MASTER

**STATE GOVERNMENT WORKSHOP ON
BARRIERS AND INCENTIVES OF
GEOTHERMAL ENERGY RESOURCES**

**Quarterly Report
For Period November 1, 1978 - January 31, 1979**

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I. INTRODUCTION

With funds from the United States Department of Energy, Division of Geothermal Energy, the National Conference of State Legislatures has undertaken a project to stimulate and assist the review of state policies that affect geothermal development.

The NCSL Geothermal Policy Project has the following work tasks:

- Prepare background material for state geothermal policy reviews;
- Develop specific geothermal profiles for target states;
- Stimulate state decisions to review geothermal policies;
- Assist states in their analysis of geothermal issues;
- Review state policy analyses and legislative actions; and
- Formally review the project's methods and results.

State assistance will be in the form of

A. Reference Materials

1. "Packet of Background Materials" -- a comprehensive gathering of information on the nature of geothermal resources and the various development opportunities available including important state legislation and research studies;
2. "Geothermal Pamphlet" -- an introduction to the nature of geothermal resources, their beneficial uses, the role of state policies and the NCSL Geothermal Policy Project;
3. "State Profile" -- a concise description of a state's leading policy concerns and potential benefits from geothermal development, including an outline of the location and character of the state's geothermal resources and their potential applications;
4. "Summary of State Actions" -- a summary of state study results and legislative actions taken during the year.

B. State Presentations and Technical Assistance

As part of the policy review process, the project will provide individual assistance at the request of the state. In the form of workshops or through more informal contacts, project staff will assist in such areas as analyzing policy alternatives, describing legislative action taken in other states, and identifying important studies, expert witnesses and concerned parties available for assistance.

C. Assistance from Experts

To insure that the policy reviews conducted are thorough and complete, the project is designed so that the states receive the expertise of all parties concerned with geothermal development. Participating in the multifaceted effort will be

- State legislators;
- State legislative staff;
- State and local officials;
- Geothermal developers, investors, utilities and other concerned private groups;
- Consultants from public and private research institutions; and
- Representatives of the Division of Geothermal Energy, U.S. Department of Energy.

This fourth quarterly report--covering the period of November 1, 1978 through January 31, 1979--includes a discussion of project activities in the areas of

- State Activities,
- Development of Project Materials,
- Liaison Activities, and
- Advisory Committee Meeting.

II. EXECUTIVE SUMMARY

In its fourth quarter of activity, the National Conference of State Legislatures' Geothermal Policy Project concentrated its efforts in working directly with project states.

The most important area of state activity was conducting six workshops and meetings in three project states. The specific purposes of these workshops varied, but their overall objective was to develop legislative recommendations for introduction in 1979 legislative sessions.

In addition to planning and conducting the workshops, the project concentrated its efforts on preparing various materials for the policy review process in project states. Particular emphasis was placed on preparing background reports for legislative committees that highlighted legislative options and recommendations in policy areas where problems had been identified. The reports gave background information on the policy areas under study, outlined options available for consideration in the 1979 legislative sessions and made recommendations for actions to be taken.

Also, the project Advisory Committee met to review the project's first year. Positive comments were received on the project's method of operation, services provided state legislatures and the written material produced by the project.

III. ACTIVITIES

A. State Activities

1. Workshops and Meetings

Six workshops were held in project states during the fourth quarter.

For each workshop, planning efforts consisted of:

- Developing agendas,
- Recruiting resource persons,
- Developing state profiles and other workshop materials,
- Sending workshop announcements,
- Contacting attendees, and
- Overall meeting coordination.

Summaries of the workshops follow.

a. New Mexico (November 9)

Project staff presented a report "Legislative Recommendations on Geothermal Energy" to the New Mexico Interim Legislative Committee on Natural Resources at the State Capitol, Santa Fe, New Mexico. The presentations outlined specific legislative proposals for the committee's consideration. Recommendations for legislative action were made in six areas:

- Policy Area: Legal Status of Geothermal Resources
- Policy Area: Direct Use (Non-Electric Applications) of Geothermal Resources
- Policy Area: Energy Research and Development
- Policy Area: State Leasing System
- Policy Area: A Coordinated State Program for Geothermal Development
- Policy Area: Continued Study of Geothermal Development in New Mexico

Following the presentations and a discussion session, the committee unanimously adopted the report for inclusion in the committee's report to the New Mexico Legislative Council. In addition to the legislation and memorials approved in the report, the committee also passed a motion accepting project staff's recommendation to continue study in three areas ("Legal Status of Geothermal Resources," "Further Modification of Lease

System" and "Interagency Cooperation in Regulating Geothermal Development") with the intention of developing legislation to be considered during the 1979 legislative session. In addition to the legislative committee meeting, project staff also met with the officials of the New Mexico Oil Conservation Division to discuss proposed changes in geothermal regulations.

b. Delaware (November 15)

A "Workshop on Geothermal Energy" was held for the Delaware General Assembly at Legislative Hall, Dover, Delaware. Invited to attend the program were members of the Senate and House Energy and Natural Resources Committees and the legislative leadership (see Attachment A for agenda).

The workshop initiated the program of geothermal policy review by the Delaware General Assembly. Its purpose was to give key legislators an overview of geothermal energy and its potential uses in Delaware. Also, discussion was held on what current state laws exist that will affect development of geothermal energy, what potential problem areas exist and what areas will have to be addressed in dealing with geothermal development. At the conclusion of the presentations, a work plan was approved by the committee to guide the development of geothermal legislation.

c. Utah (December 21)

Project staff presented a report "Legislative Recommendations on Geothermal Resources" to the Utah Interim Committee on Natural Resources at the State Capitol, Salt Lake City, Utah. The presentation outlined specific legislative proposals for the committee's consideration. Recommendations for legislative action were made in three areas:

- Regulatory authorization and policy direction
 - Proposed legislation: Geothermal Resource Conservation Act
- Directuse of geothermal resources
 - Proposed legislation: District Heating Authorization Amendments
 - Proposed legislation: Alternative Energy Systems Feasibility Study Act
 - Proposed legislation: Alternative Energy Device Tax Credit
- Continued study of geothermal policies for Utah
 - Proposed legislation: Geothermal Policy Study Resolution

The committee recommended that the legislation be refined for introduction in the 1979 Utah legislative session.

d. Utah (January 19 and 26)

At the direction of the Utah Legislature's Interim Energy and Natural Resources Committee, two workshops were held on January 19 and 26 in Salt Lake City to review and refine the proposed "Geothermal Resource Conservation Act" for introduction during the 1979 legislative session. Members of the review committee represented the greatest geothermal expertise and involvement in geothermal development in Utah.

The geothermal act was examined in detail during the workshops. Problems and omissions in the act were identified and vigorously discussed in order to improve the provisions of the act. Written comments were prepared by many of the participants (see Attachment B for workshop summary and list of participants).

e. New Mexico (January 24)

Project staff met with legislative and executive officials concerning proposed legislation for introduction in the 1979 legislative session.

Meetings were held with:

- Senator Joseph Gant, Chairman, Senate Conservation Committee;
- Charles Young, Legislative Council;
- Daniel Nutter, Chief Supervisor, Oil Conservation Division; Department of Energy and Minerals;
- Lynn Teschendorf, General Counsel, Oil Conservation Division, Department of Energy and Minerals;
- Gene Gray, Director, Bureau of Water Rights, State Engineer's Office;
- Jack Kennedy, Director, State Lands Office;
- Oscar Jordan, General Counsel, State Lands Office;
- Charles Wood, Legislative Liaison, Department of Energy and Minerals.

As a result of the various meetings, agreement was reached that legislative recommendations approved by the Interim Committee on Natural Resources would be introduced in the 1979 legislative session. Project staff agreed to develop bill analyses for these proposals, including arguments for and against proposed legislation.

In terms of the areas designated for further study and development--the legal status of geothermal resources, further modifications of the leasing system and developing an interagency geothermal coordinating committee--contact was made with the executive agencies with jurisdiction over these areas. Their comments on the proposed legislation in these areas were solicited.

2. Work Plans

A final work plan was developed for Delaware (see Attachment C). The work plan outlines and prioritizes the areas to be addressed during the policy study and designates the organization taking the lead responsibility and a time deadline for each task. The plan calls for introduction of geothermal legislation in the 1979 legislative session.

B. Development of Project Materials

1. State Profiles

A preliminary state profile was developed for Delaware (see Attachment D). The profile organizes available information on geothermal energy for Delaware in the following categories:

- Description of geothermal resources
 - Characteristics
 - Locations
- Resource applications and economic value
- Current state statutes and regulations
- Areas of policy concern
- Contacts

2. Workshop Summaries

Summaries of the proceedings of the following workshops were prepared and distributed to workshop participants and, in some cases, to appropriate legislative committees:

- Delaware "Workshop on Geothermal Energy" (November 15) (see Attachment E)
- Virginia "Workshop on Geothermal Energy" (October 27) (see Attachment F)
- Oregon "Workshop on State Legislative Issues in Geothermal Energy" (October 4) (see Attachment G)

3. Background Reports

a. New Mexico

A report "Legislative Recommendations for Geothermal Development" was prepared for the New Mexico Interim Legislative Committee on Natural Resources (November 9 workshop). The report made recommendations for legislative action in six policy areas:

- Legal Status of Geothermal Resources
- Direct Use (Non-Electric Applications) of Geothermal Resources
- Energy Research and Development
- State Leasing System
- A Coordinated State Program for Geothermal Development
- Continued Study of Geothermal Development in New Mexico

In each area, background information was given on the issues and the problems identified as impeding efficient geothermal development. This information was followed by specific recommendations in the form of a committee resolution, joint legislative memorial or a bill (see Attachment H).

b. Utah

A report "Legislative Recommendations on Geothermal Resources" was prepared for the Utah Interim Committee on Energy and Natural Resources. The report gave background information on the policy areas under study, identified the issues to be addressed and made specific recommendations for legislative action. The following legislation was proposed:

- Geothermal Resource Conservation Act
- District Heating Authorization Amendments
- Alternative Energy Systems Feasibility Study Act
- Alternative Energy Device Tax Credit
- Geothermal Policy Study Resolution (see Attachment I)

In follow-up activity, project staff prepared a packet of information for the review committee workshops held on January 19 and 25. Included were:

- Proposed legislation "Utah Geothermal Resource Conservation Act"
 - Draft one
 - Draft two
 - Draft three
- Legal analysis of "Utah Geothermal Resource Conservation Act"
- Comments
 - NCSL
 - Amax Exploration, Inc.
 - Van Cott, Bagley, Cornwall and McCarthy
 - R.L. Knuth
 - Homestake Mining Company

(See Attachment B for copies of materials.)

c. Hawaii

A "Background Report on Geothermal Policy: Legislative Options and Recommendations" was prepared for the Hawaii Legislature. The report--based on issues discussed at the August 2, 1978 workshop--discussed the issue areas where problems had been identified, outlined options available for consideration in the 1979 legislative session and made recommendations for actions to be taken.

The following issue areas were covered in the report (see Attachment J):

- Ownership
 - State claims to geothermal resources underlying private lands
 - Native Hawaiian claims
 - Relationship to water resources
- Incentives
 - Stimulating utilization
 - Stimulating production
- Intra-governmental coordination
- Regulatory delays
 - Facilitating the regulatory process
- Direct use
 - Authorization for heating district formation
- Land use planning
 - Changes in land use law
- Lease stipulations

d. Oregon

A report "Legislative Recommendations on Geothermal Policy" was prepared for the Oregon Legislative Assembly. The paper gave background information on the policy issue areas outlined in the October 4 workshop and presented options the legislature has in taking actions to encourage geothermal development in the state.

The following issue areas were covered in the report (see Attachment K):

- Legal status of geothermal resources
 - Ownership
 - Classification (water issues) and regulatory authority
- Resource access
 - Access for exploration
 - Leases
 - Land use policies
- Field development
 - Fluid disposal
 - Facility siting
- Marketing
 - District heating
 - Utility regulation
- Financial incentives
 - Incentives to stimulate utilization of geothermal
 - Incentives to stimulate production of geothermal
 - Incentives to remove uncertainties over geothermal resources

C. Liaison Activities

1. U.S. Department of Energy

Project staff attended three meetings to monitor and discuss DOE geothermal activities:

- a. Workshop on Direct Utilization of Geothermal Energy, November 15-17, 1978, Keystone, Colorado;
- b. Workshop on Federal Omnibus Geothermal Legislation held in conjunction with the Geothermal Resources Council's "Workshop on Commercialization of Geothermal Energy," November 29, 1978, San Diego, California; and

c. Rocky Mountain Basin and Range Geothermal Users Workshop and Project Progress meeting, January 23-25, 1979, Pocatello, Idaho.

D. Advisory Committee Meeting

A meeting of the Geothermal Policy Project's Advisory Committee was held on December 13, 1978, in Washington, D.C. in conjunction with the NCSL State-Federal Assembly. The following members were present:

- Senator John Canulla, Rhode Island
- Senator Joseph Gant, New Mexico
- Senator Paul Hess, Kansas
- Senator Harris McDowell, Delaware
- Representative Daniel Pierce, Illinois

The purpose of the meeting was to receive legislator input into the review of the Geothermal Policy Project's first year. Comments were solicited in two major areas:

- a. The project's method of operation and services provided state legislatures in light of its goal of stimulating state action to encourage geothermal development and
- b. The written materials produced by the project.

Overall reaction by the legislators to the project was positive. It was their consensus that the project was providing a very valuable service to state legislatures and that the project should attempt to provide technical assistance to all states with potential for geothermal development.

The following materials were provided to the Advisory Committee members as examples of the type of work produced by the project and to show the progressive steps involved in developing legislative recommendations for consideration in project states:

- Project brochure
- "State Policies for Geothermal Development"
- "Issues in Geothermal Legislation"
- Oregon Preliminary State Profile
- Virginia Preliminary State Profile
- Summary of Proceedings for the Hawaii Workshop on State Legislative Issues in Geothermal Development

- Summary of Proceedings for the Delaware Workshop on Geothermal Energy
- "Background Report on Geothermal Policy," prepared for the New Mexico Interim Committee on Natural Resources
- "Legislative Recommendations on Geothermal Energy," prepared for the New Mexico Interim Committee on Natural Resources

IV. VARIANCES OR PROBLEMS

None

V. PLANS FOR FUTURE REPORTING PERIODS

The project's request for renewal is currently under consideration by the Department of Energy.

ATTACHMENT A
NATIONAL CONFERENCE OF STATE LEGISLATURES

Geothermal Policy Project

Workshop on Geothermal Energy

November 15, 1978

Delaware General Assembly
Legislative Hall
Dover, Delaware

1:30 p.m.	INTRODUCTIONS	Senator Harris McDowell Chairman Senate Energy Committee Rutherford C. Harris Director Geothermal Policy Project
1:45 - 2:15 p.m.	GEOHERMAL ENERGY: WHAT TYPE OF RESOURCE EXISTS IN DELAWARE?	Robert Jordan Delaware State Geologist
2:15 - 2:30 p.m.	DISCUSSION	
2:30 - 3:00 p.m.	GEOHERMAL ENERGY: WHAT POTENTIAL APPLICATIONS EXIST FOR MEETING THE STATE'S ENERGY NEEDS?	Fletcher Paddison Program Manager Applied Physics Laboratory Johns Hopkins University
3:00 - 3:15 p.m.	DISCUSSION	
3:15 - 3:45 p.m.	GEOHERMAL ENERGY: WHAT STATE LAWS WILL AFFECT THE DEVELOPMENT? WHAT POTENTIAL PROBLEM AREAS EXIST? WHAT AREAS SHOULD BE ADDRESSED IN DEVELOP- ING LEGISLATION?	David Press Special Assistant to the Governor for Energy
3:45 - 4:00 p.m.	DISCUSSION	
4:00 - 4:30 p.m.	WRAP-UP SESSION: HOW SHOULD THE DELAWARE GENERAL ASSEMBLY PROCEED IN DEVELOPING LEGISLATION TO FOSTER AND CONTROL DEVELOPMENT OF THE STATE'S GEOHERMAL RESOURCES?	Senator Harris McDowell Chairman Senate Energy Committee

ATTACHMENT B

SUMMARY

of

REVIEW COMMITTEE WORKSHOPS

on

GEOHERMAL RESOURCE CONSERVATION ACT

State of Utah

**National
Conference
of State
Legislatures**

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President
Jason Boe
President of
The Oregon Senate

Executive Director
Earl S. Mackey

**Utah Geothermal Resource Conservation Act
Review Committee Workshops**

By direction of the Utah Legislature's Interim Energy and Natural Resources Committee, the proposed Geothermal Resource Conservation Act has been refined for introduction during the 1979 session. Two review workshops were held in Salt Lake City for this purpose, January 19 and 26. Special attention was given to the relationship between geothermal resources and the water resources of the state.

Members of the review committee represented the greatest geothermal expertise and involvement with geothermal development in Utah (see attached roster).

The geothermal act was examined in detail during the workshops. Problems and omissions in the act were identified and vigorously discussed in order to improve the provisions of the act. Written comments were prepared by many of the participants (see attachments).

NCSL staff revised the act according to the January 19 discussions. The revision was distributed on January 23 for a follow-up meeting on the 26th. The revisions included numerous refinements in language, but in substance mainly concerned unitization provisions and the relationship between geothermal resources and water. Regarding water, the original draft of the act required geothermal developers to obtain water appropriations only to the extent that geothermal production affected standard ground and surface waters. The revisions agreed upon during the January 19 workshop require the developer to file for a geothermal fluid appropriation. An approved application establishes a priority date for the geothermal appropriation vis-a-vis standard water appropriations. No priority is established, however, between geothermal appropriations. Instead, geothermal production is regulated according to the principle of correlative rights.

The revised version of the act was thoroughly discussed on January 26. Some language refinements were agreed upon, but no substantial changes were recommended, except the addition of provisions for enforcement of the act, judicial review and injunctive relief. Except for Utah Power and Light, all parties concurred with the language and purposes of the act. Utah Power and Light objected to the fundamental approach of regulating geothermal development according to correlative rights.

NCSL staff incorporated the January 26 modifications and distributed the act on January 30 for final review before bill introduction in the legislative session.

APPENDIX A

Review Committee Members

<u>Name</u>	<u>Organization</u>	<u>Workshops</u>		<u>Written Comments</u>
		<u>19th</u>	<u>26th</u>	
Stan Green	UT Division of Water Rights	x	x	
Earl Stager	UT Division of Water Rights		x	
Ward Wagstaff	UT Division of Water Rights	x	x	
Vee Sharp	UT Office of Legislative Research	x	x	
Denise Dragoo	UT Energy Office (Asst. Atty. Gen.)	x	x	
Rick Knuth	UT Attorney General's Office	x		x
Verl R. Topham	Utah Power & Light Company	x	x	x
Bill Berge	Phillips Petroleum		x	
Bob Wright	Phillips Petroleum	x	x	
Dick Lenzer	Phillips Petroleum	x		
Charles E. Lee	Phillips Petroleum	x		
Dick Sager	Van Cott, Bagley, Cornwall & McCarthy (representing Phillips Petroleum)	x	x	x
Bill Long	AMAX Exploration	x	x	
Clayton Parr	Martineau and Maak (representing AMAX Exploration)	x	x	x
Dale Corman	Obrien Resources	x		
Owen Olpin	O'Melveny and Meyers	x		
Dennis Goldstein	Homestake Mining			x
Douglas Sacarto	National Conference of State Legislatures	x	x	x
Ken Wonstolen	National Conference of State Legislatures	x	x	x

GEOTHERMAL RESOURCE CONSERVATION ACT

1979

GENERAL SESSION

S.B. No. _____

By _____

AN ACT RELATING TO THE DEVELOPMENT OF GEOTHERMAL RESOURCES: DECLARING THE PUBLIC INTEREST; ASSIGNING REGULATORY AUTHORITY TO THE DIVISION OF WATER RIGHTS; DEFINING THE RESOURCE AND ITS RELATIONSHIP TO WATER; PROVIDING FOR THE PROTECTION OF CORRELATIVE RIGHTS AND THE PREVENTION OF WASTE; AUTHORIZING AND ESTABLISHING PROCEDURES FOR UNITIZATION OF GEOTHERMAL AREAS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF UTAH:

SECTION I. Declaration of Public Interest in Development of Geothermal Resources

It is declared to be in the public interest to foster, encourage and promote the discovery, development, production, utilization and disposal of geothermal resources in the State of Utah in such a manner as will prevent waste, protect correlative rights and safeguard the natural environment and the public welfare; to authorize, encourage and provide for the development and operation of geothermal resource properties in such a manner that the maximum ultimate economic recovery of geothermal resources may be obtained through, among other things, agreements for cooperative development, production, injection and pressure maintenance operations.

SECTION II. Lands to Which Act Is Applicable

This act shall apply to all lands in the State of Utah, including federal and Indian lands to the extent allowed by law. When such lands are committed to a unit agreement involving lands subject to federal or Indian jurisdiction, the Division may, with respect to such unit agreement, deem this act or any part of this act complied with, provided that the unit operations are regulated by the United States and the Division finds that conservation of geothermal resources and prevention of waste are accomplished under such unit agreement.

SECTION III. Definition of Terms

As used in this act, unless the context requires otherwise:

(a) "Correlative rights" means the rights of each geothermal owner in a geothermal area to produce without waste his just and equitable share of the geothermal resource underlying the geothermal area. Areal holdings and, when known, resource temperature, pressure, fluid quality and productivity are among the factors to be considered in determining correlative rights.

(b) "Division" means the Division of Water Rights, Department of Natural Resources, State of Utah.

(c) "Geothermal area" means the general land area which is underlain or reasonably appears to be underlain by geothermal resources.

(d) "Geothermal fluid" means water and steam naturally present in a geothermal system.

(e) "Geothermal resource" means (1) the natural heat of the earth at temperatures greater than 120 degrees centigrade, (2) the energy, in whatever form, present in, resulting from, created by or which may be extracted from that natural heat, including pressure, (3) the material medium containing the energy, and (4) all minerals, gases or other substances in solution with or obtained from the material medium but excluding oil, hydrocarbon gas and other hydrocarbon substances.

(f) "Geothermal system" means any strata, pool, reservoir or other geologic formation containing geothermal resources.

(g) "Material medium" means geothermal fluids, or water and other substances artificially introduced into a geothermal system to serve as a heat transfer medium.

(h) "Operator" means any person drilling, maintaining, operating, producing or in control of any well.

(i) "Owner" means any person who has the right to drill into, produce and make use of the geothermal resource.

(j) "Person" means any individual, business entity (corporate or otherwise) or political subdivision of this or any other state.

(k) "Waste" means any inefficient, excessive or improper production, use or dissipation of geothermal resources. Wasteful practices include but are not limited to:

1. Transporting or storage methods that cause or tend to cause unnecessary surface loss of geothermal resources.

2. Locating, spacing, constructing, equipping, operating, producing or venting of any well in a manner that results or tends to result in unnecessary surface loss or in reducing the ultimate economic recovery of geothermal resources.

(l) "Well" means any well drilled, converted or reactivated for the discovery, testing, production or subsurface injection of geothermal resources.

SECTION IV. Division of Water Rights--Power and Authority--Injunctive Relief

(1) The Division shall have and is hereby given jurisdiction and authority over all persons and property, public and private, necessary to enforce the provisions of this act and shall have the power and authority to make and enforce rules, regulations and orders and do whatever may reasonably be necessary to carry out the provisions of this act.

(2) Any affected person may apply for a hearing before the Division, or the Division may initiate proceedings upon any question relating to the administration of this act, and jurisdiction is hereby conferred upon the Division to hear and determine the same and enter its rule, regulation or order with respect thereto.

(3) The Division shall have the power to summon witnesses, to administer oaths, and to require the production of records, books and documents for examination at any hearing or investigation conducted by it.

(4) In case of failure or refusal on the part of any person to comply with a subpoena issued by the Division, or in case of refusal of any witness to testify as to any matter regarding which he may be interrogated, any District Court in the state, upon the application of the Division, may in term time or vacation issue an attachment for such person and compel him to comply with such subpoena, and to attend before the Division and produce such records, books, and documents for examination, and to give his testimony. Such court shall have the power to punish for contempt as in the case of disobedience to a like subpoena issued by the court, or for refusal to testify therein.

(5) Whenever it shall appear that any person is violating or threatening to violate any provision of this act or any rule, regulation, or order made hereunder, the Division shall bring suit in the name of the State against such person in the District Court in the county of residence of any defendant, or in the county of the residence of any defendant if there be more than one defendant, or in the county where the violation is alleged to have occurred, to restrain such person from continuing such violation or from carrying out the threat of violation. In such suit, the court may grant injunctions, prohibitory and mandatory, including temporary restraining orders and temporary injunctions.

(6) Nothing in this act, and no suit by or against the Division, and no violation charged or asserted against any person under any provisions of this act, or any rule, regulation or order issued hereunder, shall impair or abridge or delay any cause of action for damages which any person may have or assert against any person violating any provision of this act, or any rule, regulation, or order issued thereunder. Any person so damaged by the violation may sue for and recover such damages as he otherwise may be entitled to receive. In the event the Division shall fail to bring suit to enjoin any actual or threatened violation of this act, or of any rule, regulation or order made hereunder, then any person or party in interest adversely affected who has, ten days or more prior thereto, notified the Division in writing of such violation or threat thereof and has requested the Division to sue, to prevent any or further violation, may bring suit for that purpose in the District Court of any county in which the Division could have brought suit. If, in such suit, the court holds that injunctive relief should be granted, then the Division shall be made a part and shall be substituted for the person who brought the suit, and the injunction shall be issued as if the Division had at all times been the complaining party.

SECTION V. Division of Water Rights--Additional Powers

(1) The Division shall have the authority to require:

(a) Identification of the location and ownership of all wells and producing geothermal leases.

(b) Filing with the Division of a Notice of Intent (NOI) to drill, redrill, deepen, permanently alter the casing of, or abandon any well. Approval of the NOI must be obtained from the Division prior to commencement of operations.

(c) Keeping of well logs and filing true and correct copies with the Division. Such records shall be public records when filed with the Division, unless the owner or operator requests, in writing, that the records be held confidential. The period of confidentiality shall be set by the Division, but not to exceed five years from the date of production or injection for other than testing purposes or five years from the date of abandonment, whichever occurs first, as determined by the Division. Well records held confidential by the Division shall be open to inspection by those persons authorized in writing by the owner or operator. Confidential status shall not restrict inspection by state officer charged with regulating well operations or by authorized officials of the Utah Tax Commission for purposes of tax assessment.

(d) The spacing, drilling, casing, testing, operating, producing and abandonment of wells so as to prevent (1) geothermal resources, water, gases or other fluids from escaping into strata other than the strata in which they are found (unless in accordance with a subsurface injection program approved by the Division), (2) pollution of surface and groundwater, (3) premature cooling of any geothermal system by water encroachment or otherwise which tends to reduce the ultimate economic recovery of geothermal resources, (4) blowouts, cavings and seepage, and (5) unreasonable disturbance or injury to neighboring properties, prior water rights, human life, health and the environment.

(e) The operator to file cash or individual surety bonds with the Division for each new well drilled and each abandoned well redrilled. The amount of surety required shall be determined by the Division. In lieu of bonds for separate wells, the operator may file a blanket cash or individual surety bond in an amount set by the Division to cover all the operator's drilling, redrilling, deepening, maintenance or abandonment activities for wells in the state. Bonds filed with the Division shall be executed by the operator, as principal, conditioned on compliance with Division regulations in drilling, redrilling, deepening, maintaining or abandoning any well or wells covered by the bond and shall secure the state against all losses, charges and expenses incurred by it to obtain such compliance by the principal named in the bond.

Any bond filed with the Division in conformance with this act may, with the consent of the Division, be terminated and canceled and the surety be relieved of all obligations thereunder when the well or wells covered by such bond have been properly abandoned or another valid bond has been substituted therefor.

(f) The geothermal owner or operator to measure geothermal production according to standards set by the Division and maintain complete and accurate production records. The records, or certified copies, shall be preserved on file by the owner or operator for a period of five (5) years and shall be available for examination by the Division at all reasonable times.

(g) Filing with the Division any other reasonable reports which it prescribes regarding geothermal operations within the state.

(2) The Division may enter into private or public land at any time to inspect any well or geothermal resource development project to determine if such well or project is being constructed, operated or maintained according to any applicable permits and to determine if the construction, operation or maintenance of such well or project

subsurface, surface, or atmospheric resources. Authorized personnel of the Utah Tax Commission for purposes of tax assessment have the same rights of entry and inspection.

SEC. VI. Unit Operation of Geothermal Area--Division Powers and Duties

- (1) The Division upon its own motion may hold, and upon the application of any affected person shall hold, a hearing to consider the need for cooperative or unit operation of a geothermal area.
- (2) The Division shall make an order providing for the cooperative or unit operation of part or all of a geothermal area if the Division finds that such operation is reasonably necessary to prevent waste, to protect correlative rights or to prevent the drilling of unnecessary wells and will not reduce the ultimate economic recovery of geothermal resources.
- (3) An order for cooperative or unit operations shall be upon terms and conditions that are just and reasonable and satisfy the requirements of Section VI (2) of this act.
- (4) An order by the Division for unit operations shall prescribe a plan, including:
 - (a) A description of the geothermal area to be so operated, termed the unit area.
 - (b) A statement of the nature of the operations contemplated, the time they will commence, and the manner and circumstances under which unit operations shall terminate.
 - (c) An allocation to the separately-owned tracts in the unit area of the geothermal resources produced and of the costs incurred in unit operations. The allocations shall be in accord with the agreement, if any, of the affected parties. If there is no such agreement, the Division shall determine the allocations from evidence introduced in a hearing before the Division. Production shall be allocated in proportion to the relative value that each tract bears to the value of all tracts in the unit area. The acreage of each tract in proportion to the total unit acreage shall be the measure of relative value, unless the Division finds after public hearing that another method is likely to result in a more equitable allocation and protection of correlative rights. The method for allocating production in unit operations shall be revised if after a hearing the Division finds that the revised method is likely to result in a more equitable allocation and protection of correlative rights. The Division shall hold a hearing to consider adoption of a revised allocation method upon the application of any affected person, provided that such application may not be made until three years after the initial order by the Division or at less than two-year intervals thereafter.
 - (e) A provision for adjustment among the owners of the unit area (not including royalty owners) of their respective investment in wells, tanks, pumps, machinery, materials, equipment, and other things and services of value attributable to the unit operations. The amount to be charged unit operations for any such item shall be determined by the owners of the unit area (not including royalty owners), but if said owners of the unit area are unable to agree upon the amount of such charges, or to agree upon the correctness

of same, the Division shall determine them after due notice and hearing thereon, upon the application of any affected party. The net amount charged against the owner of a separately-owned tract shall be considered expense of unit operation chargeable against such tract. The adjustments provided for herein may be treated separately and handled by agreements separate from the unitization agreement.

(e) A provision providing how the costs of unit operations, including capital investments, shall be determined and charged to the separately-owned tracts and how these costs shall be paid, including a provision providing when, how, and by whom the unit production allocated to an owner who does not pay the share of the cost of unit operation charged to such owner, or the interest of such owner, may be sold and the proceeds applied to the payment of such costs. The operator of the unit shall have a first and prior lien for costs incurred pursuant to the plan of unitization upon each owner's geothermal rights and his share of unitized production to secure the payment of such owner's proportionate part of the cost of developing and operating the unit area. This lien may be established and enforced in the same manner as provided by sections 38-1-8 to 38-1-26 UCA inclusive. For such purposes any nonconsenting owner shall be deemed to have contracted with the unit operator for his proportionate part of the cost of developing and operating the unit area. A transfer or conversion of any owner's interest or any portion of it, however accomplished, after the effective date of the order creating the unit, shall not relieve the transferred interest of the operator's lien on said interest for the cost and expense of unit operations.

(f) A provision, if necessary, for carrying or otherwise financing any person who elects to be carried or otherwise financed, allowing a reasonable interest charge for such service payable out of such person's share of the production.

(g) A provision for the supervision and conduct of the unit operations, in respect to which each person shall have a vote with a value corresponding to the percentage of the costs of unit operations chargeable against the interest of such person.

(h) Such additional provisions that are found to be appropriate for carrying on the unit operations.

(4) No order of the Division providing for unit operations shall become effective unless and until the plan for operations prescribed by the Division has been approved in writing by those persons who, under the Division's order, will be required to pay 66 percent of the costs of the unit operation, and also by the owners of 66 percent of the production or proceeds thereof that are free of cost, such as royalties, overriding royalties and production payments, and the Division has made a finding that the plan for unit operations has been so approved. If the persons owning required percentage of interest in the unit area do not approve the plan within six (6) months from the date on which the order is made, such order shall be ineffective and shall be revoked by the Division unless for good cause shown the Division extends this time.

(5) An order providing for unit operations may be amended by an order of the Division in the same manner and subject to the same conditions as an original order for unit operations; provided that if such amendment affects only the rights and interests of the owners, the approval of the amendment by the owners of royalty, overriding royalty, production payments and other interests which are free of costs shall not be required. Production allocation may be amended only according to the provisions of Section VI (4) (c) of this act.

(6) All operations, including, but not limited to, the commencement, drilling, or operation of a well upon any portion of the unit area shall be deemed for all purposes the conduct of such operations upon each separately-owned tract in the unit by the several owners thereof. The portions of the unit production allocated to a separately-owned tract in a unit area shall, when produced, be deemed, for all purposes, to have been actually produced from such tract by a well drilled thereon. Good faith operations conducted pursuant to an order of the Division providing for unit operations shall constitute a complete defense to any suit alleging breach of lease or contractual obligations covering lands in the unit area to the extent that compliance with such obligations cannot be had because of the order of the Division.

(7) The portion of the unit production allocated to any tract, and the proceeds from the sale thereof, shall be the property and income of the several persons to whom, or to whose credit, the same are allocated or payable under the order providing for unit operations.

(8) Except to the extent that the parties affected so agree and as provided in Section VI (4) (e) of this act, no order providing for unit operations shall be construed to result in a transfer of all or any part of the title of any person to the geothermal resource rights in any tract in the unit area. All property, whether real or personal, that may be acquired in the conduct of unit operations shall be acquired for the account of the owners within the unit area and shall be the property of such owners in the proportion that the expenses of unit operations are charged.

(9) An order of the Division for unit operations shall constitute a complete defense to any suit charging violation of any statute relating to trusts, monopolies and combinations in restraint of trade on account of unit operations conducted pursuant to the order.

SEC. VII. Relationship to Water--Application to Appropriate--Nature of the Right

- (1) Geothermal fluids are deemed to be a special kind of underground water resource, related to and potentially affecting other water resources of the state. The utilization or distribution for their thermal content and subsurface injection or disposal thereof shall constitute a beneficial use of the water resources of the state.
- (2) (a) Geothermal owners shall, prior to the commencement of, or increase in, production from a well or group of wells to be operated in concert, file an application with the Division to appropriate such geothermal fluids as will be extracted from such well or group of wells. Publication of applications shall be made as provided in Section 73-3-6 of this Title, and protests may be filed as provided in Section 73-3-7 of this Title. The Division shall approve an application if it finds that proposed extraction of geothermal fluids will not materially impair existing rights to the waters of the state, but such determination shall be made without regard to possible impairment of rights to geothermal fluids.

(b) The Division may grant the quantity of an application on a provisional basis, to be finalized upon stabilization of well production. Flow testing of a discovery well shall not require an application to appropriate geothermal fluids.
- (3) The date of an application to appropriate geothermal fluids, when approved by the Division, shall be the priority date as between the geothermal owner and the owners of rights to water other than geothermal fluids. No priorities shall be created among geothermal owners by the approval of an application to appropriate geothermal fluids. Geothermal resources and associated geothermal fluids shall be allocated among common geothermal owners according to the principle of correlative rights.

SEC. VIII. Actions to Test Validity of Act, Rule, Regulation, or Order--False Entries In Reports

- (1) Any person adversely affected by any rule, regulation or order issued under this act, may within ninety (90) days after the entry thereof bring a civil suit or action against the Division in the District Court of Salt Lake County, or in the District Court of the county in which the complaining person resides, or in the U.S. District Court for Utah (if it otherwise has jurisdiction), and not elsewhere, to test the validity of any provision of this act, or rule, regulation or order, or to secure an injunction or to obtain other appropriate relief, including all rights of appeal.
- (2) An action or appeal involving any provision of this act, or a rule, regulation or order shall be determined as expeditiously as feasible. The trial court shall determine the issues on both questions of law and fact and shall affirm or set aside such rule, regulation or order, or remand the cause of the Division for further proceedings. Such

court is hereby authorized to enjoin permanently the enforcement by the Division of this act, or any part thereof, or any act done or threatened thereunder, if the plaintiff shall show that as to him the act or conduct complained of is unreasonable, unjust, arbitrary, or capricious, or violates any constitutional right of the plaintiff or if the plaintiff shows that the act complained of constitutes or results in waste, or does not in a reasonable manner accomplish an end that is the subject matter of this act.

- (3) Any person who, for the purpose of evading this act or any rule, regulation or order of the Division, shall make or cause to be made any false entry in any report, record, account, or memorandum required by this act, or by any such rule, regulation, or order, or shall omit or cause to be omitted from any such report, record, account or memorandum, full, true and correct entries as required by this act, or by any such rule, regulation or order, or shall remove from this state or destroy, mutilate, alter or falsify any such record, account, or memorandum, shall be guilty of a misdemeanor and, upon conviction, shall be subject to a fine of not more than five-thousand dollars (\$5,000) or imprisonment for a term not exceeding six (6) months, or to both such fine and imprisonment.
- (4) No suit, action or other proceeding based upon a violation of this act or any rule, regulation or order of the Division hereunder shall be commenced or maintained unless same shall have been commenced within one (1) year from date of the alleged violation.

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LEGAL ANALYSIS OF UTAH
GEOTHERMAL RESOURCES CONSERVATION ACT

I. GENERALLY

A. State Power to Regulate the Resource

1. The public at large has sufficient interest in the preservation of natural resources to justify legislation to prevent exploitation or waste thereof.

--Ohio Oil Co. v. Indiana 177 US 190 (1900)

--Eden Irrig. Co. v. Dist. Ct. 66 U 103, 211 P 957 (1922)

B. State Power to Establish Categories of Property Rights and Adjust Competing Claims

1. The right to acquire, possess and protect property is subject to the police power of the state.

--State v. Briggs 46 U 288, 146 P 261 (1915)

2. Every owner must use his property so as to not unreasonably injure other property rights, and the state may reasonably regulate and restrain such use of property.

--Bountiful City v. De Luca 77 U 107, 292 P 194 (1930)

II. SECTION VIII (WATER MATERIAL)

A. Requirement of a Permit to Appropriate Geothermal Fluids

1. Underground water must be appropriated and a valid water right established.

--Sec 73-3-1, 2 UCA (1953)

--Snake Creek Min. & Tunnel Co. v. Midway Irr. Co. (CA8) 271 Fed. 157,
aff'd. 260 US 596 (1923)

B. Protection of Priority vis-a-vis Junior Appropriators

1. Priority constitutes part of a property right to water

--Whitmore v. Murray City 107 U 445, 154 P 2d 748 (1944)

C. Non-Application of Priority/Quantity vis-a-vis Competing Geothermal Owners

1. There is no precedent for this feature, since the "correlative water right" for geothermal fluid production is a new creation. Authority may be inferred from the state's general power to regulate property (cases supra).

- a. The police power is not confined within the narrow circumspection of precedents, resting upon past conditions; the police power develops to meet changing conditions

--Candlestick Properties Inc. v. San Francisco Bay Cons. & Dev. Comm. Cal. App. 2d, 89 Cal. Rptr. 897 (1970)

D. Curtailment of Production of Junior Appropriators

1. Appropriators have priority according to respective dates of appropriation.

--Sec. 73-3-21 UCA (1953)

NOTE: In 73-3-21, a preference is given to domestic and agricultural use in times of scarcity. The Geothermal Resources Conservation Act gives a preference to "geothermal water use" vis-a-vis subsequent appropriators regardless of use or scarcity.

E. Provision of Offsets or Compensation to Senior Appropriators

1. Junior appropriators of groundwater are granted the right to condemn and replace the water use of senior appropriators of groundwater.

--Sec. 73-3-23 UCA (1953)

--Riordan v. Westwood 115 U 215, 203 P 2d 922 (1949)

2. The right of replacement includes the payment of damages (additional lift costs)

--Hanson v. Salt Lake City 115 U 404, 205 P 2d 255 (1949)

F. The Right to Condemn Senior Water Rights

1. All classes of private property may be taken for public use when such taking is authorized by law

--Sec. 78-34-3 (6) UCA (1953)

- a. Whether private condemnation and compensation can constitute a taking for "public use"

- i. Public use is that which will promote the public interest in the development of the natural resources of the commonwealth

--Nash v. Clark 27 U 158 (1904) aff'd. 198 US 361 (1905)

- ii. There is nothing which prevents a state in carrying out its declared public policy from requiring individuals to make to each other, on due compensation, such concessions as the public welfare demands

--Highland Boy Gold Min. Co. v. Strickley 28 U 215 (1904) aff'd. 200 US 527 (1906)

G. Correlative Rights for Geothermal and Associated Water Resources

1. Every owner must use his property so as not to injure others

--Bountiful City v. De Luca (supra)

- a. When legislative action is within the scope of the police power, fairly debatable questions as to its reasonableness, wisdom and propriety are not for the determination of the courts but for that of the legislative body

--Standard Oil v. Marysville 279 US 582 (1929)

2. Whether retroactive imposition of correlative rights effects a taking of property: the priority of water rights applied for under existing law for geothermal resources

- a. An application for a water right is not a vested property right

--Opinion of the Utah Attorney General

- b. That the exercise of police power regulations may to some extent prevent enjoyment of individual rights in property or cause loss to the owner, does not necessarily render the exercise unconstitutional; such laws are not considered as appropriating private property for public use, but simply as regulating its use and enjoyment. Provided that, constitutional mandates are not invaded by a confiscation, destruction or deprivation of property.

--Bountiful City v. De Luca (supra)

- c. Whether retroactive imposition of correlative rights confiscates the value of existing water rights applications via "inverse condemnation"

- i. The early applicants will still need water rights for their geothermal fluid production for protection against subsequent water appropriators; thus value will accrue to those which are granted. The increment of value lost is that which priority for a quantity of production would add to a correlative share. An otherwise valid exercise of police power is not unconstitutional merely because it deprives property of its highest economic use. The reduction in value may exceed 90% without constituting a taking.

--Goldblatt v. Hempstead 369 US 590 (1963)

--Hadacheck v. Sebastian 239 US 394 (1915)

COMMENTS OF AMAX EXPLORATION, INC. ON PROPOSED
GEOTHERMAL RESOURCE CONSERVATION ACT, BEFORE THE
ENERGY AND NATURAL RESOURCES COMMITTEE,
UTAH STATE LEGISLATURE

Section III--Definitions.

(d) Definition of "Geothermal Resource." By restricting the scope of the term "geothermal resource" to heat greater than 250 degrees Fahrenheit, the jurisdictional definition would not cover low-heat geothermal developments such as green houses, space heating, etc. This leaves a question as to whether or not such developments are to be regulated at all, and, if so, by whom and under what authority. Clarification is needed in this regard.

Section IV--Power and Authority of Division of Water Rights.

Subsection (3) is the only reference in the proposed Act bearing on judicial review of Division actions. It is deficient since it simply says that the Division may sue or be sued in any state or federal district court of competent jurisdiction. Unlike the federal system, Utah does not have a broad administrative procedures act with general applicability over regulatory agencies. Therefore, the Act must provide for the orderly review of a Division action in order to provide necessary procedural safeguards. Reference should be made to Sections 40-6-8, 9, and 10 of Utah Code Annotated wherein procedural and judicial review provisions are established in respect of actions of the Board of Oil, Gas, and Mining, which exercises controls similar to those now being proposed for the Division of Water Rights.

Section V--Additional Powers of Division of Water Rights.

Paragraph (1)(c) provides for a period of confidentiality for information supplied to the Division extending five years from the date of production or injection, or abandonment, whichever occurs first. It is unclear whether the five-year period would apply to abandonment as well as to production or injection. In any event, it is suggested that a two-year period of confidentiality be provided for after abandonment since a well can be abandoned and still form the basis for additional exploration in the immediate area. It is suggested that the phrase "two years from the date of" be inserted before the word "abandonment."

Subparagrah (1)(d)(1) prohibits escape of geothermal fluids into strata other than the strata in which they are found. It is suggested that the parenthetical "(except in accordance with an approved reinjection program)" be inserted after the word "found" and before the comma, to allow flexibility in the reinjection of excess fluids.

Subparagraph (e) regarding furnishing of security is too vague. Security is ordinarily provided in connection with plugging wells and reclaiming disturbed surface. It would be an excessive burden to require a bond or other security to guarantee compliance with all of the regulations of the Division. It is suggested that reference be made to Section 40-6-5 of Utah Code Annotated which limits the responsibility of furnishing security to performance of the duty to plug dry or abandoned wells.

Section VI--Unitization.

Subparagraph (1) should be modified to provide that a hearing will be held not only on the need for co-operative or unit operation of a geothermal area, but also on the details of the terms and conditions to be imposed should that need be determined to exist.

Subparagraph (1) should be modified to provide for a hearing upon the application of any "affected" person rather than any "interested" person.

Subparagraph (1) refers to "cooperative" or unit operation of a geothermal area; however, the remainder of Section VI refers only to unitization. In order to provide the Division with flexibility, and to reflect the fact that the objectives to be attained by unitization can also be attained through a cooperative agreement, Section VI should be revised throughout its entirety to make reference to both possible arrangements.

Subparagraph (3) requires that the Division impose terms and conditions that are simply "just and reasonable." Since the exercise of authority to create a unit rests upon a determination made according to Subparagraph (2), it is suggested that the terms and conditions should also achieve the objectives set forth in Subparagraph (2). Accordingly, the following should be inserted after the word "that" and before the word "are" in the first line.

"prevent waste, protect correlative rights, prevent the drilling of unnecessary wells, and increase the ultimate economic recovery, and"

Subparagraphs (3)(a)-(d) are patterned after similar provisions of Section 40-6-17 of the Oil and Gas Conservation Act. Other essential provisions are, however, omitted. Subparagraphs (d)-(g) of Section 40-6-7 pertain to adjustments in accounts and respective interests of the participants, allocation of costs of unit operations, financing of a person who elects to be carried, and supervision and conduct of unit operations. Such matters must be dealt with in any unit plan. By not addressing these subjects, the Legislature would be leaving them entirely to the discretion of the Division. It is suggested that the Legislature in this instance should follow the practice established with the Oil and Gas Conservation Act to provide the Division with more specific direction with respect to formation of a unit plan.

Subparagraph (3)(c) provides for allocation of production on the basis of evidence introduced at a hearing before the Division. The method of allocation to individual tracts is one of the principle considerations in formulating a unit plan. Allocation must be fair and equitable to avoid the possibility that the owner of any tract will be allocated an unreasonably small proportion of production from the unit area. It is suggested that reference be made to Section 40-6-17 of the Oil and Gas Conservation Act wherein this problem was dealt with by the Legislature by providing that the production allocated to each tract shall be "the proportion that the relative value of each tract so determined bears to the relative value of all tracts in the unit area." Although it may be difficult to determine the relative value of the respective tracts, said determination must be made in order to avoid an unconstitutional taking of a valuable property right through inequitable allocation of production.

Subparagraph (4). In order to ensure that a single party who controls a large block of land cannot arbitrarily subject substantial minority owners to an inequitable unit agreement, and to be consistent with Section 40-6-17(7) of the Oil and Gas Conservation Act, approval of those persons who hold an 80% interest should be required rather than 60% as now provided.

Subparagraph (6) protects the unit participant from the risk that a lease or contractual obligations will be breached as a result of compliance with the order of the Division in respect of the unit. Language should be inserted in this provision to state specifically that operations on any portion of the unit area are considered to constitute operations on all portions of the unit area. Otherwise, leases may terminate automatically for failure by the lessee to engage in operations within the time permitted by the lease. Such a determination would ordinarily take place without there being any breach and without the necessity on the part of the lessor to initiate any action alleging a breach.

Section VII--Relationship of Geothermal Resources and Water Resources.

Subparagraph (1) states that when interference between geothermal water rights is demonstrated, the prior right shall take precedence. The priority date of a water right is easy to determine; however, there is no apparent basis for determining the priority date for a geothermal right. Clarification must be provided as to the conditions under which a geothermal right will be considered to be prior to an existing water right that is affected by geothermal operations.

In view of the previous policy at the Division to require that a geothermal developer possess a valid water right through an application to appropriate, a question exists to whether the Legislature can now retroactively abolish those rights.

Many questions are left unanswered by Subparagraph (2), which describes the steps that may be taken by the Division to protect the holder of a prior right. Ordinarily, a party alleging injury or damage by virtue of interference with a prior water right would seek redress in the courts. The possible remedies are numerous and the procedural burdens clearly established. Although there would be advantages to having the Division make a preliminary determination of such matters, it is likely that a dispute, if it cannot be settled amicably, would still ultimately be resolved by the courts. Therefore, unless an elaborate program for dealing with situations where geothermal operations interfere with prior rights is adopted, it would seem preferable to leave the matter for determination by the courts.

General.

A serious omission in the proposed Act is the lack of any reference to drilling or "pooling" units similar to that contained in Section 40-6-6 of the Oil and Gas Conservation Act. Although the Division of Oil, Gas and Mining has jurisdiction both to create drilling units and field units, that jurisdiction is exercised almost exclusively in the formation of drilling units. This authority allows the Division to permit drilling to take place within a spacing area by "force pooling"--that is, entering an order that is binding on nonconsenting property owners. It is possible that the Division of Water Rights may find itself in need of similar jurisdiction in respect of spacing areas in a geothermal field. Accordingly, consideration should be given to inserting a provision for the establishment of drilling units under the Geothermal Act.

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OF COUNSEL
CLIFFORD L. ASHTON

Mr. Vee J. Sharp
Research Analyst
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Re: Proposed Geothermal Resources Legislation

Dear Mr. Sharp:

The Geothermal Resource Conservation Act which has been prepared by the Energy and Natural Resources Committee represents what our client, Phillips Petroleum Company, feels is a step in the right direction. As Robert L. Wright of Phillips has stated at previous Committee meetings, Phillips recognizes the difficulty in drafting legislation which will be suitable to all interests; however, Phillips feels it is essential to the geothermal industry and to the State of Utah that specific authority and guidelines be given to the Division of Water Rights so that the State Engineer can proceed and act upon pending geothermal applications in order that development of geothermal resources can be accomplished in Utah without further undue delays. We feel that your office and Doug Sacarto should be complimented for your efforts in putting together what appears to be a workable bill.

Phillips Petroleum Company has some concerns, however, with certain portions of the proposed bill. This letter addresses those concerns.

Section III--Definitions.

The definition of "geothermal resource" in subsection (d), which provides for a cutoff point between water and

Mr. Vee J. Sharp
January 17, 1979
Page Two

geothermal resources at 250° Fahrenheit, may cause problems of the type described in Dennis Goldstein's letter to Doug Sacarto of January 8, 1979. However, Phillips believes that the apparent purpose of such a definition, namely to remove geothermal resources from the doctrine of water appropriation, is a salutary objective. Perhaps the general cutoff point of 250° can be established, with some discretion left in the State Engineer to determine from evidence adduced at a hearing whether a particular application which falls slightly above or below that point is to be regarded as an application for geothermal resources or for water. After that determination is made, the State Engineer could then process the application as a geothermal resources application or a water application, subject of course to the right of appeal to the court under existing statute.

There are some troubling aspects in the proposed definition of geothermal resource in subsection III(d)(4). That subparagraph embraces in the definition of geothermal resources "all minerals in solution or other products obtained from those naturally heated fluids, brines, associated gases and steam, in whatever form, found below the surface of the earth, but excluding oil, hydrocarbon gas and other hydrocarbon substances." Geothermal resources are further declared to be a mineral resource. That portion of the definition is troublesome in that it does not mention the purpose such definition is intended to serve. Without limiting the applicability of such declaration, it may be interpreted as creating or supporting a claim of ownership rights to geothermal resources by holders of mineral interests in fee and federally-owned lands where the holders of such mineral interests do not presently own the rights to the geothermal resources. For example, a fee tract may be subject to two separate leases, one covering the mineral estate and the other covering the geothermal estate. In such a situation, a conflict may exist between the lessees as to their respective rights, and proposed subparagraph (d)(4) would tend to favor the mineral owner's claim to the geothermal resources. Similarly, on public domain lands of the United States which are open not only to geothermal leasing but also to the location of mining claims, the declaration that geothermal resources is a mineral could have the effect of strengthening a mining claimant's assertion that he owns the geothermal resources within his claim.

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To obviate such results, it would seem that a more accurate description of the unique nature of geothermal resources should be set forth in the bill, such as the Idaho provision which declares geothermal resources to be sui generis, being neither a mineral resource nor a water resource, but closely related to and possibly affected by water and mineral resources in many instances. Such a provision would not tend to favor one party over the other which could otherwise be the case if the legislature declared geothermal resources to be a mineral.

Section VI--Unitization.

The allocation of production in a unitized area under subsection VII(3)(c) is too open-ended in view of generally accepted practices in the geothermal industry. As stated on page 9 of Cargill and Conover's article, Concepts in Unitization of Federal Geothermal Leases, "for an exploration unit, acreage is the only parameter known with certainty throughout the area. Therefore, except in rare and unusual circumstances, the allocation formula for an exploration unit is based solely on the acreage in the participating area." After production has been begun, it is recognized that the formula for allocation of production of unitized substances can be based on several parameters, the selection of which and the percentage weight given to each should depend on the circumstances involved. However, to be considered productive, an area must be "nearly developed or completely developed." Phillips therefore strongly concurs with Dennis B. Goldstein's suggestion that some statutory guidance should be provided to the State Engineer by requiring that allocation be based upon the proportionate acreage that each tract bears to the total unit acreage unless the State Engineer finds at a hearing that another method is likely to result in a more equitable allocation. Such a provision would place the burden of proving that an allocation on other than acreage basis would be more equitable than the traditional allocation based on acreage.

In the judgment of the Phillips Petroleum Company, the provision that approval of only 60 percent of persons who hold interests in a unit is required for the State Engineer's unitization order to become effective is a reasonable and workable provision. A more stringent requirement of 80 percent as suggested by some parties would be inconsistent with

Mr. Vee J. Sharp
January 17, 1979
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the Act's purpose of encouraging unitization for the economic development of a common reservoir.

Section VII--Relationship of geothermal resources and water resources.

Subsection (1) provides that the prior right will take precedence where interference between a geothermal right and a water right is demonstrated. The proposed statute does not indicate how the priority of geothermal rights is to be established, while the priority of water rights historically has been based upon the date a water application is filed in the State Engineer's office. Because the only State system to date for acquiring geothermal rights has involved the filing of a water application covering geothermal fluids, there would seem to be merit in recognizing or granting priorities to geothermal applicants who have diligently prosecuted their applications through the drilling of exploratory wells, have completed hearings under the water statute, and who pursuant thereto have developed wells through the expenditure of significant sums of money. A statutory scheme which does not protect the rights of a geothermal developer who has taken all of the foregoing steps could be construed as retroactively abolishing or impairing those rights, would be manifestly unjust, and could raise constitutional issues. It would therefore seem advisable to include a savings or grandfather clause which in effect would recognize and perpetuate the rights acquired by a geothermal developer who had taken all of the foregoing steps under the previously-existing statutory and regulatory framework.

Robert L. Wright of Phillips Petroleum Company and I will be pleased to work with you and the other parties that are concerned with this legislation in the hope that a satisfactory bill can be enacted which will encourage rather than impede further development of geothermal resources within this state.

Very truly yours,

Richard K. Sager

RKS/vf

VAN COTT, BAGLEY, CORNWALL & MCCARTHY

Mr. Vee J. Sharp
January 17, 1979
Page Five

cc: Doug Sacrato
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January 10, 1979

Mr. Doug Sacarto
National Conference of State Legislators
1405 Curtis Street
Suite 2300
Denver, Colorado 80202

Dear Mr. Sacarto:

Utah Power & Light Company has a number of concerns with respect to proposed geothermal legislation in Utah, at least in its present form.

We are concerned that to exempt geothermal steam from application of the State's water law simply opens the door to an attempt to exempt great quantities of water from application of the water law if the water can be devoted to special uses. We have difficulty understanding why geothermal steam is any different from any other water simply because it is used to turn a turbine. We might point that the remarkable similarity to hydroelectric plants which have used falling water as opposed to hot water to turn turbines and generate electricity for many years.

We are concerned that any attempt to create property rights in geothermal steam will vest constitutionally protected rights with which the State will be powerless to apply water law in the event circumstances develop in which water law principles would be appropriately applied. While we assume that present plans in the Roosevelt Springs area would be that the water would not be adapted to any other use than the production of electric energy, we are not convinced that would be the case in all geothermal fields and to create property rights in water and make water subject to different laws in certain circumstances than in others would create havoc for all water users in the State of Utah.

We are also concerned about the impact that such legislation might have upon the State's ability to exercise any control over geothermal steam on Federal lands. The ownership of ground water existing under Federal lands in Utah is,

Mr. Doug Sacarto
January 10, 1979
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I think at best, unclear. Once the State of Utah has declared that geothermal steam is not water, however, I think the State has given up any hope it might have to gain some control over its development or use on Federal lands. Certainly, one of the most pressing problems facing the State of Utah at this time is control of Federal lands. It is clear that so much of Utah is owned by the Federal Government that the use of all lands in the State can be virtually controlled by restrictions placed on use of Federal land. It would, in our opinion, be a great mistake to abdicate whatever rights the State of Utah might have in any kind of ground water now existing under those Federal lands.

Utah Power is not cognizant of any major problems which exist in the development of geothermal energy because it would be subject to the State's water law. We have done substantial investigation and exploration on our own behalf for geothermal energy and we have had discussions with every known potential supplier of geothermal energy in the State and we remain unconvinced that the application of water law to geothermal steam shows any substantial hinderance to the development of geothermal energy in this State. We do believe that the water law of Utah is somewhat different than some other states, particularly the State of California, and that simply using solutions which may have been found effective in those states for the State of Utah may create more problems than solutions when superimposed over Utah's water laws.

I look forward to further discussion on this matter with interested parties and will cooperate in any reasonable way to solve any problems which now inhibit the development of geothermal steam in Utah.

Very truly yours,

VERL R. TOPHAM

VRT:mb

cc: Clayton Parr
Richard Sager
Stan Green
V. Sharp
Dallin Jensen
Dennis Goldstein
Owen Olpin

M E M O R A N D U M

TO: National Council of State Legislatures

FROM: R. L. Knuth

RE: Proposed Geothermal Resource Conservation Act

Nature of the Resource

The nature of the geothermal resource is carried in the word itself; literally, "earth-heat." That is, the energy from the earth's radioactive core in the form of heat.

Because the idea of harnessing the earth's heat has attracted widespread interest only recently, how the geothermal resource fits into traditional property concepts has been a point of some contention. The two major classifications have been mineral and water, though some states have carved out a unique category. Strictly speaking, neither the mineral nor water classifications completely encompass the nature of the geothermal resource, and the protections afforded vested property rights preclude the arbitrary application of any such definition.

The mineral classification is the more prevalent and allows for a more extensive proprietary interest than water. The geothermal resource is analogized to reservoirs of oil and gas. Classification as water opens the geothermal resource to wider state controls since, in the West, water is not generally susceptible to exclusive ownership. Thus, unlike a mineral estate, the landsman has no right to use the geothermal resource unless he has just perfected a valid appropriation. The "sui generis" classification makes the geothermal resource unique, and thus requires only incidental conformity to related resources. It should be recalled, however, that regardless of how it is classified, water remains the medium by which the earth's heat is conveyed and made to work.

The Federal Definition

The federal treatment of geothermal resources is provided for in the Geothermal Steam Act of 1970 which states:

Geothermal steam and associated geothermal resources means (i) all products of geothermal processes, embracing indigenous steam, hot water and hot brines; (ii) steam and other gases, hot water and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations; (iii) heat or other associated energy found in geothermal formations; and (iv) any byproduct derived from them.

That this Act constitutes a mineral classification may be seen from that provision which authorizes the Attorney General to quiet title to geothermal rights on any land the surface of which has passed from federal ownership but where the United States has reserved the mineral rights. The Court of Appeals for the Ninth Circuit stated in the recent case of U.S. v. Union Oil Co., 549 F.2d 1271, 1273-4, (1977): "All of the elements of a geothermal system—magma, porous rock strata, even water itself—may be classified as 'minerals'."

It should be noted here, that in 1967 the Secretary of the Interior withdrew from appropriation under public land laws, all federal land valuable or potentially valuable because of the presence of geothermal steam. Therefore, it may be argued that there exists a federal reserved right to geothermal waters analogous to the federal reserved water rights doctrine.

Utah's Proposed Geothermal Resource Conservation Act

A. Nature of the Resource

Heretofore, the nature of the geothermal resource has remained undefined, though in 1973 the Division of Water Rights was granted authority over all wells used for geothermal purposes. U.C.A., Section 73-1-20. The proposed Geothermal Resource Conservation Act defines the geothermal resource as:

. . . (1) the natural heat of the earth at temperatures greater than 250 degrees fahrenheit, (2) the energy, in whatever form, below the surface of the earth present in, resulting from, created by, or which may be extracted from, that natural heat, including pressure, (3) the natural or artificial medium containing the energy, and (4) all minerals in solution or other products, . . . in whatever form . . . Geothermal resources further are found and hereby declared to be a mineral resource. (Emphasis added)

The proposed Act follows the California model in that it defines the geothermal resource as the energy of the earth's natural heat and declares it to be a "mineral". However, like the federal definition the Utah Act specifically includes the medium as part of the resource. This reinforces the mineral classification and sidesteps potential conflicts where the surface owner has rights to the water but not the mineral estate, which would include dissolved byproducts in the water.

However, though the Act declares the geothermal resource to be a mineral resource, in actuality it creates a dual-system, since it must be regarded as water insofar as it interferes with a conventional water use or is less than 250 degrees. Moreover, since geothermal resources are placed under the jurisdiction of the Division of Water Rights and a valid appropriation permit is required for a well, the Act necessitates a two-step process for geothermal development; first, the mineral rights must be procured, followed by the perfection of a sufficient water right.

B. Relationship to Water Resources

Section VII (1) of the Act states:

Geothermal resources are presumed to be separate from water resources in the state. Where interference between geothermal rights and water rights is demonstrated, however, the prior right shall take precedence.

Thus, though a rebuttable presumption is raised that the two resources are separate, where the geothermal developers operations interfere with a conventional use of water, he is treated as simply another appropriator. Where injury to a conventional water user senior in time, the State Engineer may order an offset or curtailment of production from the geothermal wells. A geothermal developer with a senior water right has the reciprocal rights.

There are several sources of conflict between conventional water users and geothermal developers. The first are suits involving competition for a common supply. These could involve suits by private appropriators or arise from the refusal of an appropriation permit by the State for geothermal developments determined not to be in the public interest. The second source of litigation would relate to claims that geothermal operations have polluted a source of fresh water. Note that the presumption of the separateness of water and geothermal resources applies here as well, even though it is arguable that in such a context the presumption is unnecessary.

C. Temperature Limitation

Likewise, the heat of the earth at less than 250 degrees is not included in the geothermal resource. Thus, geothermal water less than 250 degrees would be treated as ordinary ground water, with no mineral character or rights attached to it. The Act does not specify whether the bottom-hole temperature or the temperature of the medium after delivery to the surface is determinative of the minimum temperature threshold. This temperature

distinction is apparently designed to allow freer use of geothermy such direct uses as space-heating rather than for electrical generation. Since geothermal resources (over 250 degrees) and ground water both fall under the jurisdiction of the Division of Water Rights the distinction, at first blush, may seem artificial. However, it would allow applying geothermal waters not suitable for power generation to direct uses without the necessity of acquiring mineral rights.

D. Correlative Rights and Unitization

The proposed Act adopts the concept of correlative rights with regard to the efficient exploitation of geothermal resources. This doctrine is borrowed from oil and gas law and is defined in the Act as: " . . . the owners' or operators' just and equitable share in the geothermal resource."

Oil rights are based on the "right of capture," that is, each landowner's right to capture the oil and gas beneath his land within limits defined by downward planes perpendicular to the surface. Each landowner's right of capture is subject to the same right in adjacent landowners.

Correlative rights are an exception to the right of capture which grants to each landowner an equitable share of the common pool. Unitization is an administrative mechanism for ensuring to each landowner his correlative rights. It combines all the properties in a field for unified operation and management. The Act grants the Division of Water Rights power to order unitization upon finding that it is " . . . reasonably necessary to prevent waste, to protect correlative rights or to prevent the drilling of unnecessary wells, and . . . /u/nit operation will increase the ultimate economic recovery of geothermal resources." Sec. VI (2) (a,b).

The Act requires that the unitization order includes an allocation of the geothermal resources produced and of operating costs among the several landowners whose tracts comprise the unit. This provision might be criticized for the fact that it does not specify upon what basis this allocation of production and costs is to be made. In unitized oil operations, most units are formed before full discovery is made of the relative productivity of the various tracts. In such cases, allocation is usually made proportionate to acreage ownership. Where more knowledge of geological conditions has been obtained, a more technical formula based on productivity is likely to be used. So, the basis of allocation really depends on at what point in development the unit is formed and the extent of information available. The Act merely requires that the terms of unitization be "just and reasonable."

It may be questioned whether the Act properly places the power to order a unitization in the Division of Water Rights. Correlative right no longer exists as a concept in Utah water law. It might be considered that the Division of Oil, Gas and Mining might be better qualified in terms of expertise and familiarity in creating plans for unitized operation of drilling fields.

HOMESTAKE MINING COMPANY

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January 8, 1979

Douglas M. Sacarto
Associate Director
Geothermal Policy Project
National Conference of State Legislatures
1405 Curtis Street
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Denver, Colorado 80202

Dear Doug:

Here are my comments on the proposed Utah Geothermal Resource Conservation Act of 1979. Many of my comments are phrased as questions to provoke thought on the issues raised. Where issues do not appear controversial, I have proposed specific resolutions.

In addition to my specific comments, I believe the draft would benefit tremendously from a "red pencil" reading by a Utah lawyer familiar with Utah's oil and gas and water rights terminology. The purpose of this editing exercise would be to clarify the meaning of various phrases and reduce the total number of words.

I have first summarized three areas where I believe there are significant difficulties and then set forth my comments in full:

(1) Precedence of Prior Right: It appears to me that the statute would under some circumstances work a reallocation of the right to extract geothermal resources if one first assumes that the right to extract geothermal resources was acquired by the land or mineral owner as an incident of ownership. If so, possible results of a judicial challenge to the statute could be: (a) the statute is unconstitutional or (b) a "worst-case" holding that all geothermal rights are prior to all water rights since all land was acquired from the United States (the landowner's ultimate predecessor in interest). None of these seems to be the draftsman's intent. See further comments on this infra where Section VII is discussed.

(2) Temperature as Part of Definition: Notwithstanding the use of a similar technique in several states, I think this rigid and arbitrary approach is a bad one for numerous reasons set forth below. On the other hand, I see no advantage to such a definition. I have no doubt that retention of it in the bill will lead to litigation and will require further legislation.

I think it is preferable to use a more flexible definition of the resource (as the bill would if the temperature clause were deleted) and regulate on the basis of use or intended use, as is appropriate. If the temperature cut-off point must be retained, it should not be in the definition section because the California experience has shown that it is likely to be misapplied in other contexts by engineers, judges and landowners, but should be in Section V. There the Division could be permitted, as was the California Division of Oil and Gas ("DOG"), not to regulate the lower temperature resource in certain ways, or not to regulate it at all. Cf. Cal. Pub. Res. Code Sec. 3703.1 and Sec. 14 Cal. Admin. Code Sections 1920.1(j) and, e.g., 1932(a), 1935.2 and 1936.

(3) The Presumption that Geothermal Resources and Water are Separate: Inclusion of this presumption is arbitrary, unfair to the owners of water resources, and at the same time accomplishes nothing useful, except perhaps a little stacking of the deck in favor of lawyers defending geothermal by lightening their burdens of proof and going forward with evidence. Although it is true that there is a California statute which permits the California DOG to set up certain presumptions by issuing a certificate under certain factual circumstances, it operates only where the DOG has a specific factual case before it and may be appealed by affected parties. The Utah proposal, on the other hand, would be self-operative and would blanket all fact situations, even those where the presumption would be contrary to obvious fact. Thus, the California statute is no precedent for the presumption contained in the Utah draft. In addition, the California statute has never been used. From my personal experience as counsel for the DOG, I know this is due, in part at least, to conclusions by operators and DOG personnel that use of the statute would cause many more problems than it would resolve, if indeed it would resolve anything.

Comments on Discussion Draft of Proposed Utah Geothermal
Resource Conservation Act of 1979

Section I. Declaration of Public Interest in Development of Geothermal Resources

Reference is made to "the greatest possible ultimate economic recovery of geothermal resources". A more commonly used phrase to say this is "maximum ultimate recovery". I am informed that the analogous Utah oil and gas phrase is "greater ultimate recovery". It seems preferable to continue using that phrase so as to avoid any implication that the state is introducing into the geothermal field a standard of recovery more stringent than that applicable to oil and gas recovery.

Section II. Lands to Which Act is Applicable

With regard to lands committed to a Federal unit agreement, it seems preferable for the Division to preserve its rights by having the right to "deem the Act, or any part thereof, complied with" instead of the right to "suspend" the Act's "application". In addition, decisions concerning whether the "conservation" and "prevention" referred to in Section II should be expressly committed to the discretion of the Division.

Section III. Definitions of Terms

Subsection (a). "Correlative rights", in the oil and gas context, is usually more broadly defined than the definition set forth here. In addition to the right to a fair and equitable share of production, it usually includes the right to protection against damage to the common supply and the right to extract from the common supply. The narrow definition here could be judicially construed to have excluded the other elements of the doctrine. This is especially likely if there is a broad Utah statutory or judicial doctrine of correlative rights applicable to oil and gas operations.

Subsection (d). I am repelled by the arbitrary temperature definition of geothermal resources. Such a definition creates enormous problems which, in my view, outweigh any benefit. Among the problems are:

- (1) Only resources higher than 250 degrees F are regulated pursuant to the Act. Are lower temperature resources to be appropriated through existing water laws even if they are to be developed as an energy source? This is the very problem the legislature started out to address and this bill obviously does not do the job with regard to lower temperature resources.
- (2) Is the reader to infer that the presumption established by Section VII does not apply to lower temperature resources? Does this make sense if it is an energy resource? May the holder of a prior vested water right use the remedy in Section VII (2) against somebody producing energy from a 245 degree resource?
- (3) I believe the bill unfairly, and possibly even unconstitutionally, discriminates against the "owners" of a resource nudging the thermometer up to 250 degrees compared to the "owner" of a resource of 251 degrees. Were this a simple police power measure aimed at health and conservation, the discrimination would probably be of little importance. But this bill, in an attempt to expedite development and production of geothermal resources, creates presumptions, procedures, dates of priority (as discussed below) and defenses to (i) breach of contract suits and (ii) violations of the state anti-trust statutes. The more likely this statute is to be of benefit to higher temperature procedures, the more likely it is to unjustifiably discriminate against lower temperature users.
- (4) Who measures the temperature and how is it done? At atmospheric or reservoir pressure? At bottom-hole or well head? Is it an average or a one-time measurement? Is it from one well or is it on a "tract" average?

What if some geothermal resources are subject to seasonal and annual changes? If a resource flunks the test once, can the affected parties keep re-measuring it as if they were taking the California bar exam?

- (5) The purpose of the temperature definition seems to be to insure that the Division does not regulate wells for hydroponic gardening and other agricultural and domestic uses that could result from low-temperature wells. In order to accomplish this it is not necessary to artificially define the resource in a manner which is likely to be misapplied in other contexts and disciplines. Instead, it would be preferable, in my opinion, to use a flexible definition of the resource such as the one in the bill, excluding the clause concerning temperature. Thus, the Division could be instructed by statute to regulate operations intended or reasonably likely to result in electricity generation or other industrial uses but not to regulate, or regulate to a lesser extent, operations intended to lead to agricultural or domestic operations. See the Cal. Admin. Code Sections cited above. The value of energy producing resources being what it is, the temperature of the resources actually under the most strict regulation would be determined by available technology and market economics and would move up or down with their changes.
- (6) Geothermal resources are declared to be a mineral for what purpose? As stated, this could be applied in any context. Legislative intent is not apparent. If intended to exclude applicability of the water statutes, it should expressly state that.

Subsection (g). If the definition of "owner" means that one needs all three of the rights listed to become an "owner", the word "appropriate" should be replaced with "capture". If only one of the three is needed, the "and" should be "or".

Subsection (i). 1. "Waste" is defined as "waste". In addition, what is excessive underground use of geothermal resources?

2. The words "unnecessary" and "excessive" are redundant, giving rise to an argument that the Division has the power to prevent "necessary" actions by the operator if excessive waste results. If the intent is that wells and steam transmission lines should be operated and managed so as to conserve energy, this can be accomplished by slightly expanding the applicability of Subsection (i)1.

Subsection (j). First line, insert "being drilled", before "drilled".

Section IV. Division of Water Rights - Power and Authority - Legal Advisor

Subsection (2). "Any person" seems too broad. "Any affected person" would be more appropriate.

Subsection (3). Given the irreparable harm or waste that can result from improper geothermal practices, the Division should be expressly authorized to seek temporary and permanent injunctions and, in the case of life-threatening emergencies, to order stoppages of work or institution of mitigation measuring without first seeking judicial recourse.

Section VI. Unitization

Subsection (1). In line 1, "and" should probably be "or" and "interested" should probably be "affected".

Subsection 3(c). This subsection gives no guidance to the Division upon which to allocate. In order to provide such guidance and still insure equality in the face of rapidly advancing technology and experience, the Division should be required to use the proportionate acreage that each tract bears to the total unit acreage unless the Division finds at the hearing that another method is likely to result in more equitable allocation.

Section VII. Relationship of Geothermal Resources and Water Resources - Powers of Division

Subsection (1). The purpose of this presumption is obscure.

This presumption could aggravate the ultimate confrontation between a geothermal user and a water user claiming injury by falsely giving geothermal users the idea that they have some kind of protection against prior water or geothermal users. They are not granted such protection and the presumption could dissuade operators or the Division from adequate investigation before production begins. On the other hand, I see no advantage to including such a presumption in the statute since prior water users who suffer injury will, of course, sue geothermal users who interfere with them regardless of the presumption. If the presumption is an attempt to apply the rule of capture to geothermal resources, as between competing geothermal users, it also fails since it does not directly address conflicts between two geothermal users. This presumption then is a substitute neither for rule of capture nor for setting up procedures and mechanisms to resolve disputes between geothermal users and users of other resources.

I would delete the sentence containing the presumption. Also, please see the comments near the beginning of this letter under the heading "The Presumption that Geothermal Resources and Water are Separate".

The second sentence of this subsection creates problems and may not produce the result intended by the draftsman. Apparently it is intended that the geothermal priorities date from Division permitting action. Assuming that the right to extract geothermal resources is not an incident of land or minerals ownership, this may be a permissible exercise of the police power in the name of conservation. If, on the other hand, the Utah courts decide that the right to extract geothermal resources

is such an incident, this statute could operate as a reallocation of that right. In other words, it could take that right away from a land or minerals owner and give it instead to one who was prior within the meaning of this statute. This raises serious questions concerning the constitutionality of such an action in the absence of an express right of condemnation. Put another way, the landowner will claim that his priority dates from the acquisition of the land or the minerals from the sovereign. If geothermal extraction rights are actually held to vest as an incident of ownership with remote dates of priority, the statute could simply be construed as a de facto water condemnation. This is not its intent. The opinion of Utah counsel should be sought on this point.

The conflict between geothermal users and water users, if it develops, is sure to wind up in court; for this reason, I believe it might be preferable to leave the issue of priorities to the courts and concentrate on creating the procedural mechanisms necessary to quantify and/or limit damages that result from interference.

"Interference" should be defined as to include damage as to quantity, quality and heat content of the resource.

Subsection (2). Is the action before the Division in Subsection (2) the sole remedy or can the injured party ignore the Division and seek declarative or injunctive relief in court?

Subsection (1) spoke of "interference"; this subsection speaks of "substantial" interference. Are they the same? What does "injury" add to "interference"? Does the party interfered with need to wait for injury or is the threat of injury enough?

Does the prior right holder agree to the idea of compensation or to the dollar amount of compensation? Compensation for what? Will the prior right holder be compensated so as to recover lost profits from an agricultural business idled by interference from a power plant or is his compensation based on the value of the resource for electricity production? What if an idled geothermal plant is being compensated as the prior right holder - is its compensation based on the reasonable value of the resource for producing electricity or for the use made by the holder of the junior right?

Very truly yours,

Dennis B. Goldstein
Assistant Counsel

DBG:pmu

cc: Owen Olpin
Clayton Parr
Verl Tophan
Dollin Jensen

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President
Jason Boe
President of
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Executive Director
Earl S. Mackey

MEMORANDUM

TO: Reviewers

FROM: Doug Sacarto

DATE: January 12, 1979

Remarks in response to comments by Dennis Goldstein and others on the draft Utah Geothermal Resource Conservation Act.

Section I. The language of the draft bill is patterned directly after the Utah Oil and Gas Conservation Act (UCA 40-6-1). The phrase in that Act is "greatest possible economic recovery," rather than the "greater ultimate recovery" suggested by Mr. Goldstein.

Conservation of a wasting resource like petroleum or geothermal resources means that the most efficient rates and methods of production are employed. Efficiency, in turn, means that economic recovery of the resource is maximized during the potential lifetime of the producing reservoir. Rapid production rates may raise a firm's current profits and, in that sense, be an economic approach. Ultimate economic recovery, however, may well be greater with a slower production rate. Conservation therefore would dictate the slower production rate for maximum ultimate economic recovery of the resource. (These issues are discussed at length in Stephen L. McDonald, Petroleum Conservation in the United States: An Economic Analysis.)

In the draft bill, the use of "maximum" probably is preferable to "greatest possible."

Section II. This section also is patterned after the Utah Oil and Gas Act (UCA 40-6-11). In response, though, to comments made by Dennis Goldstein, Owen Olpin and Dallin Jensen, the following language is suggested as a substitute.

"This act shall apply to all lands in the State of Utah, including federal and Indian lands to the extent permissible. When such lands are committed to a unit agreement involving lands subject to federal or Indian jurisdiction, the Division may, with respect to such unit agreement, deem this act or any part of this act complied with, provided that the unit operations are regulated by the United States and the Division finds that conservation of geothermal resources and prevention of waste are accomplished under such unit agreement."

Section III (a). The definition of "correlative rights" is patterned after that in the Utah Oil and Gas Act. The definition does not refer to resource production, but broadly to the geothermal resource. Comments regarding a narrowing of the "standard" definition therefore appear to have no bearing.

Section III (d). The comments on this part of the draft become abrasive, but do not have much force. Contrary to the thrust of those comments, the 2500 F threshold in the geothermal definition is not arbitrary (in the sense of having no reasonable basis), and the definition as a whole is not a backwards way of regulating geothermal development according to the use made of the resources. (See comments in cover letter.)

(1) The act would remove geothermal resources from the water appropriation regime in Utah to which they currently are subject. The act does not need to state that resources not so removed are still in the water regime.

(2) No inferences as to the extent of the presumption and remedies of Section VII are called for. They clearly apply to geothermal resources.

(3) See discussion of geothermal definition in cover letter.

(4) The procedures for determining reservoir temperatures are left as a regulatory concern by the draft bill.

(5) The purposes of the geothermal definition are misconstrued in Dennis Goldstein's comments. The definition establishes what geothermal resources are physically and their relationship to other natural resources, in particular water. Again, the definition is not a covert ploy for regulating geothermal development according to use.

(6) The mineral declaration is for purposes of ownership. The language may be clarified to achieve this more directly. An alternative declaration of public ownership also might be considered.

Section III (g) Substitute "make use of" for "appropriate."

Section III (i) The terms "unnecessary" and "excessive" are not redundant. The language empowers the Division to prohibit unnecessary waste, but to permit necessary waste (such as venting) if it is not excessive.

The wording of the waste definition may be improved somewhat by deleting "Underground waste resulting from" in the first part.

Section III (j) The phrase "being drilled" may be added to the definition of "well", but is unnecessary. The definition designates types of excavations, not their temporal or physical location. Section V clearly makes the locating and drilling of wells subject to Division regulation.

Section IV (2) "Affected person" probably is better and also should be substituted for "interested person" in other parts of the act.

Section IV (3) Conflicting opinions have been given on the need to specify judicial review procedures. This issue should be resolved.

Section V (1c) The five-year period of confidentiality has been criticized as too long. Dick Bowen, for instance, feels that the two-year period usual for oil and gas records is long enough for a geothermal developer to secure development rights to the resource. Early release of records will hasten development, particularly of lower temperature resources.

As the act is drafted, the five-year period is a maximum, leaving the Division with discretion to set a shorter period. As a practical matter, though, the Division may have difficulty setting a shorter confidentiality period.

(1 d) Substitute "so" for "in such a manner" in line 2; delete "supplies" from line 5.

(1 f) Rephrase as follows: "The geothermal owner or operator to measure geothermal well production according to standards set by the Division and maintain complete and accurate production records. The records, or certified copies, shall be preserved on file by the owner or operator for a period of five (5) years and shall be available for examination by the Division at all reasonable times.

Section VI (1) Substitute "affected person" for "interested person." Use of "and" is proper.

(2) Insert "cooperative or" before "unit" in the first line.

(3) The bill provides that unitization must be on terms that are just and reasonable. This certainly applies to any allocation formulas.

A just allocation generally will involve more than a calculation of participating acreage, and the bill should not advance such a simple formula. Whether the bill should prescribe a complex set of considerations and findings is an issue, however, that might be considered.

Section VII (1) Many of the comments on this part of the bill have little basis. The purpose of the presumption is clear - assigning burden of proof; the extent of protection provided is clearly limited to non-interference with prior rights; the section explicitly addresses geothermal-water conflicts, not geothermal-geothermal conflicts.

The concern about impingement on resource ownership rights is important, and language on this point should be clear and carefully drawn. There is no basis, however, for objections in principle to legislative provisions regulating conflicts between geothermal and water uses.

Property rights are not absolute. An owner of natural resources does not have an automatic right to produce them regardless of consequences to other property rights. Zoning and environmental protection statutes are simple examples of limitations on property use.

The draft bill conditions water and geothermal rights in three ways:

- (1) Water rights are conditioned on non-interference with geothermal rights having an earlier priority date.
- (2) Geothermal rights are conditioned on non-interference with the correlative rights of other geothermal owners.
- (3) Geothermal rights are conditioned on non-interference with prior water rights.

To provide clearer procedures for resolving conflicts between geothermal and water uses, the following language is proposed:

"Section V (1 b) Filing and obtaining approval of a notice of intent to drill (NOI) with the Division prior to the commencement of any well. The date of NOI approval shall constitute a priority date for the resolution of geothermal and water use conflicts."

"(1 d) The spacing... and (6) injury to existing water uses."

"Section VII (1) Water rights shall be neither required nor available for geothermal fluid production or injection. Water rights may be required, at the discretion of the State Engineer, for byproduct water (suitable for agricultural or domestic use without further treatment) unless such byproduct water is used for energy purposes. By-product water used for energy purposes shall be deemed "developed" water and shall be the property of the geothermal owner.

"(2) Where a conflict between geothermal production and water uses occurs, either affected party may make a showing before the Division of interference and actual injury. The Division shall enter a finding supporting or denying the allegation. Should the finding support the allegation and the affected parties certify that they are unable to reach agreement resolving the conflict, the State Engineer shall call a hearing and enter a remedial order providing for offsets, curtailment of production, compensation for actual damages or a combination thereof to protect the prior use. Water use shall be accorded the priority date of its concomitant water right, and the geothermal use shall be accorded the priority date provided for in Section V(1)(b) of this act."

This approach protects both geothermal and water uses on the basis of seniority in case of a conflict between them. Negotiations are required before a hearing may be called. The affected parties, of course, retain the right to seek judicial review of the finding or order of the Division after exhausting administrative remedies. This language also gives the Division power of condemnation in its ability to order compensation.

The suggested priority approach would not result in a taking of either geothermal or water rights. Property rights to water already are conditioned on temporal priority. Property rights to geothermal resources are not yet established in Utah. It is within the scope of state authority to define such rights so as to be conditioned upon non-interference with vested water rights.

In effect, the right to produce geothermal and water resources that are in connection is conditioned upon non-interference with an existing use. This is analogous to holding that the rights of competing geothermal owners to produce geothermal resources from a common pool are conditioned upon non-interference with individual correlative rights. In both cases, the state is defining a property regime by making adjustments between competing claims. This is a constitutional exercise of state power.

Note, in addition, that the presumption of separation is removed under this approach. Instead, geothermal fluid production is specifically exempted from the requirement of obtaining water rights.

ATTACHMENT C

NATIONAL CONFERENCE OF STATE LEGISLATURES
GEOTHERMAL POLICY PROJECT

State Work Plan for Delaware

I. Policy Study - Areas to be Addressed (in order of priority)

- A. Resource Definition/Ownership/Legal Status
- B. Lease Stipulations (acreage limitations, length, etc.)
- C. Regulatory Scheme
- D. Incentives (investment security, state support, taxes, royalties, support of direct use applications, etc.)

II. Work Tasks

Lead Responsibility Time Deadline

A. Introduce project and geothermal energy to Delaware General Assembly	NCSL	November 15 (1978)
B. Outline study areas	DE Legislative Council	December 30 (1978)
C. Policy review	NCSL-general
DE Legislative Council-state	January-February
D. Draft legislation	DE Legislative Council	February
E. Introduce legislation	DE Legislative Council	March

ATTACHMENT D

Preliminary
GEOTHERMAL PROFILE
STATE OF DELAWARE

Geothermal Policy Project
National Conference of State Legislatures
1405 Curtis Street, Suite 2300
Denver, Colorado 80202
303/623-6600

November 1978

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I. POTENTIAL RESOURCE

A. Physical Characteristics

Geothermal energy is the natural heat of the earth. In Delaware, geothermal resources probably consist of hydrothermal (hot water) systems that are low-to-medium temperature (under 120°C). The high-temperature resource found in the Western states, suitable for electricity production, in all likelihood will not be found in the state.

Delaware's geothermal resources result from its geologic regime. Thick (up to 12,000 feet) coastal sediments overlies granitic basement rock which contains scattered intrusive plutons. These plutons generate radiogenic heat, which may be absorbed by Appalachian runoff infiltrating the overlying formation. The thick sediment layers insulate these "thermal aquifers," trapping the heat for productive use.

In addition to the hydrothermal resources, it may become feasible at some future date to tap the energy within the radiogenic plutons themselves--so called "hot dry rock." The likely avenue of exploitation involves fracturing the formation and circulating a working fluid to transfer the heat to the surface. This technology is in preliminary stages with Los Alamos Scientific Laboratory currently conducting experiments at Fenton Hill, New Mexico.

A less dramatic, but nevertheless important, potential resource may be groundwater heated by the geothermal gradient (whether normal or abnormally high). Such fluids may be utilized by water-referenced heat pumps, a technology already in existence.

B. Location

No definitive location of geothermal resources has yet been made in Delaware. However, 94% of the state lies over the Atlantic Coastal Plain, the area of general interest. Coastal sediments reach their maximum depth--and hence insulating capacity--in Delaware and immediately offshore.

The Delaware Geological Survey is conducting gravimetric surveys in Kent and Sussex counties, under the U.S. Department of Energy auspices. The purpose of these surveys is the detection of basement features--principally intrusive plutons--beneath Coastal Plain sediments. In addition, Gruy Federal has drilled five test holes in Delaware as part of a Department of Energy Atlantic Coast geothermal survey. Gradient* results ($^{\circ}\text{C}/\text{km}$) follow:

1. Dover Air Force Base - 37°
2. Ellendale - 33°
3. Lewes - 24°
4. Assawoman Bay - 20°
5. Bridgeville - stabilizing

II. RESOURCE APPLICATIONS

A. Existing

Aside from an occasional water-referenced heat pump, there is no current utilization of geothermal energy in Delaware.

B. Potential

Many direct heat applications of low-to-medium temperature geothermal resources are possible on the Atlantic Coastal Plain:

1. Residential and commercial space conditioning, perhaps via water-referenced heat pumps
 - a. Large potential market in military installations
2. Residential and commercial hot water, including hydrothermal spas and pools
3. Industrial process heat

* Normal geothermal gradient = $25^{\circ}\text{C}/\text{km}$

4. Agriculture

- a. Crop drying (corn, soybeans, peanuts)
- b. Food processing
- c. Tobacco curing
- d. Poultry raising (brooding and space heating)
- e. Frost protection for fruit orchards
- f. Greenhousing

5. Aquaculture

Atlantic Coastal industries with process heat demands generally under 120°C include: food and kindred products, textiles, tobacco products, lumber, pulp and paper, and chemicals. The food industry appears to be the most likely target for geothermal development due to its demand for large amounts of process water. Tobacco and lumber companies could profitably utilize geothermal energy, but their locations are scattered and total energy demands relatively small. Large pulp and paper companies are generally self-sufficient for thermal demand due to the availability of wood wastes. Only one large chemical industry has been identified (in New Jersey) which requires large amounts of heat below 120°C.

Of course, geothermal development is not limited to existing markets. A promising area of development is the siting of new industrial/agricultural parks near geothermal fields, matching process heat demands with resource characteristics and employing cascading delivery systems to maximize heat utilization.

The Johns Hopkins Applied Physics Laboratory has identified several specific potential applications for geothermal resources in the Delmarva area. These include: space-conditioning for new multi-family condominiums at Indian River Inlet and conversion of appropriate existing structures; development of integrated chicken

producing complexes; space conditioning of greenhouses for cut flowers, small plants and vegetables; and, development of integrated industrial parks.

In this last regard, it should be noted that Maryland and Delaware state and county planning organizations have been developing plans for new industrial parks near Berlin, Maryland, and near Georgetown, Delaware. The prospect of geothermal resources resulted in the consideration of food processing plants as an additional plan element. Food processing was once a significant industry in the area but has declined due to foreign competition. The availability of large volumes of hot water might rejuvenate the industry.

C. Energy and Economic Value

The East Coast presently lacks significant indigenous energy reserves and is dependent on costly, imported fossil and nuclear fuels. However, direct heat applications at less than 250°C account for 40% of the nation's total energy consumption. Medium-temperature geothermal resources could reduce the consumption of costly, high-grade fuels for these purposes.

Geothermal space heating, perhaps via water-referenced heat pumps, is an especially important avenue to pursue. The East Coast has suffered persistent natural gas and fuel oil curtailments during the recent severe winters. Utilization of geothermal resources for home heating offers an alternative, secure, domestic energy supply. This would free supplies of gas and oil to keep industries operating during harsh weather, avoiding the plant closings of recent years.

The Johns Hopkins University Applied Physics Laboratory has developed a scenario which estimates the potential geothermal contribution to the energy mix of the Atlantic Coastal states. Excluding the increment available through water-referenced heat pumps, deep coastal plain aquifers (heated radiogenically) could supply 140 mQ (1 mQ = 10^{12} BTU) per year by 2000. This is a conservative estimate: rapid inflation

of fossil fuel prices, rapid population or industrial growth, or other economic inducements could increase the geothermal utilization by 50%.

III. STATUTES AND REGULATIONS

Delaware currently has no specific geothermal statutes or regulations. However, under existing authorities, a well-drilling permit would be required. In addition, withdrawals of water exceeding 50,000 gallons per day would require a separate permit. Reinjection would also require a permit, with disposal mandated to the same aquifer or one of similar water quality. Surface discharge would fall under the NPDES system. Delaware's Coastal Zone Act may impact geothermal development as well, although it is doubtful whether geothermal facilities themselves would be regulated as "manufacturing plants."

IV. POLICY CONCERNS

A. Resource Characterization

1. Define the resource
2. Clarify the legal status of the resource--especially the interaction with existing water rights procedures
3. Assign ownership rights

B. Resource Access

1. Land use planning to identify the appropriate areas for geothermal development
2. Provide entry rights for resource exploration on private and state lands
3. Provide development rights
4. Ensure a streamlined access procedure

C. Field Development

1. Authorize the necessary drilling controls
2. Determine reservoir management procedures
3. Decide on resource allocation among competing interests

4. Establish facility siting procedures
5. Institute appropriate environmental regulation
6. Streamline regulatory processes

D. Marketing

1. Clarify utility issues
2. Consider direct use market structures

E. Incentives

1. Consider appropriate tax benefits
2. Stimulate investment
3. Stimulate market expansion

Novel market structures for direct applications will be especially important in the East Coast states. Heating districts, industrial corridors and geothermal zoning are various areas to be examined. The utility status (rate regulation, transmission access) of geo-heat facilities is a related question.

Please refer to the NCSL paper: Issues in Geothermal Legislation for additional information on all topics listed above.

V. CONTACTS

A. State

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ATTACHMENT E

WORKSHOP ON
GEOTHERMAL ENERGY

Delaware General Assembly
Legislative Hall
Dover, Delaware
November 15, 1978

Summary of Proceedings

Geothermal Policy Project
National Conference of State Legislatures
1405 Curtis Street, Suite 2300
Denver, Colorado 80202

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- I. Executive Summary
- II. Workshop Summary
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EXECUTIVE SUMMARY

Geothermal energy can significantly contribute to the energy needs of Delaware, and it is important that the state consider how it wishes to control and foster development of this new energy resource. To help in this regard, the Delaware General Assembly is participating in the Geothermal Policy Project of the National Conference of State Legislatures which is designed to help state legislatures determine what current state laws will affect geothermal development, what potential problem areas exist and what areas should be addressed in developing legislation.

To understand the current situation, the following major points should be considered:

1. Geothermal resources in Delaware consist of hydrothermal (hot water) systems that are low-to-medium temperature (under 120°C).
2. Through a market study of the state (surveying energy users, matching users with the resource and looking at questions of costs), several potential users of geothermal energy have been identified. These include numerous industries, primarily located in Sussex County, plus all facets of the state's poultry industry.
3. Preliminary study indicates that geothermal energy costs, under suitable conditions, can easily match, and in some cases are lower, than traditional fossil fuels. In addition to being cost competitive, geothermal also has the quality of price predictability in the future (as opposed to dependence on uncertain foreign energy resources) and has negligible environmental effects.
4. No specific geothermal laws or regulations currently exist in Delaware, although well drilling and reinjection permits are required. Legislative issues that must be addressed before effective development of geothermal resources can occur in the state include: statutory definition, determination of ownership, tax considerations, appropriate access to geothermal resources and regulations for development.
5. In summary, the likelihood exists of utilizing geothermal energy in Delaware. Initial results indicate that the hydrothermal reservoirs in the state are of a high enough temperature that the heat can be utilized for energy purposes. However, the full answer is not known and much needs to be done before it can be said with any great certainty that geothermal resources definitely can help meet Delaware's energy demands.

NATIONAL CONFERENCE OF STATE LEGISLATURES
GEOTHERMAL POLICY PROJECT

Workshop on Geothermal Energy
Delaware General Assembly
November 15, 1978
Dover, Delaware

SUMMARY OF PROCEEDINGS

On November 15, 1978, a "Workshop on Geothermal Energy" was held for the Delaware General Assembly. A summary of the workshop follows. (See Appendix A for workshop Agenda and Appendix B for Attendance List.)

"Introduction" - Senator Harris McDowell, Chairman, Senate Energy Committee, State of Delaware

Geothermal energy can significantly contribute to the energy needs of Delaware, and it is important that the state consider how it wishes to control and foster development of this new energy resource. The Delaware General Assembly is participating in the Geothermal Policy Project of the National Conference of State Legislatures to undertake a comprehensive policy review and learn of the experiences encountered in other states. Through this thorough analysis of the policy issues before the resource is developed, it is hoped that the state can develop the best possible program for geothermal development.

"Introduction" - Rutherford Harris, Director, National Conference of State Legislatures, Geothermal Policy Project

This workshop is the initial step in a policy review process that is being undertaken by the Delaware General Assembly--in cooperation with the Geothermal Policy Project of the National Conference of State Legislatures--to determine what laws and

regulations are needed to foster and control the development of geothermal energy in the state. The objective of this meeting is to outline for the members of the Delaware General Assembly the potential for geothermal energy development in Delaware-- both in terms of the type of resource that has been found here and the possible applications that exist for using geothermal to meet a portion of the state's energy needs. Also, discussions will begin on what current state laws will affect geothermal development, what potential problem areas exist and what areas should be addressed in developing legislation.

One word of caution should be expressed in considering all these areas. Although there is good reason to be very optimistic about the potential for geothermal energy contributing to the energy needs of Delaware the full answer is not known at the present time. But, whatever the outcome, it is important that key policymakers in the state be included in the process of developing information and moving to a consideration of laws necessary to foster and control development.

"Geothermal Energy: What Type of Resource Exists in Delaware?" - Robert Jordan and Kenneth Woodruff, Delaware Geological Survey

Geothermal resources in Delaware consist of hydrothermal (hot water) systems that are low-to-medium temperature (under 120°C). The source of heat for these resources is radiogenic plutons found in the granitic basement rock. In the Atlantic Coastal Plain, thick sedimentary layers overlie the basement rock and act as an insulator. Water infiltrates the overlying formation and absorbs the trapped heat. This water is then brought to the surface to extract its heat value.

In identifying a potential geothermal resource, two things are looked for: (a) a temperature gradient (change of temperature with depth) that is above the average gradient found in Delaware and (b) sufficient thermal conductivity (a thick enough sedimentary layer to insulate the heat source). Five test holes of 1,000 feet

depth have been drilled so far in Delaware. Preliminary results show two very promising areas that are worthy of further investigation: around the Dover area and in the West Redden State Forest.

In summary, the likelihood exists of utilizing geothermal energy in Delaware. Initial results indicate that the hydrothermal reservoirs in the state are of a high enough temperature that the heat can be utilized for energy purposes. However, much needs to be done before it can be said with any great certainty that geothermal resources definitely can help meet the state's energy demands.

"Geothermal Energy: What Potential Applications Exist for Meeting the State's Energy Needs" - Fletcher Paddison, Program Manager, Applied Physics Laboratory, Johns Hopkins University

There are two general ways that geothermal energy can be utilized: in generating electricity and in direct (non-electric) applications such as space heating and industrial processing. In the Eastern United States, the potential for utilizing geothermal lies in the direct use area and specifically in such ways as community heating, low-temperature process heating (poultry, food processing and agricultural drying), space heating, greenhouses and fish farming.

In conducting a market study of Delaware--surveying energy users, matching users with the resource and looking at questions of costs--several potential users of geothermal energy have been identified. Possible user industries include Draper/Cole, Dorse Food, Old Salt Seafood, Barcroft, R & P Adams, H.P. Cannon & Son, Delarga, East Shore Lab, Robert Brothers, Sterner & Co., J. G. Thompson and Vlasic Food. It should be noted that most of these industries are located in Sussex County. The northern part of the state has not yet been carefully surveyed since it is believed that the temperature of the geothermal resources found there are lower and thus not as promising as that found in the southern part of the state. In terms of the state's

poultry industry, it is thought that all facets of the industry--including hatcheries, broiler houses and grain drying--are potential users of geothermal energy. Other potential applications are industrial parks in Seaford and Georgetown, new residential construction in the Bethany Indian River area and conversion of the Dover Air Force Base to a geothermal steam heating system.

In addition to finding potential users of geothermal energy, work has been underway to determine if geothermal is cost competitive with traditional fuels. Preliminary results indicate that geothermal energy costs under suitable conditions can easily match and in some cases are lower than traditional fuels. In terms of specifics, the relative costs of geothermal energy vis-a-vis conventional fuels are competitive with oil and gas at the wellhead. Also, the cost of delivering energy to a community for space heating through a geothermal system is competitive with heating systems run on fossil fuels.

In summary, geothermal energy is an attractive new energy source for Delaware. It is cost competitive with conventional fuels, has the quality of price predictability in the future (as opposed to dependence on uncertain foreign energy sources) and has negligible environmental effects. The major areas that need to be addressed to encourage development of this new energy source are:

- A. A lack of understanding of geothermal energy and how to utilize it;
- B. Technical uncertainty;
- C. Legal questions surrounding ownership of the resource;
- D. Questions of who will develop and service the resource; and
- E. The overall issue of resource management.

"Geothermal Energy: What State Laws Will Affect the Development: What Potential Problem Areas Exist? What Areas Should Be Addressed in Developing Legislation?" - David Press, Special Assistant to the Governor for Energy

No specific geothermal laws or regulations exist in Delaware. However, well drilling permits are required, and any well using in excess of 50,000 gallons of water

requires an additional permit. Also, reinjection permits are required. The state's coastal zone management act may have provisions under which geothermal activities would fall.

To encourage geothermal development, it is imperative that the resource be competitive with other energy resources and therefore competitive in the investment capital market. The key elements in creating a favorable climate include:

- A. Developing consumer confidence;
- B. Establishing equitable tax policies;
- C. Assuring prompt development of proven resources, and
- D. Assuring secure leasing arrangements.

The legislative issues that must be addressed before effective development of geothermal resources can occur in the state are:

- A. Statutory definition of geothermal resource - (water, energy, etc.);
- B. Uniform procedures for assessment of geothermal properties;
- C. Determination of ownership of geothermal properties;
- D. Tax considerations for encouraging production and use of geothermal resources;
- E. Role of PSC in geothermal development;
- F. Access to geothermal resources; and
- G. Regulations for development--environmental, production, management.

APPENDIX A
NATIONAL CONFERENCE OF STATE LEGISLATURES

Geothermal Policy Project

Workshop on Geothermal Energy

November 15, 1978

Delaware General Assembly
Legislative Hall
Dover, Delaware

1:30 p.m.	INTRODUCTIONS	Senator Harris McDowell Chairman Senate Energy Committee Rutherford C. Harris Director Geothermal Policy Project
1:45 - 2:15 p.m.	GEOHERMAL ENERGY: WHAT TYPE OF RESOURCE EXISTS IN DELAWARE?	Robert Jordan Delaware State Geologist
2:15 - 2:30 p.m.	DISCUSSION	
2:30 - 3:00 p.m.	GEOHERMAL ENERGY: WHAT POTENTIAL APPLICATIONS EXIST FOR MEETING THE STATE'S ENERGY NEEDS?	Fletcher Paddison Program Manager Applied Physics Laboratory Johns Hopkins University
3:00 - 3:15 p.m.	DISCUSSION	
3:15 - 3:45 p.m.	GEOHERMAL ENERGY: WHAT STATE LAWS WILL AFFECT THE DEVELOPMENT? WHAT POTENTIAL PROBLEM AREAS EXIST? WHAT AREAS SHOULD BE ADDRESSED IN DEVELOP- ING LEGISLATION?	David Press Special Assistant to the Governor for Energy
3:45 - 4:00 p.m.	DISCUSSION	
4:00 - 4:30 p.m.	WRAP-UP SESSION: HOW SHOULD THE DELAWARE GENERAL ASSEMBLY PROCEED IN DEVELOPING LEGISLATION TO FOSTER AND CONTROL DEVELOPMENT OF THE STATE'S GEOHERMAL RESOURCES?	Senator Harris McDowell Chairman Senate Energy Committee

Attendance List

Delaware Geothermal Workshop
November 15, 1978

SENATORS

Harris B. McDowell III, Chairman, Senate Energy Committee
Jacob W. Zimmerman, Chairman, Senate Natural Resources & Environmental Control Committee

REPRESENTATIVES

Marian P. Anderson, House Environmental Control Committee
Howard A. Clendaniel, Chairman, House Agriculture Committee
Ronald L. Darling, Chairman, House Energy Committee

OTHERS

Dan Anstine, Delaware Energy Office
Myrna Bair, Delaware Energy Office
McDonald T. Coker, Assistant Director, Legislative Council of Delaware
C. W. Cooke, Jr., duPont Company
Clara Cooke, teacher
Richard S. Cordrey, Senate Natural Resources & Environmental Control Committee
Debbie Doelze, Delaware Energy Office
Lynn Foltz, League of Women Voters of Delaware
George L. Frick, Delaware Oilmen's Association
Rutherford C. Harris, Director, Geothermal Policy Project, National Conference of
State Legislatures
Robert Jordan, Delaware State Geologist, Delaware Geological Survey
Terri L. Synderman, Institute of Energy Conversion, University of Delaware
Sue McDonald, secretary, Legislative Council of Delaware
John A. Mancus, aide to Senator McDowell
Fletcher Paddison, Program Manager, Applied Physics Laboratory, Johns Hopkins University
David L. Press, Special Assistant to Governor for Energy
Jack Russell, administrative assistant, Senate Democrat caucus
Hummel Sapp, Delmarva Power & Light Company
Robert R. Thompson, legal counsel, Department of Natural Resources & Environmental
Control, State of Delaware
Kenneth Woodruff, Senior Hydrologist, Delaware Geological Survey
D. Wayne Yerkes, Delmarva Power & Light Company

ATTACHMENT F

WORKSHOP ON
GEOTHERMAL ENERGY

Virginia Study Commission on Coal and Energy
State Capitol
Richmond, Virginia
October 27, 1978

Summary of Proceedings

Geothermal Policy Project
National Conference of State Legislatures
1405 Curtis Street, Suite 2300
Denver, Colorado 80202

NATIONAL CONFERENCE OF STATE LEGISLATURES
GEOTHERMAL POLICY PROJECT

Workshop on Geothermal Energy
Virginia General Assembly
October 27, 1978
Richmond, Virginia

SUMMARY OF PROCEEDINGS

On October 27, 1978, a "Workshop on Geothermal Energy" was held for the Virginia Study Commission on Coal and Energy. A summary of the workshop follows.

"Introduction" - Rutherford Harris, Director, National Conference of State Legislatures,
Geothermal Policy Project

This workshop is the initial step in a policy review process that is being undertaken by the Virginia General Assembly--in cooperation with the Geothermal Policy Project of the National Conference of State Legislatures--to determine what laws and regulations are needed to foster and control the development of geothermal energy in the state. The objective of this meeting is to outline for the members of the Virginia Study Commission on Coal and Energy the potential for geothermal energy development in Virginia--both in terms of the type of resource that has been found here and the possible applications that exist for using geothermal to meet a portion of the state's energy needs. Also, discussions will begin on what current state laws will affect geothermal development, what potential problem areas exist and what areas should be addressed in developing legislation.

One word of caution should be expressed in considering all these areas. Although there is good reason to be very optimistic about the potential for geothermal energy contributing to the energy needs of Virginia, the full answer is not known at the present time. But, whatever the outcome, it is important that key policymakers in the state be included in the process of developing information and moving to a consideration of laws necessary to foster and control development.

"Geothermal Energy: What Type of Resource Exists in Virginia?" - Joseph Lambiase,
Research Associate, Virginia Polytechnic Institute

The source of heat for geothermal energy in Virginia, and the entire Atlantic Coastal Plain, is radioactive decay. The heat from radiogenic plutons pours upward through thick sedimentary layers and heats local ground water. In determining geothermal potential, three factors are important: a radiogenic heat source, a thick sedimentary insulator with low conductivity and favorable reservoir conditions.

The Virginia Polytechnic Institute program is designed to predict usable heat sources in the Atlantic Coastal Plain by measuring heat flow. Eight holes have been measured in Virginia, and--at this point--two areas show particular promise: Wallops Island and Portsmouth. The overall heat flow gradient at Portsmouth is 35°C per kilometer of depth and at Wallops Island $34^{\circ}\text{C}/\text{km}$. Compared to an average gradient of $30^{\circ}\text{C}/\text{km}$, these two areas look very promising. No concrete data is available at this time for other areas.

"Geothermal Energy: What Potential Applications Exist for Meeting the State's Energy Needs?" - Ned Tillman, Applied Physics Laboratory, Johns Hopkins University

In general, geothermal resources that reach temperatures of 350°F or higher can be used to generate electricity, while those of 300°F or lower can be used in direct (non-electric) applications. Examples of direct applications of geothermal energy are heating and cooling of buildings, industrial processing and drying crops and other uses.

The Applied Physics Laboratory is undertaking a market study to match geothermal resources to potential energy users. The results of this study so far indicate two areas where geothermal can be used. First, in the Norfolk area, there is the potential for geothermal being used for space and water heating. Also, several businesses--including bottling companies, vegetable processors, lumber drying and tobacco drying--could utilize geothermal in their industrial processing operations.

A second area--Accomack and North Hampton Counties--also shows potential for use of geothermal energy. In this area of the state, industrial processing seems to be the most likely candidate for using geothermal since the population is too small and diffuse to make geothermal an economically viable alternative for heating and cooling of residences. In terms of industrial processing, there are two large vegetable processing operations, two poultry plants and several seafood processors that could utilize geothermal energy. Also, an important consideration in determining the feasibility of using geothermal is the fact that this area is in need of economic stimulation and having an indigenous energy resource could be extremely helpful in attracting new business.

In summary, the market study indicates that geothermal is an attractive alternative to conventional energy sources in site specific applications. Costs of utilizing geothermal resources can be competitive, and the benefits of geothermal use--especially its price predictability as opposed to reliance on foreign energy sources and its negative environmental affects--make it an attractive alternative to conventional fuels.

To encourage and speed geothermal development, several areas need to be addressed. First of all, the lack of understanding as to what geothermal energy is and some technical uncertainties must be overcome. Also, legal questions of ownership and questions of how to manage geothermal reservoirs and who will develop the resource must be addressed and answered.

"Geothermal Energy: What State Laws Will Affect the Development? What Potential Problem Areas Exist? What Areas Should Be Addressed In Developing Legislation?" - Albert Giles, Geologist, Virginia Water Control Board

An important area must be addressed immediately as the state considers possible development of geothermal energy: how geothermal development will fit into current laws controlling the use of groundwater. In looking at this issue, it is important

to differentiate between the large-scale use of geothermal discussed earlier--for industrial processing, heating and cooling of building complexes, etc.--and the drilling of wells for small-scale uses such as heating single family dwellings. The availability of groundwater in many parts of the state in abundant supply and the cost competitiveness of using heat pumps to convert this water to an energy source makes this latter aspect of geothermal development a strong likelihood in the near future, and the legislature must look at what should be done to control it.

The use of geothermal resources as an energy source for heating single homes requires drilling shallow wells to remove groundwater from the subsurface, the possible reinjection of water into the subsurface and well construction. These activities would fall under the jurisdiction of the Water Control Board which is mandated by the Ground Water Act of 1973 to regulate every well drilled in the state. The law, however, has some weak points which should be addressed if this type of geothermal development is to be controlled and the groundwaters of the state protected.

Of primary importance, information reporting requirements of the current law are nonenforceable and not tailored to geothermal wells. The current working of the law requires the well owner instead of the driller to report drilling activities. Because most homeowners do not know such a reporting requirement exists, the great majority of well drilling activity goes unreported. This situation is not good since geothermal activity will amount to a large use of water; and, considering the possibility of reinjection of fluids into shallow aquifers, there is the danger of pollution of water used for drinking and other domestic purposes. Well drilling activity associated with this type of geothermal development therefore must be closely monitored. Other areas that need to be addressed include determining what type of application system should be designed including the types of permits required; establishing minimum safety standards and safeguards; and developing criteria to safeguard aquifers and groundwater, the land's surface and the public.

ATTACHMENT G

WORKSHOP

ON

STATE LEGISLATIVE ISSUES IN GEOTHERMAL DEVELOPMENT

Oregon Legislative Assembly
State Capitol
Salem, Oregon
October 4, 1978

Summary of Proceedings

Geothermal Policy Project
National Conference of State Legislatures
1405 Curtis Street, Suite 2300
Denver, Colorado 80202

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EXECUTIVE SUMMARY

Geothermal energy is one of only a few energy resources indigenous to Oregon. The development of this resource is important to the economy of the state since it will help to reduce the approximately \$1 billion currently spent annually to import foreign oil.

In the past, Oregon has taken very positive steps to boost geothermal development. Two examples are the funding in 1969 of a project to geoheat the campus of the Oregon Institute of Technology and the passage of a flexible geothermal law that has allowed development of lower temperature geothermal resources to progress without being impeded by regulations necessary to control the production of the higher temperature reservoirs.

Beyond these past actions, the state should move to encourage faster and more efficient development of Oregon's geothermal potential. Major problem areas and possible changes in current state laws, regulations and policies include:

I. STATE SUPPORT

- General
 - Develop a strong state policy advocating geothermal development
 - Remove the state's image of opposing industrial development
 - Carry out a program to attract industries which could utilize geothermal
 - Develop a program to convince the general public that geothermal resources are secure enough to assure their investment
- State Facilities
 - Identify existing and new facilities that could use geoheating
 - Site new state buildings with strong consideration of geoheat potential
- Coordination
 - Coordinate state agencies involved in geothermal development
 - Coordinate state and federal efforts with particular emphasis on speeding up leasing of federal lands

II. RESOURCE ASSESSMENT

- Accelerated Programs
 - Encourage continued and accelerated resource assessment activities
- State Support
 - Make DOGAMI competitive in obtaining federal funds for resource assessment by appropriating matching funds

III. RESOURCE CHARACTERIZATION

- Definition
 - Determine if the statutory geothermal resources definition should reflect the present regulatory division of the resource into shallow, warm (under 2000'/250°F) and deep hot regimes
- Classification
 - Determine if groundwater as a heat vehicle is a "beneficial use" of the resource
 - Consider designating heat as a property right

IV. INCENTIVES

- Tax Benefits
 - Defer property taxes until electricity is produced
 - Allow rapid write-off of exploration costs
 - Exempt new housing developments utilizing geothermal resources for heating from property taxes
 - Encourage potential user to hook up to a district heating system through tax incentives
 - Consider not levying a property tax on heat value
- Loans
 - Ensure that low-interest loans are available for geothermal uses
 - Do not limit loan programs to veterans or to a \$3000 limit
- Cost Sharing
 - Encourage development through state cost-shared exploration

V. REGULATIONS

- General
 - Keep all regulations flexible
 - Keep regulations simple
- Division of Responsibility
 - Reduce the water temperature breakdown for regulatory purposes to 100°F

- Fluid Disposal
 - Eliminate duplicative state agency actions and coordinate agency activities on fluid disposal
 - Change definition of "groundwaters" in ORS 537.515 to exclude waters with a temperature greater than 250°F
 - Expand the Groundwater Act (ORS 537) to allow regulation of wells less than 2000 feet deep drilled and/or used for the purpose of reinjecting groundwaters.
 - Expand Geothermal Resources (Chapter 522) to allow regulation of geothermal fluid reinjection wells
 - Have DOGAMI adopt rules concerning appropriation and use of geothermal resources
 - Study whether prohibitions on discharge to surfacewaters are excessive in some cases

VI. LEASING

- Rentals
 - Deemphasize immediate revenue production by slowing rental escalation
 - Make sure costs on state lands are competitive with adjacent federal lands

VII. MISCELLANEOUS

- Energy Facility Siting Council
 - Consider extending authority to include geothermal plants smaller than 25 MW
 - Determine what is needed to site transmission lines and whether rights given to gas and electric utilities of eminent domain and to use state and county highways should be extended to geothermal
- Land Use Policies
 - Require areas of identified geothermal potential to address geothermal utilization in land use plans
 - Recognize geothermal as a "conditional use"
 - Consider "off-set" of areas for nondevelopment to compensate effects in developed areas
- Public Utilities Commission
 - Investigate what level of risk ratepayers should be asked to bear for geothermal exploration in return for lower fuel costs
 - Examine rate regulations to exempt non-profit organizations that develop geothermal heating districts

National Conference of State Legislatures
Geothermal Policy Project

Workshop on
State Legislative Issues in Geothermal Development

Oregon Legislative Assembly
State Capitol
Salem, Oregon
October 4, 1978

Summary of Proceedings

"Introduction" - Rutherford Harris, Director, NCSL Geothermal Policy Project

The Oregon Legislative Assembly in cooperation with the National Conference of State Legislatures, is undertaking a review of state policies that affect geothermal development in Oregon. The goal of the policy review is to establish state statutes and regulations that are consistent with the efficient development of geothermal energy in Oregon. In particular, the project's activities will be directed toward legal and institutional questions that either have not been addressed or have been resolved by placing unnecessary barriers to geothermal development.

This workshop begins the policy review process in Oregon. Its objective is to set an agenda for the policy study - to determine the parameters for the study and also to prioritize the issues that need to be addressed.

"Introduction" - Senator Edward Fadeley, Chairman, Senate Energy Committee

Geothermal energy is one of only a few energy resources indigenous to Oregon. The development of this and other local energy sources is important to the economy of the state and part of the national effort to reduce foreign energy imports.

Although identified geothermal resources in Oregon have lower temperatures than those in some other areas of the United States, development is taking place in the state and broader interest has been expressed. Incentives may be desirable, though, to encourage more rapid development. While promoting development, the state also should prevent monopolization of the resource.

"Geothermal Energy in Oregon: The Federal Perspective" - Robert Hackman, Region X,
U.S. Department of Energy, Seattle, Washington

The Division of Geothermal Energy of the U.S. Department of Energy has structured its program on a regional basis. Three regions--Eastern, Intermountain and Pacific--have been established to design and administer programs for the commercialization of geothermal energy.

The Pacific Region program has six facets--planning, commercialization, institutional support, resource definition (in cooperation with BLM, USGS and USFS), environmental assessment and technical applications. These program elements are described in the Pacific Region Commercialization Plan.

In Oregon, the DGE Pacific Region is funding cooperative programs with the Oregon Department of Geology & Mineral Industries for resource assessment and geothermal heating of prototype buildings. The resource assessment effort is compiling existing information and identifying gaps in present knowledge of the resource in Oregon. Heating is being explored for Timberline Lodge and Old Maid Flats on Mt. Hood.

Geoheat development also is being funded for Klamath Falls district heating and for food processing by Ore-Ida Foods in Eastern Oregon. Other federally funded activities in Oregon include:

- Operations research at Oregon Institute of Technology,
- Assistance to county governments in eastern Oregon to identify the resource and plan for development,
- Technical assistance and public education, with up to 100 hours of professional engineering services to geothermal development projects,
- Review of specific environmental problems, and
- Support of the state interagency geothermal coordinating council.

"Geothermal Energy in Oregon: An Update of State Programs" - Donald Hull, State Geologist, Oregon Department of Geology and Mineral Industries

The location of geothermal prospects presently is based mainly on heat flow studies and the presence of young volcanoes and other surface manifestations such as fumaroles. Little is known about the deep geologic structure of the state or about the availability of fluids in geothermal reservoirs.

Large areas of Oregon are promising for geothermal development. A key area apparently lacking economic geothermal potential, however, is the heavily populated portion of the state west of the Cascades. Without massive redistribution of the state's population, development of geothermal resources on a large scale will require transportation of the energy over considerable distances.

The state program for geothermal resources has several objectives:

- Fund the resource,
- Provide incentives for direct heat applications,
- Maximize revenues to the state through leasing,

- Protect public health and safety through development regulations and
- Assist in siting decisions for production and transportation facilities.

The state Energy Facility Siting Council currently is examining issues regarding geothermal facilities. Research projects are underway at the Oregon Institute of Technology and at the University of Oregon. The universities have established a large body of expertise regarding geothermal resources, and they are making large contributions to present understanding of the resource and its development.

Resource exploration and development historically have been financed by private capital. For geothermal resources, though, the pattern has changed. In 1977, state and federal expenditures in Oregon for exploration and development exceeded private investments. Nonetheless, the federal government has been a net impediment to geothermal development, due primarily to federal tax policies and the failure to lease federal lands.

"Recommendations of the Oregon Interagency Geothermal Fluid Report" - Charles K. Ashbaker, Oregon Department of Environmental Quality

The state task force on geothermal fluid disposal tried to reach a "meeting of the minds" among state agencies. The task force concluded that existing state laws and regulations for fluid discharge cover geothermal exploration activities but are inadequate for fluid disposal from field development. The state Attorney General is to determine what additional legislative authorization is needed.

The task force recommended the elimination of duplicative state agency actions and, specifically, the drafting of a memorandum of understanding among state agencies for coordinated action on fluid disposal.

In addition, the task force report:

- Advocates fluid re-injection where practical to conserve the resource;
- Encourages secondary uses of geothermal fluids;
- Finds that state and federal laws require the state Department of Environmental Quality to issue permits prior to any geothermal fluid discharge to public waters, but return of geothermal fluids to the production zone does not require a permit;
- Finds that land disposal needs a DEQ permit, while beneficial use does not require a DEQ permit (a water right is needed, though); and
- Identifies several specific deficiencies in state laws and regulations regarding geothermal fluid disposal
 - : regulatory responsibilities not spelled out,
 - : ORS 522 needs to incorporate disposal,
 - : Department of Geology & Mineral Industries needs regulations on fluid disposal.

"Making Oregon A Model State For Geothermal Development: An Overview of Needed State Actions" - Richard Bowen, Consulting Geologist, Wy'East Exploration and Development Company

The state of Oregon in the past provided several boosts to geothermal development. In 1969, the state invested \$150,000 for geoheating the OIT campus. This was a risky

undertaking that has paid off many times over. The development of resource data by the Department of Geology & Mineral Industries has been of immense value.

The passage of a flexible geothermal law also was a major accomplishment. The law establishes 250°F as the minimum temperature for applying geothermal regulatory requirements. Through this approach, over-regulation of low-temperature use has been avoided, so that direct heat development has progressed. The 250°F threshold was chosen because serious well control problems do not arise below that temperature, and also because it was a temperature greater than any already developed for direct use in the state.

Beyond these past actions, several areas should be addressed by the state government. These include:

- Tax benefits to geothermal developers through property tax deferral until production and through rapid write-off of exploration costs;
- Revision of the state leasing system to deemphasize immediate revenue production; in particular, rentals are escalated too quickly given the long permitting and development delays faced by geothermal firms;
- Identify state facilities that could use geoheating; Vale, Burns and Lakeview are good candidate areas;
- Site new state buildings with strong consideration of geoheat potential;
- Continue and accelerate efforts to assess the state's geothermal potential; and
- Continue to develop utilization technology.

"Exploration and Development: What Can the State Do To Encourage the Development of Geothermal?" - Skip Matlock, Republic Geothermal, Inc.

Republic Geothermal is pleased with Oregon's geothermal regulations. The state law is one of the best in the United States. The biggest problem for geothermal developers in Oregon is the federal "land lock-out," especially for Forest Service lands.

Property taxation is a concern, and it should be deferred until production is achieved.

"Electricity Production: What Can the State Do To Encourage the Use of Geothermal?" - Roger Colburn, Public Utilities Commission

The state Public Utilities Commission has very little involvement with geothermal resource development at this time. Various regulatory incentives for geothermal development--such as rapid write off or expensing of geothermal exploration or development by public utilities--would be a ratepayer subsidy to developers and precluded without special legislative authorization.

"Electricity Production: What Can the State Do To Encourage the Use of Geothermal?" - Alan Grant, Portland General Electric Company

As an indigenous resource, geothermal energy is economically preferable to other energy sources, such as coal, since development expenditures remain in the state. Geothermal development also is environmentally preferable to most other energy development.

Regulatory policies for geothermal development should be kept flexible. Mandates for fluid reinjection or wheeling of power should be avoided, since they may prove inappropriate in specific cases.

Particular policies that should be considered include the following:

- Extend the authority of the Energy Facility Siting Council to include plants smaller than 25 MW in order to cover small geothermal plants and to investigate "off-set" of areas for non-development to compensate efforts in developed areas;
- Make the Department of Geology & Mineral Industries competitive in obtaining federal funds for resource assessment by appropriating matching funds;
- Recognize geothermal development as a conditional use in land use plans;
- Have the Public Utilities Commission investigate what level of risk ratepayers should be asked to bear for utility geothermal exploration in return for lower fuel costs;
- Have the state adopt a strong statement of support for geothermal development;
- Make sure state leasing policies are such that costs of leases on state lands are comparable to adjacent federal lands; and
- Provide necessary economic incentives to encourage geothermal development.

"Electricity Production: What Can the State Do To Encourage the Use of Geothermal?" - Walter Youngquist, Eugene Water and Electric Board

Oregon pays approximately \$1 billion annually for oil imports to the state. Development of an alternative local energy supply--like geothermal energy--therefore is attractive.

Unfortunately, meetings to discuss impediments to geothermal power production in Oregon may be attacking a non-problem. While the state's geothermal power potential may well be 10,000 to 20,000 megawatts, at this time no geothermal reservoir suitable for electricity production has been located in Oregon.

Without substantial evidence of real potential, it's impossible to intelligently discuss policies for geothermal power production. Ten wells in the Cascades drilled to 9,000 feet would give the information needed for productive discussions, but in fact such wells have not been drilled.

Two general recommendations for geothermal policies in the state are: remove the image that Oregon opposes industrial development and don't burden the geothermal industry with taxes before it is established.

"Industrial and Agri-Business Applications: What Can the State Do To Encourage the Use of Geothermal?" - Ray Huff, Oregon Trail Resource Development

Significant geothermal development can occur in the field of district heating with numerous cities in the state interested in establishing geothermal heating districts. As part of this development, downhole heat exchangers will be used, and to protect that use from interference by water producers, the state should consider designating heat as a property right or perhaps reducing the temperature breakdown for regulatory purposes to 100° F.

Other areas that need to be addressed include controlling drilling to avoid the danger of commingling of aquifer fluids and not levying a property tax on heat value since a 20 mill levy would make geothermal energy uncompetitive in terms of using it in direct uses.

"Industrial and Agri-Business Applications: What Can the State Do To Encourage the Use of Geothermal?" - Steve Munson, Hot Lake Development Company

The Hot Lake Development Company is converting a hotel in LeGrande to a geothermal heating system and expects to save \$55,000 per year on heating costs as compared to using fossil fuels. Geothermal was chosen over solar, wind and other alternative energy systems because it is technologically commercial now.

To encourage more geothermal development in Oregon, several ideas should be considered by the state:

- Cost-shared exploration would get development started and reap tax benefits for the state;
- Political support which has proven helpful in California would be valuable in Oregon; and
- A formalized program by the Department of Economic Development to attract industry to the state to use geothermal would be a positive step.

"Industrial and Agri-Business Applications: What Can the State Do To Encourage the Use of Geothermal?" - Andy Parker, Oregon Desert Farms, Inc.

Oregon Desert Farms has utilized geothermal energy in its greenhouses for ten years in growing various agricultural crops, flowers and tree seedlings. Two actions should be taken to make geothermal a more viable energy resource:

- Make regulations simpler and
- Consider some financial incentives, such as a low-interest loan or bond program, to put geothermal on an equal footing with heavily subsidized fossil fuels.

"District Heating: What Can the State Do To Encourage the Use of Geothermal?" - Harold Derrah, City of Klamath Falls

The following recommendations are made to encourage the use of geothermal energy for district heating purposes:

- Consider incentives to encourage users to hook up to a district heating system and to develop geothermal usage in nonurbanized areas;
- Declare a moratorium on property taxes for new developments using geothermal; and
- Develop a program to convince the general public that the resource is secure enough to assure their investment.

"District Heating: What Can the State Do To Encourage the Use of Geothermal?" - John Hook, Northwest Natural Gas Company

To speed up geothermal development, the state should consider taking the following actions:

- Study whether prohibitions on discharge to surface waters are excessive in some cases in terms of the turbidity and temperature criteria for discharge;
- Coordinate state agencies involved in geothermal development;
- Bring about better state/federal coordination especially in terms of the state putting pressure on the federal government to expedite the leasing of federal lands;
- Determine what is needed in the siting of transmission lines and, in particular, whether the rights given to gas and electric utilities of eminent domain and to use state and county highways when needed should be extended to geothermal; and
- Establish economic incentives.

"District Heating: What Can the State Do To Encourage the Use of Geothermal?" - Don Karr, Oregon Institute of Technology

There are several recommendations that can be made to encourage space heating projects utilizing geothermal energy. Some of the most important include:

- Considering the use of groundwater as a heat vehicle to be a "beneficial use" of the resource;
- Evaluating the policy requiring geothermal fluids to be reinjected to determine if it needs revising or modifying;
- Requiring areas that have identified geothermal resources to address geothermal utilization in comprehensive land use plans and ordinances;
- Investigating a state loan program that is not limited to veterans or a monetary value of \$3,000; and
- Examining utility-style rate regulations to exempt non-profit organizations that develop geothermal heating districts.

Appendix A
National Conference of State Legislatures
Geothermal Policy Project
Workshop on
STATE LEGISLATIVE ISSUES IN GEOTHERMAL DEVELOPMENT
State Capitol, Salem, Oregon
October 4, 1978

9:00 - 9:15 a.m. INTRODUCTIONS

Rutherford C. Harris, Director, NCSL Geothermal Policy Project
Senator Edward Fadeley, Chairman, Senate Energy Committee
Representative Nancie Fadeley, Chairwoman, House Energy Committee

9:15 - 9:45 a.m. GEOTHERMAL ENERGY IN OREGON: THE FEDERAL PERSPECTIVE

Robert Hackman, Region X, U.S. Department of Energy, Seattle, Washington

9:45 - 10:15 a.m. GEOTHERMAL ENERGY IN OREGON: AN UPDATE OF STATE PROGRAMS

Donald Hull, State Geologist, Oregon Department of Geology and Mineral Industries

10:15 - 10:30 a.m. BREAK

10:30 - 11:00 a.m. RECOMMENDATIONS OF THE OREGON INTERAGENCY GEOTHERMAL FLUID REPORT

Charles K. Ashbaker, Oregon Department of Environmental Quality

11:00 - 12:00 noon MAKING OREGON A MODEL STATE FOR GEOTHERMAL DEVELOPMENT: AN OVERVIEW OF NEEDED STATE ACTIONS

Richard Bowen, Consulting Geologist, Wy'East Exploration and Development Company

12:00 - 1:00 p.m. LUNCH

1:00 - 1:45 p.m. EXPLORATION AND DEVELOPMENT: WHAT CAN THE STATE DO TO ENCOURAGE THE DEVELOPMENT OF GEOTHERMAL?

Skip Matlock, Republic Geothermal, Inc.
Representative, Chevron Resources Company
Representative, Phillips Petroleum Company
Representative, Union Oil Company of California

1:45 - 2:30 p.m.

ELECTRICITY PRODUCTION: WHAT CAN THE STATE DO TO ENCOURAGE THE USE OF GEOTHERMAL?

Roger Colburn, Public Utilities Commission

Alan Grant, Portland General Electric Company

Walter Youngquist, Eugene Water and Electric Board

2:30 - 3:15 p.m.

INDUSTRIAL AND AGRI-BUSINESS APPLICATIONS: WHAT CAN THE STATE DO TO ENCOURAGE THE USE OF GEOTHERMAL?

Ray Huff, Oregon Trail Resource Development

Steve Munson, Hot Lake Development Company

Andy Parker, Oregon Desert Farms, Inc.

3:15 - 3:30 p.m.

BREAK

3:30 - 4:15 p.m.

DISTRICT HEATING: WHAT CAN THE STATE DO TO ENCOURAGE THE USE OF GEOTHERMAL?

Harold Derrah, City of Klamath Falls

John Hook, Northwest Natural Gas Company

Don Karr, Oregon Institute of Technology

4:15 - 5:00 p.m.

WRAP-UP AND SUMMARY: RECOMMENDATIONS FOR LEGISLATIVE STUDY

Appendix B

Oregon Workshop Participants

Elizabeth Achorn, Oregon Legislative Counsel
Charles K. Ashbaker, Oregon Department of Environmental Quality
Mike Bakkela, Portland General Electric
Michael Berger, Bonneville Power Administration
Richard Bowen, Wy'East Exploration and Development Company

Representative Bud Byers, Oregon House of Representatives
J. R. Cogar, P.S. Ogden Power Company
Roger Colburn, Oregon Public Utilities Commission
Joe Cone, writer
Bill Cox, Oregon State Land Board

Harold Derrah, City of Klamath Falls
Senator Edward N. Fadeley, Oregon State Senate
Representative Nancie Fadeley, Oregon House of Representatives
Alan D. Grant, Portland General Electric
Bob Hackman, U.S. Department of Energy

Robert W. Haines, Phillips, Coughlin, Buell, Stoloh & Black
Rutherford C. Harris, National Conference of State Legislatures
Marcy Hertzmark, Oregon Legislative Counsel
Craig Honeyman, Northwest Natural Gas Company
Charlotte Hook, John Hook & Associates

John Hook, Northwest Geothermal
Paul Howe, Northwest Natural Gas Company
Ray Huff, Oregon Trail Resource Development
Don Hull, Oregon Department of Geology
Debra Justus, Geo-Heat Center, Oregon Institute of Technology

Steve Kaifa, Oregon Department of Economic Development
Don Karr, Geo-Heat Center, Oregon Institute of Technology
Larry D. Mann, U.S. Department of Energy
Kent Mathoit, Oregon Department of Water Resources
Skip Matlick, Republic Geothermal

Dave Morgan, Oregon Department of Geology
Steve Munson, Hot Lake Development Company
Nan Nalder, U.S. Department of Energy
Clarence Parker, Oregon Department of Economic Development
D. Andy Parker, Oregon Desert Farms

David Philbrick, Oregon Department of Energy
J. Michael Pollock, Oregon Department of Energy
Deborah Raber, Oregon State University
Gordon M. Reistad, Oregon State University
Ed Rowan, Northwest Natural Gas Company

Paul Rutten, Oregon Trail Resource Development
Ralph Shay, Oregon State University
Glen Stadler, Eugene Water & Electric Board
Claude Steusloff, Capitol Press
Leonard Wilkerson, Oregon State Land Board

Rod Wimer, Portland General Electric
Walter Youngquist, Eugene Water & Electric Board

LEGISLATIVE RECOMMENDATIONS
ON
GEOTHERMAL ENERGY

Prepared for the New Mexico Legislature
1978 Geothermal Policy Review

Geothermal Policy Project
National Conference of State Legislatures
1405 Curtis Street, Suite 2300
Denver, Colorado 80202
303/623-6600

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POLICY AREA

LEGAL STATUS OF GEOTHERMAL RESOURCES

BACKGROUND INFORMATION

The statutory definition of geothermal resources is an important influence on the development of the resource. A definition should accomplish three things:

1. Describe the physical features and constituent elements of geothermal resources;
2. Classify geothermal resources in relation to other resources in the state; and
3. Establish regulatory jurisdictions regarding their development.

New Mexico defined the resource in its "Geothermal Resources Act" of 1967

as:

"geothermal resources" means the natural heat of the earth, or the energy, in whatever form, below the surface of the earth present in, resulting from, or created by, or which may be extracted from, the natural heat, and all minerals in solution or other products obtained from naturally heated fluids, brines, associate gases, and steam, in whatever form, found below the surface of the earth, but excluding oil, hydrocarbon gas and other hydrocarbon substances;

The State also dealt with the legal status of geothermal resources in the "Geothermal Resources Conservation Act" of 1975. This act distinguished deep, hot geothermal systems (suitable for electrical production) from shallow, warm aquifers (suitable for direct use applications).

A regulatory scheme was established, however, whereby both the Oil Conservation Division (Department of Energy & Minerals) and the State Engineer have maintained regulatory authority over low-temperature and high temperature thermal wells.

ISSUE: REGULATING THE RELATIONSHIP OF GEOTHERMAL RESOURCES TO OTHER RESOURCES

The existing legislation does not clearly differentiate geothermal resources from other natural resources, in particular water. As a result, overlapping regulatory jurisdictions have been established for geothermal resources. Such regulatory duplication is unnecessary and inflationary, as it causes delays and multiplied costs due to over-regulation.

The need to clarify the legal status of geothermal resources is central to encouraging geothermal development in New Mexico. However, the ramifications of making any changes in existing laws and regulatory authority are great. Modifications therefore should be carefully designed and reviewed.

Recommendation

It is recommended that the committee approve the resolution directing the NCSL Geothermal Policy Project to continue to study this area and work with individual committee members and state administrative officials in developing possible recommendations to clarify the legal status of geothermal resources.

(resolution on page 51)

POLICY AREA

DIRECT USE (NON-ELECTRIC APPLICATIONS) OF GEOTHERMAL ENERGY

BACKGROUND INFORMATION

Nonelectric applications of geothermal energy, utilizing lower temperature resources, have much more potential to benefit the state than electricity production. Examples of these applications are for heating and cooling of buildings, in industrial processing and for crop drying and other agricultural uses. Since these direct heat applications at less than 250°C account for 40% of the nation's total energy consumption--and natural gas, oil, coal and electric power presently supply this energy--actions to substitute geothermal energy for those costly, high-grade fuels should be promoted.

ISSUE: INCENTIVES

A significant problem in converting existing energy systems to geothermal is the large initial investment that must be made. This significant initial outlay of capital deters potential users and hinders the development of geothermal energy.

Recommendation

To encourage the use of geothermal resources, it is recommended that an income tax credit of 25% of the installed cost, not to exceed \$2,500, be approved for installation of a geothermal energy system (as proposed by the New Mexico Department of Energy & Minerals).

ISSUE: HEATING DISTRICTS

District heating is highly compatible with the development of moderate-temperature geothermal resources. Such reserves have a greater overall potential for New Mexico's energy future than do the high-temperature fields suitable for electrical generation. Various bonding options already are authorized for such projects: general obligation bonds, revenue bonds, municipal and county industrial revenue bonds. The basic authority for heating district formation, however, is lacking. Such authority may be created through minor changes and additions to New Mexico's utility codes.

Recommendation

It is recommended that current laws be amended as follows to establish heating district authority in municipalities, special districts and public utilities:

(bill follows)

Summary of Proposed Legislation

The proposed bill would:

1. Amend the public utility code (Title 68, Articles 1 and 3 NMSA 1953) to include facilities for the distribution of water within the definition of a public utility. The change does not limit distribution to geothermal water

only, but also allows for heating district utilization of waste heat from cogeneration facilities. Nor is the distribution of only hot water authorized; centralized space conditioning for heating and cooling is envisioned. In addition, private purposes are added to the existing public purposes so as to allow distribution of process heat to industrial users.

2. Enact a new article, appended to the municipal utility code, authorizing municipalities to form heating districts. District heating authorization would then automatically extend to Special Districts (15-53 NMSA 1953) and Community Service Districts (15-54 NMSA 1953) as well.

PROPOSED LEGISLATION

34TH LEGISLATURE - STATE OF NEW MEXICO - FIRST SESSION, 1979

INTRODUCED BY

DISCUSSION DRAFT

1. Section 68-1-1 NMSA (being Laws 1909, Chapter 141, Section 31; 1912, Chapter 50, Section 31) is amended to read:

68-1-1. INCORPORATION. - Corporations for the generation, production, transmission, distribution, disposal, sale or utilization of gas, electricity, steam, or water for lighting, heating, cooling, power, manufacturing or other purposes may be organized under the general incorporation laws of this state.

2. Section 68-3-2.F(4) NMSA 1953 (being Laws 1967, Chapter 96, Section 33) is amended to read:

(4) any plant, property or facility for the production, transmission, disposal utilization or delivery for public or private purposes of steam or water for heating, cooling, power or other uses;

3. A new article 14-22.A NMSA 1953 is enacted to read:

14-22.A-1. (New Material) HEATING DISTRICTS - AUTHORIZATION - ACQUISITION - OPERATION - JURISDICTION. - A. Municipalities are authorized to form heating districts and acquire and operate facilities for the generation, production, transmission, distribution, disposal, sale or utilization of steam and water for heating and cooling purposes. Such services may be provided for public or private use, within and without the municipality.

B. For the purpose of maintaining and protecting heating district facilities, the jurisdiction of the municipality extends to the territory occupied by such facilities.

Underscored Material = NEW

1 14-22.A-2. EASEMENTS - EMINENT DOMAIN. - A. Any municipal heating
2 district is granted:

3 1. Easements not to exceed 20 feet in width along, upon or across
4 any land over which an existing distribution line, main or pipe
extends and along, upon or across public streets, roads, highways
or alleys;

5 2. Authority to remove or trim trees and shrubbery to the extent
6 necessary to keep them clear of the lines, mains, pipes or systems.

7 B. Any municipal heating district is granted the power to enter and con-
8 demn private property, within or without the municipality, for the con-
struction, maintenance and operation of heating district facilities. Such
proceedings shall be in the manner provided by law.

9 14-22.A-3. WATER RIGHTS. - Municipal heating districts may acquire any
10 necessary water rights through purchase, condemnation or appropriation.
Such proceedings shall be in the manner provided by law.

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ISSUE: INITIAL MARKET FOR GEOTHERMAL HEATING

Geothermal heating needs an initial market to demonstrate the technology to consumers and to establish an economic base. The state can play an important role in public acceptance of geothermal energy by creating a market for the resource.

Recommendation

It is recommended that the following joint memorial be approved:

(memorial follows)

1 JOINT MEMORIAL

2 34TH LEGISLATURE - STATE OF NEW MEXICO - FIRST SESSION, 1979

3 INTRODUCED BY

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6 DISCUSSION DRAFT

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10 A JOINT MEMORIAL

11 DECLARING THE NEED TO INCLUDE GEOTHERMAL IN THE STATE'S LIFE-CYCLE COST
12 ANALYSIS PROGRAM: REQUESTING THE ENERGY AND MINERALS DEPARTMENT TO TAKE SUCH
13 ACTION.

14
15 WHEREAS, the earth's natural heat offers a major energy supply in New
16 Mexico for heating and cooling buildings;

17 WHEREAS, geothermal heating needs an initial market to demonstrate the
18 technology to consumers and to establish an economic base;

19 WHEREAS, the state can play an important role in public acceptance of
20 geothermal energy by creating a market for the resource;

21 WHEREAS, life-cycle cost analysis for energy systems in new or renovated
22 state buildings can serve to create a market for geothermal energy when it
23 proves economically competitive

24 WHEREAS, the state currently requires a life-cycle cost analysis of
25 alternative energy supply systems for new or renovated state buildings;

1 NOW, THEREFORE, BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF NEW
2 MEXICO that the energy and minerals department include geothermal energy sources
3 as one of the alternative energy sources evaluated in the existing life-cycle
4 cost analysis program;

5 BE IT FURTHER RESOLVED that a copy of this memorial be transmitted to the
6 secretary of energy and minerals.

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ISSUE: PUBLIC INFORMATION PROGRAMS

One of the problems that has been identified as hindering the development of geothermal energy is a lack of information that is readily available to the general public, both on the potential for developing the resource and assistance available to stimulate development.

Recommendation

It is recommended that a joint memorial be approved as follows:

(memorial follows)

1 JOINT MEMORIAL

2 34TH LEGISLATURE - STATE OF NEW MEXICO - FIRST SESSION, 1979

3 INTRODUCED BY

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6 DISCUSSION DRAFT

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10 A JOINT MEMORIAL

11 DIRECTING THE ENERGY AND MINERALS DEPARTMENT TO INSTITUTE EDUCATIONAL
12 PROGRAMS IN ORDER TO FACILITATE PUBLIC AWARENESS OF GEOTHERMAL POTENTIAL
13 AND STATE AND FEDERAL GEOTHERMAL FINANCIAL ASSISTANCE,

14
15 WHEREAS, geothermal energy is a major alternative resource capable of
16 solving many of New Mexico's energy problems; and

17 WHEREAS, the amount of geothermal energy reserves available in New
18 Mexico to heat and cool buildings and to generate electricity is potentially
19 immense; and

20 WHEREAS, institutional, legal and environmental problems associated with
21 the development of geothermal resources must be overcome; and

22 WHEREAS, there currently exists a complex regulatory structure concerning
23 the availability of both state and federal financial assistance for the
24 development of geothermal reserves;

25 NOW, THEREFORE, BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF NEW

1 MEXICO that the energy and minerals department be directed to institute
2 public educational programs to provide information to the general public
3 on the potential for developing geothermal energy and state and federal
4 financial assistance that is available to stimulate development of geothermal
5 resources in the state of New Mexico; and

6 BE IT FURTHER RESOLVED that a copy of this memorial be transmitted to
7 the secretary of energy and minerals.

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POLICY AREA

ENERGY RESEARCH AND DEVELOPMENT

BACKGROUND INFORMATION

The New Mexico Legislature passed in 1973 an Energy Research and Development Act (Sections 65-12-1 through 65-12-8 NMSA 1953) which created a fund for the purpose of financing research and development projects in the energy field. The specific purpose of the act is "to provide the means to seek solutions to fuel and energy problems through energy research and development for benefits to the citizens of New Mexico in the fields of wind, solar, geothermal, fossil, nuclear and all other research..."

ISSUE: AGGRESSIVE RESEARCH AND DEVELOPMENT PROGRAM

Geothermal development in New Mexico is two to three years behind schedule. A primary reason for this lag has been an attitude on the part of the state to continue to fund studies rather than an aggressive development program. Direction and guidance is needed from both the legislature and executive agencies to develop geothermal energy at a faster rate.

Recommendation

It is recommended that a joint memorial be approved as follows:

(memorial follows)

1 JOINT MEMORIAL

2 34TH LEGISLATURE - STATE OF NEW MEXICO - FIRST SESSION, 1979

3 INTRODUCED BY

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6 DISCUSSION DRAFT

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10 A JOINT MEMORIAL

11 DECLARING THE NEED FOR AN AGGRESSIVE GEOTHERMAL RESEARCH AND DEVELOPMENT
12 PROGRAM IN THE STATE OF NEW MEXICO; REQUESTING THE ENERGY AND MINERALS
13 DEPARTMENT TO FACILITATE SUCH A PROGRAM.

14
15 WHEREAS, geothermal resource development is an important energy alternative
16 for the citizens of the state of New Mexico; and

17 WHEREAS, geothermal development in New Mexico is two to three years behind
18 schedule, due to the state's emphasis on geothermal research rather than
19 development; and

20 WHEREAS, there is needed direction from both the legislative and executive
21 branches in order to facilitate geothermal resource development;

22 NOW, THEREFORE, BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF NEW
23 MEXICO that the energy and minerals department place more emphasis on geothermal
24 development activities as opposed to the study efforts that have predominated
25 in the past; that state funds be made available to match federal money that is

1 available for drilling activities; that New Mexico's energy research and
2 development fund be strengthened by providing reasonable project schedules
3 and deadlines with appropriate follow-up activities; and

4 BE IT FURTHER RESOLVED that a copy of this memorial be transmitted to
5 the secretary of energy and minerals.

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ISSUE: SEEKING ASSISTANCE FROM NATIONAL LABORATORIES

There exists an enormous potential at the national laboratories located in the state for providing expertise to facilitate geothermal resource development in New Mexico. To take advantage of this potential the state must take the initiative in requesting assistance.

Recommendation

It is recommended that the following joint memorial be approved:

(memorial follows)

1 JOINT MEMORIAL

2 34TH LEGISLATURE - STATE OF NEW MEXICO - FIRST SESSION, 1979

3 INTRODUCED BY

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6 DISCUSSION DRAFT

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10 A JOINT MEMORIAL

11 DECLARING THE NEED TO TAKE ADVANTAGE OF THE EXPERTISE OF THE NATIONAL
12 LABORATORIES IN THE STATE; REQUESTING THE STATE TO SEEK THEIR ASSISTANCE
13 IN DEVELOPING A COMPREHENSIVE GEOTHERMAL ENERGY PROGRAM.

14
15 WHEREAS, the state should take advantage of all avenues of assistance in
16 developing a comprehensive program for geothermal development;

17 WHEREAS, there exists an enormous potential at the national laboratories
18 in the state--Sandia and Los Alamos--for providing expertise to facilitate
19 geothermal resource development in New Mexico;

20 NOW, THEREFORE, BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF NEW
21 MEXICO that the state request the assistance of the national laboratories in
22 the state, namely Sandia laboratory and Los Alamos scientific laboratory, and
23 that such expertise be utilized to facilitate the development of geothermal
24 resources;

25 BE IT FURTHER RESOLVED that a copy of this memorial be transmitted to the

1 directors of Sandia laboratory and Los Alamos scientific laboratory, to the
2 secretary of the U.S. Department of Energy and to the secretary of energy
3 and minerals.

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POLICY AREA

STATE LEASING SYSTEM

BACKGROUND INFORMATION

To encourage exploration and development of geothermal resources, the state must establish a system that allows appropriate access to state lands. This access system should foster development and at the same time, protect the state's interests in its natural resources.

ISSUE: CHANGES IN LEASE TERMS

New Mexico's five year primary geothermal lease term has presented an obstacle to geothermal development--contrary to the state's avowed policy of encouraging the utilization of geothermal resources. The time period from lease application to commercial energy production has been estimated at 6-12 years, with regulatory processes a significant factor in the calculation. The New Mexico Department of Energy and Minerals supports lease law revisions to correct this problem.

SB 119 (1978) addressed this matter but failed to pass. A contributing factor was overly cumbersome drafting, apparently an attempt to stay within the confines of New Mexico's Enabling Act. This constraint has been removed due to Congressional approval of HJR 747, which allows New Mexico to extend its primary geothermal lease term to ten years.

New Mexico's present geothermal acreage limitations also may raise obstacles to development. The minimum limit of 640 acres per lease is too high for small-scale direct (non-electric) utilization of geothermal resources; while the limit on maximum holdings of 25,620 acres is too restrictive. Large areas of land (several prospects of 10,000 to 20,000 acres) must be leased when exploring for high-temperature reservoirs. Successful geothermal developers, in particular, may be blocked from further exploration as their productive acreage expands.

Recommendation

It is recommended that the following changes be made in the existing law:

(bill follows)

Summary of Proposed Legislation

The draft amendments to New Mexico's Geothermal Resources Act (Sections 7-15-1 to 7-15-28 NMSA 1953) would

1. Extend the primary lease term to ten years and add a force majeure clause for lease continuance after the primary term;
2. Authorize the commissioner of public lands to amend existing leases pursuant to this act; and
3. Raise the maximum acreage limitation to 51,200 acres and provide the commissioner of public lands with discretionary authority to issue direct utilization leases smaller than 640 acres.

Blank

1 PROPOSED LEGISLATION

2 34TH LEGISLATURE - STATE OF NEW MEXICO - FIRST SESSION, 1979

3 INTRODUCED BY

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5
6 DISCUSSION DRAFT

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10 1. Section 7-15-11 NMSA 1953 (being Laws 1967, Chapter 158, Section 11)
11 is amended to read:

12 7-15-11. LEASES-DURATION. - Leases under this article shall be for a
13 primary term of 10 years and so long thereafter as geothermal resources
14 are being or capable of being produced or utilized in commercial quantities
15 from such lands or from lands unitized therewith, provided the lessee is
16 in compliance with the terms and conditions of an exploration and develop-
17 ment program specified in the lease pursuant to Section 7-15-7.C.

18 Provided, that if for any reason beyond the control of the lessee
19 commercial production or utilization or the potential thereof is temporarily
20 lost after the primary term has expired, the lessee may, at the discretion
21 of the commissioner, continue such lease in effect from year to year for
22 an additional period up to 3 years by payment of an annual rental of five
23 dollars (\$5.00) per acre.

- 24 2. A new Section 7-15-11.1 NMSA 1953 is enacted to read:

25 7-15-11.1. (New Material) EXISTING LEASES-AMENDMENT. - The commissioner
is authorized to extend existing 5-year geothermal leases, which have been
maintained in good standing, for a period of 10 years from the date of
original issuance. Diligence provisions shall continue in effect for such
extended leases, or the commissioner may, at his discretion, impose additional
requirements for the period of the extension.

3. Section 7-15-5.B NMSA 1953 (being Laws 1967, Chapter 158, Section 5) is
amended to read:

B. A geothermal lease on state lands shall not be issued for less than

Underscored Material = NEW

1 640 acres nor more than 2560 acres and shall embrace a reasonably
2 compact area. Provided, that a lease on state lands may, at the dis-
3 cretion of the commissioner, be issued for a parcel less than 640 acres
4 if the parcel is isolated or not contiguous with other lands available
5 for a lease or if the geothermal resources are to be produced or utilized
6 solely for non-electric applications. The commissioner may provide for
7 compensatory agreements on those parcels of state lands which he determines
8 should be subjected to such an agreement rather than a lease. No person,
9 association or corporation, except as otherwise provided in the Geothermal
10 Resources Act, shall take, hold, own or control at one time any direct
11 or indirect interests in state geothermal leases exceeding 51,200 acres.
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ISSUE: FURTHER MODIFICATION OF LEASING SYSTEM

In addition to the recommended changes in lease terms, other problem areas have been identified in the current leasing system that may unnecessarily hinder development.

Study areas include:

- KGRF designation and competitive leasing
- Royalty rates for KGRF leases, byproducts, recreation, use (rather than sale) and power production
- Lease renegotiation
- Discretion for reduced royalties
- Other provisions, including confidentiality, lease forfeiture, withholding of lands, parcel configuration, sale announcement

Recommendation

It is recommended that the committee approve the resolution directing the NCSL Geothermal Policy Project to continue to study this area and work with individual committee members and administrative officials in developing possible legislative recommendations to modify the current leasing system.

(resolution on page 51)

ISSUE: COMPETITIVE ONLY LEASING

Under the current state leasing system, as administered by the commissioner of public lands, all lands are leased on a competitive only basis. This policy is not solely due to the broad classification of lands as KGRF, and hence statutorily required to be competitively leased. The commissioner of public lands issued an order (No. 1, 1974) stating that only competitive geothermal leases would be available on any state lands. This may have been due to perceived constraints under New Mexico's Enabling Act as then in effect. These constraints have been removed through an amendment in 1967 to Article XXIV of New Mexico's Constitution and the passage of HJR 747 by the U.S. Congress in 1978. There is also a question as to whether the Commissioner of Public Lands Order No. 1 (1974) is consistent with the Geothermal Resources Act Section 7-15-5.C.NMSA 1953 which states "The commissioner shall issue a lease to the first qualified applicant under regulations adopted by the commissioner."

The straight competitive system has been criticized for unnecessarily slowing development by delaying lease issuance and by shifting available funds from exploration to lease payments. The existing policy and the resulting criticisms raise questions as to whether a competitive only leasing system is in the best interests of the state.

Recommendation

It is recommended that the following joint memorial be approved:

(memorial follows)

1 JOINT MEMORIAL

2 34TH LEGISLATURE - STATE OF NEW MEXICO - FIRST SESSION, 1979

3 INTRODUCED BY

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6 DISCUSSION DRAFT

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10 A JOINT MEMORIAL

11 DECLARING THE NEED TO STUDY THE CURRENT LEASING SYSTEM FOR LEASING LANDS
12 FOR GEOTHERMAL DEVELOPMENT; REQUESTING THE COMMISSIONER OF PUBLIC LANDS TO
13 INSTITUTE SUCH A STUDY.

14
15 WHEREAS, development of geothermal resources will be of positive benefit
16 to the State of New Mexico in terms of meeting a significant portion of its
17 energy needs;

18 WHEREAS, one of the problems identified as unnecessarily hindering devel-
19 opment of these resources is the existing state administrative policy of
20 leasing all lands on a competitive basis;

21 WHEREAS, there is a need to have more information on the effect a land
22 classification scheme has on encouraging development while protecting the
23 state's interest in its natural resources;

24 NOW, THEREFORE, BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF NEW
25 MEXICO that the commissioner of public lands examine the existing policy of leasing

1 state lands only on a competitive basis, consider alternatives--including
2 a system combining exploration permits for resource assessment, non-competitive
3 leases for land with low or unknown potential and competitive leases for
4 lands with demonstrated geothermal value--and report to the Legislature by
5 July 31, 1979, his recommendations;

6 BE IT FURTHER RESOLVED, that a copy of this memorial be sent to the commis-
7 sioner of public lands.

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POLICY AREA

A COORDINATED STATE PROGRAM FOR GEOTHERMAL DEVELOPMENT

BACKGROUND INFORMATION

State policies for geothermal research and development, financial incentives, leasing, permitting and environmental review are most effective as part of a coordinated state program. The character of development industries changes over time, and state policies should evolve correspondingly. Such a concerted, responsive program requires interagency cooperation and a regular forum for resolving policy issues.

ISSUE: INTERAGENCY COOPERATION IN REGULATING GEOTHERMAL DEVELOPMENT

A coordinated state program for geothermal development is needed if the resource is to be developed promptly and efficiently. With this objective, several states have created interagency geothermal coordinating councils to enhance interagency cooperation; to give guidance to state research and development programs, leasing activities, development permitting and environmental reviews; and to establish concerted state positions regarding federal geothermal programs.

Recommendations

It is recommended that the committee approve the resolution directing the NCSL Geothermal Policy Project to continue to study this area and work with individual committee members and state administrative officials in developing possible legislative recommendations for a state interagency geothermal coordinating council:

(resolution on page 51)

POLICY AREA.

CONTINUED STUDY OF GEOTHERMAL DEVELOPMENT IN NEW MEXICO

BACKGROUND INFORMATION

Because of the complex nature of geothermal resources, geothermal development is directly affected by numerous state policies. These include water law, land use planning, building and zoning requirements, environmental regulation, taxation policies, utility regulations and securities regulation.

ISSUE: ASSISTANCE FROM THE NCSL GEOTHERMAL POLICY PROJECT

The National Conference of State Legislatures' Geothermal Policy Project is designed to help state legislatures determine what actions can be taken to encourage the efficient development of geothermal resources. This is a comprehensive effort encompassing all state policies that affect geothermal development. Some of the policy areas are quite complex. For this reason, the review could not be completed in the short time available to the committee during the interim.

Recommendation

It is recommended that the following resolution be approved directing the NCSL Geothermal Policy Project to continue work in specified areas to develop legislative recommendations for the 1979 legislative session:

(resolution follows)

1 RESOLUTION

2 33rd LEGISLATURE - STATE OF NEW MEXICO - 1978 INTERIM LEGISLATIVE COMMITTEE ON

3 NATURAL RESOURCES

4 INTRODUCED BY

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7 DISCUSSION DRAFT

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11 A RESOLUTION

12 DIRECTING THE NATIONAL CONFERENCE OF STATE LEGISLATURES' GEOTHERMAL POLICY
13 PROJECT TO CONTINUE TO STUDY CERTAIN AREAS AND TO WORK WITH INDIVIDUAL COMMIT-
14 TEE MEMBERS IN DEVELOPING LEGISLATIVE RECOMMENDATIONS.

15
16 WHEREAS, the Interim Legislative Committee on Natural Resources requested
17 the assistance of the National Conference of State Legislatures' Geothermal
18 Policy Project in determining what actions the State of New Mexico could take
19 to encourage development of geothermal resources in the state;

20 WHEREAS, the NCSL Geothermal Policy Project has produced background
21 information and study recommendations for consideration by the Interim Legis-
22 lative Committee on Natural Resources;

23 WHEREAS, the Geothermal Policy Project has provided legislative recommenda-
24 tions in those areas sufficiently advanced to allow such;

25 WHEREAS, there are certain important areas that require further study; in

1 particular, the legal status of geothermal resources, certain provisions of
2 the current leasing system and the development of an interagency geothermal
3 coordinating council;

4 WHEREAS, the Geothermal Policy Project is prepared to work further in
5 identifying policies to remove unnecessary barriers to geothermal development
6 in New Mexico;

7 WHEREAS, the Joint Legislative Committee on Natural Resources must conclude
8 its investigation and report to the Legislative Council by December 1, 1978;

9 NOW, THEREFORE, BE IT RESOLVED BY THE JOINT LEGISLATIVE COMMITTEE ON
10 NATURAL RESOURCES that the further work of the Geothermal Policy Project should
11 be supported and encouraged;

12 BE IT FURTHER RESOLVED that individual committee members and state adminis-
13 trative officials work with the staff of the NCSL Geothermal Policy Project in
14 developing further legislative recommendations for introduction in the 1979
15 legislative session.

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ISSUE: GEOTHERMAL POLICY REVIEW DURING THE 1979 INTERIM

Recommendation

It is recommended that the following joint memorial be approved directing the Legislative Council to include geothermal policy study in the work of the 1979 interim committees:

(joint memorial follows)

Blank

1 JOINT MEMORIAL

2 34TH LEGISLATURE - STATE OF NEW MEXICO - FIRST SESSION, 1979

3 INTRODUCED BY

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6 DISCUSSION DRAFT

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10 A JOINT MEMORIAL

11 REQUESTING THE LEGISLATIVE COUNCIL TO INCLUDE GEOTHERMAL POLICY STUDY IN
12 THE WORK OF THE 1979 INTERIM COMMITTEES.

13
14 WHEREAS, geothermal resources can contribute significantly to the energy
15 needs of New Mexico;

16 WHEREAS, legal and institutional problems unnecessarily burden the efficient
17 development of these resources;

18 WHEREAS, the National Conference of State Legislatures' Geothermal Policy
19 Project is designed to provide assistance to state legislatures in addressing
20 problem areas;

21 WHEREAS, the National Conference of State Legislatures' Geothermal Policy
22 Project worked successfully with the 1978 Interim Legislative Committee on
23 Natural Resources in making legislative recommendations on areas for considera-
24 tion in the 1979 legislative session;

25 WHEREAS, numerous policy areas that affect geothermal development were not

1 included in this previous policy review;

2 NOW, THEREFORE, BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF NEW
3 MEXICO that the Legislative Council be directed to include geothermal policy
4 study in the work of at least one interim study committee;

5 BE IT FURTHER RESOLVED that the committee which examines the geothermal
6 policy area should work closely with the staff of the National Conference
7 of State Legislatures' Geothermal Policy Project.

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ATTACHMENT I

LEGISLATIVE RECOMMENDATIONS
ON
GEOTHERMAL RESOURCES

Prepared for the Utah Legislature
1978 Geothermal Policy Review

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Policy Area

REGULATION OF GEOTHERMAL DEVELOPMENT

Background Information

Substantial reserves of geothermal resources are located in Utah, and major commercial development already is underway for electricity production and direct heat applications. As yet, however, no statutory guidance for regulation of this development has been provided.

High-temperature geothermal resources with the greatest immediate potential for electricity production reside in the Roosevelt Hot Springs-Cove Fort-Thermo Hot Springs area. Construction of 50-100 megawatts of geothermal generating capacity is scheduled for completion in 1982. Geothermal reserves in the area are conservatively estimated to be 400-800 megawatts of electrical generating capacity.

Lower temperature resources suitable for direct heat applications are widespread in Utah. The large deposits along the Wasatch Front are especially attractive because they are near concentrations of population and industry. Major direct heat projects currently funded in Utah include a district heating system for Monroe City; space and water heating for the minimum security building at Utah State Prison; and conversion of greenhouse heating (six acres) in Sandy, Utah, from oil and gas to geothermal.

Responding to development pressures, the State Engineer has promulgated geothermal development regulations. Statutory guidance for these important policies is lacking, however, and in some instances basic authorization is needed.

ISSUE: REGULATORY AUTHORIZATION AND POLICY DIRECTION

Legislative authorization and policy direction for the regulation of geothermal development is needed in Utah. The resource should be defined and its relationship to other natural resources specified. Regulatory authority and objectives should be outlined and the responsible agency designated.

Recommendation

It is recommended that the Utah Legislature enact a geothermal resource conservation act which defines the resource and provides for regulation by the Utah Division of Water Rights to prevent waste and protect correlative rights (bill follows).

Summary of Proposed Legislation

The proposed bill would:

1. Define the physical features and elements of geothermal resources;
2. Declare the public interest in the regulation of geothermal development to prevent waste and protect correlative rights;
3. Establish the Division of Water Rights as the regulatory agency for geothermal development and outline the agency's jurisdiction and powers;
4. Declare geothermal resources to be a mineral resource separate from water resources in the state, with prior rights governing any conflicts between these separate resource rights; and
5. Provide for unitization of geothermal resource areas where necessary to prevent waste or protect correlative rights.

GEOTHERMAL RESOURCE CONSERVATION ACT

1979

GENERAL SESSION

Discussion Draft

B. No. _____

By _____

AN ACT RELATING TO THE DEVELOPMENT OF GEOTHERMAL RESOURCES: DECLARING THE PUBLIC INTEREST; ASSIGNING REGULATORY AUTHORITY TO THE DIVISION OF WATER RIGHTS; DEFINING THE RESOURCE AND ITS RELATIONSHIP TO WATER; PROVIDING FOR THE PROTECTION OF CORRELATIVE RIGHTS AND THE PREVENTION OF WASTE; AUTHORIZING AND ESTABLISHING PROCEDURES FOR UNITIZATION OF GEOTHERMAL AREAS; INCLUDING A SEVERABILITY CLAUSE.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF UTAH:

SECTION I. Declaration of Public Interest in Development of Geothermal Resources

It is declared to be in the public interest to foster, encourage and promote the discovery, development, production, utilization and disposal of geothermal resources in the State of Utah in such a manner as will prevent waste and safeguard the natural environment and the public welfare; to authorize, encourage and provide for the development and operation of geothermal resource properties, including, inter alia, agreements for cooperative development, production, injection and pressure maintenance operations, in such a manner that the greatest possible ultimate economic recovery of geothermal resources may be obtained and that the correlative rights of all owners be fully protected.

SECTION II. Lands to Which Act Is Applicable

This act shall apply to all lands in the State of Utah lawfully subject to its police power, and shall apply to lands of the United States or to lands subject to the jurisdiction of the United States over which the State of Utah has the police power, and shall apply to any lands committed to a unit agreement approved by the Secretary of the Interior or his duly authorized representative, except that the Division may, with respect to such unit agreement, suspend the application of this act or any part of this act so long as the conservation of geothermal resources and the prevention of waste is accomplished under such unit agreements.

SECTION III. Definition of Terms

As used in this act, unless the context requires otherwise:

(a) "Correlative rights" means the owners' or operators' just and equitable share in the geothermal resource.

(b) "Division" means the Division of Water Rights, Department of Natural Resources, State of Utah.

(c) "Geothermal area" means the general land area which in its subsurface is underlain or reasonably appears to be underlain by geothermal resources.

(d) "Geothermal resource" means (1) the natural heat of the earth at temperatures greater than 250 degrees Fahrenheit, (2) the energy, in whatever form, below the surface of the earth present in, resulting from, created by, or which may be extracted from, that natural heat, including pressure, (3) the natural or artificial medium containing the energy, and (4) all minerals in solution or other products obtained from those naturally heated fluids, brines, associated gases and steam, in whatever form, found below the surface of the earth, but excluding oil, hydrocarbon gas and other hydrocarbon substances. Geothermal resources further are found and hereby declared to be a mineral resource.

(e) "Geothermal system" means any strata, pool, reservoir or other geologic formation containing geothermal resources.

(f) "Operator" means any person drilling, maintaining, operating, producing or in control of any well.

(g) "Owner" means any person who has the right to drill into, produce and appropriate the geothermal resource.

(h) "Person" means any individual, business entity (corporate or otherwise) or political subdivision of this or any other state.

(i) "Waste" means any physical waste, including but not limited to:

1. Underground waste resulting from inefficient, excessive or improper use, or dissipation of geothermal resources in any way, including the locating, spacing, constructing, equipping, operating or producing of any well in a manner which results or tends to result in reducing the ultimate economic recovery of geothermal resources from any geothermal area in the State.

2. The inefficient above-ground transporting and storage of geothermal resources and the locating, spacing, equipping, operating or producing of any well in a manner causing or tending to cause unnecessary or excessive surface loss or destruction of geothermal resources, including the venting of geothermal resources or hot water in excess of what is reasonably necessary in the efficient development or production of a well.

(j) "Well" means any well drilled, converted or reactivated for the discovery, testing, production or disposal of geothermal resources, or for injecting geothermal resources to subsurface strata.

SECTION IV. Division of Water Rights--Power and Authority--Legal Advisor

(1) The Division shall have and is hereby given jurisdiction and authority over all persons and property, public and private, necessary to enforce the provisions of this act and shall have the power and authority to make and enforce rules, regulations and orders and do whatever may reasonably be necessary to carry out the provisions of this act.

(2) Any person may apply for a hearing before the Division, or the Division may initiate proceedings upon any question relating to the administration of this act, and jurisdiction is hereby conferred upon the Division to hear and determine the same and enter its rule, regulation or order with respect thereto.

(3) The Division may sue or be sued in its administration of this act in any state or federal district court of competent jurisdiction.

(4) The attorney general, when requested by the Division, shall act as the legal advisor of the Division and represent the Division in any court proceedings and in any proceedings before it and in any proceedings to which the Division may be a party before any department of the federal government.

SECTION V. Division of Water Rights--Additional Powers

(1) The Division shall have the authority to require:

(a) Identification of the location and ownership of geothermal wells and producing leases.

(b) Filing with the Division a notice of intent to drill before any well is commenced.

(c) The making and filing with the Division of true and correct copies of well logs. Such records shall be public records when filed with the Division, unless the owner or operator requests, in writing, that the records be held confidential. The confidential period shall not exceed five years from the date of production or injection for other than testing purposes, or abandonment, whichever occurs first, as determined by the Division. Well records held confidential by the Division shall be open to inspection by those persons authorized in writing by the owner or operator. Confidential status shall not restrict inspection by state officers charged with regulating well operations or by authorized officials of the Utah Tax Commission for purposes of tax assessment.

(d) The spacing, drilling, casing, testing, operating, producing and abandonment of wells in such a manner as to prevent (1) geothermal resources, water, gases or other fluids from escaping into strata other than the strata in which they are found, (2) pollution of fresh water supplies, (3) premature cooling of any geothermal system by water encroachment or otherwise which tends to reduce the ultimate economic recovery of geothermal resources, (4) blowouts, cavings and seepage, and (5) unreasonable disturbance or injury to neighboring properties, human life, health and the environment.

(e) Furnishing of reasonable security conditioned upon conformance with Division regulations.

(f) The geothermal owner or operator to measure geothermal well production according to standards set by the Division and maintain, for a period of five (5) years, complete and accurate production records, which records, or certified copies thereof, shall be available for examination by the Division at all reasonable times within that period.

(g) Filing with the Division any other reasonable reports which it prescribes regarding geothermal operations within the state.

(2) The Division may enter into private or public land at any time to inspect any well or geothermal resource development project to determine if such well or project is being constructed, operated or maintained according to any applicable permits or to determine if the construction, operation or maintenance of such well or project may involve an unreasonable risk to life, health, property, the environment or subsurface or atmospheric resources. Authorized personnel of the Utah Tax Commission for purposes of tax assessment have the same rights of entry and inspection.

SECTION VI. Unitization of Geothermal Area--Division Powers and Duties

(1) The Division upon its own motion may hold, and upon the application of any interested person shall hold, a hearing to consider the need for cooperative or unit operation of a geothermal area.

(2) The Division shall make an order providing for the unit operation of part or all of a geothermal area if the Division finds that:

(a) Such operation is reasonably necessary to prevent waste, to protect correlative rights or to prevent the drilling of unnecessary wells, and

(b) Unit operation will increase the ultimate economic recovery of geothermal resources.

(3) The order for unitization shall be upon terms and conditions that are just and reasonable and shall prescribe a plan for unit operations that includes:

(a) A description of the geothermal area to be so operated, termed the unit area.

(b) A statement of the nature of the operations contemplated, the time they will commence, and the manner and circumstances under which unit operations shall terminate.

(c) An allocation to the separately-owned tracts in the unit area of the geothermal resources produced and of the costs incurred in unit operations. The allocations shall be in accord with the agreement, if any, of the interested parties. If there is no such agreement, the Division shall determine the allocations from evidence introduced in a hearing before the Division.

(d) Such additional provisions that are found to be appropriate for carrying on the unit operation.

(4) No order of the Division providing for unit operations shall become effective unless and until the plan for unit operations prescribed by the Division has been approved in writing by those persons who, under the Division's order, will be required to pay 60 percent of the costs of the unit operation, and also by the owners of 60 percent of the production or proceeds thereof that are free of cost, such as royalties, overriding royalties and production payments, and the Division has made a finding that the plan for unit operations has been so approved. If the persons owning required percentage of interest in the unit area do not approve the plan within six (6) months from the date on which the order is made, such order shall be ineffective and shall be revoked by the Division unless for good cause shown the Division extends this time.

(5) An order providing for unit operations may be amended by an order of the Division in the same manner and subject to the same conditions as an original order for unit operations; provided that if such amendment affects only the rights and interests of the owners, the approval of the amendment by the owners of royalty, overriding royalty, production payments and other interests which are free of costs shall not be required.

(6) Good faith operations conducted pursuant to an order of the Division providing for unit or cooperative operations shall constitute a complete defense to any suit alleging breach of lease or contractual obligations covering lands in the unit area to the extent that compliance with such obligations cannot be had because of the order of the Division.

(7) An order of the Division for unit operations shall constitute a complete defense to any suit charging violation of any statute relating to trusts, monopolies and combinations in restraint of trade on account of unit operations conducted pursuant to the order.

SECTION VII. Relationship of Geothermal Resources and Water Resources--Powers of Division.

(1) Geothermal resources are presumed to be separate from water resources in the state. Where interference between geothermal rights and water rights is demonstrated, however, the prior right shall take precedence.

(2) Upon a showing before the Division by holder of the prior right that substantial interference and injury actually exists, the Division shall order an offset or a curtailment of production by holder of the junior right, or upon agreement by holder of the prior right, shall order reasonable compensation to holder of the prior right.

SECTION VIII. Severability

If any provision of this act, or the application of any provision to any person or circumstance, is held invalid, the remainder shall not be affected thereby.

Policy Area

DIRECT USE (NON-ELECTRIC APPLICATIONS) OF GEOTHERMAL RESOURCES

Background Information

Nonelectric applications of geothermal energy, utilizing lower temperature resources, have much more potential to benefit the state than electricity production. Examples of these applications are for heating and cooling of buildings, in industrial processing and for crop drying and other agricultural uses. Since these direct heat applications at less than 250°C account for 40% of the nation's total energy consumption--and natural gas, oil, coal and electric power presently supply this energy--actions to substitute geothermal energy for those costly, high-grade fuels should be promoted.

ISSUE: HEATING DISTRICTS

District heating is highly compatible with the development of moderate temperature geothermal resources--an important fact since these reserves probably coincide with Utah's population centers along the Wasatch Front. Currently, the appropriate avenue for heating district formation by political entities is unclear. Private utilities are already authorized to provide "artificial heat."

Recommendation

It is recommended that current laws be amended to establish heating district authority in Metropolitan Water Boards and to allow private utilities to provide heating and cooling services (bill follows).

Summary of Proposed Legislation

The proposed bill would:

1. Amend the public utility code (Title 54, Chapter 2 UCA 1953) to characterize

"heating plants" as those providing heating and cooling services. The characterization of such services as "artificial" would be deleted.

2. Amend the metropolitan water district act (Title 73, Chapter 8 UCA 1953) to specify delivery of heating and cooling services within its authorization. Such services may be provided via development of both geothermal resources and hot water supply sources, whether subsurface in nature or part of a waste heat management/cogeneration program. Disposal of such fluids and vapors, whether by reinjection or otherwise, is added to the list of functions such districts may perform. Condemnation of water and geothermal rights and sources of supply is specifically authorized.

Note

Metropolitan Water Boards are currently authorized to devote water to a broad range of services and exercise considerable powers. These powers include incurring debt and issuing general obligation or revenue bonds, levying taxes, apportioning service charges, fixing service rates, entering into joint ventures with other corporate entities, condemning property, obtaining easements, etc. The proposed amendments would specify that these powers may be exercised in order to provide district heating service.

DISTRICT HEATING AUTHORIZATION

1979

GENERAL SESSION

Discussion Draft

B. No. _____

By _____

AN ACT RELATING TO DISTRICT HEATING AND COOLING SERVICES: AMENDING TITLE 54, CHAPTER 2 AND TITLE 73, CHAPTER 8 (UCA 1953) TO AUTHORIZE PRIVATE AND MUNICIPAL HEATING AND COOLING DISTRICTS UTILIZING HOT WATER OR GEOTHERMAL RESOURCES.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF UTAH:

SECTION I. Section 54-2-1 (15) (UCA 1953) is amended to read:

(15). The term "heating plant" includes all real estate, fixtures, machinery, appliances and personal property controlled, operated or managed in connection with or to facilitate the production, generation, transmission, disposal, delivery or furnishing of fluids or vapors, whether natural or manufactured, for anti-ficial-heat heating and cooling purposes.

SECTION II. Section 73-8-2 (UCA 1953) is amended to read:

73-8-2. "Words and phrases" defined.--As used herein the term "municipality" or "city" shall be deemed to mean and include any incorporated city or town of the state of Utah.

The terms "board" and "board of directors" shall be deemed to refer to the board of directors created under section 73-8-20 hereof.

The term "governing body" as used herein shall be deemed to mean the legislative body of any municipality.

The term "public corporation" as used herein shall be deemed to mean and include the United States or any public agency thereof, this or any other state or any political district or subdivision thereof.

The terms "water," "water rights," "sources of water supply," "water works" and "water companies" as used herein shall be deemed to include, respectively, geothermal resources, geothermal resource rights, geothermal systems, geothermal facilities and geothermal resource companies.

SECTION III. Section 73-8-3 (UCA 1953) is amended to read:

78-8-3. Purpose and corporate existence of districts.--Metropolitan water districts may be organized hereunder for the purpose of acquiring, appropriating, developing, storing, selling, leasing, disposing and distributing water and geothermal resources for, and devoting water and geothermal resources to, municipal and domestic purposes, irrigation, power, heating and cooling, milling, manufacturing, mining, metallurgical and any and all other beneficial

New Material
Deleted Material

uses, and such district may be formed of the territory included within the corporate boundaries of any one or more municipalities, which need not be contiguous, and may be organized and incorporated and thereafter governed, maintained and operated as herein provided, and when so incorporated shall have and exercise such powers as are herein expressly granted, together with such powers as are reasonably implied herefrom and necessary and proper to carry out the objects and purposes of such incorporated districts. Each such district when so incorporated shall be a separate and independent political corporate entity.

SECTION IV. Section 73-8-18 (e) is amended to read:

(e) To have and exercise the power of eminent domain and in the manner provided by law for the condemnation of private property for public use to take any property, including water and geothermal resource rights and sources of supply, necessary to the exercise of the powers herein granted. In any proceeding relative to the exercise of such power of eminent domain, the district shall have the same rights, powers and privileges as a municipal corporation.

SECTION V. Section 73-8-18 (1) is amended to read:

(1) To acquire water and water rights within or without the state; to develop, store and transport water; to subscribe for, purchase and acquire stock in canal companies, water companies and water users' associations; to provide, dispose, sell, lease and deliver water within or outside of the district for municipal and domestic purposes, irrigation, power, heating and cooling, milling, manufacturing, mining and metallurgical and any and all other beneficial uses; to fix the rates therefor, and to acquire, construct, operate and maintain any and all works, facilities, improvements and property necessary or convenient therefor, and in the doing of all said things to obligate itself jointly with other persons and corporations, public and private, and execute and perform such obligations according to the tenor thereof.

(no further changes)

SECTION VI. Section 73-8-26 (UCA 1953) is amended to read:

73-8-26. Bonds--Types--Election--Terms--Interest--Payment--Resolution--Refunding.-- Any district may issue its bonds for the acquisition through construction, purchase, or otherwise and for the improvement or extension of any properties necessary or desirable in the obtaining, treatment, disposal and distribution of water...(no further changes)

ISSUE: ALTERNATIVE ENERGY SYSTEMS FEASIBILITY STUDY

As a novel resource, geothermal energy faces the hurdle of establishing an initial market. This involves determining its economic competitiveness and demonstrating utilization technology. The state can take a lead role in this area by requiring an analysis of the feasibility of using geothermal and other alternative energy systems before constructing or renovating public buildings. Where economically feasible, such systems would then be employed, thereby initiating a market. This would tend to encourage consumer confidence in such systems and stimulate business investments.

Recommendation

It is recommended that the Utah State Building Board be directed to prepare an Alternative Energy System Feasibility Study prior to the construction or major renovation of certain public buildings. The study would be used in siting, designing and selecting energy systems for such buildings (bill follows).

Summary of Proposed Legislation

The proposed legislation would direct the Utah State Building Board to (1) prepare an alternative energy system feasibility study, considering at least two non-fossil energy systems, prior to construction or major renovation of certain public buildings, (2) utilize life-cycle cost analysis, including a system operation simulation, and (3) employ the feasibility study to guide the selection of building site, design and energy systems.

ALTERNATIVE ENERGY SYSTEMS FEASIBILITY STUDY ACT

1979

GENERAL SESSION

Discussion Draft

_____ B. No. _____

By _____

AN ACT RELATING TO THE PREPARATION OF FEASIBILITY STUDIES ON ALTERNATIVE ENERGY SYSTEMS FOR NEW OR RENOVATED PUBLIC BUILDINGS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF UTAH:

SECTION I. A new clause (c) is added to Section 63-9-49 (2) (UCA 1953) to read:

(c) (new material) Prepare an alternative energy systems feasibility study prior to the commencement of siting, construction or major renovation of buildings owned by the State of Utah and its political subdivisions. This provision applies to buildings having more than 20,000 square feet of usable floor space. The study shall employ life cycle cost analysis and include simulations of system performance over a year's operating period. At least two non-fossil energy systems shall be evaluated, including the utilization of geothermal or hot water resources where available. The study shall guide the selection of building site, design and energy systems.

ISSUE: ALTERNATIVE ENERGY DEVICE TAX CREDIT

Substantial first costs for the installation of geothermal and other alternative energy devices deter consumers who usually shop for goods with the lowest initial purchase price, rather than the lowest life-cycle cost. To help overcome this tendency and provide an incentive for the use of alternative energy sources, more than 30 states give tax breaks for the installation of alternative energy devices.

Recommendation

It is recommended that the Utah Legislature approve a 35 percent income tax credit for alternative energy devices installed for residential use (credit not to exceed \$3,000) and for commercial use (credit not to exceed \$6,000), and a 60-month amortization option for commercial alternative energy devices (bill follows).

Summary of Proposed Legislation

The proposed legislation would:

1. Define alternative energy devices;
2. Provide a 35 percent income tax credit, up to \$3,000, for alternative energy devices installed for a principle residence in the state;
3. Provide a 35 percent income tax credit, up to \$6,000, for alternative energy devices installed for commercial properties;
4. Allow a carry forward to subsequent tax years if the allowed credit exceeds the taxpayer's tax liability;
5. Reduce the allowed credit by the amount of any federal income tax credit claimed by the taxpayer for the same alternative energy device;
6. Allow alternative energy devices installed for commercial facilities to be amortized for income tax purposes over a 60-month period;
7. Restrict the provisions of the act to alternative devices installed before June 30, 1985; and
8. Designate the Utah Tax Commission to administer the act and prescribe rules and standards in conjunction with the Utah Energy Office and the Utah Division of Water Rights.

ALTERNATIVE ENERGY DEVICE TAX CREDIT

1979

GENERAL SESSION

Discussion Draft

B. No. _____

By _____

AN ACT RELATING TO ALTERNATIVE ENERGY DEVELOPMENT: DEFINING ALTERNATIVE ENERGY DEVICES; PROVIDING AN INCOME TAX CREDIT FOR SUCH DEVICES; ALLOWING A CARRY OVER TO SUCCEEDING TAXABLE YEARS; PROVIDING FOR AMORTIZATION OF ALTERNATIVE ENERGY DEVICES IN COMMERCIAL USE; DESIGNATING THE STATE TAX COMMISSION TO ADMINISTER THIS ACT AND ESTABLISH STANDARDS IN CONJUNCTION WITH THE UTAH DIVISION OF WATER RIGHTS AND THE UTAH ENERGY OFFICE.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF UTAH:

SECTION I. Definition of Terms

As used in this act:

(a) "Alternative energy device" means (1) any system, mechanism or series of mechanisms which uses solar radiation, wind or geothermal resource for space heating, water heating or cooling, or for generation of mechanical or electrical energy for use but not for resale, (2) a system that employs a fluid-to-air heat pump operating on groundwater reservoir or a fluid reservoir heated by solar radiation or geothermal resource, and (3) equipment necessary to utilize and connect to a private or municipal system for purposes of heating and cooling that employs an alternative energy device or heat from an industrial or utility cogeneration system.

(b) "Cogeneration system" means a system which produces electrical energy and steam or forms of useful energy (such as heat) which are used for industrial, commercial, heating or cooling purposes.

(c) "Installation costs" means the costs, as determined according to standards established in the administration of this act, for acquisition, installation, construction, reconstruction or remodeling properly attributable to the use of an alternative energy device.

SECTION II. Residential Tax Credit

(1) Any resident individual taxpayer who completes installation of an alternative energy device for use in such taxpayer's principal dwelling prior to June 30, 1985, or who acquires title to a dwelling prior to June 30, 1985,

which dwelling is to be used as a taxpayer's principal dwelling and is supplied energy from an alternative energy device for which the credit allowed by this section has never been claimed, shall be entitled to claim a tax credit in an amount equal to thirty-five percent (35%) of the installation costs of such system or three thousand dollars (\$3,000), whichever is less, against the income tax liability imposed against the taxpayer pursuant to Title 59 Chapters 14 and 14A of the Utah Code Annotated, 1953. Such tax credit shall be deducted from the taxpayer's income tax liability for the taxable year in which the alternative energy device was completed or acquired and placed in service by the taxpayer.

(2) If the amount of such tax credit exceeds the taxpayer's income tax liability for such taxable year, the amount thereof which exceeds such tax liability may be carried over for deduction from the taxpayer's income tax liability in the next succeeding taxable year or years until the total amount of the tax credit has been deducted from tax liability.

(3) The provisions of this section shall be retroactive to the 1979 taxable year.

SECTION III. Commercial Tax Credit

Any taxpayer who completes installation of an alternative energy device upon real property located within this state prior to June 30, 1985, which real property is either used in a trade or business or held for the production of income, or any taxpayer who acquires title to real property located within this state prior to June 30, 1985, which real property is used in a trade or business or held for the production of income and is equipped with an alternative energy device for which the credit allowed by this section has never been claimed, shall be entitled to claim an income tax credit in an amount equal to thirty-five percent (35%) of the installation costs of such system or six thousand dollars (\$6,000) or an amount equal to the taxpayer's income tax liability in the taxable year for which the credit is claimed, whichever is less, against the tax liability imposed against such taxpayer pursuant to Title 59 Chapters 14 and 14A of the Utah Code Annotated, 1953. Such tax credit shall be deducted from the taxpayer's tax liability for the taxable year in which such system is acquired and placed into service by the taxpayer. This provision shall apply retroactively to include the 1979 taxable year.

SECTION IV. Federal Tax Credit

The federal income tax credit for an alternative energy device as defined in this act shall be subtracted from the state credit prior to obtaining the state credit so that the combined credit, state and federal, would be 35% or \$3,000 for claimants under Section II, and for claimants under Section III, 35% or \$6,000.

SECTION V. Amortization of Alternative Energy Device

(1) Retroactive to the 1979 taxable year, and in addition to the income tax credit allowable, any taxpayer who completes installation of an alternative energy device upon real property located within this state prior to June 30, 1985,

which real property is either used in a trade or business or held for the production of income, may elect to amortize the adjusted basis of the alternative energy device based upon a period of sixty (60) months. In computing Utah taxable income, such amortization shall be allowed as a deduction from Utah adjusted gross income ratably over such sixty-month period beginning with the month in which such alternative energy device was completed or acquired and placed into service by the taxpayer. The election of the taxpayer to claim the amortization deduction allowed by this section shall be indicated in an appropriate statement attached to the taxpayer's income tax return for the taxable year in which such alternative energy device was completed or acquired and placed into service. As used in this section, "adjusted basis of the alternative energy device" shall mean an amount that is properly attributable to the construction, reconstruction, remodeling, installation or acquisition of such system.

(2) In any case where a taxpayer, hereinafter referred to as transferor, has qualified and elected to amortize the adjusted basis of an alternative energy device pursuant to subsection (1) and the real property equipped with such system is acquired and used in a trade or business or held for the production of income by another taxpayer, hereinafter referred to as transferee, and the transferor has not fully amortized the adjusted basis of such system as provided in subsection (1), the transferee shall be entitled to amortize that portion of the transferor's adjusted basis of such system remaining unamortized, but the total amount to be amortized by the transferee shall not exceed said transferee's adjusted basis in the system. The transferee shall amortize such remaining amount based upon the remaining portion of the sixty-month period unused by the transferor. The amount by which the transferee's adjusted basis exceeds the amount of the transferor's adjusted basis remaining unamortized shall be amortized over the useful life of the system.

SECTION VI. Administration

The Utah State Tax Commission in conjunction with the Utah Division of Water Rights and the Utah Energy Office is hereby authorized to administer this act and shall prescribe such rules, regulations and standards as may be deemed necessary to carry out the purposes of this act.

Policy Area

CONTINUED STUDY OF GEOTHERMAL POLICIES FOR UTAH

GEOHERMAL POLICY STUDY RESOLUTION

1979

GENERAL SESSION

Discussion Draft

_____ B. No. _____

By _____

A JOINT RESOLUTION DIRECTING THE OFFICE OF LEGISLATIVE RESEARCH TO STUDY STATE POLICY CONCERNS IN GEOTHERMAL DEVELOPMENT AND REPORT TO THE GENERAL SESSION OF THE FORTY-FOURTH LEGISLATURE; REQUESTING THE ASSISTANCE OF THE NATIONAL CONFERENCE OF STATE LEGISLATURES.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF UTAH:

WHEREAS, geothermal resources can contribute significantly to the energy needs of Utah;

WHEREAS, legal and institutional problems unnecessarily burden the efficient development of these resources;

WHEREAS, the National Conference of State Legislatures' Geothermal Policy Project is designed to provide assistance to state legislatures in addressing problem areas;

WHEREAS, the National Conference of State Legislatures' Geothermal Policy Project worked successfully with the 1978 Interim Legislative Committee on Energy and Natural Resources in making legislative recommendations on areas for consideration in the 1979 legislative session;

WHEREAS, numerous policy areas that affect geothermal development were not included in this previous policy review;

NOW, THEREFORE, BE IT RESOLVED BY THE LEGISLATURE OF THE STATE OF UTAH that the Office of Legislative Research be directed to study state policy concerns in geothermal development and report to the General Session, Forty-Fourth Legislature;

BE IT FURTHER RESOLVED that the National Conference of State Legislatures' Geothermal Policy Project be requested to assist this policy study.

ATTACHMENT J

BACKGROUND REPORT ON GEOTHERMAL POLICY

Legislative Options and Recommendations

Prepared for the
1979 Hawaii Legislature

Geothermal Policy Project
National Conference of State Legislatures
1405 Curtis Street, Suite 2300
Denver, Colorado 80202

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INTRODUCTION

The Hawaii Legislature, in cooperation with the National Conference of State Legislatures, is undertaking a review of state policies affecting geothermal development. As part of this effort a workshop was held on August 2, 1978. At that time a state work plan was developed calling for policy studies in the following areas (in order of priority):

- I. Ownership
- II. Incentives
- III. Intra-governmental coordination
- IV. Regulatory delays
- V. Direct use
- VI. Land use planning
- VII. Lease terms

A summary of workshop proceedings was distributed and comments were solicited. This report has drawn from that material, as well as other information available to the NCSL Geothermal Policy Project. It focuses on the outlined issues and presents various legislative options for consideration in the 1979 session.

I. OWNERSHIP

Hawaii has declared geothermal to be a mineral resource. No compelling reason has been advanced to change that classification. In fact, any such midstream change would create a climate of uncertainty, tending to deter rapid geothermal development. There are, however, unresolved issues regarding geothermal ownership in Hawaii. Two areas, in particular, concerned workshop participants and deserve further study.

A. ISSUE: WHAT IS THE EXTENT OF STATE CLAIMS TO GEOTHERMAL RESOURCES UNDERLYING PRIVATE LANDS WHERE NO EXPRESS OR IMPLIED MINERAL RESERVATION TO THE STATE EXISTS?

Option: Assert state ownership of all geothermal resources. The state may claim all geothermal resources under the "public trust" doctrine, which has been applied by the Hawaii Supreme Court to a number of natural resource fact situations (e.g. lava flow extensions, surface water rights, seashore boundaries).

Legal challenges by aggrieved property owners would be highly probable. Protracted litigation (the Union Oil case took almost seven years) would not be conducive to geothermal development. The state should balance the possibility of additional royalty revenues against delays in developing a promising indigenous energy source.

Surface access to private lands for geothermal exploration and production must be provided under this option. Generally, the state has given surface owners a first right to lease reserved mineral rights. This same privilege should be extended to surface owners where no previous mineral/geothermal reservation to the state exists. In addition, royalty sharing with such owners might reduce the likelihood of litigation.

Option: Leave geothermal resources in the mineral estate; waive any additional state claims. Under this approach, Hawaii owns geothermal resources under state lands (~38% of the state) as well as those under private lands where the estate is severed by a mineral reservation to the state--although legal challenges by surface owners remain a possibility. On other lands the operating assumption is that geothermal resource ownership is in the mineral estate, usually held by the surface owner. The state could specifically waive any claims to such resources or leave the situation alone.

This approach would probably avoid the lawsuits likely under the previous option; however, the state would forego some potential royalty revenues. An additional contingency must be considered: a legal challenge by Native Hawaiian groups. Such an action would probably assert that the state breached its trust responsibilities to Native Hawaiians by failing to claim ownership of a public resource. HO'ALA KANAWAI, INC. filed an amicus brief in Robinson v. Ariyoshi (CA9, No. 7432) arguing in this vein regarding water; this indicated that a similar challenge regarding geothermal resources could occur.

B. ISSUE: WHAT IS THE EXTENT OF NATIVE HAWAIIAN CLAIMS TO GEOTHERMAL RESOURCES AND DEVELOPMENT REVENUES?

Under Section 5f of the Hawaii Admissions Act, state lands and their revenues are held in trust for a class of beneficiaries, including Native Hawaiians. Thus, Native Hawaiians have a claim to state geothermal revenues. This claim is not, however, absolute since the legislature retains flexibility in distributing trust proceeds among the various beneficiaries listed in the Act. Practical and equitable considerations dictate that due consideration be given to state trust responsibilities in this regard. The alternative is likely to be lawsuits and political disruption.

Several Native Hawaiian groups have raised concerns regarding geothermal development in Hawaii, and the U.S. Department of Energy has funded the United Indian Planners Association to investigate native claims and opportunities for geothermal utilization by native groups. ALU LIKE, PUNA HUI, OHANA and HO'ALA KANAWAI are associated with this effort. UIPA and PUNA HUI OHANA representatives sit on the State Geothermal Advisory Committee.

Option: At this time it seems appropriate to continue study and education efforts in this regard. The legislature might request the State Geothermal Advisory Committee, in conjunction with Native Hawaiian groups, UIPA and NCSL, to produce a report on this issue for the 1980 session. Channels for Native Hawaiian input to the geothermal development process should be established and maintained. In addition, educational efforts regarding the possible benefits of geothermal development to the native community may be useful.

C. ISSUE: WHAT IS THE RELATIONSHIP OF GEOTHERMAL RESOURCES TO WATER RESOURCES?

Last year's Constitutional Convention resulted in a directive to the state to review the water resource regime in Hawaii. This policy review should include a consideration of geothermal resource rights in relation to water rights, especially with regard to conflict situations.

Option: Integrate geothermal resource production into the water rights scheme. This approach would require operators to appropriate and obtain water rights for their fluid production. Total fluid production, consumptive fluid use, by-product water and water table offsets are various possible measures for water rights requirements.

Option: Separate geothermal fluid production from the water rights scheme.

This approach would not require geothermal operators to appropriate and obtain water rights for their fluid production. Byproduct water would be considered "developed" water and the property of the geothermal producer. A conflict resolution mechanism for water use/geothermal operation disputes would be needed.

Option: Establish a mixed regime for geothermal/water rights. This approach, basically, would not require water rights for deep, hot geothermal fluids while requiring them for shallow, warm geothermal fluids. A use (electrical/direct use) distinction or temperature/depth levels may be employed to divide the categories. A conflict resolution mechanism would again be needed.

Recommendation: It is suggested that the Hawaii Legislature, in concert with the NCSL Geothermal Policy Project, continue its policy review of geothermal ownership issues, including the water rights interface, during the 1979 session.

II. INCENTIVES

There are numerous financial incentives available to encourage geothermal development. Generally they can be divided into user and producer incentives.

A. ISSUE: WHAT INCENTIVES ARE AVAILABLE TO STIMULATE THE UTILIZATION OF GEOTHERMAL RESOURCES?

Hawaii has already exempted geothermal utilization equipment (original or retrofitted) from property tax assessment. This is a "passive" inducement since front end installation costs are not reduced.

Option: Provide income tax credits or deductions to geothermal users. Allowing a portion of the installation costs of geothermal equipment to be credited to or deducted from state income tax liability would be an additional "active" incentive for geothermal development. Hawaii has provided such as incentive for solar energy expenditures.

B. ISSUE: WHAT INCENTIVES ARE AVAILABLE TO STIMULATE THE PRODUCTION OF GEOTHERMAL RESOURCES?

Tax policy and other fiscal measures can have a significant impact on the pace of geothermal development.

Option: Defer property and/or excise taxes on geothermal operations until commercial production begins. The front-end costs of geothermal development are high; additional tax liabilities during the often lengthy period between resource discovery and commercial production can constitute a significant added impediment to development. The state may defer property tax liability until

commercial production begins. Once in production the geothermal operator would repay the amount of deferred liability, an important fact for local government treasuries. Another approach would be to substitute a well-head tax for ad valorem assessment, whereby local government would not receive any back payments.

The state exempts various categories of industry from its excise (gross income) tax according to public policy considerations. For instance, pulp and paper manufacturers using bagasse are exempt from the excise tax for the first five years of production. A similar incentive may be appropriate for geothermal producers.

Option: Adopt the federal income tax benefits extended to geothermal producers by the National Energy Act of 1978. These include a depletion allowance, deductions for intangible costs and an additional investment credit. The state does not currently have investment credits, but may incorporate the federal deductions into the state tax code administratively. If this does not occur, the legislature should consider mandating such action.

Option: Develop an insurance scheme for geothermal plants in high risk areas. Hawaii's unique geologic setting has given the state the hottest geothermal well in the world to date. The same geologic factors place geothermal development in a risk situation due to seismicity and volcanism. An insurance scheme, especially in the early years of development when such risks are still being assessed, may be helpful to geothermal development. Alternatively, the Public Utilities Commission might be authorized to allow destroyed or defunct geothermal plant costs to be included in utility rate bases.

Recommendation: It is suggested that the Hawaii Legislature, in concert with the NCSL Geothermal Policy Project, consider the various financial incentives outlined and adopt those it considers worthwhile during the 1979 session.

III. INTRA-GOVERNMENTAL COORDINATION

A State Geothermal Advisory Committee with a broad range of state, county and local officials, university, industry and citizen representatives has been established. Dr. Eugene M. Grabbe of the Center for Science Policy and Technology Assessment is the chairman.

Recommendation: It is suggested that the Hawaii Legislature support the efforts of the State Geothermal Advisory Committee. This support should include funding as necessary to carry out review and study tasks as requested by the Hawaii Legislature.

IV. REGULATORY DELAYS

The Department of Lands and Natural Resources promulgated Regulation No. 8 in June of 1978 to govern leasing and drilling of geothermal resources in Hawaii. As any new regulation will experience a shakedown period, it is too early to assess Regulation No. 8 at this point. The first well permit under the new regulations was issued recently to Puuwaawaa Steam Corporation for a test well on the Big Island. Agency personnel indicate that the process went smoothly, and no complaints were received from the developers. There are some areas worthy of examination as the regulations are implemented.

A. ISSUE: WHAT STEPS ARE AVAILABLE TO FACILITATE THE GEOTHERMAL REGULATORY PROCESS?

Option: Differentiate between discovery wells and production wells. On an informal, interpretative basis the DLNR is issuing discovery well permits without requiring an environmental assessment or special land use permit. The state may specifically mandate this approach or leave the situation alone.

Option: Establish a geothermal "expeditor" to facilitate the regulatory process. This approach would provide geothermal operators with assistance in negotiating regulatory requirements, especially in satisfying multiple jurisdictions.

Option: Mandate a time limit for agency decisions. Some states have directed their agencies to decide on well or project applications within a specified length of time. Such an approach assists development planning.

Recommendation: It is suggested that the Hawaii Legislature request the State Geothermal Advisory Committee to review and assess the geothermal regulatory climate on a continuing basis, study streamlining alternatives and make recommendations as necessary.

V. DIRECT USE

Since direct applications must occur near resource locations, local economic benefits can be expected. Thus, direct use of geothermal resources has a significant potential to benefit the state in job creation as well as substituting for fossil fuels. The incentives presented in Section II would encourage development of geothermal direct use. Another area for legislative initiative is in authorization of heating district formation.

A. ISSUE: WHAT AUTHORIZATIONS ARE NECESSARY TO ALLOW HEATING DISTRICT FORMATION?

Various approaches are possible to authorize district heating. Numerous factors must be considered, including bonding options, tax authority, rate-making authority, power of eminent domain, transmission easements, etc. The NCSL Geothermal Policy Project has been very active in this area and stands ready to assist the Hawaii Legislature in these matters.

Option: Amend existing statutes and charters to specifically authorize district heating. Such amendments should address both general law and charter counties and other special districts. Any of several bonding avenues (general obligation, revenue, economic development, anti-pollution) or a combination thereof might be employed to finance district heating if so authorized. The Public Utility Code could also be amended to specify district heating within utility franchises.

Option: Enact a specific district heating bill. Under this approach, a new or existing political subdivision would be specifically chosen and authorized to supply district heating services. Bonding and other powers must be provided for if a new "special district" is created. Among existing special districts, Boards of Water Supply are likely candidates as heating district vehicles.

Option: Enact a general district heating bill. It may be possible to generally authorize existing political subdivisions to provide district heating without amending each particular charter or parent statute. Such a general approach should also deal with the various existing bonding options.

Recommendation: It is suggested that the Hawaii Legislature, in cooperation with the NCSL Geothermal Policy Project, study the above alternatives and enact district heating legislation during the 1979 session.

VI. LAND USE PLANNING

Hawaii's Land Use Law (C.205 HRS) divides the state into four land use classifications: urban, rural, agricultural and conservation. State and local jurisdictions overlap with regard to the first three categories; state jurisdiction only applies to conservation districts.

A. ISSUE: WHAT CHANGES IN HAWAII'S LAND USE LAW WOULD FACILITATE GEOTHERMAL DEVELOPMENT?

Overlapping jurisdictions over agricultural districts have already raised a problem with the first geothermal well permit issued by the state. While the DLNR did not require a special land use permit for a geothermal discovery well in the district, the County of Hawaii did. The geothermal operators are presently proceeding at their own risk on the basis of the state well permit.

Option: Amend the Land Use Law to specify geothermal drilling as a permitted use in agricultural and conservation districts. The DLNR has administratively taken this position with regard to conservation districts (Reg. No. 4, 1978). Such an amendment would ameliorate the problem caused by overlapping jurisdictions over agricultural districts. It should be remembered that environmental assessment will always precede commercial development. The amendment would facilitate exploratory drilling for geothermal resources.

Option: Amend the Land Use Law to allow geothermal commercial development within agriculture and conservation districts. This approach would eliminate the need for obtaining a special land use permit for the commercial phase of geothermal

development. The change in use categories might be limited to direct use projects, which are especially compatible with agricultural development.

Recommendation: It is suggested that the Hawaii Legislature amend the state Land Use Law to make geothermal drilling a permitted use in agricultural and conservation districts during the 1979 session. Consideration should also be given to allowing commercial development of geothermal resources in such districts.

VI. LEASE STIPULATIONS

Since geothermal development is in its infancy in Hawaii, the appropriateness of state lease terms (acreage limitations, length, royalty rates, surrender provisions, etc.) has not been tested. Presently, the number of geothermal leases and total acreage granted to geothermal leases is discretionary with the DLNR.

Recommendation: It is suggested that the Hawaii Legislature request the State Geothermal Advisory Committee to review state lease stipulations on a continuing basis and recommend changes as necessary.

ATTACHMENT K

LEGISLATIVE RECOMMENDATIONS ON GEOTHERMAL POLICY

Prepared for the Oregon Legislative Assembly

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INTRODUCTION

The Oregon Legislative Assembly, in cooperation with the National Conference of State Legislatures, is undertaking a review of state policies affecting geothermal development. As part of this effort a workshop was held on October 4, 1978, to set an agenda for the legislative review of state actions to encourage geothermal development. At that time problem areas were identified and possible changes in current state laws, regulations and policies were suggested by the workshop participants. Discussions were held in the following areas:

- I. Legal Status
- II. Resource Access
- III. Field Development
- IV. Marketing
- V. Financial Incentives

A summary of workshop proceedings was distributed and comments were solicited. This report was drawn from that material, as well as other information available to the NCSL Geothermal Policy Project. It presents various legislative options for consideration in the 1979 Oregon legislative session.

POLICY AREA

LEGAL STATUS OF GEOTHERMAL RESOURCES

BACKGROUND INFORMATION

Geothermal resources are similar in some respects to water, minerals, and gas. As a result, considerable disagreement--including litigation--has arisen over the essential nature of the resource and corresponding ownership rights. This climate of uncertainty impedes geothermal development and makes resource characterization a major issue. As long as the nature of geothermal resources remains unclear, ownership also will be uncertain. As a result, geothermal entrepreneurs face the difficult task of negotiating with all possible lessors for access rights. Legislative concerns include the definition of resource elements, designation of ownership rights and the relationship of geothermal resources to other resource categories, especially water.

Oregon defined the resource in its Geothermal Resources Act, O.R.S. Ch. 522 (1975) as:

"Geothermal resources" means the natural heat of the earth, the energy, in whatever form, below the surface of the earth present in, resulting from, or created by, or which may be extracted from, the natural heat, and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases, and steam, in whatever form, found below the surface of the earth, exclusive of helium or of oil, hydrocarbon gas or other hydrocarbon substances, but including, specifically:

(a) All products of geothermal processes, embracing indigenous steam, hot water and hot brines;

(b) Steam and other gases, hot water and hot brines resulting from water, gas, or other fluids artificially introduced into geothermal formations;

(c) Heat or other associated energy found in geothermal formations; and

(d) Any byproduct derived from them.

Other salient features of this statute include:

- assignment of regulatory authority to the DOGAMI;
- exclusion of shallow (under 2000 feet), low temperature (under 250°F) resources from the act;
- assignment of ownership to the surface estate; and
- permit and bonding provisions for geothermal prospect and production wells.

ISSUE: OWNERSHIP

The unique nature of geothermal resources and their similarity to water, minerals and gas requires that close attention be paid to the legal status of the resource. Although the Oregon statute clearly assigns geothermal resources to the surface owner, there may be additional steps that can be taken to clarify questions over the legal relationship of geothermal resources to established resource categories and the corresponding application of existing law--including implications for ownership. Any such actions will contribute significantly to the encouragement of geothermal development in Oregon.

OPTION

Incorporate the division of the resource into shallow, warm (under 2000'/250°F) and deep, hot regimes for regulatory purposes into Oregon's definition of geothermal resources.

OPTION

Study the extent of potential ownership conflicts between state or private surface owners and federal claims under various mineral reservations and make recommendations for needed legislation.

OPTION

Clarify if separate ownership regimes exist as a result of the regulatory division of authority. In other words, determine if shallow, warm fluids are a geothermal resource (surface estate) as indicated by the definition or a groundwater resource (public trust reserved to the state) as implied by the Department of Water Rights regulatory authority over these fluids. (In this

regard, the HJR 50 report defined "geothermal fluid" as "any fluid derived from a process to extract heat from groundwaters or geothermal resources.")

ISSUE: CLASSIFICATION (WATER ISSUES) AND REGULATORY AUTHORITY

A major hindrance to geothermal development is confusion over the exact relationship between geothermal and existing resource categories, especially water. This issue has been addressed in Oregon by dividing regulatory authority between the Department of Geology and Mineral Industries and the Department of Water Rights with the latter having jurisdiction over development activities of fluids with a temperature under 250°F and from wells shallower than 2000 feet deep. In carrying out this authority, questions have been raised and concerns expressed over the exact responsibilities of these two agencies for various types of geothermal development. Also, confusion exists over the exact requirements for obtaining necessary water rights.

OPTION

Clarify if DWR has authority to require water rights for all geothermal fluid production including wells under DOGAMI jurisdiction.

OPTION

Establish for deep, hot geothermal wells a presumption of non-interference with existing water rights.

OPTION

Limit required water rights to consumptive use (fluid not reinjected).

OPTION

Establish heat production from groundwater as a "beneficial use" of the resource and require appropriation rights for the volume of consumptive use.

OPTION

Revise the definition of "groundwaters" in O.R.S. 537.515 to exclude fluids with a temperature over 250°F and from depths over 2000 feet to make it consistent with the Geothermal Resources Act (O.R.S. 522).

OPTION

Clarify the extent of geothermal surface ownership rights where concomitant water rights are unavailable.

POLICY AREA

RESOURCE ACCESS

BACKGROUND INFORMATION

The type of system established to provide access for exploration and development influences how quickly development occurs, protects public and private interests and controls fragmentation and monopolization of the resource. It is vital that the process established to control access to the state's geothermal resources be streamlined and efficient, provide prompt access and secure rights to the resource and coordinate access procedures for state, federal and private lands.

In terms of leasing requirements, the Division of State Lands issued "Geothermal Lease Regulations" (Sec. 75-010 et. seq.) in 1975. Salient features include: (a) exploration permits (non-convertible, non-exclusive); (b) two-tier leasing (KGRA: competitive, cash bonus bidding/non-KGRA: public drawing or application); (c) 10 year primary lease term; (d) renewal provisions; (e) escalating annual rental; (f) royalties (primary: 10%, demineralized water: 1%, other byproducts: 5%); and (g) minimum lease acreage of 40 acres.

The following figures reflect the status of leasing in the state in 1977:

Federal:

30 KGRA leases issued	60,685 acres
82 noncompetitive leases issued	109,162 acres
KGRA lands not yet offered for lease	398,936 acres

State:

Leases in force	6,080 acres
Applications	4,080 acres

Private:

Total estimated acreage	400,000 acres
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ISSUE: ACCESS FOR EXPLORATION

Oregon issues exploration permits which is a positive step in avoiding the burdensome requirements of obtaining a lease before the potential for development is known. However, for a developer to move into an area and take the financial risks incumbent in exploration, he must have some assurance that his investment is secure if the exploration proves successful.

OPTION

Make exploration rights exclusive and convertible to leases upon discovery.

OPTION

Give the holder of an exploration permit preferential rights to a lease.

OPTION

Allow exploration expenditures to be credited against lease bids.

ISSUE: LEASES

Lease terms should balance public and private interests in the resource. Public interests include fair return of resource value, efficient production and protection of surface lands. Private interests include security of tenure, flexibility in development and profitability. Several areas should be reviewed to make sure that unnecessary barriers to development are removed while at the same time the public interest is protected. Relevant areas to address include lease duration, renewal, rentals, bonding, stipulations (work commitments, environmental conditions, covenants for surface restoration), royalties or profit shares and renegotiation.

OPTION

Deemphasize immediate revenue production by slowing rental escalations.

OPTION

Make sure rental costs on state lands are competitive with adjacent federal lands.

OPTION

Reduce the minimum acreage limit of 40 acres to encourage small-scale direct use projects.

OPTION

Grant authority to renegotiate.

OPTION

Set time periods for agency review processes.

OPTION

Make sure the review process is streamlined with a single review satisfying multiple jurisdictions. Consider designating a lead agency to handle all review requirements.

ISSUE: LAND USE POLICIES

Oregon requires land use plans (Comprehensive Planning Coordination Act O.R.S. Ch. 197 (1973)), and any use of the state's lands must fall within the parameters set by the plans. If the state's potential for using geothermal energy is reached, it is important that the land use planning process not impose unnecessary barriers to development through excessive delays in review periods.

OPTION

Ensure that land use plans required by O.R.S. 197 make provisions for geothermal development.

OPTION

Require areas of identified geothermal potential to address geothermal utilization in land use plans..

OPTION

Recognize geothermal as a "conditional use."

OPTION

Consider in land use planning "off-set" of areas for nondevelopment to compensate effects in developed areas.

POLICY AREA

FIELD DEVELOPMENT

BACKGROUND INFORMATION

Regulation of field development is an important part of a state's role in managing its natural resources. Drilling controls, reservoir management and allocation of production rights for purposes of safety and resource conservation, facility siting and environmental regulation are areas that have to be addressed.

To control well drilling, DOGAMI issued "Rules and Regulations...Relating to Exploration and Development of Geothermal Resources in Oregon" in 1977. Salient provisions concern: (a) well permits; (b) drilling bonds; (c) well records; (d) casing; (e) directional drilling; (f) completion and abandonment; (g) noise abatement; (h) blow-out prevention; (i) well spacing; (j) commingling production; and (k) waste disposal and reinjection. The DOGAMI also has authority in the areas of unitization and production restrictions.

The Oregon Energy Facility Siting Council has the responsibility for siting all energy facilities in the state.

ISSUE: FLUID DISPOSAL

Pursuant to HJR 50, the Oregon Departments of Water Resources, Environmental Quality, Geology and Mineral Industries and Energy formulated policies regarding disposal of geothermal fluids. In this regard, the Interagency Geothermal Fluid Report made numerous recommendations to change current laws and regulations affecting fluid disposal to reflect the general policy of encouraging geothermal development with the minimum amount of administrative procedure and adverse environmental impact. (See "Interagency Geothermal Fluid Report for specific recommendations.)

OPTION

Implement the recommendations made in the Interagency Geothermal Fluid Report.

OPTION

Enact legislation on disposal wells to establish procedures for reinjecting geothermal fluids, establish bonds or security for prospect wells, permit DOGAMI to adopt rules on reinjection and require a water pollution control facilities permit for reinjecting contaminated effluent.

ISSUE: FACILITY SITING

Having a process for siting energy facilities that is efficient and that cuts down on delays in permitting encourages geothermal development.

OPTION

Require the Energy Facility Siting Council to adopt specific siting procedures for geothermal powerplants and heat transmission facilities.

POLICY AREA

MARKETING

BACKGROUND INFORMATION

The availability of geothermal markets will ultimately determine the pace of development. Policies to expand the available market and to encourage investment would be a great boon to geothermal development. Of major importance are utility regulatory issues, such as access to transmission lines and rate regulation. Novel market structures for direct use of geothermal resources should be considered as well.

In terms of encouraging the formation of geothermal district heating, the Oregon Legislative Assembly passed the "Geothermal Heating Districts Act," O.R.S. Ch. 523 (1975). Geothermal heating districts, under the act's provisions, are authorized to: (a) contract for services; (b) hold and transfer real property; (c) sue and be sued; (d) form cooperative agreements; (e) issue general obligation, revenue or refunding bonds; (f) exercise the power of eminent domain; (g) levy special assessment taxes; (h) levy special ad valorem taxes; and (i) provide supplemental energy from non-geothermal sources in emergencies.

ISSUE: DISTRICT HEATING

The creation of district heating systems utilizing geothermal energy is a very promising use of the resource, especially considering the potential for displacing a heavy dependence on oil and gas for space heating and cooling. The current district heating legislation forms an excellent basis for establishing geothermal heating districts in the state. Serious consideration should be given, however, to additional actions that can be taken to speed development of this very important use of geothermal energy.

OPTION

Require that existing wells be incorporated into geothermal heating districts.

OPTION

Determine what compensation is due, if any, to an owner with an existing well whose supply is depleted by heating district formation.

OPTION

Grant eminent domain authority to heating districts. (O.R.S 523.010 on drainage work has the only reference to eminent domain. The power exists generally in heating districts only by implication.)

ISSUE: UTILITY REGULATION

The production of electricity offers a viable use of the state's geothermal resources. However, numerous problems stand in the way of production and actions must be taken by the state to remove unnecessary obstacles. Attention must be paid to encouraging utilities to pursue development of a new, uncertain resource, ensuring that geothermal developers who generate electricity themselves can sell and distribute their product and consider interconnection possibilities.

OPTION

Assure geothermal power plants access to existing transmission systems.

OPTION

Exempt small geothermal power producers from utility status (and rate regulation) if their output is marketed to existing utilities.

OPTION

Require utilities to purchase geothermal power if reasonably priced.

OPTION

Allow utility investments in geothermal facilities a higher rate of return.

OPTION

Allow utility investments in geothermal facilities to include such costs in their rate base even if the field or facility fails.

OPTION

Allow utility investments in geothermal facilities to be expensed as research and development costs.

OPTION

Exempt non-profit organizations that develop geothermal heating districts from rate regulation.

OPTION

In order to site transmission lines from geothermal powerplants, extend the rights given to gas and electric utilities of eminent domain and to use state and county highways.

POLICY AREA

FINANCIAL INCENTIVES

BACKGROUND INFORMATION

A significant part of encouraging geothermal development is the cost factor. There are three major considerations: (1) how to make geothermal competitive in an artificially priced and subsidized energy market, (2) how to overcome the large initial investment that must be made to install geothermal energy devices; (3) how to deal with the high front-end costs of geothermal development and the lengthy period between resource discovery and commercial production and (4) how to remove the uncertainties over the resource that inhibit market development.

Current programs in the state are:

- an income tax credit up to \$1,000 for residential geothermal space heating (S.B. 339 (1977)).
- a loan program for veterans--up to \$3,000 for residential geothermal energy facilities (S.B. 477 (1977)).
- an Energy Conservation and Production Fund financed by state bond issues established to assist utility companies and individuals in development of non-nuclear energy resources. Emphasis on geothermal and other resources not currently in widespread use. Oregon Department of Energy authorized to develop alternate energy projects, fix rates and sell energy (S.B. 572 (1977)).
- an authorization for the issuance of bonds for Energy Conservation and Production Fund (which subsequently was defeated by the voters) (SJR 32 (1977)).

ISSUE: INCENTIVES TO STIMULATE UTILIZATION OF GEOTHERMAL

Substantial first costs for the installation of geothermal energy devices deter consumers who usually shop for goods with the lowest initial purchase price, rather than the lowest life-cycle cost. To help overcome this tendency and provide an incentive for the use of alternative energy sources, financial incentives must be considered.

OPTION

Provide a property tax exemption for new housing developments utilizing geothermal for space heating and cooling.

OPTION

Do not levy property taxes on heat value.

OPTION

Extend current loan program (S.B. 477 (1977)) for residential geothermal energy facilities to non-veterans and increase limit to more than \$3,000.

OPTION

Pass authorization legislation for the issuance of bonds for the Energy Conservation and Production Fund.

ISSUE: INCENTIVE TO STIMUALTE THE PRODUCTION OF GEOTHERMAL

Tax policy and other fiscal measures can have a significant impact on the pace of geothermal development. The front end costs of geothermal development are quite high and additional tax liabilities during the often lengthy period until commercial production can constitute a significant impediment to development. Also, the discovery of new reservoirs will be required before geothermal energy can be expanded markedly in Oregon. Discovery and development can only result from more drilling, and incentive options must clearly recognize these facts.

OPTION

Defer property and/or excise taxes on geothermal operations until commercial production begins. Once in production, require repayment of deferred liability.

OPTION

Exempt geothermal producers from the state excise (gross income) tax.

OPTION

Adopt the federal income tax benefits extended to geothermal producers by the National Energy Act of 1978. These include a depletion allowance, deductions for intangible costs and an additional investment credit.

OPTION

Grant an investment tax credit for geothermal investments.

OPTION

Defer royalties until investment is recovered including appropriating matching funds to assure that DOGAMI is competitive in obtaining federal funds for resource assessment.

OPTION

Increase state funding of resource assessment including a consideration of state cost-shared exploration.

OPTION

Institute loan guarantee and/or low-interest loan programs to stimulate capital formation for geothermal development.

OPTION

Allow rapid write-off of exploration costs.

OPTION

Substitute a wellhead tax for property tax.

ISSUE: INCENTIVES TO REMOVE UNCERTAINTIES OVER GEOTHERMAL RESOURCES

As a novel resource, geothermal energy faces the hurdle of establishing an initial market. This involves determining its economic competitiveness and demonstrating utilization technology. The state can play a lead role in encouraging consumer confidence and stimulating business investments.

OPTION

Develop a strong state policy advocating geothermal development including removing the state's "no-growth" image of opposing industrial development.

OPTION

Fund public education programs to acquaint the general public with potential for geothermal utilization.

OPTION

Require life-cycle cost analysis of alternative energy supply systems to identify existing and new facilities of the state or its political subdivisions for geoheating.

OPTION

Site new state buildings with strong consideration of geoheat potential.