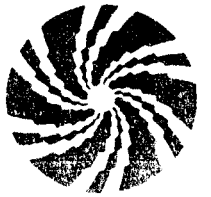
Maurice A. Richard  
Hawaii Regional  
Development Manager

MAR/cn

WLF  
50  
LM

RECEIVED

ORMAT®



MAR 22 8 31 39

July 18, 1988

DEPT. OF WATER &  
LAND DEVELOPMENT

Mr. William W. Paty  
Chairman  
Board of Land and Natural Resource  
P.O. Box 621  
Honolulu, HI 96809

Dear Mr. Paty:

In accordance with the Department of Land and Natural Resources Administrative Rules, Title 13, Chapter 183-65(7)(c), we are herewith requesting a 180-day extension of our modification permits for the well designated Kapoho State 2, on DLNR geothermal resources mining Lease R-2. A permit to modify Kapoho State 2 was issued by your office on July 10, 1987, based on the application filed by Thermal Power Company on June 3, 1987.

As outlined in the above mentioned permit application, Kapoho State 2 will be modified below 4200 feet by a deviated and directed wellbore in order to penetrate the geothermal reservoir over an expected longer producing interval. Following successful completion of the proposed modification, we propose to flow test the well to demonstrate its productive capacity.

We are scheduled in Honolulu beginning June 25, 1988 to visit with you, update you, and plan for a smooth ownership transition from Thermal Power to Ormat. Ormat looks forward to a long and successful relationship with you and the DLNR staff and we look forward to your positive response to this request for extension.

Sincerely yours,

Maurice A. Richard  
Regional Development Manager

MAR/lks

34874M

ORMAT ENERGY SYSTEMS, INC.

610 East Glendale Ave., Sparks, Nevada 89431-5811 • Telephone (702) 356-9111 • Facsimile (702) 356-9125 • Telex 170030

ormatl

Mr. Maurice A. Richard  
Regional Development Manager  
Ormat Energy Systems, Inc.  
610 East Glendale Ave.  
Sparks, Nevada 89431-5811

Dear Mr. Richard:

Geothermal Well Modification Permit - Kapoho State No. 2

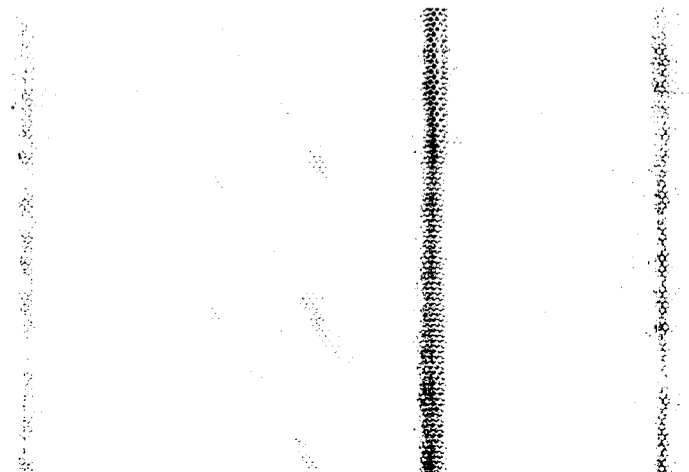
The Department of Land and Natural Resources approves your request for a 180-day extension of the well modification permit for Kapoho State No. 2. The new expiration date is January 10, 1989.

Please be informed that all provisions of the original permit are applicable through this extension period and that reasonable prior notice should be given our staff whenever any testing is to be conducted. Appropriate lead time is necessary for scheduling staff personnel to inspect the test activities.

Additionally, the following conditions are applicable to this permit:

- The applicant shall comply with all valid requirements of all municipal, state and federal authorities and observe all municipal, state and federal laws and regulations pertaining to the lands and permittee's operations, which are now in force or which may hereafter be in force, including, but not limited to, all water and air pollution control laws, and those relating to the environment. The State of Hawaii, acting in its governmental capacity, may by regulation regulate the drilling, location, spacing, testing, completion, production, operation, maintenance and abandonment of a well or wells or similar activity as well as the construction, operation and maintenance of any other facilities in the exercise of its police powers to protect the public health, welfare and safety as provided in the regulations.
- Pollution of the ocean and tidelands, rivers, or other bodies of water, and all impairment of and interference with bathing, fishing, or navigation in the waters of the ocean or any bay or inlet thereof is prohibited, and no brine, minerals, or any refuse of any kind from any well or works shall be permitted to be deposited on or pass into waters of the ocean, any bay or inlet thereof, rivers, lakes or other bodies of water, without specific written State authorization.
- No substances which may be produced from any well drilled upon the land shall be blown, flowed, or allowed to escape into the open air or in the ground in such a manner as to create a nuisance, which shall specifically include but not be limited to noise, air or other pollution, and other activities which disturb the occupier's or his Tenant's use of the lands. Subject to the foregoing, the applicant may bleed substances to the atmosphere so long as such operations are lawfully and prudently conducted in accordance with good geothermal drilling and production practices and are not otherwise in violation of the law.

Very truly yours,



RECEIVED

87 JUN 4 P 3: 30



**Diamond Shamrock**

Thermal Power Company

DIV. OF WATER &  
LAND DEVELOPMENT

3 June 1987

RECEIVED

87 JUN 3 P 4: 14

Ralph A. Patterson, Jr.  
Hawaii Project Manager  
& NATURAL RESOURCES  
STATE OF HAWAII

Mr. William W. Paty  
Chairperson  
Board of Land Natural Resources  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Re: Application for Permit to  
to Modify Well KS-2  
State Geothermal Mining Lease R-2  
Puna District, Hawaii County

Dear Mr. Paty:

In accordance with DLNR Administrative Rule, Title 13, Subchapter 183-65 and our recently approved Amendment to Plan of Operations dated 1 December 1986, Thermal Power Company as Operator for the Puna Geothermal Venture submits herewith an Application for Permit to Modify Well KS-2 on the referenced lease. As previously reported to the DLNR, KS-2 was originally drilled as a vertical wellbore to 8005 feet in April 1982. After subsequent testing of geothermal fluids, KS-2 was plugged and suspended in March 1983. In accordance with condition (3) of the approval letter for the amended Plan of Operations, a schematic drawing of Well KS-2, in its existing configuration, was submitted to DLNR under a transmittal letter dated 28 May 1987.

Thermal now proposes to drill out the cement plug and modify the well below 4200 feet depth, as a directed and deviated wellbore in a second penetration of the geothermal reservoir. Following a successful completion of the proposed modification, we propose to flow test the well to demonstrate expected improvement in productive capacity.

Please note that our approved Amendment to Plan of Operations (page 5) raised the concept of conducting a short term fluid injection experiment in the KS-2 wellbore before proceeding with the modification. We have determined that we will not conduct such experiment.

Mr. William W. Paty  
Page Two  
3 June 1987

A \$100 non-refundable filing fee accompanies the enclosed Application. An early consideration and approval of the Permit to Modify Well KS-2 will be appreciated in order to allow the orderly procurement of materials and services. Please contact Dan Mason at (808) 524-8940 if Thermal can assist by responding to questions or further requests regarding this Application.

Yours very truly,

A handwritten signature in black ink that reads "Ralph A. Patterson". The signature is written in a cursive style with a large, prominent initial "R".

Ralph A. Patterson  
Project Manager

RAP/ma/WLD139  
APPCOVL1

6/7/87 check for 100.00 deposited  
dk

PUNA GEOTHERMAL VENTURE

APPLICATION FOR PERMIT TO MODIFY ONE EXISTING GEOTHERMAL WELL,  
KAPOHO STATE 2, ON RESERVED LANDS, KAPOHO, PUNA, HAWAII

In accordance with DLNR Administrative Rule, Title 13, Subchapter 183-65 and the approved second amendment to Plan of Operation, dated 1 December 1986, Thermal Power Company, as Operator for the Puna Geothermal Venture, herewith makes application for Permit to Modify Well KS-2 upon approval by the Hawaii Board of Land and Natural Resources.

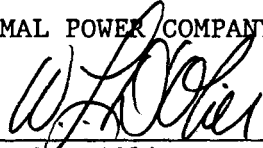
The following items in bold print reference the provisions of Section 13-183-65 of the DLNR rules.

- (1) Name, signature and address of the applicant, the owner of the mining rights and the landowner if the applicant is not the landowner.

Applicant:

Thermal Power Company  
220 So. King Street, Suite 1750  
Honolulu, Hawaii 96814

THERMAL POWER COMPANY

By:   
W. L. D'Olier  
Vice President  
Geothermal Exploration

Owner of Mining Rights:

Kapoho Land Partnership

Land Owner

Kapoho Land and Development Company, Limited

- (2) The number or other designation by which the well shall be known. The number or designation shall be subject to the chairperson's approval.

Well designation: Kapoho State 2 (KS-2), as previously approved.

- (3) A plot plan showing the tax map key, site elevation, and well location reference to established property corners. A survey by a Hawaii licensed surveyor may be required by the department, if deemed necessary.

The attached tax key map, Exhibit A of this Application, designates the location and 718-foot elevation of the existing drillsite for Well KS-2 within State Geothermal Mining Lease R-2.

- (4) A statement by applicant of the purpose and extent of the proposed work and an estimate of the depths between which discovery, production, injection, or plugging will be attempted.

The purpose of the proposed modification in Well KS-2 is to make a new penetration of the geothermal reservoir with a directionally drilled wellbore below the undisturbed original 9-5/8" casing at 4209 feet. The new wellbore would be directionally drilled to 7670 feet at a new bottomhole location approximately 1400 feet distant from the existing wellhead location. Fluid productivity in the new angled hole should exceed the 33,000 pounds per hour steam flow tested in the KS-2 vertical hole in mid-1982. New flow test results at KS-2 will assist production wellfield planning for an initial PGV generating unit proposed in an earlier submittal to DLNR. A new and increased flow may also provide a backup supply for the existing HGP-A generating plant in the interim period.

The new wellbore, as directionally drilled, will remain within State Geothermal Mining Lease R-2. Directional surveys of the new wellbore will be submitted to DLNR with the well operations report upon completion of the work.

The modification of Kapoho State 2 will require approximately 25 drilling days. The new wellbore would commence at 4230 feet and build at 2° per 100 feet to a maximum 25° angle. This angle will be maintained in a deeper, straight hole section to a total depth of approximately 7670 feet.

- (5) A description of the proposed drilling and casing program; and a plan or drawing showing the proposed work and vertical section of the well.

The Modification Program, Drillsite Plan and Vertical Section for Well KS-2 are attached, as Exhibits B, C, and D respectively, to this Application.

- (6) A statement by applicant agreeing to file a bond meeting the requirements of Section 13-183-68 with the chairperson within ten calendar days after notification that the application has been approved.

An Indemnity Bond in the amount of \$250,000 (multi-well and statewide) has been filed with the State of Hawaii. A copy of this bond is attached as Exhibit E.

- (7) A statement by applicant to perform the work and thereafter to operate and maintain the well in accordance with these rules and all other federal, state and county requirements.

Thermal Power Company, as Operator for the Puna Geothermal Joint Venture, agrees to perform the proposed modification as outlined in this application and agrees to maintain the well in accordance with Administrative Rule, Title 13, Subchapter 183-80, State of Hawaii and all Federal and County geothermal regulations.

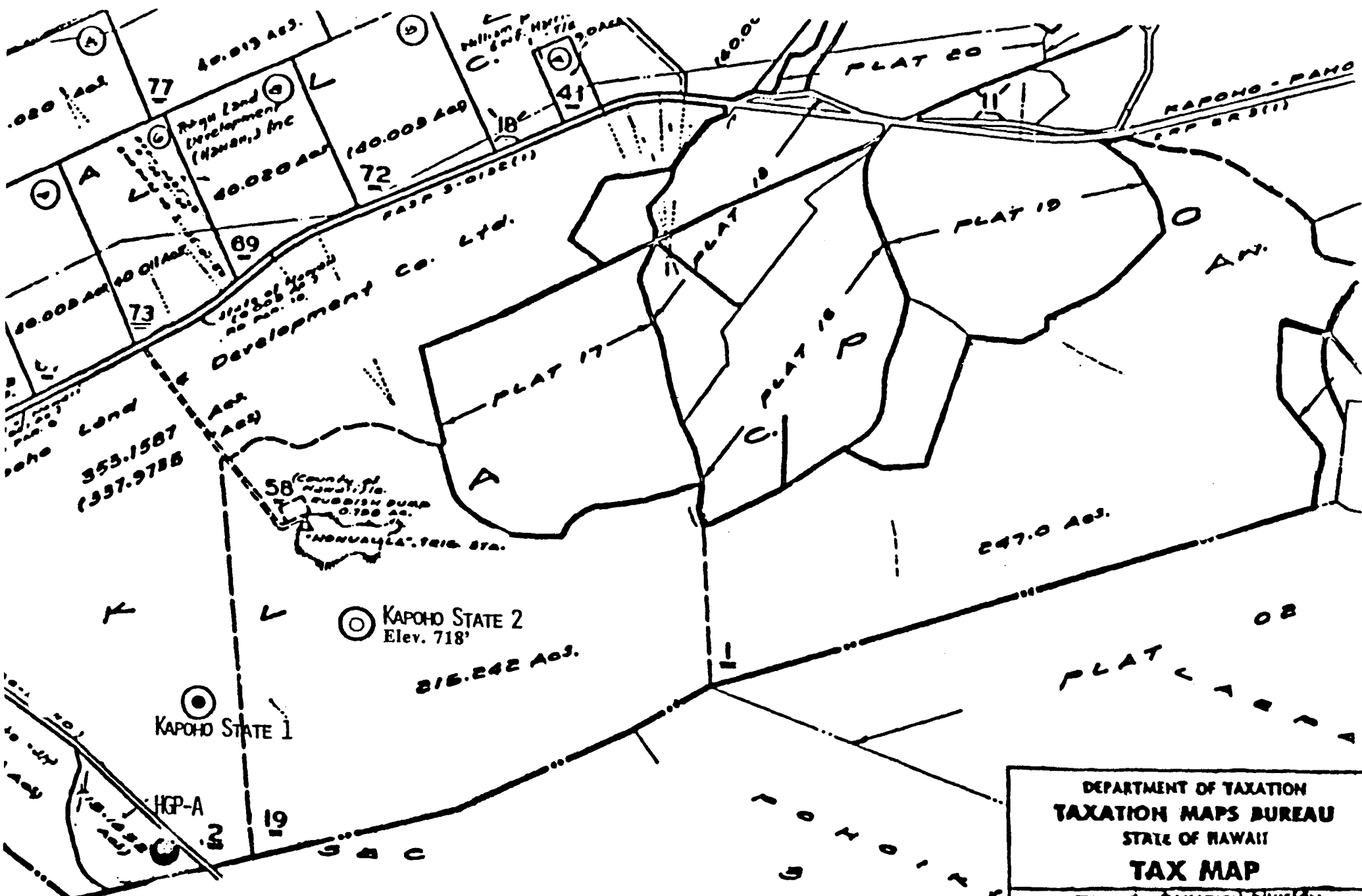
A non-refundable filing fee in the amount of \$100 accompanies this Application, as required in Section 13-183-67.

WLD139

Attachments: \$100 Filing Fee

Submitted: 29 May 1987

Exhibit A	Tax Key Map
B	Modification Program
C	Drillsite Plan
D	Vertical Section; Proposed Well Modification
E	Copy - Indemnity Bond



State Geothermal Mining Lease R-2

DEPARTMENT OF TAXATION  
 TAXATION MAPS BUREAU  
 STATE OF HAWAII  
**TAX MAP**

THIRD TAXATION DIVISION

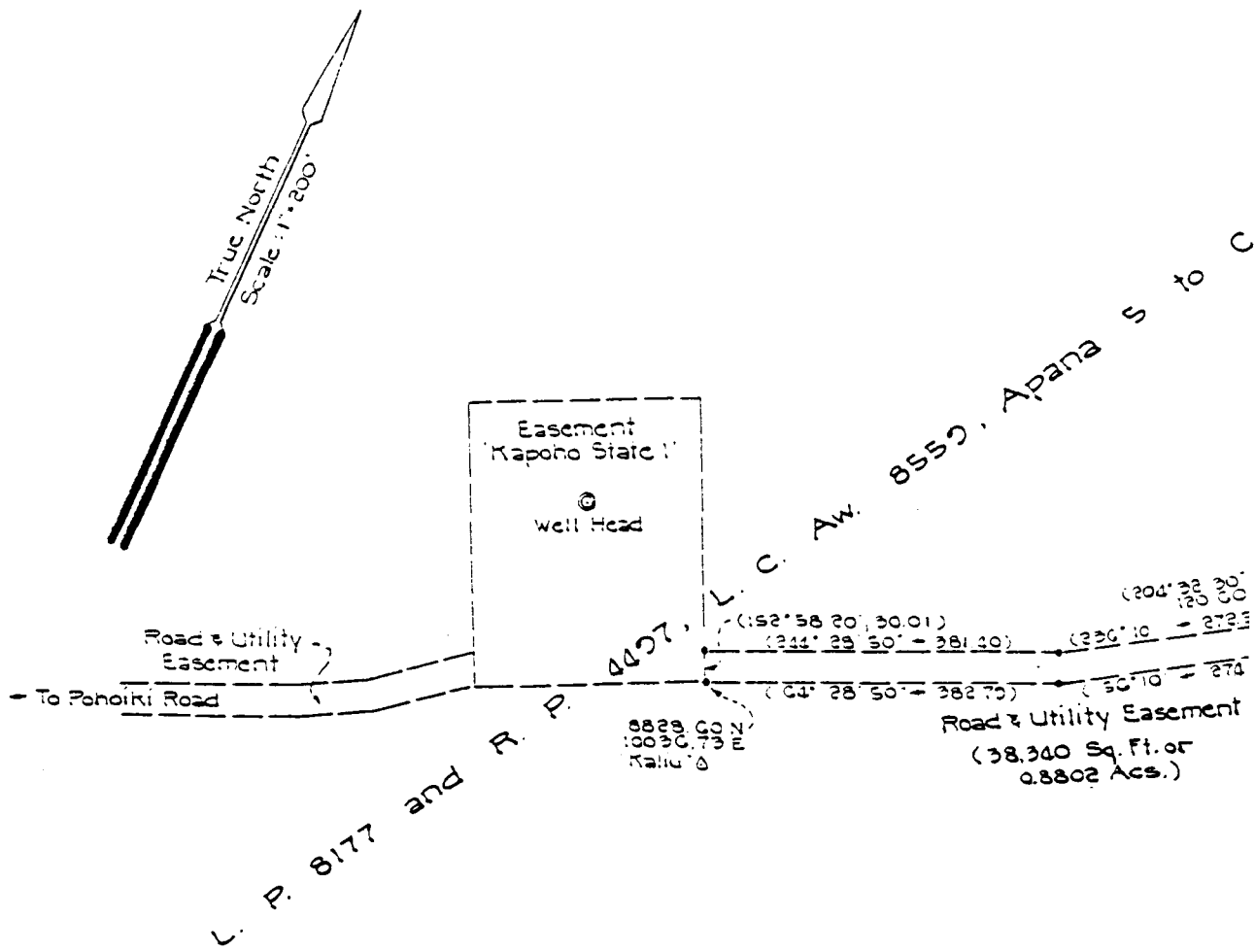
ZONE	SEC.	PLAT
1	4	01

Exhibit A

20 May 1987

PUNA GEOTHERMAL VENTURE  
PROPOSED MODIFICATION PROGRAM WELL KS-2

1. a) Notify Hawaii Department of Land and Natural Resources (DLNR) 24 hours prior to commencement of operations on the drillsite.  
b) Confirm compliance with all permit requirements. Move in drilling rig. Install blowout preventors above wellhead master gate.
2. a) Run 8-1/2" bit; drill out cement plug below 2994' and cleanout 9-5/8" casing to top of 7" liner at 3981'. Use drilling string weight and mud weight to contain possible pressure of 1450 psig, below cement plug.  
b) Run 6" bit, 4-1/2" drill collar and 3-1/2" drill pipe; cleanout 7" liner to 4396'.
3. Pull 7" liner from 3981' to 4396'; cleanout with 8-3/4" bit to 4396'.
4. Run deviation/directional survey if possible to 4396' (Eastman Instrument).
5. Place cement plug from 4396' to 4200'; dress plug and kick off at about 4230' with mud and Dyna drill. Directional heading will be specified by Thermal Power Company, as determined by geotechnical data. Drill 8-3/4" diameter hole.
6. Deviate wellbore at 2° per 100' to 20°-25° maximum angle by 5200' true vertical depth (TVD); then drill straight bore on directed heading, at constant maximum angle to about 7400' TVD or approximately 7670' measured total depth. Obtain and record detailed directional surveys of the entire directionally drilled bore from 4230' to TD.
7. Based on wellbore data, consider option of brief flow test of the well to estimate its productivity.
8. Cleanout to total depth with 8-3/4" bit run. Condition hole as directed by drilling fluid circulation from TD. Run 7", 26 lb/ft, SM-90SS, VAM-ACE, regular coupled, perforated liner to 7640' measured depth. Hang this liner in existing 9-5/8" casing at approximately 4000'.
9. Run 7", 26 lb/ft, SM-90SS, VAM-ACE regular coupled production casing to 4000'. Centralize and cement 4000-3700' interval, using metal petal baskets and DV collar at 3700'. Open DV collar at 3700'. Circulate out excess cement and continue circulating for six hours. Wait on cement and prepare to tension casing.
10. Tension upper 3700' of 7" casing to not more than 300,000 lbs; monitor casing stretch at incremental increases. Cement with Class G, 40% silica flour geothermal blend at 15-16 ppg slurry weight to the surface.
11. Run 6" bit and cleanout 7" liner to bottom at 7670'. Circulate fresh water until the hole is cleaned.
12. POH and lay down drill pipe and prepare for possible mini injection test and wellbore temperature survey. Nipple down BOP's. Clean pits and release rig.



EASEMENT

KAPOHO STATE

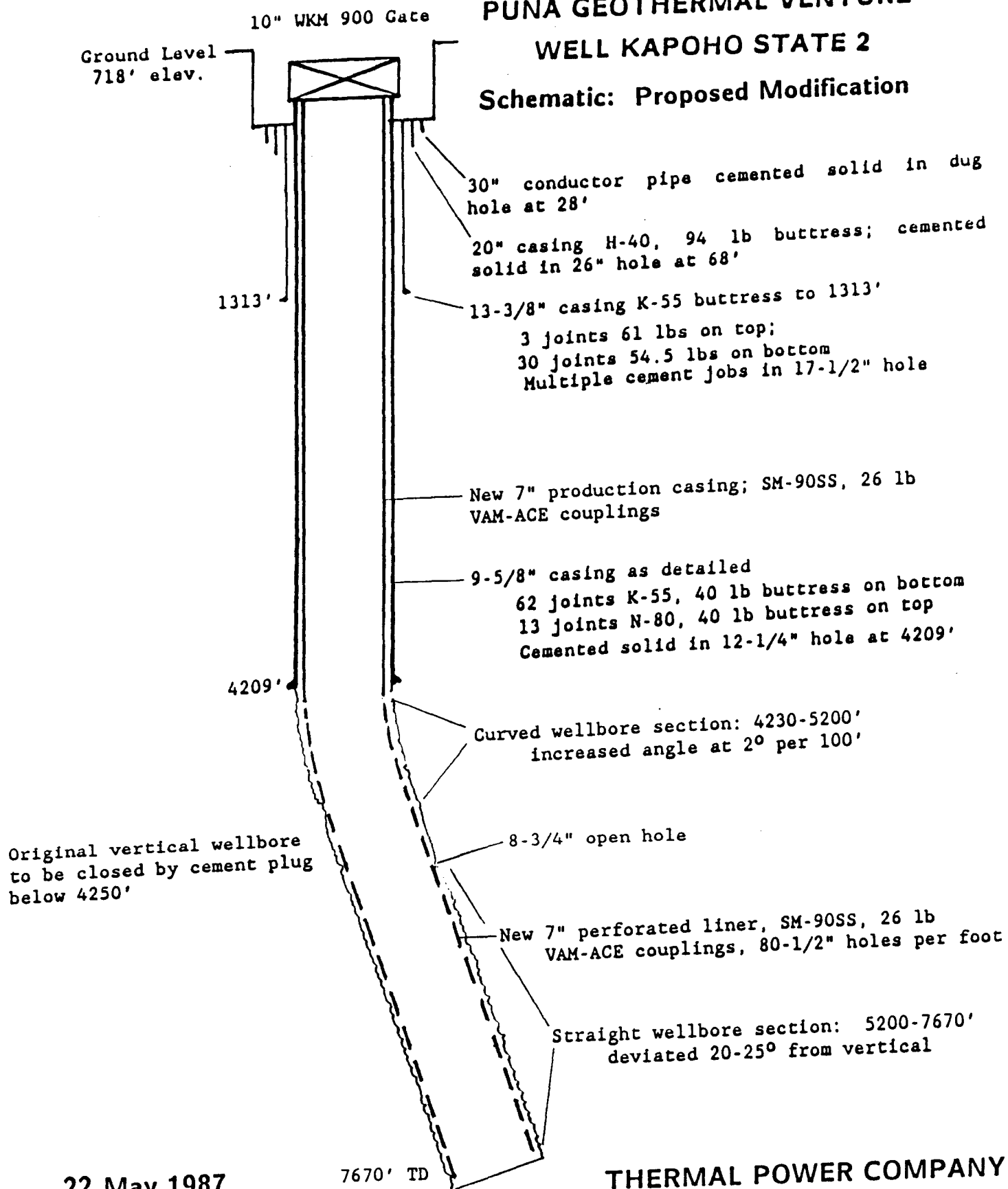
Geothermal Well  
 within L.P. 8177 and  
 L.C. Aw. 8552, Apana 5  
 Kapoho, Puna, Island of H

Survey and Plan by Murray, Smit  
 P. O. Box 863

# PUNA GEOTHERMAL VENTURE

## WELL KAPOHO STATE 2

### Schematic: Proposed Modification



22 May 1987

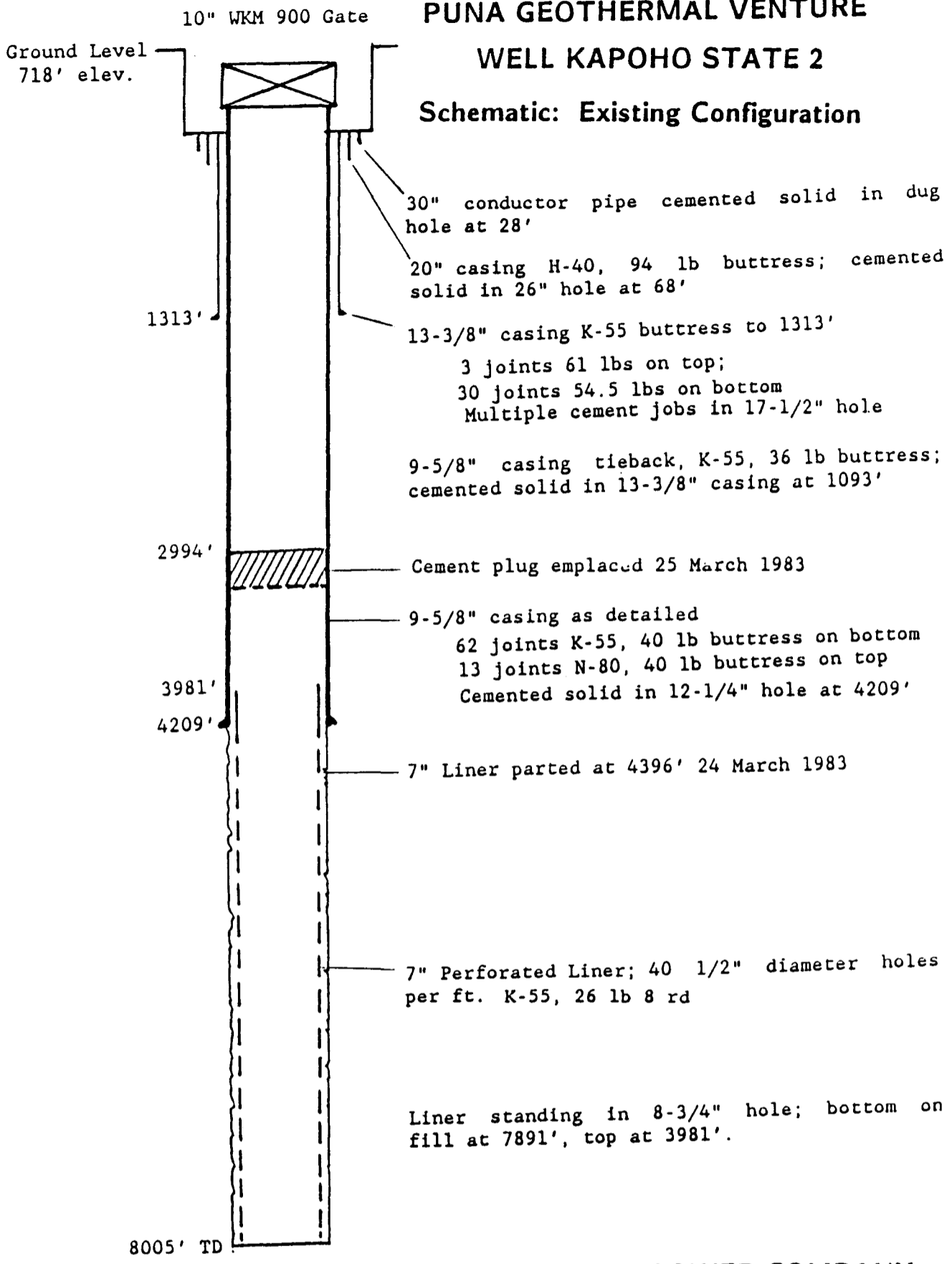
Exhibit D

**THERMAL POWER COMPANY**  
Operator for PGV

# PUNA GEOTHERMAL VENTURE

## WELL KAPOHO STATE 2

### Schematic: Existing Configuration



Spud Date: 19 January 1982

Completion: 2 April 1982

THERMAL POWER COMPANY  
Operator for PGV

# DRAFT

## PUNA GEOTHERMAL VENTURE

### APPLICATION FOR PERMIT TO MODIFY ONE EXISTING GEOTHERMAL WELL, KAPOHO STATE 2, ON RESERVED LANDS, KAPOHO, PUNA, HAWAII

In accordance with DLNR Administrative Rule, Title 13, Subchapter 183-65 and the approved second amendment to Plan of Operation, dated 1 December 1986, Thermal Power Company, as Operator for the Puna Geothermal Venture, herewith makes application for Permit to Modify Well KS-2 upon approval by the Hawaii Board of Land and Natural Resources.

The following items in bold print reference the provisions of Section 13-183-65 of the DLNR rules.

- (1) Name, signature and address of the applicant, the owner of the mining rights and the land owner if the applicant is not the land owner.

*OK* Applicant:

Thermal Power Company  
220 So. King Street, Suite 1750  
Honolulu, Hawaii 96814

THERMAL POWER COMPANY

Owner of Mining Rights:

Kapoho Land Partnership  
State of Hawaii,  
Department of Land & Natural Resources

By:

W. L. D'Olier  
Vice President  
Geothermal Exploration

Land Owner

Kapoho Land and Development Company, Limited

- (2) The number or other designation by which the well shall be known. The number or designation shall be subject to the chairperson's approval.

*OK* Well designation: Kapoho State 2 (KS-2)

- (3) A plot plan showing the tax map key, site elevation, and well location reference to established property corners. A survey by a Hawaii licensed surveyor may be required by the department, if deemed necessary.

The attached tax key map, Exhibit A to this Application, designates the location and 718-foot elevation of the existing drillsite for Well KS-2 within State Geothermal Mining Lease R-2.

\* *Should also submit a map (scale 1:24,000) with required info.*

# DRAFT

- (4) A statement by applicant of the purpose and extent of the proposed work and an estimate of the depths between which discovery, production, injection, or plugging will be attempted.

The purpose of the proposed modification in Well KS-2 is to make a new penetration of the geothermal reservoir with a directionally drilled wellbore below the undisturbed original 9-5/8" casing at 4209 feet. The new wellbore would be directionally drilled to 7670 feet at a new bottomhole location approximately 1400 feet distant from the existing wellhead location. Fluid productivity in the new angled hole should exceed the 33,000 pounds per hour steam flow tested in the KS-2 vertical hole in mid-1982. New flow test results at KS-2 will assist production wellfield planning for an initial PGV generating unit proposed in an earlier submittal to DLNR. A new and increased flow may also provide a backup supply for the existing HGP-A generating plant in the interim period.

The new wellbore, as directionally drilled, will remain within State Geothermal Mining Lease R-2. Directional surveys of the new wellbore will be submitted to DLNR with the well operations report upon completion of the work.

The modification of Kapoho State 2 will require approximately 25 drilling days. The new wellbore would commence at 4230' and build at 2° per 100 feet to a maximum 25° angle. This angle will be maintained in a deeper, straight hole section to a total depth of approximately 7670 feet.

- (5) A description of the proposed drilling and casing program; and a plan or drawing showing the proposed work and vertical section of the well.

The Modification Program, Drillsite Plan and Vertical Section for Well KS-2 are attached, as Exhibits B, C, and D respectively, to this Application.

- OK (6) A statement by applicant agreeing to file a bond meeting the requirements of Section 13-183-68 with the chairperson within ten calendar days after notification that the application has been approved.

An Indemnity Bond in the amount of \$250,000 (multi-well and statewide) has been filed with the State of Hawaii. A copy of this bond is attached as Exhibit E.

- 1) In what direction (N, S, etc.) will the directional well be drilled?
- 2) Will the original 9-5/8" casing (w/leak) be used in conjunction with the directional hole? If so, need info on any proposed repairs to the casing.
- 3) Will a 7" slotted liner be used in the directional hole? or will the entire length of the wellbore be re-cased with smaller diam. casing?
- 4) Casing program shall be filed w/ application. (13-183-71)
- 5) Will a cement plug be used below the kick off point to seal the orig. well bore below?

# DRAFT

- (7) A statement by applicant to perform the work and thereafter to operate and maintain the well in accordance with these rules and all other federal, state and county requirements.

Thermal Power Company, as Operator for the Puna Geothermal Joint Venture, agrees to perform the proposed modification as outlined in this application and agrees to maintain the well in accordance with Administrative Rule, Title 13, Subchapter 183-80, State of Hawaii and all Federal and County geothermal regulations.

OK A non-refundable filing fee in the amount of \$100 accompanies this Application, as required in Section 13-183-67.

WLD139  
8073E

Attachments: \$100 Filing Fee                      Submitted: 22 May 1987

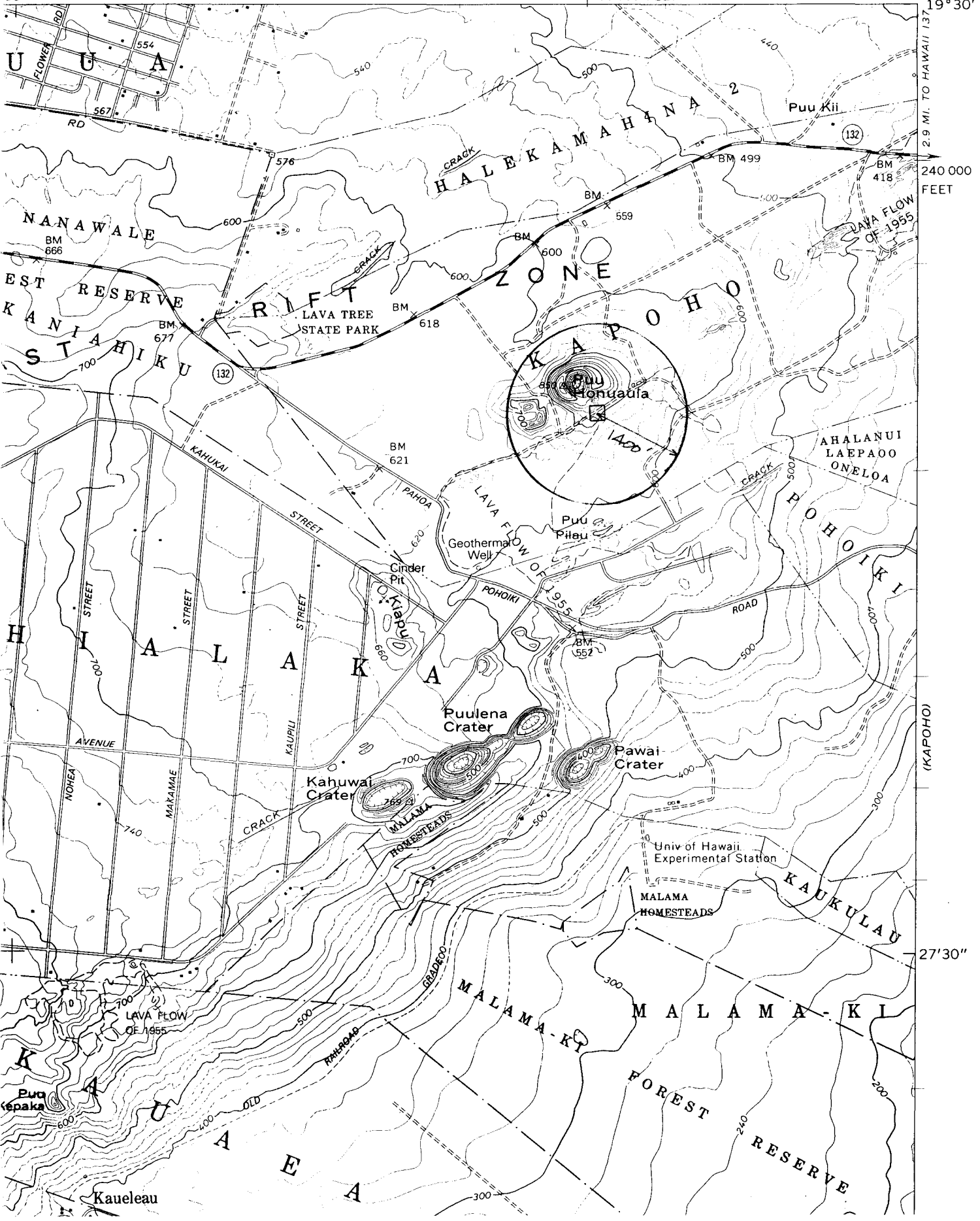
Exhibit A    Tax Key Map  
          B    Modification Program  
          C    Drillsite Plan  
          D    Vertical Section; Proposed Well Modification  
          E    Copy - Indemnity Bond

*FYI: 1) permit shall be valid for 365 days. (Extendable for 180 days)  
2) Application shall be acted upon within 60 days  
after receipt.*

PAHOA SOUTH QUADRANGLE  
HAWAII-HAWAII CO.  
ISLAND OF HAWAII-PUNA DISTRICT  
7.5 MINUTE SERIES (TOPOGRAPHIC)

(KAPOHO)

55' 710 000 FEET 154° 52' 30" 19° 30'



(KAPOHO)

27'30"

DRAFT 8/10/88

ormatl

Mr. Maurice A. Richard  
Regional Development Manager  
Ormat Energy Systems, Inc.  
610 East Glendale Ave.  
Sparks, Nevada 89431-5811

Dear Mr. Richard:

The Department of Land and Natural Resources acknowledges the receipt of your letter requesting a 180-day extension of the Geothermal Well Modification Permit for Kapoho State No. 2. issued to Thermal Power Company.

Your request for extension is currently under evaluation by our staff, however, in order to complete our review, the following ~~information~~ is required:

- 1) Information confirming <sup>both</sup> the acquisition of Thermal Power Co. by Ormat Energy Systems, Inc., and the transfer of responsibility from Thermal Power to Ormat as the new designated operator for Puna Geothermal Venture (PGV).
- 2) Submittal of a performance bond as required by DLNR's Chapter 183, or evidence which will confirm the legal transfer of the existing bond which currently identifies Thermal Power Co. as the principal party bound unto the State of Hawaii.
- 3) Current status of the development activities described in PGV's Second Amendment to the Plan of Operations approved by the Board of Land and Natural Resources on April 25, 1987.
- 4) An update of all pending applications with the County of Hawaii and the Department of Health, including the status of the Pohoiki-Puna 69KV transmission line project.

In addition, any further information which you may be able to provide concerning your overall project will be greatly appreciated. Thank you for your continued cooperation.

Sincerely,

William W. Paty, Chairperson  
Board of Land and Natural Resources

WELL LOG

PROJECT KAPOHO STATE 2

BORING NO. KS2 Page No. 1 of     

LOCATION PUNA, HAWAII

Type of Boring                     

Driller WRII

Date 1/19/82 to 4/2/82 Diam.                     

Elev. 717.87'

Datum                     

Field Party                     

Water                     

Level                     

Time                     

Date                     

Sampler	Time	Depth of Casing	Sample No.	DESCRIPTION - Soil type, firmness, sampler driving records, depth and driving of casing, depth drilling mud used, groundwater variations and times.
		28'		(ELEV. @ 717.87') ALL MEASUREMENTS FROM KELLY BUSHING
		68'	100'	
			500'	
			1000'	
				WATER LEVEL @ 724'
				HOLE IN 9 5/8" CASING @ 975'
				CASING LEAK @ 1040' - 1050'
				(4' GAP @ 9 5/8" CASING TIEBACK BETWEEN 1093' - 1097')
		1313'		13 3/8" casing
			1500'	
			2000'	DURING TESTING @ 2000' DEPTH 4200' OF WIRELINE & SURVEY TOOLS LOST IN HOLE.
			2500'	DURING FISHING OPERATIONS @ 2,400' DEPTH 1800' OF WIRELINE LOST
			3000'	



**Diamond Shamrock**  
Thermal Power Company

27 May 1987

Mr. Daniel Lum  
Dept. of Water and  
Land Development  
DLNR  
1151 Punchbowl Street  
Honolulu, Hi 96813

Dear Dan:

Attached is a draft application for Puna Geothermal  
Venture's planned modification to Kapoho State 2, an existing  
geothermal well. Upon completion of your review of this draft  
application, Thermal Power will forward the final version to  
Chairman Paty. Thanks for your consideration of this matter.

Sincerely,

Daniel H. Mason  
Marketing Manager

attach  
DHM/cn  
LUMDRLTR

**Thermal Power Company**

A subsidiary of Diamond Shamrock, 601 California Street, San Francisco, California 94108  
Phone 415 981-5700, Telex 34387 DIASHAM SFO

# DRAFT

## PUNA GEOTHERMAL VENTURE

### APPLICATION FOR PERMIT TO MODIFY ONE EXISTING GEOTHERMAL WELL, KAPOHO STATE 2, ON RESERVED LANDS, KAPOHO, PUNA, HAWAII

In accordance with DLNR Administrative Rule, Title 13, Subchapter 183-65 and the approved second amendment to Plan of Operation, dated 1 December 1986, Thermal Power Company, as Operator for the Puna Geothermal Venture, herewith makes application for Permit to Modify Well KS-2 upon approval by the Hawaii Board of Land and Natural Resources.

The following items in bold print reference the provisions of Section 13-183-65 of the DLNR rules.

- (1) **Name, signature and address of the applicant, the owner of the mining rights and the land owner if the applicant is not the land owner.**

Applicant:

Thermal Power Company  
220 So. King Street, Suite 1750  
Honolulu, Hawaii 96814

THERMAL POWER COMPANY

Owner of Mining Rights:

Kapoho Land Partnership  
State of Hawaii,  
Department of Land & Natural Resources

By: \_\_\_\_\_

W. L. D'Olier  
Vice President  
Geothermal Exploration

Land Owner

Kapoho Land and Development Company, Limited

- (2) **The number or other designation by which the well shall be known. The number or designation shall be subject to the chairperson's approval.**

Well designation: Kapoho State 2 (KS-2)

- (3) **A plot plan showing the tax map key, site elevation, and well location reference to established property corners. A survey by a Hawaii licensed surveyor may be required by the department, if deemed necessary.**

The attached tax key map, Exhibit A to this Application, designates the location and 718-foot elevation of the existing drillsite for Well KS-2 within State Geothermal Mining Lease R-2.

# DRAFT

- (4) A statement by applicant of the purpose and extent of the proposed work and an estimate of the depths between which discovery, production, injection, or plugging will be attempted.

The purpose of the proposed modification in Well KS-2 is to make a new penetration of the geothermal reservoir with a directionally drilled wellbore below the undisturbed original 9-5/8" casing at 4209 feet. The new wellbore would be directionally drilled to 7670 feet at a new bottomhole location approximately 1400 feet distant from the existing wellhead location. Fluid productivity in the new angled hole should exceed the 33,000 pounds per hour steam flow tested in the KS-2 vertical hole in mid-1982. New flow test results at KS-2 will assist production wellfield planning for an initial PGV generating unit proposed in an earlier submittal to DLNR. A new and increased flow may also provide a backup supply for the existing HGP-A generating plant in the interim period.

The new wellbore, as directionally drilled, will remain within State Geothermal Mining Lease R-2. Directional surveys of the new wellbore will be submitted to DLNR with the well operations report upon completion of the work.

The modification of Kapoho State 2 will require approximately 25 drilling days. The new wellbore would commence at 4230' and build at 2° per 100 feet to a maximum 25° angle. This angle will be maintained in a deeper, straight hole section to a total depth of approximately 7670 feet.

- (5) A description of the proposed drilling and casing program; and a plan or drawing showing the proposed work and vertical section of the well.

The Modification Program, Drillsite Plan and Vertical Section for Well KS-2 are attached, as Exhibits B, C, and D respectively, to this Application.

- (6) A statement by applicant agreeing to file a bond meeting the requirements of Section 13-183-68 with the chairperson within ten calendar days after notification that the application has been approved.

An Indemnity Bond in the amount of \$250,000 (multi-well and statewide) has been filed with the State of Hawaii. A copy of this bond is attached as Exhibit E.

# DRAFT

- (7) A statement by applicant to perform the work and thereafter to operate and maintain the well in accordance with these rules and all other federal, state and county requirements.

Thermal Power Company, as Operator for the Puna Geothermal Joint Venture, agrees to perform the proposed modification as outlined in this application and agrees to maintain the well in accordance with Administrative Rule, Title 13, Subchapter 183-80, State of Hawaii and all Federal and County geothermal regulations.

A non-refundable filing fee in the amount of \$100 accompanies this Application, as required in Section 13-183-67.

WLD139  
8073E

Attachments: \$100 Filing Fee                      Submitted: 22 May 1987

Exhibit A      Tax Key Map  
          B      Modification Program  
          C      Drillsite Plan  
          D      Vertical Section; Proposed Well Modification  
          E      Copy - Indemnity Bond

Original



**Diamond Shamrock**  
Thermal Power Company

15 April 1987

Mr. Dean Nakano  
Geologist-DOWALD  
Department of Land and  
Natural Resources  
1151 Punchbowl Street #227  
Honolulu, HI 96813

Dear Mr. Nakano:

Attached, per our March 25th discussion, is a schematic drawing of PGV's Kapoho State 2 well in its existing configuration. The "as-built" configuration would differ only by the absence of the cement plug and the parting IN the 7" liner at 4396 feet of depth. If you need any other information on KS-2 or any other aspect of the project, do not hesitate to contact me.

Very truly yours,

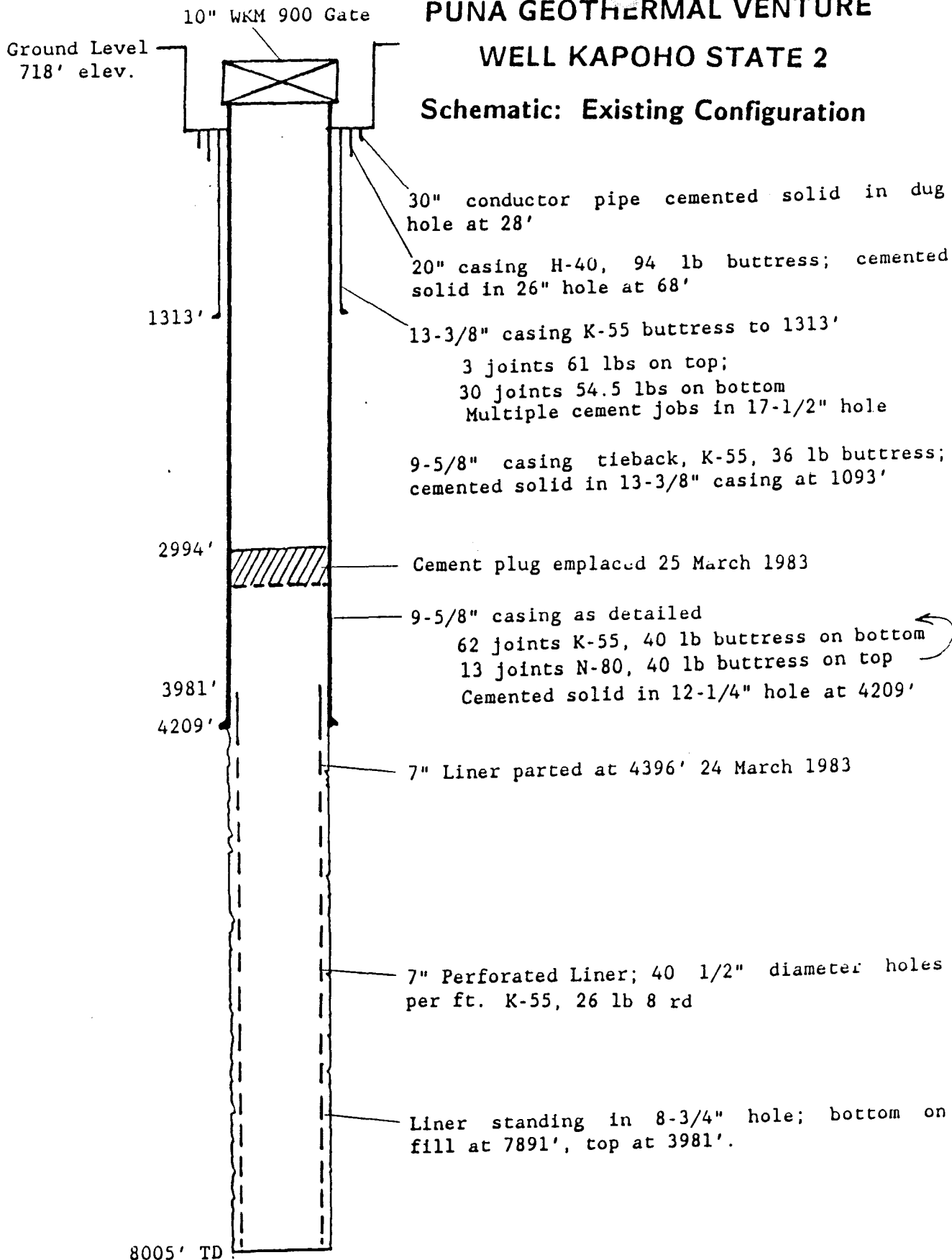
Daniel H. Mason  
Marketing Manager

attach  
DHM/cn  
NAKANLT1

# PUNA GEOTHERMAL VENTURE

## WELL KAPOHO STATE 2

### Schematic: Existing Configuration



Spud Date: 19 January 1982

Completion: 2 April 1982

THERMAL POWER COMPANY  
Operator for PGV

DOWALD

L345



# THERMAL POWER

COMPANY

14 December 1982

RECEIVED

82 DEC 15 P 1: 20

DEPT. OF LAND & NATURAL RESOURCES  
STATE OF HAWAII

Jere Denton  
Vice President  
Hawaii Project

Mr. Susumu Ono  
Chairman  
Board of Land & Natural Resources  
Kalanimoku Bldg. Room 130  
1151 Punchbowl St.  
Honolulu, Hi 96813

DEPT. OF WATER & LAND DEVELOPMENT

32 DEC 16 A 8: 21

RECEIVED

**Re: Geothermal Well: Kapoho State 2  
Geothermal Resource Mining Lease R-2  
Puna District, Hawaii County**

Dear Mr. Chairman:

Since drilling on Kapoho State 2 geothermal well was concluded in April of 1982, Thermal Power Company has conducted numerous flow tests and attempted logging via several methods. As a result of these tests, wire from wireline used in logging has been lost in the wellbore and flow test information indicates a probable small leak at the 9 5/8" to 13 3/8" casing lap. Thermal Power proposes to reenter the well when a rig becomes available approximately February 1st, in order to repair the casing lap leak and to clean out the well utilizing the procedure attached. Thermal Power therefore requests a 180 day extension to the Kapoho State 2 drilling permit which would otherwise expire on January 8, 1983. Thermal would propose to conduct additional flow tests subsequent to these remedial operations.

I would be happy to discuss the Kapoho State 2 well status, remedial plan or the completion report which was provided earlier, with your staff at their convenience.

Sincerely yours,

JMD/crn

attachment

**Geothermal Well: Kapoho State 2**

Location: TMK 1-4-01:19  
Kapoho, Puna, Hawaii County  
Elevation: 717.87' Above Sea Level  
Total Depth: 8005'

**Casing Depths:**

20" to 68'  
13-3/8" to 1313'  
9-5/8" to 4209'  
7" from 3891 to 7891'

**Status:** Shut in with  $\pm$  700 psig wellhead pressure, not on bleed.  
9-5/8" to 13-3/8" casing lap leak; 1050 to 1313'.

**WELL PROGRAM: CASING LAP REPAIR AND CLEAN OUT**

1. Move in and rig up rotary drilling equipment.
2. Remove upper master valve. Install BOE stack, consisting of spool, double hydraulic gate (with pipe rams and blind rams), Hydril and Grant rotating head.
3. Hook up rig pumps to side outlets on wellhead and spool with blind rams closed, pump water into well at maximum rate and kill well. Run 6" bit on 3½" drill pipe if well is not killed. Run to top of 7" liner, pump in water and kill well. Utilize a brine solution if required.
4. Run in with four drill collars, jars, bumper sub and wireline spear on 3½" drill pipe. Recover all wire line debris in 9-5/8" casing. Attempt minimal circulation with water.
5. Proceed with wire line spear to clear out 7" perforated liner to 6920-foot bridge or to maximum depth of 7300 feet. Attempt minimal circulation with water.
6. Run in open ended with 3½" drill pipe to 1500 feet and lay in 100 lineal foot cement plug. WOC 8 hours.
7. Rig for cementing. With 3½" drill pipe at 900 feet, pump, mix and squeeze away a 200 lineal foot cement plug. WOC 12 hours.
8. Clean out with 8-3/4" bit to 1100 feet. Pressure test cemented lap with 1500 psig for 15 minutes. If pressure fails, repeat steps 5 and 6.
9. If pressure holds, clean out cement plug at 1500 feet and clean out to top 7" liner at 3981 feet.

10. Run retrievable RTTS packer to top of 7" liner and pressure check 9-5/8" casing for any additional leaks. Squeeze any additional casing leaks indicated.
11. Pressure test casing again as in 6 above. If pressure test holds, retrieve RTTS packer.
12. With 3½" drill pipe open ended at 1500 feet, blow well down until return fluid temperatures increases to 190°F, then stop air lifting. Close lower master gate and remove BOE stack.
13. Install production wellhead and release rig.

WLD/RJB/HEW/ikl  
12/14/82

DIVISION OF WATER AND LAND DEVELOPMENT

From: ste Date: 8/1 File In: [circled]

To Initial

- |                                     |                   |                          |                      |
|-------------------------------------|-------------------|--------------------------|----------------------|
| <input checked="" type="checkbox"/> | Robert T. Chuck   | <input type="checkbox"/> | See Me               |
| <input type="checkbox"/>            | Takeo Fujii       | <input type="checkbox"/> | Take action by _____ |
| <input type="checkbox"/>            | James Yoshimoto   | <input type="checkbox"/> | Route to your branch |
| <input checked="" type="checkbox"/> | Manabu Tagomori   | <input type="checkbox"/> | Review & comment     |
| <input type="checkbox"/>            | George Morimoto   | <input type="checkbox"/> | Draft reply by _____ |
| <input type="checkbox"/>            | Herbert Morimatsu | <input type="checkbox"/> | For Information      |
| <input type="checkbox"/>            | George Miyashiro  | <input type="checkbox"/> | Xerox distributed    |
| <input type="checkbox"/>            | Harold Sakai      | <input type="checkbox"/> | Acknowledge receipt  |
| <input type="checkbox"/>            | Leslie Asari      | <input type="checkbox"/> | File _____           |
| <input type="checkbox"/>            | Albert Ching      | <input type="checkbox"/> | Jane Sakai           |
| <input type="checkbox"/>            | George Matsumoto  | <input type="checkbox"/> | Doris Hamada         |
| <input type="checkbox"/>            | Daniel Lum        | <input type="checkbox"/> | Lorraine Nanbu       |
| <input type="checkbox"/>            | Paul Matsuo       | <input type="checkbox"/> | Jean Starot          |
| <input type="checkbox"/>            | Noboru Kaneshiro  | <input type="checkbox"/> | Elsie Yonamine       |
| <input checked="" type="checkbox"/> | Edwin Sakoda      | <input type="checkbox"/> | _____                |
| <input type="checkbox"/>            | _____             | <input type="checkbox"/> | _____                |
| <input type="checkbox"/>            | _____             | <input type="checkbox"/> | _____                |

*old envelope for filing*



# **THERMAL POWER**

COMPANY

3 August 1982

Jere Denton  
Vice President  
Hawaii Project

Mr. Manabu Tagomori  
DLNR  
Div. of Water & Land Development  
Kalanimoku Building Room 227  
1151 Punchbowl St.  
Honolulu, Hawaii 96813

Dear Mr. Tagomori:

Because of your interest in our geothermal project, I thought you would be interested in the enclosed copies of letters which have been sent to residents in the vicinity of the project area.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Jere Denton', written in a cursive style.

JMD/crn

enclosures

1600 Kapiolani Boulevard, Suite 808, Honolulu, Hawaii 96814 808-944-5545



# **THERMAL POWER**

COMPANY

3 August 1982

To: Residents of Puna in the Vicinity of the Puu Honuaula

From: Thermal Power Company

Due to the interest in our geothermal project, we thought an update on our testing program would be helpful to your understanding of the geothermal exploration process.

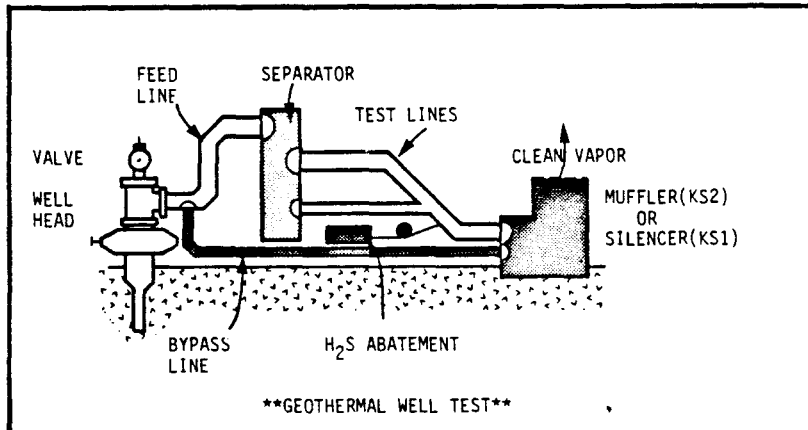
As indicated in our letter of May 28, 1982, we began second phase testing on our Kapoho State 2 well June 3rd. This program has continued close to our expected schedule. As you may have noticed we have since installed a new testing device on this location called a separator. This equipment will help us physically separate the steam and water flows, better determine the heat content and get representative samples of the liquid and gas phases of the geothermal fluids (see diagram). Since June 3rd we have completed various tests consisting of periods of continuous flow where both noise and odor abatement systems were successfully utilized and periods where the well was completely shut-in.

We have decided to begin our testing program on Kapoho State 1. That well was initially tested last December, where we discovered that the noise abatement equipment was undersized. This equipment, a silencer, has been altered according to specifications given to us by our noise consultant, so we do not expect further problems. The testing of Kapoho State 1 will follow the general program we designed for Kapoho State 2. However, these two wells will not be flowed simultaneously at this time.

We do not plan on any vertical stacking for Kapoho State 1. Vertical stacking is the standard industry procedure required to initially clean out the wellbore by directly venting the geothermal fluids to the atmosphere. The test line has been designed to try to eliminate the need for vertical stacking, except in emergency conditions. However, each well is very different and requires different handling procedures. We will inform the community, as soon as possible, of any changes to our vertical stacking needs.

Testing of Kapoho State 1 is scheduled to begin August 4, 1982. We anticipate both Kapoho State 1 and 2 testing phases will be complete within the 3 to 9 month period indicated in our use permit application.

We appreciate your interest in our project and look forward to discussing our program with you. Our answering service number is 961-2187. If you have any written comments our corporate offices are located at 601 California Street, San Francisco, California 94108 and our Honolulu offices are 1600 Kapiolani Boulevard, 8th Floor, Honolulu, Hawaii 96811, and my direct line is (415) 765-0626.



Very truly yours,

*Becker*

Rebecca L. Beemer  
Manager  
Environmental/Regulatory Affairs

*Arnold*

1479



RECEIVED

RECEIVED

MAR 22 10:04

**THERMAL POWER**  
COMPANY

MAR 19 P 3: 24

DEPT. OF LAND & NATURAL RESOURCES

DEPT. OF LAND & NATURAL RESOURCES  
STATE OF HAWAII

15 March 1982

Mr. Susumu Ono, Chairman  
Board of Land and Natural Resources  
State of Hawaii  
Kalanimoku Building  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Re: Geothermal Well: Kapoho State 2  
Geothermal Resource Mining Lease R-2  
Puna District, Hawaii County

Dear Mr. Chairman:

The Drilling Permit for the referenced well was issued on January 8, 1982 and Thermal Power Company, as Operator for the Puna Geothermal Venture, is now drilling below 6300 feet. The Permit limits this drilling to a total depth of 8000 feet.

Because drilling progress is better than anticipated, Thermal requests State approval to drill Kapoho State 2 to a slightly greater total depth, but not deeper than 8400 feet. In telephone discussion of this request on March 15th, the undersigned received provisional approval to bottom the well between 8000 and 8400 feet from Mr. Tagomori of Department of Land and Natural Resources subject to your receipt of this written confirmation of our proposed possible change in the drilling program.

We very much appreciate the prompt attention and direction provided by Mr. Tagomori in this matter.

Very truly yours,  
*W. L. D'Olier*

W. L. D'Olier  
Vice President - Exploration

WLD/ikl

WLD #4  
2-DOWNARD

8246



**THERMAL POWER**  
COMPANY

30 November 1981

Mr. Susumu Ono, Chairman  
Board of Land and Natural Resources  
State of Hawaii  
Kalanimoku Building  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Re: Proposed Second Well  
State Geothermal Mining Lease R-2  
Puna District, Hawaii County

RECEIVED  
DIVISION OF  
LAND MANAGEMENT  
DEC 2 11 39 AM '81

Dear Mr. Chairman:

The Thermal-Dillingham-Amfac Joint Venture herewith applies for Permit to Drill on the referenced State Lease issued to Kapoho Land Partnership. We propose to drill Kapoho State 2, the second of the two wells included in the Plan of Operation approved by the Board of Land and Natural Resources on March 13, 1981 for State Lease R-2.

Kapoho State 1, the first well drilled under the approved Plan of Operation, was completed on 12 November 1981 at a total depth of 7290 feet with the capability of producing a geothermal resource. This will be defined by further flow testing. Thermal is preparing the completion reports on Kapoho State 1 for early submittal to DLNR. In summary, Kapoho State 1 encountered higher wellhead pressure, temperatures and flow rates than the HGP-A Well, however, all conditions remained safely within the working ranges of the equipment and procedures of our DLNR approved drilling program. The proposed drilling program for Kapoho State 2 (Exhibit B of application) has only minor modifications which should reduce drilling operations time and improve safety margins.

Because of the practical identity of the drilling objective and program of our second well with our first successful well, we respectfully request an expedited consideration and approval of this application for Kapoho State 2. Thermal would be able to spud Well 2 in January if early approvals are obtained. We were pleased to benefit from the specially good work of the resident Hawaii County drilling crews in completing Kapoho State 1 and we look forward to their help on Kapoho State 2.

Very truly yours,

W.L. D'Olier  
Vice President  
Geothermal Operations

WLD/ckm  
Enclosures

APPLICATION FOR PERMIT TO DRILL PROPOSED GEOTHERMAL WELL  
KAPOHO STATE 2 ON RESERVED LANDS, KAPOHO, PUNA, HAWAII

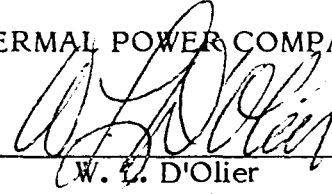
Complying with Regulation 8, Rule 9.1, Thermal Power Company as Operator for the Thermal-Dillingham-Amfac Joint Venture herewith makes application for Permit to Drill for approval by the Chairman, Hawaii Board of Land and Natural Resources.

a. Applicant:

Thermal Power Company  
601 California Street  
San Francisco, California 94108

THERMAL POWER COMPANY

By



W. E. D'Olier  
Vice President  
Geothermal Operations

Owner of Mining Rights:

Kapoho Land Partnership

Land Owner:

Kapoho Land and Development Company, Limited

- b. Proposed well designation: Kapoho State 2
- c. The enclosed tax key map, Exhibit A, designates the approximate location of the drillsite for Kapoho State 2 located on State Geothermal Mining Lease R-2 issued to Kapoho Land Partnership as lessee. The wellhead location will be surveyed by a registered surveyor upon completion of the geothermal well and removal of the drill rig.
- d. The purpose of this exploratory drilling is to better determine the commercial possibilities for the geothermal reservoir which exists in the Kapoho region of the Puna District, Hawaii. The drilling of Kapoho State 2 will require approximately 60 drilling days to reach the proposed depth of 8000 feet. The expected production interval may be encountered below 4000 feet. Upon completion of this well, a long flow test (maximum 3 months) will be performed. The proposed drilling and flow test will be done in close cooperation with the Hawaii Geothermal Project adjoining this acreage to better determine the economic significance of this reservoir.
- e. The Drilling and Completion Procedures, Drillsite Plan, and Vertical Section for Kapoho State 2 are contained in Exhibits B, C and D respectively.
- f. A multi-well drilling bond (\$250,000) has been filed with the State of Hawaii; a copy is attached.
- g. Thermal Power Company, as operator for the Thermal-Dillingham-Amfac Joint Venture, agrees to perform such exploratory drilling as outlined in this application and agrees to maintain the well in accordance with Regulation 8, State of Hawaii, and all Federal and County geothermal regulations.

Attachments: 1. \$100 filing fee  
2. Exhibits A, B, C, D  
3. Multi-Well Drilling Bond copy  
4. Designation of Agent copy

Submitted: 30 November 1981

GEORGE R. ARIYOSHI  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF LAND MANAGEMENT  
P. O. BOX 621  
HONOLULU, HAWAII 96809

DIVISIONS:  
CONVEYANCES  
FISH AND GAME  
FORESTRY  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

June 24, 1981

Thermal Power Company  
601 California Street  
San Francisco, California 94108

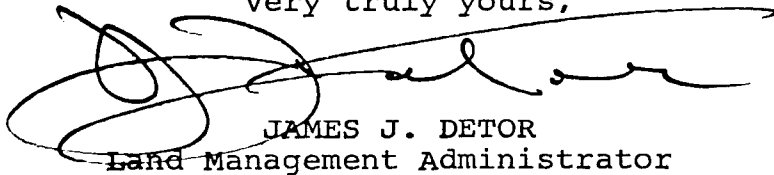
Attn.: Ms. Jayne Iffla

Gentlemen:

Subject: Geothermal Resources Mining Lease  
No. R-2

This will confirm our telephone discussion of this morning in which I informed you that your Well Indemnity Bond No. 567 7792 is acceptable.

Very truly yours,



JAMES J. DETOR  
Land Management Administrator

cc: Mr. R. Higashi  
Mr. G. Taguchi  
DOWALD

RECEIVED  
JUN 29 1981  
TPC

BOND NO. 567 7792

GEOTHERMAL RESOURCES WELL INDEMNITY BOND  
(\$250,000 Statewide Well Bond)

KNOW ALL MEN BY THESE PRESENTS:

That we, Thermal Power Company, as principal; and NATIONAL FIRE INSURANCE COMPANY OF HARTFORD organized and existing under and by virtue of the laws of the STATE OF HAWAII and authorized to transact surety business in the STATE OF HAWAII, as surety, are held and firmly bound unto the State of Hawaii in the full and just sum of TWO HUNDRED FIFTY THOUSAND AND NO/100 DOLLARS (\$250,000.00) lawful money of the United States of America, to be paid to the said State of Hawaii, for which payment, well and truly to be made, we do hereby bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Signed, sealed, delivered and dated this 17th day of March,  
19 81.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT,

WHEREAS, said principal is about to acquire, drill, redrill, deepen, operate, maintain or abandon a geothermal resources wells in the State of Hawaii and is required to file this bond in connection therewith in accordance with Rule 9.4 of Regulation 8 of the Department of Land and Natural Resources, State of Hawaii.

NOW, THEREFORE, if said THERMAL POWER COMPANY, the above bounden principal, shall well and truly comply with all the provisions of said Regulation 8 and shall obey all lawful orders of the Chairman of the Board of Land and Natural Resources, or his representative, if not appealed to the Board of Land and Natural Resources, or upon affirmance thereof by the Board of Land and Natural Resources, if appealed thereto, and shall pay all charges, costs, and expenses incurred by the Chairman or his representative.

State of Hawaii  
DEPARTMENT OF LAND AND NATURAL RESOURCES

DESIGNATION OF AGENT

In compliance with Rule 8.2 of Regulation 8 of the Department of Land and Natural Resources, notice is hereby given and I hereby certify that I, W. L. D'Olier, representing Thermal Power Company of San Francisco, State of California, have appointed, authorized and empowered Bishop Trust Company whose address is King and Bishop Streets, Honolulu, State of Hawaii, upon whom all orders, notices and processes under the provisions of said Regulation 8 may be served.

This notice supersedes all previous designations made for the above-described purposes.

IN WITNESS WHEREOF I have signed this certificate this 18<sup>th</sup> day of February, 1981.

Witness:

J. Connolly

W. L. D'Olier

W. L. D'Olier  
Vice President  
Geothermal Operations

Agents's acceptance:

\_\_\_\_\_  
BISHOP TRUST COMPANY

By

Paulette Yoshida  
Paulette Yoshida  
Assistant Corporate Trust Officer



**THERMAL POWER**  
COMPANY

DEPARTMENT OF  
LAND AND NATURAL RESOURCES

31 March 1981

RECEIVED  
DIVISION OF  
LAND MANAGEMENT  
APR 9 11 43 AM '81

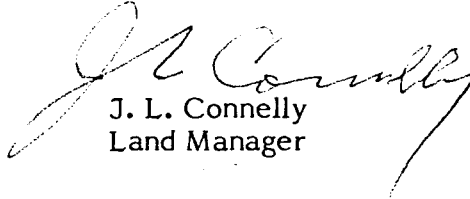
Mr. James Detor  
State of Hawaii  
Department of Land and Natural Resources  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

Re: Geothermal Drilling Bond

Dear Mr. Detor:

Pursuant to Rule 9.4(a) of Regulation 8, we attach blanket drilling bond in the principal sum of \$250,000, being Bond No. 567 7792, issued by National Fire Insurance Company of Hartford, as Surety, and Thermal Power Company, as Principal.

Very truly yours,

  
J. L. Connelly  
Land Manager

JLC/ikl  
Attachment *in Hawaii 11/11/81*

cc: Ralph Patterson  
Jere Denton

State of Hawaii  
DEPARTMENT OF LAND AND NATURAL RESOURCES

DESIGNATION OF AGENT

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Witness:

J. Connolly

W. L. D'Olier

W. L. D'Olier  
Vice President  
Geothermal Operations

Agents's acceptance:

\_\_\_\_\_  
BISHOP TRUST COMPANY

By

Paulette Yoshida

Paulette Yoshida  
Assistant Corporate Trust Officer

WLD  
2-DOWNLOAD

8246



**THERMAL POWER**  
COMPANY

DEC 1 3:17

30 November 1981

Mr. Susumu Ono, Chairman  
Board of Land and Natural Resources  
State of Hawaii  
Kalanimoku Building  
1151 Punchbowl Street  
Honolulu, Hawaii 96813

STATE OF HAWAII  
LAND & NATURAL RESOURCES

Re: Proposed Second Well  
State Geothermal Mining Lease R-2  
Puna District, Hawaii County

RECEIVED  
DIVISION OF  
LAND MANAGEMENT  
DEC 2 11 39 AM '81

Dear Mr. Chairman:

The Thermal-Dillingham-Amfac Joint Venture herewith applies for Permit to Drill on the referenced State Lease issued to Kapoho Land Partnership. We propose to drill Kapoho State 2, the second of the two wells included in the Plan of Operation approved by the Board of Land and Natural Resources on March 13, 1981 for State Lease R-2.

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Very truly yours,  
  
W.L. D'Olier  
Vice President  
Geothermal Operations

WLD/ckm  
Enclosures

**APPLICATION FOR PERMIT TO DRILL PROPOSED GEOTHERMAL WELL  
KAPOHO STATE 2 ON RESERVED LANDS, KAPOHO, PUNA, HAWAII**

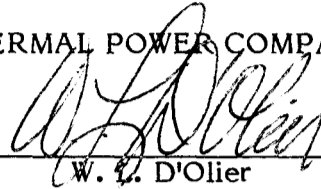
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San Francisco, California 94108

THERMAL POWER COMPANY

By



W. G. D'Olier  
Vice President  
Geothermal Operations

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- e. The Drilling and Completion Procedures, Drillsite Plan, and Vertical Section for Kapoho State 2 are contained in Exhibits B, C and D respectively.
- f. A multi-well drilling bond (\$250,000) has been filed with the State of Hawaii; a copy is attached.
- g. Thermal Power Company, as operator for the Thermal-Dillingham-Amfac Joint Venture, agrees to perform such exploratory drilling as outlined in this application and agrees to maintain the well in accordance with Regulation 8, State of Hawaii, and all Federal and County geothermal regulations.

Attachments: 1. \$100 filing fee  
2. Exhibits A, B, C, D  
3. Multi-Well Drilling Bond copy  
4. Designation of Agent copy

Submitted: 30 November 1981

11/23/81

G.L. 705 est.

K.B. 723 est.

**EXHIBIT "B"**

**DRILLING AND COMPLETION PROCEDURES**

**(In Detail)**

1. Prepare road and location including an 10' x 10' x 10' cemented cellar and water storage facility.
2. Move in and rig up rotary tools. Drill and set rathole.
  - (a) Notify Board of Land and Natural Resources (BLNR) 24 hours prior to commencement of drilling.
  - (b) Read and comply with requirements as set forth in Rules 7-13 of Regulations on Leasing of Geothermal Resources and Drilling For Geothermal Resources in Hawaii.
3. Spud hole with 12¼" bit and drill to 50' using mud or aerated mud as a circulating medium. Survey hole as directed. Catch 10-foot samples.
4. Open 12¼" hole to 17½" hole. Change hole openers and open hole to 26". Control lost circulation with LCM; if severe, cement as required to assure competent cement job.
5. Run and cement with 100% excess 20" O.D. 94#, K-55 Buttress casing at 50' with Class "G" cement premixed with 3% calcium chloride.
  - (a) Check temperatures to ascertain proper amount of cement additives.
  - (b) Do not use float equipment on 20" - underdisplace by 20 lineal feet.

6. W.O.C. 2 hours. Land 20" conductor casing.
  - (a) Center casing with welded gusset type braces.
  - (b) Fill annulus with dry cement slurry or gravel if cement has dropped in annulus.
  - (c) Install fill and diverter line.
  
7. Drill 17½" hole to 1300' using mud or aerated mud system as a circulating medium. Survey hole every 200' or every nearest bit change. Run multi-shot directional survey if necessary.
  - (a) Using basic gel-water-caustic mud system.
  - (b) Record all lost circulation zones.
  - (c) Install mud logging service at shoe of 20" conductor casing previous to drilling out. Record continuous mud in and out temperatures, H<sub>2</sub>S, CH<sub>4</sub>, CO<sub>2</sub>, lithology, and drilling rate. Have pit level indicator and intercom to driller's station. Catch four sets of 50 gpm dry sample every 20'. Make daily copies of the mud log, keeping one (1) copy up to date and spliced in trailer. Send five copies to:

THERMAL POWER COMPANY  
601 California Street  
San Francisco, California 94108  
Attention: W. L. D'Olier
  - (d) Run temperature and induction electric logs from 1300' to 50' unless BLNR deems such logging to be impractical or impossible.
  - (e) At ± 750' (30' below sea level) take a one gallon sample of water from the bottom of the well and determine the elevation of the water level in the wellbore.
  
8. Run and cement 13-3/8" 54.5# and 61#, K-55 Buttress casing at 1300'. Cement as directed with Class "G" cement premixed with 1-1 perlite, 40% silica flour, 3% gel, and 1/2% CFR-2 calculating 100% excess. Include tail slurry of 200 sks Class G cement with 40% silica flour, 3% gel, 1/2% CFR-2.

Note: DO NOT permit any free water and/or mud to remain in the 20" x 13-3/8" annulus.

- (a) Run a float shoe on bottom of joint #1.
- (b) Run 1" parasite string to 500' while running casing if lost circulation is severe or other such conditions warrant its use.

- (c) Centralize joints #1, #2, the last two and every fifth joint.  
Do not use turbolizing centralizers or cement baskets.
  - (d) Run pre-flush consisting of 20 bbls of Flo-Chek. Run 5-wiper cement plug ahead of cement slurry. Run 100% excess slurry. Maintain pump rate to attain as near turbulent flow as hole conditions will permit.
  - (e) Do not overdisplace top plug. Do not exceed 1200 psi while displacing slurry. Let job dictate exact displacement of cement.
  - (f) If float leaks do not pump and bleed. Close valve on cement head and wait for initial set.
  - (g) Wait 8 hours minimum before proceeding to step 9.
9. Land 13-3/8" surface casing. Weld on 12" - 400 x 13-3/8" S.O.W. casing head. Install and test B.O.E. as directed. Enter test results on tower report.
- (a) Test of casing weld not to exceed the casing collapse rating (see attached sheet).
  - (b) B.O.E. to consist of 12" Series 400 gate valve, a 12" mud cross with two side outlets for a kill line and a choke manifold, a hydraulically-operated double ram blowout preventer with one set each of pipe and blind rams, a 12" expansion-type annular preventer, and a mud fillup line. A rotating head may be added as directed. See attached diagram for B.O.E. details.
  - (c) Notify the Chairman of the Hawaii Board of Land and Natural Resources (BLNR) well enough in advance of B.O.P. test so that he or his designated representative can travel to the site and witness the test.
  - (d) Test each preventer, the stack, casing, kelly cock, master valve, check valves in kill line, and blowdown line valve to 1000 psig.
  - (e) Monitor fall back in annulus. Do not allow water to enter annulus from top. Maintain cement top at surface.
  - (f) If required, cement annulus through 1" pipe to top of existing cement with an accelerated slurry. Check with office prior to performing.
10. Drill and survey 12 1/4" hole to  $\pm$  4000' using mud, water, aerated water, or air as a circulating medium as hole conditions dictate.
- (a) Prior to drilling out cement, make sure kelly cock is installed between kelly and swivel.

- (b) Survey hole as hole conditions dictate (but at least at 500' intervals. Run maximum reading thermometers with each survey.
  - (c) Continue mud logging as specified in 6(c).
  - (d) Record but do not test zones of lost circulation. (See 23.)
  - (e) Run Dual Induction, Caliper, and Temperature logs, and other logs as directed by wellsite geologist.
11. Run and cement as directed 9-5/8" 40#, K-55, and N-80 casing, Buttress liner from 1100' to 4000' with 40% excess of calculated Class "G" cement premixed with 1-1 perlite, 40% silica flour, 3% gel, friction reducer, and retarder, followed by tail-in slurry of same w/o perlite (heavy cement).
- (a) Run float shoe on bottom of joint #1 and float collar between joints #1 and #2. Liner hanger to have tie back capability and adequate fluid passages. Jewelry may differ depending upon hole conditions.
  - (b) Centralize joints #1, #2, #3, every tenth joint and last three joints. Space turbolizing centralizers or cement baskets as directed.
  - (c) Allow minimum 200' liner lap and hang 5' above hole bottom.
  - (d) Circulate at least two hole volumes and reciprocate casing to cool hole and establish adequate circulation prior to pumping flush. Let hole and mud conditions dictate length of this circulation.
  - (e) Pre-Flush with 30 bbls Salt-Gel flush followed by 15 barrels water, 30 bbls Flo-Chek, 15 bbls water, then cement.
  - (f) Hang liner just prior to pumping cement slurry.
  - (g) Conditions may dictate releasing from hanger prior to cementing.
  - (h) Do not overdisplace wiper plug.
  - (i) If floats leak DO NOT pump and bleed.
  - (j) WOC minimum 16 hours.
  - (k) Drill out to top of liner with 12 1/4" bit.
  - (l) Test lap with surface pressure plus fluid hydrostatic to equal a 0.8 lb./ft. gradient at liner top. Wait a minimum of 24 hours prior to testing. Enter test results on tower reports.
  - (m) Test B.O.E. prior to drilling out shoe. Enter test results on tour reports. Notify the BLNR before B.O.E. test (see 9(c) ).

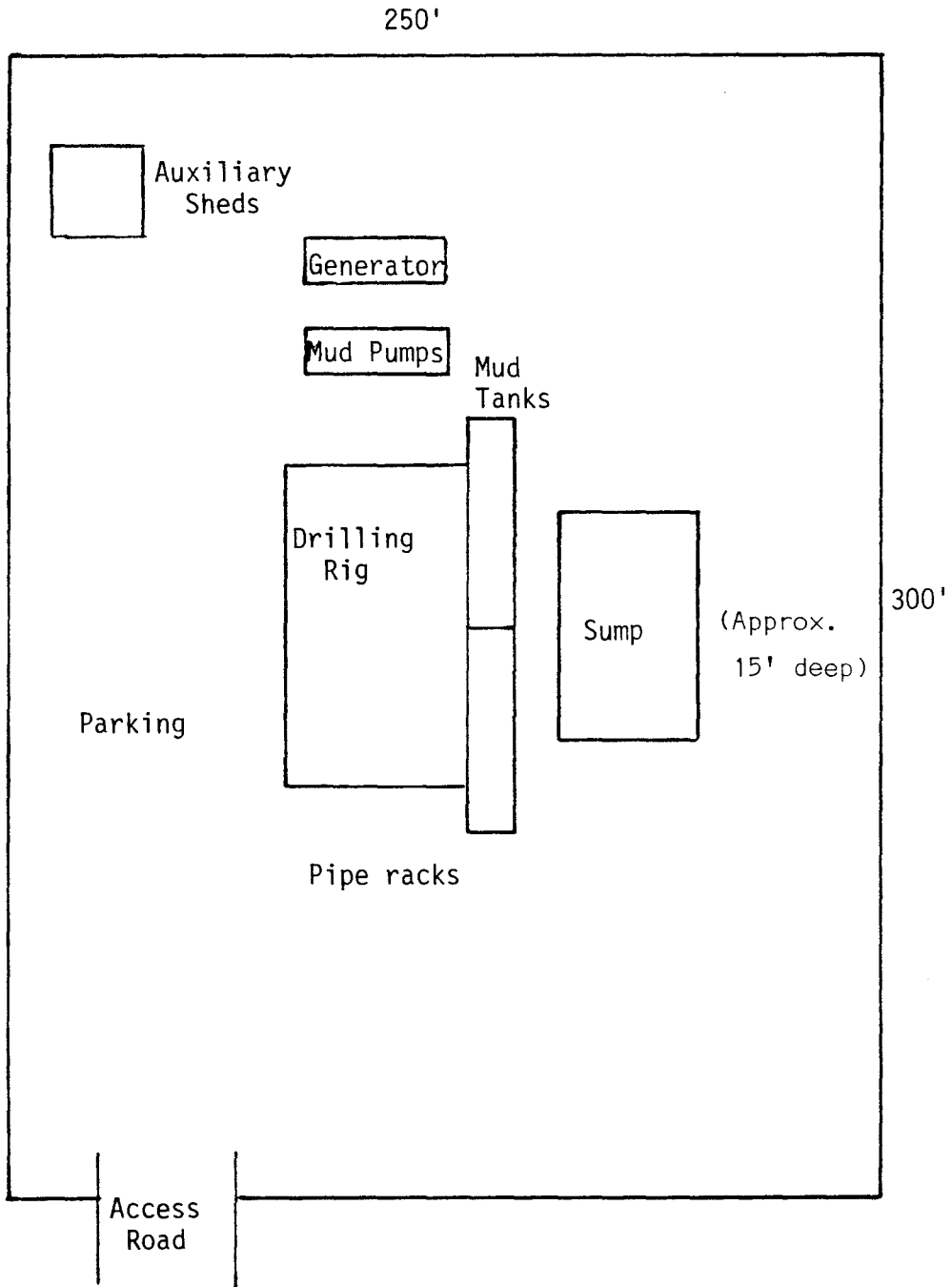
12. Set a drillable bridge plug in the liner.
  - (a) Set EZSV 25' below shoe of 13-3/8" casing.
  - (b) Fill 9-5/8" with fluid from EZSV to surface.
13. Test plug and liner lap to 0.85#/ft. with water. Squeeze cement if required. (0.85#/ft. includes hydrostatic head.)
14. Squeeze with 13-3/8" RTTS tool set 100'+ above liner top if required and as indicated by breakdown rate.
15. Run 9-5/8" 36#, K-55 Buttress casing from top of 9-5/8" liner hanger to the surface. Use 40# K-55 for top five joints. Before cementing casing, pick up the BOP stack and install 9-5/8" x 13-3/8" pack-off guide for the environmental expansion spool. Cement as directed with 20% excess.
  - (a) Run insert (disc type) flapper float, 40' above "stab-in" mandrel.
  - (b) Centralize casing with slim hole centralizers or lugs on every third joint and top four joints.
  - (c) Monitor fall back in annulus. Do not allow water to enter annulus from top. Maintain cement top at surface.
16. Install a 13-3/8" x 9-5/8" environmental expansion spool and blowout preventers for 10" stack, modifying the set-up in 9(b) appropriately.
  - (a) Test of casing head weld not to exceed the casing collapse rating.
  - (b) Install 10" Series 600 valve (or 900 Series if available).
  - (c) Test B.O.E., as directed previously.
17. Drill out cement and bridge plug.
18. Drill and survey 8-3/4" hole to 8000'+ using mud, water, aerated water, or air as a circulating medium as hole conditions dictate.
  - (a) Run electric logs as determined by wellsite geologist.
  - (b) Continue mud logging as outlined in 6(c).
  - (c) Survey after each bit change or 500', as conditions permit.

19. Cleanout to bottom logging any bridges or fill.
20. Run 7" perforated liner to bottom. Use slipless hanger and lay liner on bottom or other point of repose. Run minimum 3 joints of lap inside 9-5/8".
21. Test using the James method. Test well through choke manifold. Check for room for ample thermal expansion before starting test. Record wellhead pressure and temperature and lip pressure of 4" pipe running from choke manifold to sump every 5 minutes while warming well up, every minute for the first 10 minutes of flow or until flow has stabilized. Record every two minutes thereafter for additional 15 minutes or until test must be terminated for safety reasons.
22. Rig down and move out rotary tools. Note: Release time (hours) on Rig Well Log and Daily Report Form.
23. In addition to B.O.P. specifications listed above, the following procedures will be observed:
  - (a) Packing elements and ram rubbers will be of high temperature resistant materials.
  - (b) The hydraulic actuators for opening and closing the ram type and expansion-type blowout preventers will be located at the drillers station and at a point on ground level 50' or more from the wellbore.
  - (c) The blowdown line connecting the wellhead and the mud pits will be equipped with steel or ceramic chokes and valves. The line will be anchored at all bends and at the end.
  - (d) A blowout prevention drill will be conducted weekly for each drilling crew. During this drill, the expansion-type blowout preventer and pipe rams will be operated, using both control station actuators. All crew personnel will participate in these drills. The results of these drills will be entered in the drillers log book. Flange bolts will be inspected for tightness as a part of this drill.
  - (e) Blind rams in blowout preventers will be checked for operation on each trip.
  - (f) The expansion-type blowout preventer and pipe ram elements of ram-type blowout preventers will be checked for operation each round trip or at least once daily.
24. Have lost circulation material and salt gel mud system additives material on location.

25. The following conditions should be carefully noted and recorded on the mud log:
- (a) MRT readings greater than 250°F or sudden mud exit kicks or drops disassociated from surface activities such as mud cooling or conditioning.
  - (b) Drill cuttings reflecting the presence and abundance of alteration minerals such as zeolites, hematite, chlorides or serpentinized formation.
  - (c) Major lost circulation zones.
  - (d) Major brecciated zones.
  - (e) Drilling rate recorder (either on rig floor or as noted by mud loggers) indicates a significant or sudden increase in penetration rate.
  - (f) Well kicks gas.
26. Take all measurements from top K.B.
27. The exact testing of the well after completion will be determined by the suitability of the produced water for disposal. It is expected that produced fluids will be of a composition such that they may be flowed to the sump. Accordingly, a short 24 hour - 48 hour flow test of the well for mass flow rate, productivity index, temperature, and detailed fluid composition will be attempted. The well will be equipped with an additional 10" production valve and appropriate surface production facilities in this case to provide H<sub>2</sub>S and noise abatement.

# DRILLSITE PLAN

KAPOHO STATE 2



THERMAL-DILLINGHAM-AMFAC

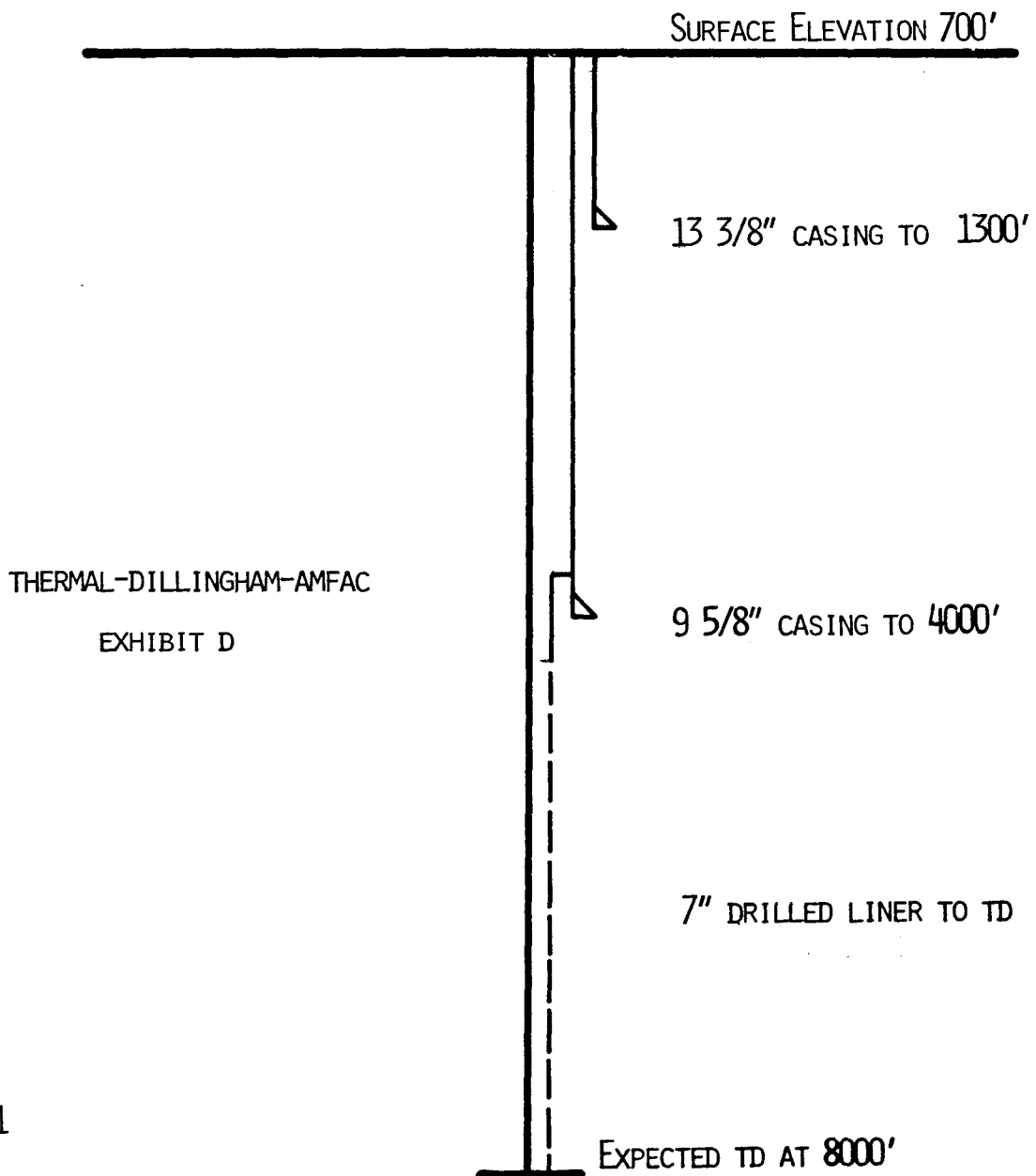
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EXHIBIT C

# Thermal Power Company

## Kapoho State 2 - Geothermal Well

### Vertical Section



GEOTHERMAL RESOURCES WELL INDEMNITY BOND  
(\$250,000 Statewide Well Bond)

KNOW ALL MEN BY THESE PRESENTS:

That we, Thermal Power Company, as principal; and NATIONAL FIRE INSURANCE COMPANY OF HARTFORD organized and existing under and by virtue of the laws of the STATE OF HAWAII and authorized to transact surety business in the STATE OF HAWAII, as surety, are held and firmly bound unto the State of Hawaii in the full and just sum of TWO HUNDRED FIFTY THOUSAND AND NO/100 DOLLARS (\$250,000.00) lawful money of the United States of America, to be paid to the said State of Hawaii, for which payment, well and truly to be made, we do hereby bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Signed, sealed, delivered and dated this 17th day of March, 1981.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT,

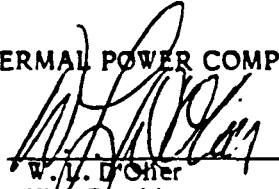
WHEREAS, said principal is about to acquire, drill, redrill, deepen, operate, maintain or abandon a geothermal resources wells in the State of Hawaii and is required to file this bond in connection therewith in accordance with Rule 9.4 of Regulation 8 of the Department of Land and Natural Resources, State of Hawaii.

NOW, THEREFORE, if said THERMAL POWER COMPANY, the above bounden principal, shall well and truly comply with all the provisions of said Regulation 8 and shall obey all lawful orders of the Chairman of the Board of Land and Natural Resources, or his representative, if not appealed to the Board of Land and Natural Resources, or upon affirmance thereof by the Board of Land and Natural Resources, if appealed thereto, and shall pay all charges, costs, and expenses incurred by the Chairman or his representative, in respect of such well or the property or properties of said principal, or assessed against such well or the property or properties of such principal, in pursuance of the provisions of said Regulation 8, then this obligation shall be void; otherwise, it shall remain in full force and effect.

COUNTERSIGNED AT HONOLULU, HAWAII  
FRANK B. HALL & CO. OF HAWAII, INC.

  
BY KAZE HIRAMOTO  
SENIOR VICE PRESIDENT  
MAR 18 1981

THERMAL POWER COMPANY

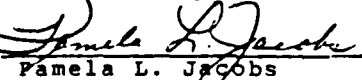
By:   
W. V. D'Orter  
Vice President  
Geothermal Operations

Approved as to form:

\_\_\_\_\_  
Deputy Attorney General

Dated: \_\_\_\_\_

NATIONAL FIRE INSURANCE COMPANY OF HARTFORD Surety

By:   
Pamela L. Jacobs  
Its: Attorney-in-Fact

And By: \_\_\_\_\_

Its: \_\_\_\_\_

CORPORATION

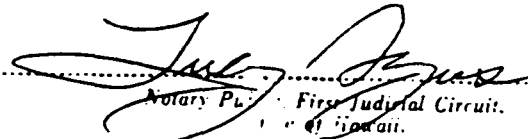
STATE OF HAWAII, }  
City and County of Honolulu } ss.

On this 18th day of March, A. D. 1981, before me appeared  
Kazu Hiramoto

to me personally known, who, being by me duly sworn, did say that ~~they are~~ <sup>he is</sup> the  
Senior Vice President

respectively of Kazu Hiramoto <sup>Frank B. Hall of Honolulu, Inc</sup>  
and that the seal affixed to the foregoing instrument is the corporate seal of said  
corporation and that said instrument was signed and sealed in behalf of said corpora-  
tion by authority of its Board of Directors, and the said Kazu Hiramoto

acknowledged said instrument to be the  
free act and deed of said corporation.

  
Notary Public, First Judicial Circuit,  
State of Hawaii.

My Commission Expires 12-20-81


STATE OF CALIFORNIA }  
County of Los Angeles } ss.

On this 17th day of March, 1981, before me, Carol G. Grasso,  
a notary public in and for the State of California with principal office in the County of Los Angeles,  
residing therein, duly commissioned and sworn, personally appeared Pamela L. Jacobs,  
known to me to be the person whose name is subscribed to the within instrument as the attorney-in-fact of the  
National Fire Insurance Company of Hartford,  
the corporation named as Surety in said instrument, and acknowledged to me that he subscribed the name of said corporation  
thereto as Surety, and his own name as attorney-in-fact.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County,  
the day and year in this certificate first above written.



S-1157 5/70

  
Notary Public