



Duey E. Milner  
Geothermal Drilling Consultant

400 E. Roberts Lane, #37  
Bakersfield, CA 93308

Duey Milner  
100 East Roberts Lane #37  
Bakersfield, CA 93308  
S.S. # [REDACTED]

RECEIVED

92 MAY 26 A 7: 54

(805) 393-7402

May 19, 1992

DIV. OF WATER &  
LAND DEVELOPMENT

Mr. Manabu Tagomori  
State of Hawaii  
Department of Land and Natural Resources  
P.O. Box 373  
Honolulu, Hawaii 96809

RE: Geothermal Well Drilling Permits for KA2-1, KA3-1,  
and True's Drilling Program

Dear Mr. Tagomori:

In reviewing the drilling procedures for the above referenced wells, I noticed on Page 2, Number 10, that to install a 20-inch blow out preventer as per attached Figure 003, would only consist of one 20-inch Hydrill bag-type BOP.

The State of Hawaii's Geothermal Management Plan, dated October 1991, Section B, Equipment Modifications - Item C, calls for an additional double gate preventer in the BOPE stack. I feel this additional gate is necessary in the event the bag should fail, as did happen on PGV's KS-8 well. Also, under Item H, the specifications call for installation of a monitor to alert the driller to down-hole pressure changes and Item I calls for the installation of a mud pit alarm system to alert the drillers. These devices will give the driller quicker information regarding any loss or gains during the drilling of the mud portion of the hole. They will also allow the driller time to react to any changes and allow the crew to operate the blowout prevention equipment necessary to secure the well in case of a kick.

This monitoring equipment will keep the drillers advised of the following:

1. Any loss or gains of fluid in pits.
2. Mud temperature in and out of hole.
3. Return mud in flow-line, increase or decrease.
4. Pump strokes and pump pressure.

Mr. Manabu Tagomori - Page 2

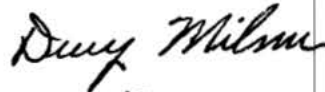
All tool pushers, drillers and derrickmen should be trained to operate and program the monitoring equipment.

In reviewing the specifications on testing the 12-inch 900 Series blowout preventer to 1000 psi; I feel that it should be tested at a higher pressure. However, I am not familiar with the reservoir pressure in the area where these wells are located.

After drilling one of the wells, we may have to test the blowout preventer equipment at a higher pressure rating. True Drilling should have no problems drilling these wells with this type of program, providing they have well-trained personnel (which I understand they had on their previous well).

Should you need further assistance, please feel free to contact me.

Sincerely,



Duey Milner

DM:rb

R. A. PATTERSON & ASSOCIATES

RECEIVED

MEMORANDUM

Date: 92 May 15, 1992  
92 MAY 19 P 2:43

TO: Manabu Tagamori-DOWALD

SUBJECT: Activity report - Contract RCUH #4361021

DIV. OF WATER &  
LAND DEVELOPMENT

SUMMARY - 16 APR-15 MAY

Per your request, these periodic reports will be submitted along with the invoices for services; this report thus covers the period above, incorporation the previous report into a monthly format.

During the period, activities were concentrated on developing a solid base for proceeding with drafts of the Hawaii Blowout Prevention Manual and the Geothermal Drilling Guide. This consisted of:

- Review of the current, DLNR-approved Plans of Operations and well drilling permit applications to establish the type of blowout prevention and drilling procedures in current use by the operators for the Puna Geothermal Venture and the True/Mid-Pacific Geothermal Venture.
- Development of a letter to the PGV, requesting clarification of specific blowout prevention procedures and training that this group has added to their approved Plan of Operations since the KS-6/KS-8 incidents. A draft of this letter was reviewed by DOWALD staff prior to it being sent to PGV.
- Discussion with the California DOG's blowout prevention manager, Peter Wygle, and an initial review of DOG's yet unpublished revision to their blowout prevention manual, which has an updated section on geothermal well control matters. This document will be published in a provisional form, and then will be subject to a public hearings process to receive input from industry and the public.
- Further research on basic publications that deal with well control and blowout prevention, especially in connection with geothermal drilling. A bibliography of such publications has been started.
- Discussions with Bill Rickard, Drilling Engineer for OESI Power Corp. which centered on well the control training program for the PGV. A cooperative arrangement on the development of the Hawaii Blowout Prevention and Drilling Guide manuals was developed, with good response from Mr. Rickard.
- Development of revised and expanded draft Tables of Contents for the two manuals. These revised drafts will be reviewed with DOWALD staff in the next week or so.
- Visit to the Geothermal Resources Council library in Davis, CA, for

publications reviews and development of draft Table of Contents.

PROBLEMS ENCOUNTERED

No specific problems have been encountered, either in the availability of resource information, or in the scheduling of the work.

DLNR PROGRESS 03/RAP May 15, 1992

*Ralph Patterson*

R. A. PATTERSON & ASSOCIATES

MEMORANDUM

Date: July 16, 1992

TO: Manabu Tagamori-DOWALD

SUBJECT: Activity report - Contract RCUH #4361021

SUMMARY - 15 JUNE-15 JULY

During the period, activities consisted of:

- A meeting and discussions with Bill Rickard and Paul Stroud, of OESI Power Corp, Louis Capuano of ThermaSource, Jerry Hamlin of UNOCAL, Mr. D'Olier, Mr. Wheeler, and Mr. Patterson, centered on well control procedures and the training program for the Blowout Manual, was held in Sacramento on June 18th.

- Completion of further draft Tables of Contents for the two Manuals. A copy of the latest working draft of the BOP Manual Table of Contents is enclosed. This revision is being used to develop the draft text of the Manual, but may undergo additional changes as the full text takes shape.

- Primary work was concentrated on the text of the BOP Manual; sections III, IV, V, VIII, X, and XIII have been written and are either being typed or are finished in preliminary draft form. Other sections are just about ready to go to the typist. A copy of the draft of Section III., Permitting Hawaii Geothermal Wells, is enclosed as an illustration of the draft.

- We expect to present a complete draft of the BOP Manual for DLNR review, along with a suggested listing of reviewers, before the middle of August. We would expect that a review can be completed by the first of October, and have scheduled a visit to Hawaii by Messrs. D'Olier and Wheeler for a review meeting and discussion on OCTOBER 20, 1992. (Reservations were made to take advantage of the low air fares available in June)

PROBLEMS ENCOUNTERED

No specific problems have been encountered, either in the availability of resource information, or in the scheduling of the work. We will be concerned about the timely review of the draft Manual in order to conform to our schedule, and will be seeking cooperation when the complete draft is ready for review.

enclosures

DLNR PROGRESS 05/RAP July 16, 1992

# HAWAII GEOTHERMAL BLOW OUT PREVENTION MANUAL

## DRAFT

DEPARTMENT OF LAND AND  
NATURAL RESOURCES

R. A. PATTERSON & ASSOCIATES  
AUGUST 1992

**DRAFT**

TABLE OF CONTENTS

(Revised: July 13, 1992/RAP)

I. INTRODUCTION

A. OBJECTIVES (*a Statement of Purposes- with some sample concepts*)

1. Blowout Prevention as it can be best practiced in Hawaii, for safe drilling/ completion of all wells required in exploration & development. Intended to promote safety and good resource management.

2. One document to guide both operators and State regulators to determine, approve and use Blowout Prevention requirements appropriate to each drilling proposal. Manual is intended to supplement regulations and to promote the use of an informed flexibility in Blowout Prevention practice, especially when modifications are required by drilling condition changes. *NOTE: Manual should become a basic working tool to all parties at interest. Expectedly, a large, well informed group will contribute to a revision within five years.*

II. SCOPE (of Manual's contents)

A. Key information sources

1. KERZ Drilling to date
2. GT drilling in other volcanic domains
3. Specific publications and selected references
4. Discussions with others

B. Organization of Manual - Successful blowout prevention is a matrix of

1. Risk analyses
2. Equipment
3. Procedures

III. PERMITTING HAWAII GEOTHERMAL WELLS

A. Concept - Operator requirements

1. This Manual designed to guide operators in fulfilling requirements for safe drilling practices and equipment.

B. Approval process - Permitting hierarchy

1. Hawaii permitting process covers two main elements of permits
  - a. Land use permits - State mining leases, Geothermal Resource Subzone requirements, and local (County) requirements.
  - b. Technical permits for drilling, air quality maintenance, wellfield and plant operations, water quality maintenance, waste disposal, etc.

C. State and County Permits

1. DLNR Administrative Rules, Chap 183 - primary source of rules on leasing, drilling and operations of wells, wellfields, and GT powerplants.
2. Other State permits
  - a. Primarily air and water quality maintenance
  - b. Administered by DOH - not covered here.
3. County permits
  - a. Primarily land use permit
  - b. Geothermal Resource Permit process
    - (1) Planning Dept/Commission in Hawaii County
  - c. Other administrative permits
    - (1) Grading and grubbing
    - (2) Building and construction permits.

#### IV. GEOTHERMAL DRILLING RISKS IN HAWAII

Note: Hydrology and active processes in both KERZ and its south flank are as critical as the geology (rock types, origins, geometry, etc.) Perhaps IV is better titled Geothermal Drilling Risk Analyses in Hawaii.

- A. THE VOLCANIC DOMAIN
- B. KERZ DRILLING TO DATE (most valuable subsurface info, but small sample)
  - 1. Eleven deep GT wells drilled in KERZ
  - 2. Deep GT wells - results
  - 3. Deep scientific observation holes
  - 4. McCabe shallow exploratory cable tool holes (3) and +/-12 local water wells in the 1960's and earlier were the first proof of warm to boiling waters.
- C. FEATURES OF PROSPECTIVE GT AREAS
  - 1. High Temperatures
  - 2. Prospective geothermal reservoir rock (well completion zone)
  - 3. Magma transport
  - 4. Rock geometry
  - 5. Hydrology of rift zones
- D. SUMMARY

#### V. GEOTHERMAL WELL PLANNING

- A. Classification of Drilling Targets
- B. Types of Wells
  - 1. Exploratory Wells
  - 2. Production Wells
  - 3. Injection Wells
  - 4. Shallow Wells
  - 5. Deep Wells
  - 6. Slim Hole (SOH) Wells
- C. The Drilling Plan
  - 1. Site Selection and construction
  - 2. Well Type Designation
  - 3. Drilling Fluids Plan
    - a. Pump Sizes
    - b. Circulation System
    - c. Fluid Cooling
    - d. Fluid Storage/Supply
  - 4. Casing and Cementing Plan
  - 5. Blowout Prevention Plan

**DRAFT**

#### VI. BOP EQUIPMENT SELECTION

- A. RAM Preventers
  - 1. Single Gate
  - 2. Double Gate
  - 3. Annular
  - 4. Rotating Head
- B. Actuating System
- C. Control Stations
  - 1. Back-up System
- D. Slab Gates

E. Banjo Box

F. BOP Stack Configurations

1. Kill and Choke Lines
2. Internal Preventers
3. Safety Valves
4. Kelly Locks
5. Choke Manifold
6. Blooie Line
7. Muffler

G. Diverters

H. Fluid Monitoring and Alarms

I. Drill Pipe Floats

VII. EQUIPMENT TESTING AND INSPECTION

**DRAFT**

A. Periodic Testing of Closing System

B. Inspection by State Authorities

C. Reporting

VIII. MONITORING

A. Drilling fluid monitoring-first line of defense

B. Drilling with Mud/Water/Foam

C. Drilling with Air

D. Monitoring and Alarms

E. Drilling penetration rate

1. Bit weight
2. Torque

F. Formation Monitoring

IX. KICK DETECTION

A. Kicks

1. While Drilling
2. While Tripping out of hole

B. Procedures involving H2S

C. Notification of Authorities

## X. TRAINING

### A. Summary

1. Proven and largely unknown risk in Hawaii, particularly in current exploration phase.
2. Need for organized training program in H2S environment
3. Practical and classroom training - balance
4. Need to train operating team as a smoothly functioning unit.

### B. Supervisory Experience

### C. Drilling Team Training

1. Classroom training-guides/references
2. BOP Equipment Drills
3. Monitoring Equipment
4. Employee Orientation
5. Site visitors
6. General Safety Training

### D. Scheduling, Testing and Retraining

1. Drilling plans should contain outline of training schedules and frequency, plus procedure for certifying training given by driller/operator.

### E. Training Reports

1. DLNR should review daily logs and other records of training, drills, etc. for timeliness and coverage (all affected workers). If planning and daily records are accurate and sufficient, DLNR should refrain from establishing additional reporting requirements.

## XI. LOGGING AND REPORTS

### A. Reporting - hierarchy and sequence - operator ultimately responsible

1. Drilling Contractor
2. Operator
3. Regulatory authorities

## XII. POST COMPLETION BLOW OUT PREVENTION

### A. Considerations

1. Wellhead Equipment Specifications
2. Inspection and Testing
3. Flow Lines and Surface Equipment
4. Corrosion and Erosion Control - Inspection and Monitoring.
5. Rework, Conversions, and Abandonment.

**DRAFT**

## XIII. SLIM HOLES

## APPENDICES

- Procedures for Manual Updates
- Illustrations

# DRAFT

## III. PERMITTING HAWAII GEOTHERMAL WELLS

### A. INTRODUCTION

The permitting process for geothermal developments in Hawaii has been developed over a relatively short period of time, with few chances to test and revise the procedures based on actual experiences. The processes that have been developed have received more than their fair share of criticism from developer-applicants, government agencies, public and private "watchdog" organizations, and the general public.

From the onset of interest in geothermal development in Hawaii, the sequence of permits (i.e. which permit, from which agency, in what order) has not been as clear as necessary. There is a logical hierarchy of permitting that should be followed in order to consider issues and permitting conditions at the proper time, when sufficient planning and information is available to make reasoned decisions; for example, it is impractical to consider specific air quality permits and conditions for a given operational project until after the geothermal resource conditions are known, and the design of the power plant has reached a certain stage. This hierarchy begins with the initial land use decisions - where does the community want to limit geothermal development (within the confines of the locations of the resources), and what basic land use decisions have to be faced before exploration and development activities can take place. The next level upwards in the hierarchy consider such items as exploration activities, facility locations, size and general design, and the general siting issues for exploration and development. It is only after some or all of these decisions have been made that many of the specific environmental and community issues can be decided. On the next level, development activities, including production drilling, power plant construction, steam and electrical transmission systems, and testing activities are considered; the final level is long-term operation of the project. Each of the levels of this structure has certain types of permits associated with it; sometimes these permits are

considered by more than one agency, or are issued on the basis of previous permits from a lower level in the permit hierarchy.

If this type of hierarchy is followed, all parties are afforded the chance to thoroughly examine pertinent issues before the next sequential steps are taken, and permits issued. In some cases agencies are asked to make permit decisions on the basis of incomplete information, or on "expected" results. When actual conditions encountered differ from those predicted, the entire development process is delayed while permit changes are requested, discussed, and approved. Previous permit actions are thus discounted because they could not accurately predict what would happen, and the public confidence in the whole process is damaged.

The sections to follow in this discussion on Hawaii permits for geothermal activities are intended to briefly outline the process for geothermal permits; this Manual, however, has a narrower scope in that it deals only with considerations and procedures designed to minimize the occurrence and severity of geothermal well blowouts. Thus, the discussion that follows is broader than necessary for the purpose of this manual. We believe that a brief understanding of the entire permit process, as it now exists, will be helpful to developers and regulatory agencies for reference purpose when the specific questions of blowout prevention rules, procedures and equipment are considered.

## B. APPROVAL PROCESS

In its own publication<sup>1</sup> the State admits that "Applicants for land and water [development] use permits and approvals are faced with an admittedly complex regulatory system.....Activities regulated by the State focus on public health, welfare and the management of natural and human resources. Counties regulate activities that are more directly related to land use, zoning and development of facilities.....Regulatory [permitting] responsibilities in come

---

<sup>1</sup> "Applicant Guide to State Permits and Approvals for Land and Water Use and Development": Department of Planning and Economic Development, June 1986.

instances overlap or are shared among the various regulatory agencies.....a...project may require the permission of only one or all three [Federal, State, County] tiers of government. This tends to complicate the permit process and may obscure the identity of appropriate regulatory agencies and the procedural sequence in which one can best obtain the necessary approvals."

This recognition that permit processing is complex and confusing has given rise to efforts to "streamline" some of the processes, encouraging cooperation and information exchange among government agencies, establishment of central coordinating agencies, and the like. This has been only partially successful in the case of geothermal permitting. On the State level, laws which established the Rules on Leasing and Drilling of Geothermal Resources<sup>2</sup> Geothermal Resource Subzones<sup>3</sup>, and Practice and Procedure for Geothermal and Cable System Development Permitting<sup>4</sup> have addressed the problems; all have solved some of the confusion while adding to it in other areas. A careful reading of the pertinent rules and regulations, however, can assure an operator that State, County (and sometimes Federal) requirements are met without undue restrictions on the exploration and development of Hawaii's geothermal energy potential.

### C. STATE AND COUNTY PERMITS

The primary source of permit rules and regulations affecting the operator's interest in geothermal drilling and wellfield operations is the "Rules on Leasing and Drilling of Geothermal Resources."<sup>5</sup> Other State

---

<sup>2</sup> Department of Land and Natural Resources (DLNR) Title 13, Subtitle 7. Water and Land Development; Chapter 183.

<sup>3</sup> Geothermal Resource Subzone Act (ACT 296, SLH 1983; modified by ACT 151, SLH 1984)

<sup>4</sup> Title 13 DLNR, Subtitle 7 Water and Land Development, Chapter 185.

<sup>5</sup> Title 13, DLNR, Subtitle 7. Water and Land Development. Chapter 183.

permits, primarily for the maintenance of air and water quality, are administered by the Hawaii Department of Health (DOH). Some of these DOH rules, and associated permits, will affect well drilling and operations; the specific permits are not discussed in this Manual, but their requirements are incorporated in the discussions of equipment and procedural requirements where appropriate.

County permits, where specific requirements have been adopted, are, as discussed above, primarily land use permits. They also include administrative-type permits, such as grading and grubbing permits, building permits, lighting, noise limits, etc. These specific requirements will not be discussed, although they too may have requirements that may affect planning and operations for drilling

In spite of the permitting and regulations discussed in the above paragraphs and their references, permits can be basically categorized into those dealing with land uses - zoning, leases, etc. - and those dealing primarily with technical matters - drilling and resource protection, air and water quality maintenance, wellfield and power plant operations, and waste disposal. It is with the latter type of permits that this manual will deal, outlining the basic requirements for the prevention of well control problems by a combination of planning, procedures and equipment.

**Duey Milner**  
**400 East Roberts Lane, #37**  
**Bakersfield, California 93308**  
SSN [REDACTED]

Mr. Manabu Tagomori  
Manager-Chief Engineer  
Division of Water and Land Development  
Department of Land and Natural Resources  
P.O. Box 373  
Honolulu, Hawaii 96809

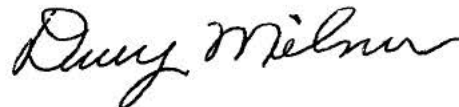
Dear Mr. Tagomori:

**Geothermal Well Drilling Permits for KA2-1 and KA3-1**

I have completed my review of the drilling permits issued to True/Mid-Pacific Venture for KA2-1 and KA3-1 and find them to satisfy the conditions of the Geothermal Management Plan.

Should you need further assistance, please feel free to contact me.

Sincerely,



Duey Milner



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

P. O. BOX 373  
HONOLULU, HAWAII 96809

MAY 12 1992

WILLIAM W. PATY, 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  
PROGRAM  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

Mr. Duey Milner  
400 E. Robert Lane  
Apt. #37  
Bakersfield, CA. 93308

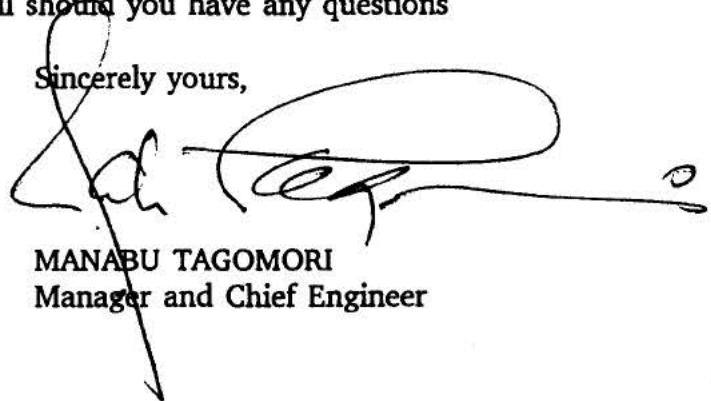
Dear Mr. Milner:

**Geothermal Permit Review**

As discussed, we request your assistance in reviewing the drilling permits issued to True/Mid-Pacific Geothermal Venture for KA2-1 and KA3-1. Please review and comment as soon as possible whether these two permits satisfy the drilling procedures set forth in the Geothermal Management Plan. Copies of the drilling program are attached to assist you in your review.

We appreciated the valuable assistance you are providing as a geothermal drilling consultant. Please do not hesitate to call should you have any questions

Sincerely yours,



MANABU TAGOMORI  
Manager and Chief Engineer

JS:cd  
Attachment

JOHN WAIHEE  
GOVERNOR OF HAWAII



WILLIAM W. PATY, 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  
PROGRAM  
LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

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

REF-WRM-CD

P. O. BOX 373  
HONOLULU, HAWAII 96809

MAY 5 1992

*Cabinet  
File # 16*

Employment Development Department  
1924 Que Street  
Bakersfield, CA 93301

Gentlemen:

I am writing with regard to Mr. Duey Milner's application of 4/26/92 to explain the terms of Mr. Milner's employment with us.

Mr. Milner was hired as an independent contractor to assist this Department in geothermal well monitoring. Mr. Milner's previous period of employment with us was August 30, 1991 through October 2, 1991 and in March 1992 we called on Mr. Milner again to assist us in monitoring work. He started working for us on March 16, 1992. Our contract with him would have provided for more work, but a legal decision shut down operations at the geothermal plant that he was monitoring for us. Consequently his last day of working for us was April 21, 1992. We have advised Mr. Milner that as soon as drilling may legally resume we will call him back to work, but at this moment we are uncertain when that will be. It could be as early as June 1992.

I hope this response is satisfactory. If you have any questions, please call me at (808) 587-0230.

Sincerely yours,

MANABU TAGOMORI  
Manager and Chief Engineer

File 29

file Jack Keppeler

OFFICE OF THE CHAIRPERSON

RECEIVED

April 24, 1992

92 APR 28 AM 11:21

To: AR, CEA, DOCARE, FW, HP, LM, SP, DOWALD, NARS  
 Through: William W. Paty  
 From: John P. Keppeler, II  
 Dona L. Hanaike  
 Re: Management Analysis of LNR Permit/License Activities

DIV. OF WATER & LAND DEVELOPMENT

*John P. Keppeler, II*  
*Dona L. Hanaike*

In the familiarization process we have been going through, it has become clear that the permit/license activities of the Department account for a significant part of its workflow. Responding to complaints regarding the administration of the permit/license activities noticeably adds to the already considerable workflow.

This important and conspicuous activity of the Department grants various kinds of permissions to use elements of the public trust (viz., public lands, including conservation-zoned private lands, public natural resources and/or public facilities). The proper management of the resulting workflow caused by: processing applications, issuance of permits/licenses, monitoring the authorized use or taking and enforcing the conditional use/taking or prosecuting the unauthorized use/taking of the public trust does amount for a large part of the success rating of this Department.

In an attempt to improve the management of this part of the Departmental work, we are asking you for a concise listing of the permits or licenses issued by your division. Please list them by:

- (a) type [e.g., Hunting, Fishing, Scientific Collection, Wildlife Collection, Conservation District Use, Land License, Revocable Permit];
- (b) class<sub>1</sub>/ [i.e., major, minor, special, emergency, and other];
- (c) duration [i.e., event, series of events, month-to-month, annual, long-term]; and
- (d) authority.

1/ The "major" classification might be reserved for complex or very significant uses or permissions granted. "Special" might connote highly unusual or unique permissions.

AR, CEA, DOCARE, FW, HP, LM, SP, DOWALD, NARS  
Page Two  
April 24, 1992

For our analysis of the managing requirements of these permit/license processing activities, please report from your current experience and forecast for the next fiscal year the volume of permissions granted by year, monthly and weekly averages and peaks of issuance.

Please, also forecast the anticipated violation level by permit type for the next fiscal year based on recent experience. We would also appreciate your discussion of the enforcement and prosecuting ramifications that might make the compliance level more responsible to the granting authority. This discussion should also include the consideration of unauthorized uses (i.e., cutting, clearing, construction of structures or facilities, commercial activities, etc.) of lands, resources and/or facilities under the jurisdiction of LNR.

Please give us an early oral indication of the amount of work that this inquiry may take to fully and properly respond to by Friday noon, May 1, 1992. We plan to gather the informational requirement called for by the end of May, barring unforeseen circumstances.

c: Chairperson  
Convey  
ADP  
Fisc  
Pers



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621  
HONOLULU, HAWAII 96809

OCT - 9 1991

DEPUTIES

KEITH W. AHUE  
MANABU TAGOMORI  
DAN T. KOCHI

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

REF:WRM-FC

Ms. Jennifer Perry  
Box 537  
Pahoa, HI 96778  
and  
Ms. Jane Hedtke  
Box 937  
Pahoa, HI 96778

Dear Ms. Perry and Ms. Hedtke:


Thank you for your letter of September 24, 1991 requesting that our geothermal consultant, Mr. Duey Milner, review and inspect the drilling program and the wellhead assembly of geothermal wells in the Lower Puna District.

Mr. Milner was hired by the Department to oversee the control operation of Puna Geothermal Venture's KS-8 well. His contract provides that he may be called upon for additional services.

To this end, we had Mr. Milner visit all geothermal well sites in Puna during his assignment on KS-8. Mr. Milner has returned to the mainland since the completion of work on KS-8.

Future work with Mr. Milner or others will be evaluated as the need arise. Meanwhile, the information you submit will be reviewed by my staff.

Very truly yours,

  
WILLIAM W. PATY

11/15  
Gov. do you know if DNR  
ever responded to this?

William Paty, Chairman  
Department of Land and Natural Resources  
PO Box 621  
Honolulu, Hawaii 96809

Dear Chairman Paty,

September 24, 1991

We understand that Mr. Dewey Milner who has been contracted by the State to oversee the securing of the KS-8 well on the PGV project site, is at present stationed on the Big Island. May we request that you consider an addition to his contract before he leaves.

As you are aware, many of the wells on the PGV project site have at present and in the past problems with gas leaks, casing failures, and wellhead failures. Enclosed is our Inventory of Wells in the Lower Puna District outlining a history of each of the wells drilled, compiled from State and County records. In our discussions with several experts, including Bill Craddick, Butch Clark, Dr. Wilson Goddard, Bob Reynolds, and Dewey Milner, requesting a second expert opinion on the adequacy of the SOH casing program and the wellhead equipment is appropriate at this time.

Mediation was requested by Bill Craddick to revise the original proposed drilling and casing plan and was agreed to by Dr. Olson per the Mediators Report of 7/11/89. On May 9, 1990 Dr. Harry Olson requested an amendment in the drilling plan for the SOH program, citing cost considerations. This revised plan has been applied to SOH 2. At present this well is cased from 0-202' with a 9-5/8" K-55/40# and 0-1896' with a 7" J-55/23#. We have several concerns regarding this casing and wellhead assembly:

1. The formation into which the 9-5/8" casing is set is "broken and poorly consolidated" (2/4/91), hard and fractured (2/5/91), cave encountered requiring several redrills (2/6/91), drill from 148-200 feet with water and no returns. On 2/9/91 at 202', the hole was straight enough to see bottom with light, numerous enlarged areas in hole also visible. Bill Craddick has warned that the casing has to be firmly attached to a competent formation to help prevent the possibility of blowouts.

2. The 7" casing is set to 1896', a few feet above a severe dogleg which caused the drilling crew continual problems with collars shearing off. On 3/13/91 the 7" casing was cemented in without returns to the surface, "but pump pressure increased to 600 psi while pumping, indicating cement moving up annulus above DV tool." This dogleg is believed to be a fracture that would correlate with the intersection of a known fault located approximately 400 feet north of SOH2 if the fault plane dip is 75-80 degrees to the south. According to Planning Commission testimony by Bill Craddick (p 88) expressed concerns about the project proposal that drilling into the fractures is the same as

drilling into the reservoir. He also indicated there are no valves on any of these wells that will take pressures of 2000 psi which can build up after they are capped.

3. The rock formation below 1896' was continually fractured, with drilling fluids migrating away from the hole. Another fault zone was hit from 4883-4940' with the formation described as fractured and sandy. There is no casing in this depth.

4. The temperature at SDH 2 exceeds 650 degrees, but no exact bottom hole measurement was taken. The deviation survey was only taken up to 3400', with the remainder 1402' to bottom estimated in a S/E direction.

As residents who live in proximity to the SDH 2 well we would be adversely affected by failures attributed to deficiencies in the drilling program. Contracting Dewey Milner to review and inspect the drilling program and the wellhead assembly would greatly allay our fears that there are these deficiencies that could threaten the safety of the well.

Sincerely,



ENC.

cc: Harry Kim  
Murray Towill  
✓ Dr. H. Olson  
Norman Hayashi

Jennifer Perry  
Box 537  
Pahoa, HI 96778  
965-8699

Jane Hedtke  
Box 937  
Pahoa, HI 96778  
965-7299



DEPUTIES

JOHN P. KEPPELER II  
DONA L. HANAIKE

*Cabinet #  
File # 14*

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621  
HONOLULU, HAWAII 96809

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

REF:WL-CD

TO WHOM IT MAY CONCERN:

Mr. Duey Milner has been retained as a Geothermal Well Drilling Consultant by the State Department of Land and Natural Resources (DLNR) effective March 15, 1992.

Mr. Milner is assigned to the Puna Geothermal Venture's (PGV) program to re-commence drilling activities since the suspension of the moratorium on geothermal activities by Hawaii County on February 28, 1992. Specific duties and responsibilities are as follows:

- Inspect and monitor all PGV drilling activities as outlined in PGV's Amended Plan of Operations and various drilling permits.
- Participate in PGV's meetings on drilling activities and modifications.
- Observe all activities in the field and communicate on a daily basis with DLNR.
- Approve or deny PGV field modifications.
- If public health, safety, and welfare are in imminent danger as determined by Mr. Milner, a stop order of all activities shall be issued immediately. Mr. Milner shall immediately notify higher authorities to resolve the problems.
- Prepare daily activity reports for the Department of Land and Natural Resources.
- Prepare a final report at the conclusion of the re-start program.

Mr. Milner is to report directly to Manabu Tagomori at 587-0230.

Very truly yours,

WILLIAM W. PATY  
Chairperson