

SUMMARY OF GEOTHERMAL ROYALTY ISSUES

Issues:

DLNR staff has recommended a modified version of the current federal netback method used to calculate geothermal royalties. The principal differences between the DLNR staff method and the Minerals Management Service (MMS) Netback Method is that the staff method reduces the allowable rate of return on invested capital by 25%, and limits the amount of generation and transmission deductions allowed.

Assuming that no minimum royalty payment is established by the Board of Land and Natural Resources (Board), the current MMS method when applied to the PGV project results in zero royalty payments for the first 11 years, as opposed to the staff method which forecasts initial royalty payments on the order of \$450,000 per year.

It would appear that, without any provision for a minimum payment, DLNR staff may have chosen to modify the federal method on the basis that zero royalty payments would be unacceptable. However, setting of an arbitrary reduction in the allowable rate of return and capping allowable deductions are both to the detriment of the developer.

Whether DLNR staff made a serious "examination of such factors as the progress of geothermal development taking place in the state at the time of the application, the technical and financial capabilities of the applicant to undertake the project, and the need for providing a financial incentive in order for the applicant to proceed" in selecting its recommended method is not known.

Discussion:

Under the State Geothermal Resource Mining Lease, no provision is made for a minimum payment of royalty. Whereas, federal leases appear to establish a minimum resource value based on one percent of the gross revenues from the sale of electricity.

Section 13-183-31 (a) of the DLNR Administrative Rules, states that in addition to royalties on geothermal production, "the board may also impose a royalty based on a percentage of the net profit, cash bonus, or otherwise." This clause would seem to imply that the Board could establish a "minimum floor" payment, regardless of the valuation methodology selected.

Considerations:

- a. The MMS netback method is an accepted and reasonable means of calculating geothermal royalty payments.
- b. Without a minimum payment provision, the federal method results in zero royalty during the early years of the project.
- c. The DLNR staff method departs significantly from the federal MMS method to the detriment of the developer.

- d. Was full consideration given by DLNR staff for the need to encourage geothermal development, as inferred by state policy, during its examination of royalty valuation methods?
- e. Where a developer can demonstrate financial hardship, the Board can consider granting a waiver of royalty payments for a period not to exceed eight years.

Recommendations:

1. The methodology adopted by the Board to determine geothermal royalty payments should be supportive of the state goal to encourage geothermal development. It should not be less encouraging than the federal method.
2. The federal MMS netback method should be adopted as the standard approach used for all geothermal development in the state.
3. A minimum royalty policy should be adopted by the Board which considers the maturity of the industry as a whole at the present time, the financial risks incurred by the developer, and the degree of financial commitment made by the state.

September 13, 1993

MEMORANDUM

TO: Mufi Hannemann
THRU: Maurice H. Kaya
FROM: Dean A. Nakano
SUBJECT: Geothermal Resource Valuation

Background

The Department of Land and Natural Resources' (DLNR) Administrative Rule, Section 13-183-31 (a) states that "The rate of the royalty paid to the State for the production of geothermal resources shall be determined by the board prior to the bidding for or granting of a mining lease, but the rate shall not be less than ten percent nor more than twenty percent of the gross amount or value of the geothermal resources produced under the lease as measured at the wellhead and sold or utilized by the lessee."

Section 13-183-31 (b) also states that "For the purpose of computing royalties, the amount or value of the geothermal resources produced shall be determined as the gross proceeds received by the mining lessee from the sale or use of geothermal resources produced from the leased land as measured at the wellhead. In the event that geothermal production hereunder is not sold to a third party but used or furnished to a plant owned or controlled by the lessee, the gross proceeds of the production for purposes of computing royalties shall be that which is reasonably equal to the gross proceeds being paid to other geothermal producers for geothermal resources of like quality and quantity under similar conditions after deducting any and all treating, processing, and transportation costs incurred. (emphasis added)"

Ideally, in a situation where steam is sold to a third-party under an "arms-length sale", gross proceeds are computed as follows: $\text{Gross Proceeds} = (\text{total pounds of steam produced and measured at the wellhead}) \times (\text{unit value of steam, } \$/\text{lbs.})$.

However, the current situation in Hawaii is different from that described above, and the calculation of gross proceeds as provided by section 13-183-31 (b) for a no-sales or non arms-length arrangement cannot be applied to the Puna Geothermal Venture Project (PGV). Although an equivalent unit value of steam (\$/lbs.) equal to that paid to other producers/suppliers of steam of like quality and quantity could be used to calculate resource value, no such "standard" unit value of steam is currently available to Hawaii for computing gross proceeds.

PGV's Geothermal Resource Mining Lease (GRML) R-2, section 5, provides that the state shall receive a "royalty of ten (10%) percent of the gross proceeds received by the Lessee from the sale or use of geothermal resources produced from the leased lands and measured at the wellhead without any deduction for treating, processing and transportation cost, notwithstanding Rule 3.13 b. of Regulation 8", (now identified as section 13-183-31 (b)).

The "notwithstanding clause" contained in the lease appears to conflict with the rules and prohibits deductions presently allowed in section 13-183-31 (b). This inconsistency, although not directly applicable to the valuation of the resource, is contained in 5 out of the 6 mining leases issued to date. GRML R-5 is the only lease that has language contained therein which allows for deduction of treating, processing, and transportation costs incurred.

Despite any potential conflict between the regulation and the leases, the PGV 25 MW project is a typical case where the lessee both produces the geothermal resource and utilizes it in its own power plant to generate electricity. In this situation, the electrical energy is sold, and not the geothermal resource. The gross revenue is a function of the sale of electricity generated rather than from the sale or use of steam.

Since there is no steam sales transaction by which to measure the value of the geothermal resource, an alternative method must be selected in which to calculate the value of the geothermal resources produced.

Discussion

There are several alternative valuation methods used when a "no-sale" or "non arms-length" transactions are involved. These valuation methods include the Netback Method and the Percentage of Proceeds Method.

Federal Netback Method

The U.S. Department of the Interior, Minerals Management Service (MMS) is in a similar position to that of the State of Hawaii, in that it leases land for geothermal development and receives royalties on the value of the geothermal resources produced. In situations like that of PGV, where the lessee both produces geothermal resources and utilizes the resources in its own plant to generate electricity, the MMS uses a method called the "netback" method to assess the value of the resource in order to calculate the royalty.

In the MMS netback method, calculations are expressed in terms of cost rates (i.e. \$/kWh), however, cost figures (rather than rates) can be used to determine the value of the resource, without expressing them in terms of kWh of electricity produced or sold. The MMS method allows for the deduction of electricity generation and transmission costs from the gross revenues received from the sale of electricity to arrive at a value of the geothermal resource.

Two methods are used in the netback calculation, either the **Return on Investment Method** or the **Depreciation Method**. The factors used in the netback calculations to determine the value of the geothermal resource include:

- 1) Transmission Costs
- 2) Generation Costs
- 3) Transmission Deductions
- 4) Tailgate Value of Electricity
- 5) Generation Deductions
- 6) Total Revenues

In addition, the netback method also uses the Standard and Poor's monthly average BBB industrial bond rate with a multiplication factor to calculate the allowable return on undepreciated assets for the netback-depreciation method, and to calculate the annual return on allowable capital investment for the netback-return on investment method.

Netback - Return on Investment Method

In the return on investment method, the current investment rate of return is applied to the entire allowable capital amount with no deductions for depreciation. In this method, allowable deductions include operation and maintenance costs, generation and transmission costs, and an annual return on allowable capital investment.

The transmission costs are based on the annual operating and maintenance expenses, plus the annual return on allowable capital investment. Similarly, the generating costs are equal to the annual operating and maintenance expenses, plus the annual return on allowable capital investments.

Netback - Depreciation Method

In the depreciation method, allowable deductions include the costs of operation and maintenance, generation and transmission costs, annual depreciation, and an annual return on the undepreciated investment.

The transmission costs are equal to the annual operating and maintenance expenses, plus the straight-line depreciation of allowable (transmission) capital investments, plus the annual rate of return on the undepreciated investment balance. Generating costs are the sum of the annual operating and maintenance expenses, plus the annual straight-line depreciation of allowable (generation) capital investments, plus the annual rate of return on the undepreciated investment balance.

Simply described, the calculation of resource value using the netback method is as follows:

- 1) **Gross Electricity Revenues - Transmission Costs = Tailgate Value of Electricity**
- 2) **Tailgate Value of Electricity - Generating Costs = Resource Value**

Using the derived Resource Value, geothermal royalty is calculated as follows:

$$\text{Resource Value} \times \text{Royalty Rate (10\%)} = \text{Royalty}$$

In November 1991, the MMS promulgated revised rules for calculating geothermal resource value using the federal netback method. The current MMS Netback Method allows a multiplication factor of 2.0 to be applied to the industrial bond rate for calculating the allowable return on the undepreciated capital. Deduction limits or ceilings on transmission and generation costs were eliminated, and additional specifications on allowable generating and transmission deductions were also provided.

Some of the "disadvantages" of the current MMS Netback Method are as follows:

- o The netback method is relatively complex and requires submission of detailed operating and capitalization figures which must be analyzed for deduction eligibility. Accounting data/records must be obtained from the developer upon which several calculations are made to compute the value of the resource. Periodic audits may be required to validate accuracy of the data received from the developer.
- o Based on proxy values presented, (and assuming that no minimum royalty payment is set by the Board of Land and Natural Resources), the MMS netback method results in "zero" royalties for a period of up to 11 years.

Some of the "advantages" of the netback methods are:

- o The netback method provides a mechanism for the recovery of costs by the developer for electrical generation/transmission costs and a return on invested capital. The valuation method uses current bond rates and current operating expenses.
- o The concept of the netback methodology is an established and accepted method and is used in the leasing of federal lands for geothermal development purposes.
- o The past and present netback methodology was adopted pursuant to a public review and revision process requiring input from both industry and government.
- o The netback method, if adopted, could provide a consistent valuation method applicable to all geothermal development projects. Technical assistance on the current netback method can be obtained from MMS directly.

Percentage of Proceeds Method

The other royalty valuation method considered by the state was the Negotiated Percentage of Electricity Revenue or "**Percentage of Proceeds**" method. In this case the royalties are calculated on the basis of a percentage of the proceeds from the sale of electricity, not as a percentage of the proceeds from the sale of the resource.

The range of negotiated percentages (allocated to the steam value) have been on the order of 35% - 50%. The calculation of the geothermal royalty based on this method would be as follows:

- 1) Electricity Revenues x Negotiated Percentage (%) = Resource Value
- 2) Resource Value x Royalty Rate (10%) = Royalty

The advantages of the Percentage of Proceeds Methods are:

- o The method is simple to calculate and is based solely on the total revenues generated from the sale of electricity.
- o Because it is based on a percentage of proceeds, the method results in royalty payments being paid from the first year of operation.

Conversely, the disadvantages of the method are:

- o The method does not provide a mechanism for reasonable recovery of capital costs by the developer.
- o Since the valuation method is based on a negotiated agreement, the "negotiated percentage" cannot be uniformly applied to all geothermal projects. Determination of future royalty payments from other geothermal project will require subsequent negotiations at that time.
- o Selection of a negotiated method over an "established" method may increase the potential for administrative/legal challenge of the valuation method.

Issues

In seeking an alternative method for valuing the geothermal resource, DLNR staff researched the various options available and determined that the netback method is the most appropriate for the State of Hawaii. This conclusion is based on the premise that the netback methodology is used extensively by the U.S. Department of the Interior, Minerals Management Service in evaluating geothermal resources which are produced on federal lands for electrical power generation.

The issue that arises, however, is that the DLNR recommended method is a modified version of the current federal netback method. The differences between the staff method and the federal method can be summarized as follows:

<u>Parameters</u>	<u>Current MMS Method</u>	<u>Staff Netback Method</u>
Multiplier	2.0	1.5
Limit on Generating Deduction	No Limits	Limited to 2/3 Tailgate Value of Electricity (or Threshold)
Limit on Transmission Deduction	No Limits	50% of Gross Electricity Revenues (or Threshold)

Several parties have raised concerns over the use of a modified netback method which deviates from the present federal netback methodology. In seeking a reasonable return of royalty to the state, DLNR staff recommended the use of certain parameters which are not currently utilized by the MMS. The DLNR netback method sets forth threshold limits previously used by MMS but which have been eliminated under the current MMS rules. The DLNR netback method also uses a multiplier that is lower than the present MMS multiplier of 2.0.

The use of these different parameters in the netback calculation of the resource value results in a relatively large variance in the amount of potential royalty between the MMS method and the DLNR method. Based on projections by DLNR (and assuming no minimum royalty payment), the current MMS Netback Method results in zero royalty payments for approximately eleven years. Whereas, the DLNR netback method forecasts immediate royalty payments on the order of \$450,000 per year.

Concern has been raised that the DLNR staff method mandates arbitrary limitations on the amount of deductions/costs that the developer may recover each year. In addition, parties have testified that the use of "artificial" parameters (related to allowable deductions) in effect negates the intent and objective of the current MMS method to establish an equitable balance between return of capital and the payment of royalty. Statements were also made that the use of a method formally adopted by the MMS, as opposed to a modified version of the federal netback method, would reduce the possibility of legal challenges and provide for a consistent methodology applicable to all geothermal projects.

Until recently, DLNR staff has rebutted that the current MMS method "does not establish a minimum resource value" and therefore, does not provide for a floor payment of geothermal royalty. (It is our understanding, however, that federal leases do establish a minimum resource value based on a percentage of revenues.) DLNR also responded that "While we agree that the methodology should consider the developer's intent in assuming the risk and providing the necessary capital for future geothermal development, we have yet to see any evidence from PGV that our proposed, modified netback version would have a negative, financial effect on them and industry."

DLNR staff further stated that "The State's lease does not allow the establishment of minimum resource value, which obviously cannot be zero." Notwithstanding any present limitations within the lease to set a minimum resource value, DLNR's current administrative rules do appear to provide the Board of Land and Natural Resources (Board) with the authority to set a minimum royalty payment.

DLNR Administrative Rules, Section 13-183-31 (a), states that in addition to royalties on geothermal production, "the board may also impose a royalty based on a percentage of the net profit, cash bonus, or otherwise." Subject to a legal interpretation, this clause would seem to imply that the Board could establish a "minimum floor" payment of royalty, regardless of the valuation methodology selected.

It should be noted that the Office of Hawaiian Affairs (OHA) requested a 30-day deferral of any board action on the matter. We understand that during presentations of the proposed resource valuation method, concerns were raised by OHA that the DLNR staff method was too low and did not provide an adequate amount

of royalty. Although the matter is still under review by their staff, OHA may recommend that another resource valuation method be selected which results in higher royalty payments than that of the staff netback method.

We believe that legislative intent should be recognized and fully considered by the Board when selecting a resource valuation method. Act 138, SLH 1985, now codified as Section 182-18, HRS, clearly states that "The board shall fix the payment of royalties to the State for the utilization of geothermal resources at a rate which will encourage the initial and continued production of such resources." The statute further provides that the Board shall have the "authority to waive royalty payments to the State for any fixed period of time up to but not exceeding eight years."

Although administrative rules have not been adopted pursuant to Chapter 91, HRS, to implement such waiver provisions, the Board's assessment of any waiver application must include "the examination of such factors as the progress of geothermal development taking place in the State at the time of the application, the technical and financial capabilities of the applicant to undertake the project, and the need for providing a financial incentive in order for the applicant to proceed." We suggest that similar consideration also be given during the selection of a resource valuation method.

The statutory requirement for promulgation of rules to implement royalty waiver provisions (Section 182-18 (b), HRS) may also require formal adoption of administrative rules to legally establish and implement the resource valuation method ultimately selected by the Board. If this interpretation is correct, actual application of any method not currently set forth in Chapter 13-183, HAR, will have to be preceded by appropriate rule-making proceedings.

Theoretically, the Board could adopt a resource valuation method but DLNR may be prohibited from actual implementation until administrative rules are in place. However, it may be permissible for the Board to establish a minimum royalty payment, as provided by section 13-183-31 (a), during the interim period when rules are being promulgated. Perhaps more importantly, the minimum royalty could be used together with the MMS netback method to offset the early years of zero royalty payments. A legal opinion on this matter should be requested from the Office of the Attorney General.

Assuming there is agreement as to the setting of a minimum royalty payment, the question arises as to the basis for determining such payment. It is our understanding that federal leases establish a minimum resource value based on 1% of the gross revenues from the sale of electricity. The Board could similarly establish a minimum floor payment based on a percentage of the proceeds from the sale of electricity. The assumption being that minimum royalty payments stop when the actual calculated royalty payment becomes higher than the established minimum floor.

It is our understanding that PGV proposed a minimum royalty payment on the order of \$160,000 per year. (We assume this proposal was based on 1% of gross electrical revenues.) Specific details of this offer are not clear and were not made available for purposes of this analysis. Further, we believe that PGV's "offer" of a minimum payment was based on a credit as opposed to actual payments.

Recommendations

We support the concept of the "netback" method and the rationale that the selected resource valuation method should be applicable to all geothermal projects. To meet this objective and to reduce possible legal challenges, we believe that conformity with current MMS rules is essential.

Nonetheless, we also recognize that adoption of the current MMS netback method (without establishment of a minimum royalty payment) will result in zero royalty payments from anywhere between 7 to 14 years for the PGV project. However, subject to a legal interpretation, we believe that the Board's authority to establish a minimum royalty payment can provide an acceptable resolution.

As such, we have recommended that the Board adopt the current MMS resource valuation method and establish a minimum payment for those early years when the "calculated" geothermal royalty is zero. At the present time, we do not support the payment of a minimum royalty based on a credit against future geothermal royalty payments.

Establishment of a minimum royalty will result in immediate payments which we believe can be legally implemented during the interim period when administrative rules are being adopted to formally establish the MMS netback method, if required.

Assuming that parties can conceptually agree to adoption of the current MMS netback method, a negotiated percentage of profits could be used to arrive at a minimum royalty. However, subject to the Attorney General's opinion, the Board may be able to set the minimum royalty without requirement for negotiations.

Conclusion

The primary objective of this discussion was to identify available options and possible administrative/legal ramifications associated with adoption and implementation of a geothermal resource valuation method.

The analysis was conducted without the benefit of access to proprietary information supplied by the developer to DLNR, and no attempt was made to calculate actual royalty projections, present values, or total return over the estimated life of the project.