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State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Water and Land Development
Honolulu, Hawaii

September 24, 1993

Board of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

RESUBMITTAL — TO ESTABLISH A RESOURCE VALUATION METHOD
TO CALCULATE ROYALTY FOR GEOTHERMAL MINING LEASE R-2
TO PUNA GEOTHERMAL VENTURE (PGV)

At the request of the Office of Hawaiian Affairs (OHA), this item was deferred by the Board at the June 25, 1993 and July 23, 1993 meetings, to allow OHA time to study this royalty calculation. Since then OHA has completed their review of the royalty calculations and will be ready to provide testimony to the Board of Land and Natural Resources.

Background

The Board of Land and Natural Resources approved Geothermal Mining Lease R-2 on February 20, 1981 to Kapoho Land Partnership. Subsequently, the Board approved the transfer to Puna Geothermal Venture at its August 27, 1982 meeting. The terms of the Geothermal Mining Lease R-2 and Regulation 8, Administrative Rules which was then in effect, requires the Board to "In the event that geothermal resources hereunder is not sold to a third party but is used or furnished to a plant owned or controlled by the lessee, the gross proceeds of such production for the purposes of computing royalties hereunder shall be that which is reasonably equal to the gross proceeds being paid to other geothermal producers for geothermal resources of like quality under similar conditions without deducting any treating, processing and transportation costs incurred, notwithstanding Rule 3.136b. of Regulation 8." This condition of the lease is consistent with Section 182-18, Hawaii Revised Statutes and Section 182-31, Hawaii Administrative Rules.

Royalties received by the Board will be shared. 50% of the funds will go to the State of Hawaii; 30% of the funds will go to the County of Hawaii; 20% of the funds will go to Office of Hawaiian Affairs.

Staff has briefed the County of Hawaii (Mayor and County Council), and Office of Hawaiian Affairs (Chairman and Trustees). Briefings have also been provided to Hawaii Geothermal Alliance. Staff has also met with Puna Geothermal Venture and True/Mid-Pacific Geothermal Venture.

Subsequent to these meetings, the Office of Hawaiian Affairs Committee on Planning, Economic Development, and Housing voted on September 8, 1993 in favor of the staff netback method to calculate geothermal royalties, and the full Board of Trustees voted on September 10, 1993 in support of the staff netback method for geothermal resource valuation in their effort to carry out their fiduciary responsibilities. Copies of OHA's actions are attached.

Staff Analysis

In order to find reasonably equal valuations to fulfill the terms of the statutes, rules and the lease, staff has investigated various methods currently being used in projects in other states to determine the value of the geothermal resource produced and used for electrical power generation. Consultants have told us that a majority of geothermal projects on the mainland have resource values ranging between 25% and 70% of gross electricity revenues, with the median falling between 35% and 50%. The median of 35% to 50% is the basis which staff used to determine whether the valuation method was reasonably equal to the gross proceeds being paid to other geothermal producers.

Staff narrowed the choices down to two possible methods for use in the State of Hawaii:

1. Percentage of Proceeds Method — uses a negotiated percentage of gross electricity revenues as the value of the resource. Under this method geothermal projects in the Western United States have geothermal resources valued between 35% and 50% of gross electricity revenues.
2. Netback Method — subtracts transmission costs and generating costs from gross electricity revenues; the balance is the value of the resources. Deduction for steamfield or geothermal well drilling costs are not allowed. The federal government uses this method for geothermal projects located on federal lands.

Upon detailed evaluation of these two methods, staff determined that the netback method is the most appropriate for Hawaii. The netback method has been used extensively by the U.S. Department of the Interior, Minerals Management Service (MMS) in evaluating geothermal resources which are produced on federal lands for electrical power generation. Staff finds the concept of netback the most fair, logical and easy to administer of the various methods examined. Under the netback method resource valuation varies with economy. The utility's avoided cost of energy, the Standard and Poor's BBB industrial bond rate, and inflation — all play a role in determining the resource value each year. This feature eliminates the need for lengthy and periodic negotiations and periodic renegotiations.

In summary, staff prefers the netback method because:

1. The netback method is a method that considers both the resource owner and the developer's risk by yielding lower resource values in the early years of a project and higher resource values in later project years. Because the transmission and generating cost rates are calculated anew each year, and because the utility's avoided energy costs, inflation, and the bond rate change over time, the netback method floats on the economy. In this regard, the method is reasonable and fair to both the resource owner and the developer. In contrast, the percentage of proceeds method values the resource at a fixed percentage of revenues and does not take into account changes in the developer's expenses or changes in the developer's revenues relative to expenses.
2. The netback method is familiar to industry. The method has been used for many years for geothermal projects located on federal lands in the western United States. It is not difficult to calculate, and the auditing requirements are simple to conduct.
3. The netback method can be applied to any geothermal project and does not require project by project negotiations, or new negotiations every few years, in contrast to the percentage of proceeds method which requires renegotiation as situations change. For example, the Board could apply the netback method to the True/Mid-Pacific Geothermal project's recently submitted projected figures without having to go through lengthy negotiations.
4. The netback method establishes a resource value which reflects its use. It is not realistic and reasonable to the resource owner to claim the resource has no value in the initial years as it is used for electricity production.
5. The Minerals Management Service (MMS) of the U.S. Department of the Interior has many years of experience administering royalty calculations using this method. The MMS has provided and will continue to provide technical assistance to the State in implementing this resource valuation method.

Parameters Used in the Netback Method

As stated, the netback method calculates geothermal resource value by subtracting transmission and generating costs from gross electricity revenues. The remainder is considered to be the resource value. Historically, the Minerals Management Service of the U.S. Department of the Interior, in administering thousands of leases on federal lands in oil, gas and geothermal resource producing projects, has used **estimates** for the developer's cost of capital, rather than **actual** figures. Threshold limits were established, historically deriving from the oil and gas industries, to estimate relationships between the costs of transmission as a percentage of revenues and the cost of generation relative to revenues and transmission costs. The estimates for the developer's cost of capital and the limits on transmission and generating costs are known as the **parameters** of the netback method. Varying these parameters affects the calculation of the resource value.

Prior to January 1, 1992, the MMS used first a prime rate for estimating capital costs, then changed to the Standard and Poor's BBB industrial bond rate. In January 1989 MMS promulgated proposed new rules in the Federal Register using a multiplier of 1.5 on the BBB industrial bond rate and limits on transmission and generating deductions.

The final rules were promulgated in November 1991, with a multiplier on the BBB industrial bond rate of 2.0 and no limits on transmission or generating costs.

In summary, the MMS netback parameters are:

- 2.0 multiplier on the BBB industrial bond rate for estimating developer's cost of capital
- no limits on transmission costs
- no limits on generating costs

If the MMS parameters are used in Hawaii, the gross proceeds of the PGV project is not reasonably equal to the gross proceeds being paid to other geothermal producers for geothermal resources of like quality under similar conditions. Hawaii's geothermal resources will have a zero value for the next 7 to 14 or more years under the MMS parameters. It is apparent the parameters used by MMS applies only to federal leases. Therefore, the staff proposes to use a modified version of the netback parameters.

Staff Parameters

The staff's modified version is patterned after the proposed January 1989 MMS rules as published in the federal register.

Specifically, the parameters proposed for use in the State of Hawaii are as follows:

- A multiplier of 1.5 times the Standard and Poor's BBB industrial bond rate in place at the time cost rates are established (the multiplier is multiplied by the bond rate to estimate the developer's cost of capital).
- A threshold limit on actual transmission costs of 50% of the gross electricity revenues ("threshold" means the limit would be subject to administrative relief upon the developer's substantiation of actual financial burden).
- A threshold or limit on actual generation costs to two-thirds of the tailgate value of electricity (gross electricity revenues minus allowable transmission costs and also subject to administrative relief upon substantiation of actual financial burden).

- Allowance for depreciation of capital equipment.

The staff parameters is proposed because under most economic conditions the proposed staff parameters will yield a resource value that is reasonable and comparable to those negotiated under the percentage of proceeds method and other methods but without requiring frequent and extensive negotiating sessions. The staff parameters yields resource values of 28—30% of gross electricity revenues for the first 15 years, and up to 50% in the 23rd year which is comparable to the 35%—50% range. The 15 year 28—30% of gross electricity revenues resource valuation falls **below** the industry 35%—50% median range. In contrast, the parameters used by MMS would value the resource at less than zero for the first 7 to 14 years. This is not "reasonable" compared to valuations of geothermal resources in projects outside federal lands. Specifically, staff believes the resource cannot be valueless as the federal calculation allows it to be.

Positions of Other Organizations

In previous testimony and meetings on this matter, the Board has heard discussions proposing adopting the MMS parameters but with a minimum royalty "floor" of 1% of gross electricity revenues as a royalty. Staff finds this proposal unacceptable because using the MMS parameters unreasonably undervalues the geothermal resource at a negative or zero figure, and the proposed floor is below the minimum range of geothermal resource valuations in other projects. The proposal of a royalty of 1% of gross electricity revenues is tantamount to evaluating the geothermal resource at 10% of gross electricity revenues. Methods previously proposed by PGV evaluated the resource at 33% of revenues, 27% of revenues, and about 24%—26% of revenues. Without substantiating evidence of similar resource valuations from similar geothermal projects elsewhere, staff finds that evaluating resources at 10% of gross electricity revenues is unreasonably low.

Staff's position is that once a **reasonable** resource valuation method has been established, if the developer finds that paying the royalty resulting from that method is a hardship, the developer can come to the Board and request a royalty waiver which the Board may grant for up to eight years.

The Office of Hawaiian Affairs took the time to research the netback method with the help of Senator Akaka who sent an official from the Minerals Management Service to brief the Trustees on the netback method, its history, and the parameters involved in using the method. In their deliberations the question came up whether there must be just **one** netback method, or whether the State of Hawaii can frame its own parameters. The OHA Trustees concluded there is no requirement for the State of Hawaii to follow the MMS parameters. There was discussion on use of **actual** cost of capital in the transmission and generating deductions in Hawaii, rather than estimates based on the BBB industrial bond rate and a multiplier, since in Hawaii there are not thousands of mining leases to manage. The Trustees concluded that the staff parameters were more appropriate for use in Hawaii than the MMS parameters, and the Trustees voted to that effect 8—1 on Friday, September 10, 1993.

The Department of Business, Economic Development and Tourism testified on July 23, 1993 in favor of the MMS parameters; Chairman Schutte and Vice Chairman DeLima of Hawaii County Council have testified similarly, by letter, at the same meeting. Mayor Yamashiro testified in favor of the MMS parameters, as did Puna Geothermal Venture.

Subsequent to the July 23, 1993 Board meeting PGV has submitted testimony for the MMS parameters with a minimum steam value provision (copy attached). True Geothermal Energy Company has provided similar testimony to the Board dated August 18, 1993.

Summary and Conclusions

All parties agree that the netback method is the best choice of method for use in evaluating geothermal resources in Hawaii in situations where the resource is not sold directly, but used to produce electricity for sale. All agree the netback method is logical, it is fair and it avoids negotiation. It is the netback **parameters** that are at issue here. Staff's position is that a multiplier of 2 times the BBB industrial bond rate overstates the estimated cost

of capital to the developer. It would be more accurate to use either actual cost of capital for transmitting and generating costs, or a multiplier of 1.5 times the BBB industrial bond rate to estimate the developer's actual cost of capital. Two times the current BBB industrial bond rate currently would be about 16%. We doubt that PGV's actual cost of capital is this high. It is more likely in the 12% range. ~~Regarding limits on cost deductions, staff's proposal is to adopt the same standards used by MMS when its method included cost limits, i.e. when the developer has actual documented expenses in excess of limits, these actual expenses will be allowable in calculating the value of the resource.~~ The audit requirements will consist of looking into directly related or directly allocable transmission and generating costs only.

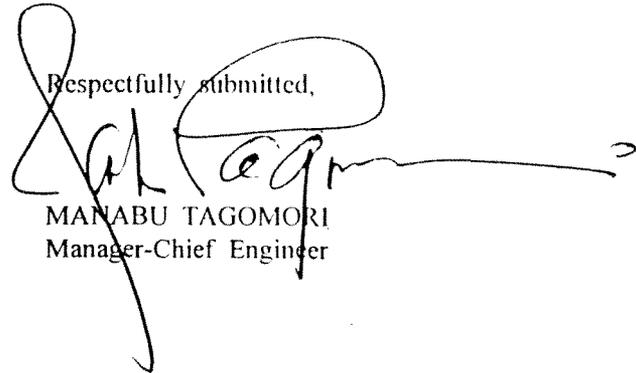
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as indicated.*

RECOMMENDATION:

Staff recommends that the netback method be adopted by the Board together with the proposed parameters (1.5 multiplier, 50% ~~threshold~~ limit on transmission costs and ~~threshold~~ limit on generation costs of two-thirds of the tailgate value of electricity, and allowance of depreciation of capital equipment) to calculate the value of geothermal resource used in the production of electricity. This method results in a reasonable resource valuation of about 28%—30% of gross electricity revenues over the first 15 years, ~~and provides administrative relief from deduction limits if cost limits are exceeded for legitimate causes.~~ This results in resource valuation as a percentage of gross electricity revenues below the median industry range of 35%—50%.

It is further recommended to authorize the chairperson to sign the appropriate documents to implement the staff's modified netback resource valuation method and to carry out annual audits of PGV's financial documents to verify the accuracy and legitimacy of cost deductions.

Respectfully submitted,



MANABU TAGOMORI
Manager-Chief Engineer

Attach.

APPROVED FOR SUBMITTAL:



KEITH W. AHUE, Chairperson



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
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DIVISION OF WATER &
LAND DEVELOPMENT

September 16, 1993

The Honorable Keith W. Ahue
State of Hawaii
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Re: Geothermal Royalty - Method of Calculation

Dear Mr. Ahue:

As you know the Division of Water Resource Management of the Department of Land and Natural Resources has proposed a method and formula to calculate geothermal royalties due to the Office of Hawaiian Affairs, the State and the County of Hawaii. Your staff has informed OHA of its proposed method and afforded us an opportunity to question them on the merits of this proposal. In addition, this office consulted various other experts in the field and on September 10, 1993 the Board of Trustees of the Office of Hawaiian Affairs accepted the method and formula proposed by the Division of Water Resource Management by passing the following motion:

To approve the Net Back method and formula to calculate geothermal royalties due the Office of Hawaiian Affairs, the State of Hawaii and the County of Hawaii as a fulfillment of fiduciary responsibility and not in any way, an approval of this particular project or any future geothermal development.

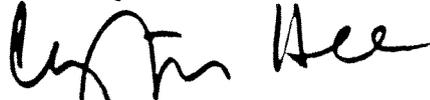
After a review of various methods and formula which could be used calculate geothermal royalties, the Board of Trustees of the Office of Hawaiian Affairs strongly recommends approval of the Net Back method and formula proposed by the Division of Water Resource Management. We believe that this method will provide the most benefit to Native Hawaiians from this resource.

Keith W. Ahue
September 16, 1993
Page two

We do not support the contention that the developer of the resource should receive a larger portion of profits through the adoption of a different method or formula. Title 13, Chapter 183, Section 31 of the Administrative Rules for the Department of Land and Natural Resources requires a royalty payment of not less than 10% and not more than 20% of the revenues from geothermal development. The developer has already received adequate support from the BLNR by receiving a royalty rate at the minimum figure of 10%.

These resources belong to the people of Hawaii. In addition, minerals are a part of the ceded land trust. As part of that trust there is a special consideration for native Hawaiians. We strongly urge you to consider this responsibility and approve the method and formula proposed by the Division of Water Resource Management.

Sincerely,



Clayton H.W. Hee, Chairperson
Board of Trustees

cc: Manabu Tagomori, Manager
Division of Water Resource Management

Moses K. Keale, Sr., Chairperson
Planning, Economic Dev. & Housing Committee

PUNA GEOTHERMAL VENTURE

A Hawaii Partnership

September 3, 1993

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

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DIVISION OF WATER &
LAND DEVELOPMENT

Dear Mr. Tagomori:

As a follow up to my letter dated August 31, the following is our proposal which could be included in your transmittal to the Board:

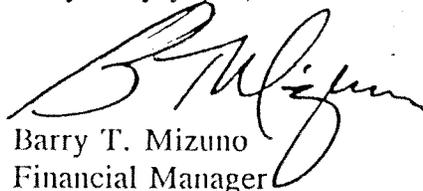
"Puna Geothermal Venture ("PGV") recognizes that the State and County have long been supporters of the development of geothermal energy. PGV appreciates as owners of the resource, the need to see a return on their investment as soon as possible. It is equally important that the Board carefully balance the scale of fairness to all parties so as to ensure preservation and expansion of future revenues from their resource assets.

To avoid any controversy as to the arbitrary nature of the proposed staff method, PGV strongly recommends the adoption of the U.S. Department of Interior's Mineral Management Services division methodology for valuing geothermal resource. We recognize that this method of steam valuation may result in low or zero royalties in the early years of the project. Accordingly we further recommend adoption of a minimum steam value provision. Using a minimum steam value to create a "floor royalty" is in our opinion better than having staff create royalties by making artificial changes to the established MMS steam valuation methodology.

It is our understanding that the County of Hawaii and the Hawaii State Department of Business, Economic Development and Tourism concur with our proposal."

We appreciate the opportunity to submit our proposal for inclusion in your transmittal to the Board. Please call me if you have any questions.

Very truly yours,


Barry T. Mizuno
Financial Manager

cc. S. E. Morris
Sus Ono
ref.0903roya

**AGENDA
FOR THE MEETING OF THE
BOARD OF LAND AND NATURAL RESOURCES**

DATE: FRIDAY, SEPTEMBER 24, 1993
TIME: 9:00 A.M.
PLACE: KALANIMOKU BUILDING
BOARD ROOM, ROOM 132
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

**MINUTES
AUGUST 27, 1993**

C. DIVISION OF FORESTRY AND WILDLIFE

1. PERMISSION TO ENTER INTO A MEMORANDUM OF UNDERSTANDING WITH BISHOP ESTATE

D. DIVISION OF WATER AND LAND DEVELOPMENT

1. RESUBMITTAL -- TO ESTABLISH A RESOURCE VALUATION METHOD TO CALCULATE ROYALTY FOR GEOTHERMAL MINING LEASE R-2 TO PUNA GEOTHERMAL VENTURE (PGV)

F. DIVISION OF LAND MANAGEMENT

1. TRANSMITTAL OF DOCUMENTS FOR BOARD CONSIDERATION
 - a. RESUBMITTAL--ISSUANCE OF REVOCABLE PERMIT TO MR. SAMUEL L. GEORGE, KAHANA VALLEY, KAHANA, KOOLAULOA, OAHU, TAX MAP KEY 5-2-02:POR.1
 - b. ISSUANCE OF LAND LICENSE TO SONNY VICK'S PAVING CO., INC., GOVERNMENT LAND AT WAKIU, HANA, MAUI, TAX MAP KEY 1-3-04:por.12
 - c. ISSUANCE OF REVOCABLE PERMIT TO MESSRS. KEITH GEORGE AND WALTER KIM, KAHANA VALLEY, KAHANA, KOOLAULOA, OAHU, TAX MAP KEY 5-2-02:POR. 1
 - d. ASSIGNMENT OF GENERAL LEASE NO. S-3836 FROM ODA ORCHIDS, INC., AS ASSIGNOR, TO KEMPEI TANAKA HAWAII, INC., AS ASSIGNEE, COVERING STATE LAND AT WAIAKEA, SOUTH HILO, HAWAII, TAX MAP KEY (3) 2-2-48:1
2. WITHDRAWAL OF LAND FROM EXECUTIVE ORDER NO. 257 (HAKALAU SCHOOL, DEPARTMENT OF EDUCATION) AND SET ASIDE TO THE COUNTY OF HAWAII FOR THE HAKALAU COMMUNITY CENTE, HAKALAU-IKI, SOUTH HILO, HAWAII, TAX MAP KEY 2-9-02:POR. 5
3. AMENDMENT TO DIRECT SALE OF EASEMENT AT WAIUAJIA, WAIMEA, SOUTH KOHALA, HAWAII, TAX MAP KEY 6-5-02:POR. 5, POR. 31

DAW

Base Production 9/22/93

Puna Geothermal Venture
State Royalty
Steam Valuation Methods

DRAFT

	<u>Steam Value % of Revenue</u>	<u>Total State Royalty</u>	<u>PV State Royalty</u>
Proposed Staff Method	49%	\$58,607	\$18,340
Industry Methods			
Pacific Gas and Electric Company 20+ Projects; > 1,000 Mwe	22%	\$26,777	\$9,304
Other Geysers Steam Purchases	35%	\$42,844	\$14,886
Typical Negotiated Percentage	33%	\$40,697	\$14,602
Mineral Management Services 12 Projects	41%	\$49,181	\$12,651
Simple Average of Industry Methods	33%	\$39,875	\$12,861
PGV Proposals			
Mineral Management Services with 10% Steam Value Minimum	42%	\$50,873	\$13,944
Negotiated % of Revenues	30%	\$36,997	\$13,275