MASTER

GEOHERMAL RESOURCES IN CALIFORNIA: THE PROBLEMS AND THE POTENTIAL

A REPORT OF THE SUBCOMMITTEE ON GEOHERMAL RESOURCES OF THE JOINT LEGISLATIVE COMMITTEE ON PUBLIC DOMAIN

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COMMITTEE

December 28, 1973

The Honorable John Burton, Chairman
Joint Rules Committee
Room 3175, State Capitol
Sacramento, California 95814

Dear John:

I am pleased to transmit to you a copy of GEOTHERMAL RESOURCES IN CALIFORNIA: THE PROBLEMS AND THE POTENTIAL, a report of the Subcommittee on Geothermal Resources of the Joint Legislative Committee on Public Domain.

This report is a summary of the activities of the Subcommittee during the first half of the 1973-74 session and a progress report on planning for the United Nations International Geothermal Symposium to be held in May of 1975 in San Francisco.

The report was prepared under the supervision of William F. Northrop, Principal Consultant to the Joint Committee on Public Domain, and Charles L. Baldwin, Consultant to the Senate Committee on Governmental Organization and Advisory Consultant to the Subcommittee on Geothermal Resources.

The data gathering and writing of this report was done by Donald L. Hoagland, Consultant to the Subcommittee on Geothermal Resources.

Sincerely,

Ralph

RALPH C. DILLS
Chairman, Subcommittee on
Geothermal Resources of the
Joint Legislative Committee
on Public Domain

RCD:smb

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SECTION IINTRODUCTION

Legislative interest in development of geothermal resources was first brought into sharp focus by a report done for the Joint Legislative Committee on Tidelands in 1967.

This report identified three major uses of geothermal energy. These were electrical power generation, chemical production and process and space heating.

The report noted that electrical power generation from geothermal energy would remain a relatively small part of the state's total energy needs because of (1) the difficulty in forecasting the power generating capacity of the state's geothermal resources and (2) the fact that electrical energy generated by geothermal steam can only be used to satisfy base load requirements.

At that time, chemical extraction from geothermal brines was being done at a relatively small scale and the report noted that the potential for this use could only be theoretical, but technology was developing rapidly, and mineral recovery from brines could make the Salton Sea and Imperial Valley areas one of the most valuable geothermal areas in the world.

The report noted that one of the most valuable uses of the geothermal resources in California could be for process and space heating. Growth of this use will be limited by the fact that geothermal energy cannot be transported any distance and agricultural and process uses would therefore have to be located at or near the site of the resource.

Partially as a result of the data presented in this report, the Legislature passed AB 169 (Way) in 1967. This measure amended the Public Resources Code. The legislation established procedures for obtaining prospecting permits and leases from the State Lands Commission for extraction and removal of geothermal resources from state lands for production of geothermal energy in commercially valuable quantities. This measure also authorized the Commission, upon recommendations of the Geothermal Resources Board, to classify state lands as geothermal resources areas and redesignated the Geothermal Energy Board as the Geothermal Resources Board.

In 1968 the duties of the Joint Legislative Committee on Tidelands were assumed

by the new Joint Committee on Public Domain. The new committee was charged with a continuing study of the administration and utilization of state lands and mineral rights on state lands.

In 1972 the Joint Committee on Public Domain created the Subcommittee on Geothermal Resources and contracted with the University of California at Riverside for a study of the potential of geothermal resources in the Imperial Valley. A report was issued November 15, 1972 entitled "Geothermal Resources Development in California: Imperial Valley Potential."

This report indicates that in terms of energy, conservative estimates of the Valley's potential are placed as equal to that of three, 1,000 megawatt nuclear-fueled generating plants. Optimistic estimates suggest this potential may be equal to thirty such plants. How long the resource will last is not known, but conservative estimates are that the resource will produce for at least 50 years.¹

¹Geothermal Resources Development in California: Imperial Valley Potential by the University of California, Riverside, November 15, 1972, Volume 1, Page 4.

In terms of water, the report notes the underground reservoirs are estimated to contain between 1.1 and 5.5 billion acre feet of recoverable water.² This would have to be desalinated, but the geothermal water already contains the heat to do this. The life of this underground water source is also uncertain, but it might be extended by reinjection of ocean water which would have the additional benefit of minimizing subsidence which might otherwise occur from withdrawal of large amounts of underground water.

The prospects for mineral recovery are not as bright due to economic and technical problems associated with mineral extraction from geothermal brines. The report does note that should these economic and technical problems be resolved, considerable quantities of certain minerals could be extracted. These include sodium, calcium, potassium and lithium chlorides, manganese, zinc, boron, lead, cesium, copper, cadmium and silver.³

²Ibid.

³Ibid.

The report found impediments to more rapid development of geothermal energy in California ranged from imprecision and contradictions of geothermal resource definitions for legal and taxation purposes to the difficulty of scientific information exchange.

The report cited the following specific institutional barriers to rapid development of geothermal energy: (1) existence of geothermal resources beneath federal, state and private lands, each being regulated by different agencies; (2) a shortage of staff and funding for geothermal resources in these agencies; (3) rules and regulations of these agencies being different and sometimes contradictory and (4) present siting regulations requiring separate applications for each power generating plant of 50 megawatt or greater size which present a major difficulty because of the unique siting and development requirements of geothermal resources.⁴

On the state level, the report suggested a variety of legal means to provide incentives to draw in private capital for the research

⁴Ibid., page 5-6.

and development work necessary to solve the technological problems now impeding full utilization of the state's geothermal resources.

These included a variety of tax incentives for steam developers such as inclusion of geothermal resources into appropriate sections of both state and federal tax codes to make developers eligible for tax concession such as depletion and writeoffs of intangible costs and proposals for utilities utilizing geothermal energy such as rapid amortization of plants using geothermal steam and inclusion of research and developments expenses as a cost of doing business for purposes of rate setting.

As a result of recommendations in the Riverside report and suggestions coming from industry at hearings and conferences, the subcommittee chairman, Senator Dills, introduced five bills designed to assist in paving the way for more rapid utilization of the state's geothermal resources.

During the 1973 session, the Senate Rules Committee, the Joint Committee on Public Domain and the Board of Supervisors of Imperial County each agreed to provide

\$5,000 for preparation of a report by the University of California, Riverside on the subject "Patterns of Geothermal Lease Acquisition in the Imperial Valley." This study should be available in early 1974.

This report of the Subcommittee on Geothermal Resources is a summary of committee activities during the first half of the 1973-74 session and includes conclusions and recommendations resulting from the year-long involvement with geothermal development in California.

SECTION II

CONCLUSIONS AND RECOMMENDATIONS

Committee staff attended hearings and meetings in California and elsewhere during the year to gather information as to the best means to assist in development of California's vast geothermal energy resource.

The committee chairman and staff participated extensively in early discussions and are continuing as coordinators and participants in the final organizational planning of the Third United Nations International Symposium scheduled for May 20-28, 1975 in San Francisco.

The committee chairman has been named to head the California delegation for this first-of-its-kind gathering of international experts in the state and Charles L. Baldwin, advisory consultant to the committee, has been named as a member of the United States Organizing Committee.

The subcommittee now finds itself mid-stream in the planning phase of this prestigious international event.

Due to its international significance, the importance of such a gathering of experts to geothermal development in general and geothermal development

in California in particular, and because the state has already committed \$50,000 in funds to assist in the initial planning, it is the conclusion of the committee that the Subcommittee on Geothermal Resources should be continued to enable the chairman and staff to follow through to successful completion the planning work already started for the International Symposium in 1975.

As a result of the information gathering effort of the committee during 1973, it is also the conclusion of the committee that there is strong evidence of the need for continued surveillance by the Legislature of the utilization of geothermal resources in California to insure full and timely development of this heat source for generation of electric power, desalinization of geothermal brines for water, mineral recovery and other uses of geothermal heat as continued technological advances will permit, such as large scale agricultural space heating, hydroponic farming and process heating.

While assuring full and timely utilization of this resource, the Legislature must maintain its vigilance to protect the environment while this resource is being developed and put to use.

Hearings throughout the year have repeatedly disclosed the need to bring state laws into conformity with federal laws in regard to tax treatment of persons exploring for geothermal steam in order to provide incentives to draw capital into this high risk venture.

To accomplish these goals, the Committee makes the following recommendations:

1. Introduce legislation urging the President and Congress to support and encourage timely development of the vast geothermal resources on the federal public domain in the western states including California through rapid implementation of the leasing provisions of the Geothermal Steam Act of 1970, prompt passage of S. 2465, the Geothermal Energy Act of 1973, while at the same time insuring that the environment is not irreparably damaged by such development.

2. Introduce legislation urging the President to release for expenditure funds already appropriated for research and development work into utilization of geothermal resources and further urging Congress to consider increased funding for innovative

research and development programs to utilize geothermal energy for electrical power generation.

3. Introduce and support legislation on the state level to provide tax incentives to draw risk capital into private enterprise research and development of geothermal energy. This should include the following:

(A) Legislation to define the nature of the resource. Such a definition could reduce or eliminate time consuming litigation.

(B) Legislation to provide that the value of a geothermal resource should not be considered for purposes of property taxation until such time as that resource is producing a cash flow from the sale of products of the resource. This might be accomplished by amending "geothermal resources" into Assembly Constitutional Amendment 32 now pending before the Legislature.

(C) Legislation to permit exploration and development costs for geothermal energy to receive the same depletion allowance currently permitted for oil and gas.

(D) Legislation to permit a schedule of rapid amortization of electrical generating facilities utilizing geothermal energy based on the useful life of the facilities.

(E) Legislation to permit intangible drilling costs for development of geothermal wells to be written off for tax purposes in the same manner presently permitted for oil and gas wells.

(F) Consideration should be given to introduction of legislation to permit ratification and adoption of the Federal Environmental Impact Statement for the Geothermal Steam Act of 1970 for Known Geothermal Resources Areas in California as a master environmental impact statement for this state. Enactment of such a master statement would eliminate costly, time consuming and often overlapping work in producing environmental impact studies for each individual geothermal well in areas already thoroughly studied by the federal government. The long-range result of such a state master statement would be to speed up development of this energy source while maintaining surveillance over the environmental impact of such development.

SECTION IIILEGISLATIVE ACTIVITY
IN 1973

Since it was formed in 1972, the Subcommittee on Geothermal Resources has received innumerable requests and suggestions for legislation to assist in development of the state's geothermal energy resource.

The most persistent of these have been in the form of requests to centralize the regulatory authorities dealing with exploration and leasing, and the need to change the tax laws to provide, through incentives, additional capital to do the necessary research and development work to prove the viability of geothermal energy.

The Subcommittee Chairman, Senator Dills, as a result of committee investigations, introduced five bills relating to geothermal development and energy during the 1973 session.

Senate Bill 563 eliminates the value of geothermal resources from the assessment of land at full cash value for the purposes of property taxation.

Investigations indicated that developers of geothermal steam fields were

being required to pay property taxes on the value of a proven field before they had a market and a cash flow from the sale of the products of the resource. This situation, while now isolated to the Sonoma and Lake County geothermal resource area, places an undue burden on the developer and has the effect of impeding the flow of development capital into geothermal exploration.

An opinion of the Legislative Counsel indicated such a change in the tax law would require a constitutional amendment and this measure was taken under submission by the Senate Committee on Revenue and Taxation.

Senate Bill 564 includes geothermal resources used in generation of electric power within the depletion allowance authorized for oil and gas wells under the Personal Income Tax Law and the Bank and Corporation Tax.

This measure was designed to give developers of geothermal steam the same tax incentives presently provided developers

of oil and gas with the hope that the tax savings created by the 22 percent depletion allowance, would help in stimulating greater exploration and development for geothermal energy.

Because of opposition from state taxing agencies and lack of concerted support on the part of the geothermal industry, this measure was dropped after a hearing before the Senate Committee on Revenue and Taxation.

Senate Bill 577 directs the Public Utilities Commission to establish a schedule of rapid amortization of the cost of public utility facilities utilizing geothermal resources, based on the estimated useful life of the facilities.

This measure, also an incentive to promote more rapid utilization of geothermal heat for electric power generation, was designed to help alleviate part of the uncertainty now faced by utilities over the life of the geothermal resource. Because of the lack of firm technological data on how long a geothermal field will produce, developers of geothermal fields have, in

some cases, been required to prove up entire fields and run them for several years before the utility will make the commitment to buy the steam and construct generating equipment.

Utilities argue that without some guidelines on the life of the resource, it is difficult for them to go into the marketplace to fund construction of generating facilities.

This measure was designed to help solve this problem by allowing a varying amortization period for geothermal generating facilities based on their useful life.

After a hearing before the Senate Committee on Natural Resources and Wildlife, this measure was sent to interim study.

An interim hearing was held on this bill October 17 and the committee heard several witnesses testify that passage of this bill would provide some measure of help in promoting greater utilization of geothermal energy for power generation.

Senate Bill 883 authorizes the Public Utilities Commission to allow research and development expenses by electrical, gas, heat and telephone corporations for rate setting purposes.

One of the most persistent complaints heard by the committee was that while everyone agreed that there was a need for a vast amount of research and development work before geothermal energy could make a sizable contribution to the energy needs of the state, the utilities which would be utilizing the energy and therefore the logical parties to do some of this work, were not permitted by law to charge off the expenses for such research and development by passing it on to the consumer in the form of rate increases. Such a prohibition, it was maintained, slowed down research and development in the geothermal field. This bill was signed by the Governor October 2, 1973 (Ch. 1118).

Senate Bill 1319 directs the Secretary of the Resources Agency to study the uses and conservation of energy, develop a state energy policy and submit the plan in the form of suggested legislation to the Legislature for approval. The study is to be completed by November 30, 1974 and report to the Legislature not later than December 30, 1974. This measure declares the intent that the Secretary of the Resources Agency shall have overall responsibility for development of a state energy policy.

The bill was passed by the Senate and is presently awaiting hearing before the Assembly Committee on Planning and Land Use.

SECTION IVUNITED NATIONS GEOTHERMAL
CONFERENCE

Subcommittee staff attended the Seminar on Development and Use of Geothermal Energy at the United Nations Headquarters in New York January 8-10, 1973.

This world-wide gathering of scientists and experts in the field of geothermal development, perhaps set the theme for subsequent hearings and gatherings into the nature and potential of geothermal resources in the United States.

Almost everyone agreed that the geothermal potential in the United States was great, while agreeing at the same time that present technology would not permit a definitive measure of that potential. There was wide agreement on the need for large scale expenditures on the part of the federal and state governments as well as private enterprise for the necessary research and development work to bring about creation of a data bank to answer the questions of the size of the resource and how to utilize it most effectively.

There were repeated warnings, particularly from Dr. Joseph Barnea, then Director of Resources and Transport Division of the Department of Economic and Social Affairs at the U. N., against treating geothermal energy as a one purpose resource for the generation of electric power.

It was pointed out that since most of the operating geothermal areas and identified known geothermal areas in the world, with the exception of The Geysers in California, are liquid dominated systems producing large quantities of mineral laden brines, consideration should be given to all of the uses to which these hot brines can be applied instead of just thinking in terms of successful electric power generation. Space heating and cooling, desalinization, mineral recovery and hydroponic farming are some of the additional uses to which geothermal heat from water dominated systems are being utilized or can be utilized in the future. In some areas, these other uses may be the most beneficial use of the resource.

Lack of hard technological information and a failure on an international scale to fully share and exchange what information

is available, legal uncertainties as to the nature of the resource, varying tax treatment from the federal government and from state to state and the failure of the federal government to release vast areas of identified geothermal potential for exploration leasing, were all cited as reasons for the failure of the United States to develop its geothermal resources at a much more accelerated rate.

Despite the difficulty of making a definitive assessment as to the potential of the geothermal resources in the United States, almost everyone agreed that it is vast, and that with continued technological advances and timely development, geothermal energy could make a large contribution to the nation's total energy needs.

It was also agreed that there was a continuing need for the kind of exchanges of information provided at this United Nations Conference and it was suggested that another such international gathering be held in late 1974. California and Mexico were both mentioned as possible sites.

SECTION VINTERNATIONAL GEOTHERMAL
CONFERENCE--1975

Following up the suggestions made at the United Nations Geothermal Symposium in New York that there was a need for another such international gathering in 1974 or 1975, Subcommittee staff attended several meetings to pull together such a conclave of geothermal experts in California.

The initial effort was spearheaded by Congressman Victor V. Veysey who made the first contacts with the Departments of State and Interior, the United Nations and in California solicited the support and expertise of the University of California at Riverside.

All of these agencies indicated interest in such a gathering, but felt that the timing necessary to acquire adequate funding as well as scheduling involved in mounting an international experts' meeting would preclude holding the conference in 1974. It was suggested that plans be formulated for spring of 1975 with the place tentatively set for San Francisco.

Committee staff made followup visits to both New York and Washington in January to consult with officials of the United

Nations on questions of sponsorship and participation, the Department of State on the international aspects of the conference and with the Department of Interior on questions of supplying staff as well as financial participation.

As a result of these preliminary sessions and the various indications of support, an ad hoc committee was formed to formulate California participation in the international meeting.

This steering committee, headed by Congressman Veysey and including members of his staff, representatives of the University of California, Riverside; Subcommittee Chairman Senator Dills and staff and representatives of various segments of the geothermal industry met at the Western White House at San Clemente on March 23.

This group named Dills to head the California delegation planning the international gathering and also finalized plans for a National Conference to examine the role of government in geothermal development for May 10-11 in Palm Springs.

The steering committee met again at Palm Springs and formed a United States

Organizing Committee to plan the Third United Nations International Geothermal Symposium for California.

Members of this group met again in December at San Francisco during the annual meeting of the American Geophysical Union and finalized membership in the United States Organizing Committee for the symposium. The following persons were named to this committee:

DR. ROBERT FOURNIER, U.S. Geological Survey, Menlo Park, Chairman;
DAVID ANDERSON, Geothermal Officer, California Division of Oil and Gas, Vice-Chairman;
DR. ARTHUR L. AUSTIN, Lawrence Livermore Laboratory;
HENRY CURTIS, Northwestern Public Power Association;
ROBERT GREIDER, Chevron Oil Company;
SIDNEY KAUFMAN, Private Consultant;
GLEN KENDALL, New England Regional Commission;
JAMES KUWADA, Rogers Engineering Company;
JOHN MATTHEWS, Supervisor, California Division of Oil and Gas;
DR. CAREL OTTE, Union Oil Company;
ARTHUR E. SUTTON, University of California, Riverside;
DR. JAMES COMBS, University of California, Riverside;
DR. MORTON SMITH, Los Alamos Scientific Laboratory;
DR. PAUL A. WITHERSPOON, University of California, Berkeley;
DR. LOUIS WERNER, U. S. Atomic Energy Commission;
DEAN WORTHINGTON, Pacific Gas and Electric Company;
CHARLES L. BALDWIN, Consultant, California Senate Committee on Governmental Organization, Advisory Consultant to the Subcommittee on Geothermal Resources.

The current expenses of the committee are being covered by a \$50,000 appropriation from the State of California and administered by David Anderson of the California Division of Oil and Gas.

Congressman Victor V. Veysey is providing the leadership for a \$225,000 augmentation to the budget of the U. S. Department of Interior for fiscal 1974 to cover major symposium costs.

The United States Organizing Committee has scheduled its next planning session for 8:00 a.m. March 15, 1974 at the Hyatt House in San Francisco.

Now in the formal planning stages, the Symposium is scheduled for May 20-28 at the Hyatt House in San Francisco. Experts will soon be named to screen scientific papers to be read at this gathering. Plans also call for field trips to geothermal fields throughout California.

SECTION VINATIONAL CONFERENCE ON GEO-
THERMAL ENERGY, MAY 10-11
PALM SPRINGS, CALIFORNIA

The National Conference on Geothermal Energy, an outgrowth of planning for the International Symposium, was headed by Congressman Victor V. Veysey and cosponsored by Subcommittee Chairman, Senator Ralph C. Dills and Ivan Hinderaker, Chancellor of the University of California, Riverside.

The purpose of the conference, which brought together experts from county, state and federal government, the academic field, representatives of the geothermal industry and private citizens, was to examine the role of various state and federal regulatory procedures affecting geothermal resource development.

This included the issues of overlapping of jurisdiction, confusion or apparent contradiction in governmental regulations and the apparent need for streamlining governmental controls and supervision.

The conference was set up into six panel sessions followed by general sessions. The panels examined the following topics: Access to Geothermal Lands; Geothermal Taxation: Incentive or Impediment?; Geothermal Exploration; Geothermal Development and Environmental Considerations.

The first day was taken up in the panel discussions and the morning of the second day was used by the panelists to formulate summaries and recommendations which were delivered at the afternoon general session.

The following is a summary of the discussions and recommendations of the panels:

ACCESS TO GEOTHERMAL
LANDS

The committee focused on three main items for discussion--(1) what is gained or lost by having parallel state and federal regulations and should cooperation between the two levels be increased; (2) is the present division of responsibility between county government and the Division of Oil and Gas satisfactory; and (3) an examination of the various sets of regulations in order to determine what, if any, procedures could be shortened or eliminated without endangering the public interest.

The panel recommended--

(a) Lack of access to federal lands is one of the major hindrances to geothermal development and it was recommended that Congressman Veysey form an ad hoc committee of members of Congress to urge the Secretary of Interior to assume jurisdiction and immediately release the environmental impact statement for the geothermal resource,

expedite final formulation and issuance of regulations and invite industry to participate with the Washington Task Force of the Department of Interior in final formulation of regulations.

(b) That the ad hoc committee attempt to see that the Bureau of Land Management and the U.S. Geological Survey are adequately funded to expedite issuance and administration of geothermal leases.

(c) That a nationally respected agency make a study of procedures for preparing environmental impact statements in an effort to streamline methods to reduce the amount of work and shorten the time element.

(d) A study should be undertaken to gather information for amendment of the National Environmental Protection Act to

- (1) satisfy the reasonable requirements of protecting the environment
- (2) avoid the burdens, delays and substantial duplications of effort and expense presently faced by industry and government and include an assessment of the alternative benefits to the economy and those who reside and work in the area
- (3) provide a concept which would permit the use of a solo environmental impact statement for various agencies throughout all levels of

Government and (4) provide some degree of administrative finality within a reasonable time with some limitations on the rights of appeal and review.

GEOHERMAL TAXATION:
INCENTIVE OR IMPEDIMENT?

This panel, after examining taxation of geothermal energy from the federal, state and local levels, made the following recommendations:

1. Investigate all available alternatives for meeting cash flow problem for research, exploration and development capital including guaranteed loans, moratorium on interest payments, low interest loans and federal insurance.

2. Federal taxation regarding classification of the geothermal resource is uncertain and the industry needs certainty in tax statute. The industry should attempt to have Congress define "geothermal" in appropriate portions of federal tax statutes.

3. The State Franchise Tax relates directly to the federal and the same avenue should be followed to assure uniformity of treatment.

4. State and local taxation are closely related to the ad valorem tax. The panel found no specific evidence of adverse

consequences to ad valorem taxation, but it was noted that the local assessor shall value a proven reserve and the problem is one of valuation. This condition exists with all industries and classes of property.

This panel also reviewed SB 563 (Dills) and it was indicated that a constitutional amendment would be required to enact such changes relating to assessment and or exemption of real property. There was also a fear expressed over loss of tax revenue to local government. A severance tax was discussed, but no definite recommendation was made.

GEOHERMAL EXPLORATION

This panel found that lack of ability to lease federally controlled public lands the largest single deterrent to geothermal exploration. This has created additional problems, since some states like Oregon and Nevada, will not lease state lands until federal regulations are enacted. As a result of this, the panel made the following recommendations:

1. Congressman Veysey and his colleagues should exert influence to speed early completion of the federal Geothermal

Environmental Impact Statement Regulations and the leasing of federal lands for geothermal exploration.

2. The Geothermal Resources Council should establish a group to prepare standard operating procedures as guidelines or model regulations for states which are preparing geothermal regulations.

3. The National Environmental Policy Act should be modified so that the required environmental impact statement would pertain to matters of direct environmental impact for planned action. There should also be a separation of the exploration and development phases of all natural resources development.

4. Public Law 91-581, Section 15, Part C, should be modified so that the various lands withdrawn from entry can be defined in precise statutory language and leasing could be permitted unless specifically excluded.

GEOHERMAL DEVELOPMENT

This panel discussion came up with several conclusions on a variety of issues. The panel found: (1) that the federal leasing program should be instituted as soon as possible; (2) that industry's

main requirement for investment is the knowledge that a profit will result; (3) definitions need to be clarified to avoid confusion; (4) although not positively received by the panel, it was suggested the federal government might delegate some responsibility and control to other agencies; (5) that more of the procedures could possibly be made ministerial rather than discretionary; and (6) consideration should be given for standardization of more of the regulations.

The panel made the following recommendations:

1. Industry should try to work within the existing legal and governmental framework rather than delaying development while seeking changes in the law.

2. Technical problems have been solved as identified and development should not be delayed because existing technology cannot deal with all imaginable problems.

3. Procedures for changing federal regulations for leasing federal lands should be kept functional. As development grows there will be a continual need for instituting changes. The panel

recommended that as soon as possible, environmental considerations will need to be more sharply defined and impact statement made more uniform.

4. Coordination and cooperation between industry, state and local regulatory agencies should be continued.

5. The major recommendation centered on the need to create as many uniform standards for as many aspects of development as possible. A prestige committee or commission should be created with membership from industry, local, state and federal government, to study the problems of regulation of the geothermal resource and the study results should be implemented into law and practice.

ENVIRONMENTAL CONSIDERATIONS

This panel addressed itself to consideration of the following three questions:

(1) what are the environmental effects of geothermal development; (2) are existing regulations adequate to deal with these problems; (3) are there in fact conflicts among these regulations which need to be resolved.

On the first question, the panel concluded that there are some significant environmental problems including land subsidence which could be substantial if uncontrolled, seismic problems about which at present there is insufficient information to make a judgement, water quality for which there is a potential for significant adverse impact, air emissions controlled and noise pollution which also needs to be controlled both during development and production phases.

On the second question, the panel concluded there are sufficient regulations at the present time to deal with the environmental problems which may come from geothermal development and there is no need for new laws to deal with unaccounted for problems.

There was a feeling for the need to develop background information through a program of continuing monitoring so that the impact of development can be mitigated through modification or regulation or, if necessary, suspension of programs where environmental risks are unacceptable.

On the third question of possible conflicts between various regulations, the

panel dealt with environmental regulations and found:

(1) There is a legitimate need for different levels of government to get different information before making decisions on development of geothermal resources.

(2) There were no specific examples of conflict among various requirements. There is a great deal of redundancy in some cases, but no conflict.

(3) The most apparent problems in resolution of conflicts stem from the various constituencies with differing interests in development of geothermal resource.

(4) In a discussion about trade-offs between the general need for energy and the rights and privileges of local citizens in the area where the energy is to be developed, the panel concluded that existing public mechanisms are adequate to hear and resolve both sides of these many issues.

The report of the panel on Environmental Considerations generated the most discussion, and the most adverse comment during the final general session. These

issues were raised during that discussion:

(1) Whether or not the stringency of impact statement requirements should be relaxed to facilitate rapid development of the resource.

(2) The need to streamline the present demand for detailed information gathering through monitoring.

(3) The need for historical and comparative information as a basis for environmental impact statement requirements; and

(4) The appropriate relationship between environmental protection through existing regulations and the need for rapid development of the resource. Some felt present regulations are overly rigid and too all inclusive and thus tend to hamper development without offering greater environmental protection.

SECTION VIIIMPERIAL VALLEY FIELD
TRIP AND JOINT INTERIMHEARING OCTOBER 16-17, 1973

Senate Bill 577 by Subcommittee

Chairman, Senator Dills, was referred for interim study to the Senate Committee on Natural Resources and Wildlife.

Because the chairman felt there was a need to acquaint members of both committees with actual geothermal operations, it was decided to combine a field trip to view federal efforts to desalinate geothermal brines in the Imperial Valley and a visit to the new Mexican geothermal electrical generating facility south of Mexicali, Baja, with an interim hearing in San Diego.

Attending were Senator John Nejedly, Chairman of the Senate Committee on Natural Resources and Wildlife; Senator Robert Lagomarsino, member of the Natural Resources Committee and Senator Dills, member of Natural Resources and Chairman of the Subcommittee on Geothermal Resources.

On October 16, members and staff visited the site of the Bureau of Reclamation's pilot desalinization plant located on the Mesa Anomaly 10 miles east of Holtville. Here, the Bureau, as part of

a seven year \$16 million program, has drilled two wells and is operating two desalinization units. The long-range goal of this program is to prove the feasibility of utilizing hot geothermal brines to create desalinated water for use in the Colorado River to reduce the dangerously high salinity levels. Final plans call for as much as 2.5 million acre-feet of desalted water annually for the Colorado and a concurrent power generation capacity of 10,500 megawatts.

The first well, Mesa 6-1 is presently being used to operate the two desalting units. One unit is a multistage flash distillation unit and the other is a vertical tube evaporator each with a capacity of 20,000 to 50,000 gallons per day.

To date, several thousand gallons of excellent quality water (less than 30 ppm) have been produced in the multistage unit while the vertical tube evaporator has been operated for several hours producing some desalted water.

With the drilling of the second well, Mesa 6-2, the Bureau eventually plans to

use this as the operating well and utilize the first well for reinjection of geothermal fluids.

Although production of desalted water is the primary goal of this project, possibilities for multipurpose development including electric power generation and mineral recovery are also being evaluated.

From here the group traveled to Calexico and south through Mexicali to the Cerro Prieto geothermal steam field where the Federal Electric Commission of Mexico this year put a two unit geothermal generating plant on line with an installed capacity of 75,000 kilowatts.

Hot brines, similar to those found in the Imperial Valley are flashed into steam to turn the turbines. Mexican officials told the committee they had experienced damage to equipment from hydrogen sulfide gas and were now working on ways to keep the gas from entering the atmosphere. They also indicated that there had been no problems to date with subsidence.

Although generation of electricity is the primary function of the Commission, officials indicated that plans are being

formulated for a multiple use of the geothermal resource to include desalinization and mineral recovery.

On Wednesday, October 17, the interim hearing on SB 577 was held in San Diego.

While meeting to hear testimony on Senator Dills' bill to allow a schedule of rapid amortization of electric generating facilities using geothermal energy, the committee heard a variety of testimony ranging from denials of allegations made by San Francisco Mayor Joseph Alioto that Union Oil Company was involved in monopolistic practices in regard to sale of geothermal steam at The Geysers in Sonoma (see Appendix Pages A-C) indictments of federal inaction in leasing the public domain for geothermal exploration, discussions of inequities in tax treatment of geothermal developers, to expressions of support for SB 577.

Dr. Carel Otte, vice-president and manager of Union Oil Company's geothermal division, testified that although it was designed to assist utilities, and Union's role was that of steam developer, SB 577 would provide more flexibility for the

utilities in utilizing geothermal energy for power generation and anything which provided more flexibility would be good for the geothermal industry.

Otte indicated that Union Oil did not feel there was a necessity for a change in the basis of ad valorem taxation of geothermal reservoirs, but asked that when taxing agencies do assess, that they give proper consideration to the many uncertainties involved with geothermal development.

He felt the largest impediment to development of the resource was the failure of the federal government to initiate the leasing program of the Geothermal Steam Act of 1970. He pointed out that since steam cannot be transported any long distance, wells and generating plants must be utilized for full utilization and this becomes very difficult, if not impossible, when there is a checkerboard pattern of ownership of private, state and federal land and the federal land is not open for exploration and development.

Otte called for removal of institutional barriers to development of the resource such

as overlapping jurisdictions and delays caused by filing of individual environmental impact statements on each geothermal well.

He outlined development of Union's partnership with Magma and Thermal Power Companies as developers of the only commercial geothermal steam field in the United States.

Asked about the charges made by San Francisco Mayor Joseph Alioto that monopolistic practices were involved in Union's control of geothermal steam at The Geysers, Otte said that Union had held discussions with the 11 cities which have now formed the Northern California Power Agency, but they could not avail themselves of the resource. He indicated that Pacific Gas and Electric Company was ready to buy the steam so it was sold to them. Subsequently, Signal Oil Company also sold the steam from their wells at The Geysers to Pacific Gas and Electric. He stressed that Union does not own the resource at The Geysers, but controls perhaps only 50 percent.

He denied Alioto's charges and indicated Union had never refused to sell steam to the NCPA. It was rather, he said, a case of the cities not being able to buy the steam.

Donald F. X. Finn, Chairman of the Board of Environmental Energy Systems, Inc., of San Francisco, suggested that ad valorem taxation of the value of geothermal fields before the field is producing could be alleviated by an amendment to the effect that geothermal steam field, or a well, is not subject to ad valorem property taxation until it starts producing income.

He suggested such an amendment be added to Assembly Constitutional Amendment 32 which is presently pending in the Senate, which, if adopted, would provide that certain limited types of property are exempt from property taxation until a certain point in time. He contended that by placing geothermal in this category, it would ameliorate the situation where assessors are required to tax steam fields regardless of the fact that no income is being produced.

He also expressed support for Senator Dills' SB 577 which he said had "its heart in the right place," but failed to take care of the steam supplier.

Finn also called for the kind of tax incentives that will convince investors to put their money into geothermal development rather than into oil or gas.

Questioned about Mayor Alioto's charges of monopoly by Union Oil at The Geysers, Finn said he did not think Alioto was accusing Union Oil. He suggested the Legislature should look into the use of federal transmission lines to bring power out of The Geysers. He pointed out that several companies in addition to Union Oil are exploring for or selling steam, but Pacific Gas and Electric is the only utility in the area with the transmission capabilities to get the power to market.

Joseph W. Aidlin, general counsel for Magma Power Company, testified that SB 577 is the single most important incentive to accelerate installation of geothermal power generating facilities.

On the question of taxation of geothermal resources, Aidlin said developers are not asking for any favors, they just do not want to be discriminated against as energy producers.

He suggested there was a great deal of misinformation about geothermal development and about taxation of the resource and conceded that under the existing structure where certain incentives were available to

developers of oil and gas, geothermal development would have to take second place in the attention it receives not only from investors, but from government.

Aidlin recommended that rather than create another larger energy agency such as that proposed in SB 283 the Warren-Alquist State Energy Resources and Conservation Act, development of geothermal energy would be better served by giving more funding and staff to the Geothermal Resources Board and making it the agency to deal with geothermal exploration and development.

He noted that the state is presently in the process of preparing a model environmental impact statement for both The Geysers and the Imperial Valley geothermal resources area and that, combined with expanded staff of the Geothermal Resources Board, could minimize the conflicts and uncertainties of meeting the requirements of various agencies.

He said he had written to Mayor Alioto after receiving copies of the Mayor's press statements relative to activities of Union Oil at The Geysers and said he was surprised the Mayor would be the vehicle for spreading complete misinformation.

Larry Counts, attorney for the State Franchise Tax Board, testified that it has been a long-standing policy of the board to discourage or recommend abolition of tax incentives such as percentage depletion.

It had been suggested during the hearing that perhaps if the state took the lead by defining geothermal resources in the appropriate sections of the tax code, the federal government might be convinced to do the same.

Counts discounted this possibility and stressed that in terms of money and tax liability, it is the federal, not the state tax that will make the difference to geothermal development. He described tax incentives as a camouflaged subsidy and indicated that if there was going to be an incentive to move large amounts of capital into geothermal development, that move will have to come from Congress.

Edwin Gladish, Executive Officer of the State Lands Commission outlined the role of the Commission in leasing of state lands for geothermal exploration and development. Similar, but expanded

testimony was given at a Subcommittee hearing November 12 in San Francisco (See Appendix Pages 4-13).

Phillip Pryde of San Diego, representing the Sierra Club, said the club did not oppose utilization of geothermal energy, but felt full utilization was precluded by the low efficiency of the energy, demands on land use and the environmental impact. He said the club would support tax incentives to solve the technical problems involved with geothermal energy, but not tax incentives for development of power plants.

Thomas C. Hinrichs and Alan G. Strachan of San Diego Gas & Electric Company outlined that firm's testing and plans for development of geothermal wells in the Niland and Heber areas of the Imperial Valley.

Strachan recommended that because of the uncertainties of geothermal energy and because the useful life of generating facilities cannot be estimated, SB 577 be amended to provide that when a public utility invests in facilities using geothermal energy, where the process has not been used sufficiently to establish

a reasonable useful life, the Public Utilities Commission should use a 10-year life. He also recommended the bill should provide that these costs be recognized as a proper cost of operation by the Public Utilities Commission in the rate-making procedure.

The effect of using a 10-year life for amortization should result in increased capital recovery in the early years of the project. If the use of a plan then has to be abandoned, there will be less of an investment to write off. He also suggested any remaining write-offs should be permitted to be amortized over a five-year period and recognized as a proper cost of operation for rate making purposes.

The needs for definitions and incentives to draw development capital while achieving equity of tax treatment between geothermal and other energy developers seem to be the main themes of the hearing along with the concurrent theme of the need for centralization and streamlining of regulatory agencies.

The allegations that Union Oil Company was involved in monopolistic practices in regard to the sale of geothermal steam to

SECTION VIIIHEARING OF THE SUBCOMMITTEE ON
GEOTHERMAL RESOURCES AND THE
SENATE COMMITTEE ON PUBLIC
UTILITIES AND CORPORATIONS
NOVEMBER 12, 1973 IN
SAN FRANCISCO

Because of the allegations made in the press against the steam producers at The Geysers geothermal field in Sonoma County and because of the comments made on this issue at the hearing in San Diego, the Subcommittee Chairman felt it would be appropriate to conduct a hearing to permit all sides in this controversy to be heard.

Since the subject covered the scope of activities of utilities in the utilization of steam as well as corporations involved in the steam winning, the chairman invited the members of the Senate Committee on Public Utilities and Corporations to participate in a joint hearing on the subject of access by the cities to steam at The Geysers for electrical generation.

The committee was interested in learning if the seven cities of the 11-city Northern California Power Agency had, as charged in the press, been denied access to steam at The Geysers, the role of the State Lands Commission in leasing of state lands at the field and if additional

legislation might be required to assure full access to steam to all competing parties.

The hearing was attended by Senator Dills, Senator Alfred Alquist, Chairman of the Senate Committee on Public Utilities and Corporations, Senate President pro Tempore James Mills, Senator Joseph Kennick, Senator Randolph Collier and staffs of the P.U.C. Committee, the Subcommittee and the Joint Committee on Public Domain.

Santa Clara Mayor Gary C. Gillmor, Chairman of the NCPA; Santa Clara City Manager Donald Von Raesfeld and Lodi Mayor Richard L. Hughes, testified for NCPA.

They traced a history of negotiations with Union, Thermal, Magma partnership which operates The Geysers field dating back to 1968 and maintained the NCPA was being treated differently from others trying to purchase steam. They said in negotiations they were being asked to prove up other things the private utilities were not required to prove up.

Questioned for specifics, they said they were required to participate in the costs of exploring and developing the steam field.

They said the Agency was seeking a firm steam supply for its members and had plans to build a 220 mw generating facility at a cost of \$40 million, but all efforts to secure the steam had been frustrated.

Representatives of NCPA described their efforts to obtain steam and electric energy transmission capabilities as "the chicken or the egg" situation.

They indicated the steam suppliers told them they would be happy to sit down and talk about supplying them steam as soon as they had generating and transmission capabilities, yet Pacific Gas & Electric Company, which has the transmission facilities out of the area and holds a veto power over who uses the transmission lines of the Central Valley Project, would tell them they would be happy to talk about transmission as soon as the Agency had a firm supply of steam.

Asked if they had tried the federal government, they indicated they had many contacts with the federal government and had a study done to indicate excess capacity in the Central Valley Project transmission lines, but Pacific Gas and Electric held the veto power over who used that capacity so they were stymied at every turn.

They indicated that finally they even agreed to put up some developmental "front money", but were still unable to secure a supply of steam.

Questioned on what they felt was their biggest problem, participating in the exploration costs or securing transmission facilities, they answered that they felt they should not have to participate in the development costs, so their big problem was securing a source of steam.

Dan A. McMillan, President of Thermal Power Company, one part of the three-part combine operating at The Geysers, was the next witness.

He outlined development at The Geysers as far back as 1921, the joining together of Thermal, Magma and Union Oil into the present operation as the major steam suppliers in the area.

McMillan indicated that the only reason development at The Geysers is not more rapid is lack of capital on the part of Thermal and Magma to keep up with the drilling commitments.

Questioned about the testimony that negotiations required financial participation for proving up a field, McMillan said that he did not think that statement was accurate.

Senator Mills put the question differently and asked if Thermal would deal with NCPA on the same basis as they had with Pacific Gas & Electric.

McMillan said that of course they would, but pointed out that they had a 50-year contract with Pacific Gas & Electric to buy all the steam they developed.

Ed Gladish, Executive Officer of the State Lands Commission, testified on the role of the Commission, particularly in The Geysers. (See an outline of the Commission's geothermal activities in the Appendix, Pages D-M).

He noted that only a small portion of state lands at The Geysers has been explored and it is the Commission's view that in the long run, geothermal energy can supply as much as 5 percent of the state's energy needs.

He noted that the question of monopoly was raised before the State Lands Commission

in regard to leasing at The Geysers and the Attorney General's office informed the Commission that while they should be aware of this matter, the final jurisdiction was up to the Public Utilities Commission. The P.U.C. subsequently ruled that the leasing of lands to Union, Magma, Thermal at The Geysers did not constitute an anti-trust violation.

Gladish was asked if the state had drilled any exploratory holes to determine the value of geothermal energy on state lands. He said the state had not done any drilling, but the University of California, Riverside, had done some exploratory work in the Salton Sea area.

Senator Mills asked if there was any particular reason why the state had not done any work to determine the value of its geothermal lands, and Gladish replied that it was a matter of philosophy of assuming the risks. The position of the Commission, he said, was to minimize the hurdles private enterprise had to go over, but it was the role of private enterprise to do the work.

David Foley, principal counsel for the State Public Utilities Commission testified

that the Commission's jurisdiction was limited to the public utilities such as Pacific Gas & Electric and had no jurisdiction over the private utilities such as the cities.

He indicated that NCPA had raised the question of anti-trust violations during hearings on power plants for Pacific Gas and Electric at The Geysers and the Commission found no violations. He said the NCPA had not appealed these decisions to the courts.

This last statement was contradicted by NCPA representatives at a hearing of the Senate Committee on Natural Resources and Wildlife, November 15, 1973 in Martinez. (See Appendix Pages N-O).

Mayor Alioto appeared in the afternoon while commending Pacific Gas and Electric for agreeing to build generators as fast as Union Oil Company could provide the steam, he claimed Union was developing the field at The Geysers on a "controlled measured basis" and he did not know why.

He also said he did not understand why there was so much speculation on the size of the resource. He urged the state to

find out how big the resource is and to cooperate in this effort with the federal government.

The Mayor suggested that grandfather clauses in the present federal Geothermal Steam Act of 1970 were the reason President Johnson had vetoed earlier legislation. He called the grandfather clause the most effective way to eliminate competitive bidding and said it was tailor-made for the leasing situation at The Geysers.

He retraced the efforts of the cities to obtain steam at The Geysers and said some people feel the state should have taken an affirmative stand and created a competitive position. He indicated that it did not now appear there was a competitive development at The Geysers.

The Mayor said the report of former Interior Secretary Walter Hickel indicated geothermal energy could provide up to one-third of all of the energy requirements of the nation and at a time when we were being blackmailed for energy in the mid-east, he wondered why there was not an "Oklahoma land boom" type rush to develop geothermal power.

He suggested that if the committee could get a look at the Union-Thermal-Magma contracts it might be able to discover the intent of the development at The Geysers.

The Mayor was questioned about whether or not the NCPA had appealed the anti-trust ruling of the Public Utilities Commission and while he indicated he could not answer that, he said he felt the P.U.C. did not have the expertise to rule on a question of anti-trust. He suggested the Attorney General be requested to render an opinion on whether there is a noncompetitive situation at The Geysers.

Joseph Aidlin of Magma Power Company appeared next and indicated there was nothing secret about the contracts between Union, Magma, Thermal or Pacific Gas and Electric. He then provided the committee with a copy of the contract between Magma, Thermal and Pacific Gas and Electric and indicated the Magma, Thermal, Union contract was also a matter of public record.

Referring to the Mayor's statement that Union Oil was responsible for controlled measured development to discourage competition, Aidlin said if that is true, then

Magma and Thermal are also responsible and he assured the committee no one could convince Magma to slow down the development for anything other than technical reasons.

He said that his firm was prepared to keep pace to help meet the energy crisis, but there was much to be done and much to be learned in the geothermal field. He indicated that the various estimates of the size of the resource did a great disservice to the entire industry for at this point no one really knows the size of the resource.

He did indicate his firm was convinced there was a tremendous resource in the Imperial Valley, but it will not be developed until it is known just what is there.

Aidlin was asked why his firm did not go and drill some wells for NCPA and he replied that they did not have the power plants to utilize the steam.

Asked if NCPA came to Thermal would they be required to finance exploration, Aidlin said they would not and he found it difficult to believe that Union would make such a request.

He indicated that Magma would be happy to sit down with the cities at any time to try to supply them with an energy source. He said they are interested in selling steam to any ready, willing and able buyer.

On the matter of the grandfather clauses, he said they have a legitimate purpose in that those who claim grandfather rights are those who developed those areas and who really have a much better idea of the problems and are ready to go ahead with development. This, he said, should be a benefit, not a deterrent to geothermal development.

Asked if the contracts call for sale of all the steam developed in the area under their control to Pacific Gas and Electric, he said this is true, but there is a clause which allows sale of any steam Pacific Gas and Electric does not want. This can be used for any purpose other than generation of public power.

Questioned if this clause would then preclude use by the cities, he said that was true.

This was contradicted by the next witness, Malcolm MacKillop, attorney for Pacific Gas and Electric who contended the contract

does not preclude the cities from utilizing steam not wanted by Pacific Gas and Electric.

Vernon Harris, representing Natomas Company, said his firm was just getting into the geothermal field and suggested the committee could be of great assistance to the cities if they could solve the transmission problems in The Geysers area either by having the cities construct their own facilities or join with Pacific Gas and Electric or the Bureau of Reclamation. This would put them in the position of assuring in advance that they had transmission capabilities and thus eliminating the "chicken or the egg" situation mentioned earlier.

He also urged the Legislature to speed up development of geothermal energy by adopting the federal environmental impact statement as a master statement for the counties producing geothermal energy.

The questions of just who should take the risks, the steam developer, the steam buyer or both, were left unresolved. It appeared from testimony that under the present development, the steam winning was done by one organization, in the case of

The Geysers, the Union, Thermal, Magma combine, and the steam buying and power generation by another, in this case Pacific Gas and Electric. No developmental risks were assumed by Pacific Gas and Electric and the cities maintained throughout the hearing that they were asking simply for the same privileges.

The question of transmission capabilities also remained unresolved. The cities maintained that they think they can solve this problem either through negotiation with Pacific Gas and Electric to use their lines, or by constructing their own to the Central Valley Project lines.

Finding them someone to sell them the steam to put through power plants they propose to build remains their major problem.

SECTION IX

HEARING OF THE SENATE
COMMITTEE ON NATURAL
RESOURCES AND WILDLIFE
ON THE CONTINUED AVAILA-
BILITY OF NATURAL GAS AND
OTHER SOURCES OF ENERGY
NOVEMBER 15, 1973 IN
MARTINEZ, CALIFORNIA

Witnesses familiar with the subject of geothermal development at The Geysers appeared at this hearing which was attended by Senator Dills and subcommittee staff.

The hearing was also attended by Committee Chairman, Senator John Nejedly, Senators Arlen Gregorio, H. L. Richardson and Assemblyman Daniel Boatwright.

Martin McDonough of Sacramento, counsel for the Northern California Power Agency, was the first witness on the question of availability of steam at The Geysers.

He indicated the NCPA has a program to develop geothermal energy and opposes any restrictions on access to geothermal steam, particularly private agreements between private parties. He said Pacific Gas and Electric Company now has exclusive rights to the steam at The Geysers.

Senator Nejedly asked if it is true Pacific Gas and Electric has control of 100 percent of the steam at The Geysers,

and McDonough replied he meant at the developed proven areas.

He was then asked if NCPA had attempted to develop areas not controlled by Pacific Gas and Electric. McDonough replied that NCPA did not plan to get involved in development, but hoped to have the development done by others and buy the steam.

He was asked if Pacific Gas and Electric can utilize all of the steam which can be developed from the field, why did NCPA expect them to sell to the Agency when other areas of the field were still undeveloped.

McDonough said NCPA had negotiated with all of the other steam developers in the field, but without success. He was then asked if it was true that there were other undeveloped areas, why the Agency did not go in and develop their own steam supply.

McDonough replied that development of geothermal energy is a highly speculative venture posing risks which power companies are not equipped to take.

He was then asked if the Agency had approached Union, Magma and Thermal and indicated they would participate financially in development of additional wells outside

the area now controlled by contract for steam supply to Pacific Gas and Electric.

McDonough said NCPA does not intend to finance exploration of wells any more than Pacific Gas and Electric participated. He indicated the problems of the NCPA in securing steam are compounded because of the arrangement Pacific Gas and Electric has with other utilities relating to joint control of generating facilities and transmission facilities.

He made particular note of the fact that Pacific Gas and Electric has a contract with the Federal Bureau of Reclamation which prevents the Bureau from using transmission facilities of the Central Valley Project in cooperation with the Agency without the consent of Pacific Gas and Electric. He said Pacific Gas and Electric has refused that consent and has continually opposed legislation to give NCPA the power to issue revenue funds to finance its generation facilities.

He indicated Agency negotiations have all foundered when steam suppliers indicate that in view of the Agency's problems with Pacific Gas and Electric, they could make a

better bargain for their steam by selling to Pacific Gas and Electric.

He said NCPA had complained to the Public Utilities Commission and the Department of Justice about the Pacific Gas and Electric contracts.

He was asked again why NCPA did not simply develop its own source of steam and McDonough replied that they had tried that with Signal and Pacific Energy and were told again, in view of the Agency's problems with the Bureau, Pacific Gas and Electric and with financing, they could make a surer, quicker deal by selling to Pacific Gas and Electric.

Senator Dills asked if the NCPA now had the financial capability to build a generating plant to utilize steam and he replied they did.

Dills said other hearings seemed to indicate the Agency wanted to take advantage of the developmental risks taken by the oil companies and then come in and ask for the steam.

McDonough replied that NCPA did not expect to take advantage of the oil companies, they were willing to take exactly the same developmental risks as those taken by Pacific Gas and Electric.

Asked if NCPA had opposed adverse decisions by the Public Utilities Commission in regard to its allegations of anti-trust violations at The Geysers, McDonough said they had and would continue to oppose this and other decisions.

George Bond, general counsel for Union Oil Company, then introduced Dr. Carel Otte, Manager of Union's geothermal division.

Otte said Union is designated by contract with Thermal and Magma as the operator of the field and as such provides all the personnel, equipment and know-how, but owns only 50 percent of the resource. The other 50 percent is co-owned by Magma-Thermal.

Senator Nejedly asked if NCPA came to Union and asked for steam from the undeveloped lands would the company deal with them. Otte said such negotiations had already taken place, but NCPA wanted Union to build the generating plants and Union indicated they were not in the business of building power plants.

He said there was apparently testimony at an earlier hearing that there were some kind of sub-rosa agreements and this was not true. He indicated that Union was willing

to sit down and deal with anyone seeking to purchase steam.

He noted the cities had an additional problem in that geothermal power is base load power and once on line it should be operated to maximum extent. Yet, the typical load curve of the cities is a residential curve of steep fluctuations. They need peaking power, and Union provides base load power. When no power is generated, then no income is generated and that makes for a difficult situation.

Senator Dills asked if Union has leases outside those now committed to Pacific Gas and Electric and if these would be available to anyone who was ready, willing and able to purchase the steam. Otte said this was correct.

He then traced the history of the development by Magma, Thermal and Union to refute Mayor Alioto's charge of controlled, measured development. In 1970 he said they started conversations with the cities and others in an attempt to bring other buyers into the field, but these negotiations went nowhere so agreements were signed with Pacific Gas and Electric with the proviso

for minimum installation of 110,000 kilowatts per year. Because of new technological discoveries which no longer required the developer to prove up an entire field before generating equipment was ordered, development was accelerated. So, between 1960 and 1971, a total of 85,000 kilowatts had been installed, and in one year the output was doubled and the next year another 110,000 went on line and this year another 110,000 was installed. At the same time, Otte said, the company has mobilized additional drilling teams.

Instead of a slow development, Otte said, what we are seeing is a demonstration of accelerated development. He indicated this had been slowed down, and in one case shut down, by county requirements for environmental impact statements on each well.

Senator Nejedly asked if it was Union's position that in the area they are involved, when they knew they had a resource, they went into the field, solicited other persons to utilize the power and which was ultimately sold to Pacific Gas and Electric, but if other parties had made the same kind of commitment, Union would have dealt with them. Otte said that was correct.

He concluded by adding that Union and its partners and Pacific Gas and Electric instead of retarding, have accelerated the development of geothermal energy at The Geysers. Within 10 years they have proved feasibility of a lease hold that nobody discussed in 1960.

Now, he said, because of their efforts, geothermal energy is being discussed by the state and the federal governments and instead of being criticized, they should be encouraged, given a pat on the back and told "go find more because we need it."

Fund-Raising Dinner

Alioto Claims Union Oil Sits On Sonoma Geysers Power Source

By Lee Fremstad
Bee Capitol Bureau Chief

Mayor Joseph Alioto of San Francisco has accused Union Oil Co. of wielding "the heavy hand of monopoly" in denying steam from the Sonoma Geysers to several small cities who want to turn it into electricity.

He called for the state attorney general to investigate what "appears to be (Union's) dominating" the natural resources.

Alioto, a Democratic candidate for governor, told a news conference before a \$10-a-plate fund raising dinner in Sacramento last night that Atty. Gen. Evelle Younger — himself a prospective candidate for the GOP gubernatorial nomination — should examine whether the geothermal fields are "being developed competitively."

Urges Probe

He later told the dinner audience of about 800 "the state itself can break the monopoly."

Alioto, who built a fortune pioneering the private practice of law in antitrust cases, also called for a "full investigation" by the legislature of over-all geothermal development in California.

"Here is a potential solution for at least part of our (energy) problems that is being allowed to slip into the basis of monopoly control," he said, referring to nine small cities of the Northern California Power Agency that applied unsuccessfully for supply contracts from the geysers, controlled mostly by Union. He said, in the face of the

"energy crisis" the steam should go to generate electricity for customers other than Pacific Gas and Electric Co.

Alioto said the geysers are capable of producing between 2,000 and 25,000 megawatts of electricity and that each 1,000 megawatts is the equivalent of a nuclear power plant or the burning of 10 million barrels of oil. He said the geysers should be developed in California like a second gold rush.

The candidate said "there ought to be litigation to compel Union Oil to sell to these nine cities" and disclosed he had consulted his law office about such a lawsuit.

New Faces

Alioto's \$10 per person steak dinner revealed a head table peopled with familiar Democratic leaders and an audience with new faces — "they are amateurs, and I'm pleased about it," said Alioto.

Thomas Kenny, executive director of the Sacramento Labor Council, acted as master of ceremonies in one evidence of Alioto's close ties with organized labor. Others at his head table included Supervisors Pat Melarkey, Ted Sheedy, Eugene Gualco and E. Henry Kloss.

Mayor Richard Marriott introduced Alioto as "... the future owner of Look magazine." Alioto has a libel action still pending against the now-defunct magazine for its allegations of links with Mafia figures.

"I'm no stranger around Sacramento," the mayor reminded his supporters. He

referred to his organizational efforts for the Rice Growers Association "which poured a lot of money into California."

"I'm going house-hunting in Sacramento," said the San Franciscan.

"I don't (as governor) want to move out to the suburbs — I'd like to move downtown."

"And if they do build a mansion in the suburbs maybe we can rent it out to the same 10 men who bought Ronald Reagan's home and they can rent it to him for weekends."

'Trickle-Down Theory'

Alioto said Reagan's administration holds to the "trickle-down theory" that what is good for big business is good for the working man.

"The problem with that is they have constructed too many dams to stop the trickle," said Alioto.

"What we need is a system that trickles up instead of trickles down."

The mayor, who supported Hubert Humphrey against George McGovern in the 1972 California presidential primary, called for a return to the traditional Democratic coalition.

He said his party learned last year it cannot allow its "new claimants" to expel the old.

"There is not going to be any 'new theology' where anybody is going to require 100 per cent adherence on 100 per cent of the issues," said Alioto.

"We want the new claimants — but we can't throw out the old. Then we won't suffer the kind of plastering we took in 1972."

OCTOBER 24, 1973

Nine Cities Consider Cutbacks In Electrical Usage

Cities Consider Cuts In Use Of Electricity

By Jeff Raimundo

Bee Staff Writer

SAN FRANCISCO — Nine California cities, including Roseville and Redding, are contemplating cutbacks in electrical usage soon because the state and the Union Oil Co. refuse to allow them to generate their own electric power from geothermal steam fields in Sonoma County.

Speaking in San Francisco where they were assembled for the annual conference of the League of California Cities, officials of the nine cities said they have tried unsuccessfully since 1968 to get Union Oil to grant them the right to construct their own generating plant at Sonoma Geysers field, where Union is the main land owner.

Speaking on behalf of the nine cities represented yesterday, San Francisco Mayor Joseph Alioto noted that Union Oil's refusal to grant rights to the steam power source comes "in the midst of an energy crisis facing the entire world."

He and the other city officials noted the steam power source is the "cleanest, cheapest, and most undeveloped" power source available today.

The nine cities represented yesterday are out of a group of 11 which are included in the Northern California Power Agency. San Francisco is not a member of the NCPA but spoke on behalf of the agency yesterday.

Among those at a press conference yesterday were Roseville Mayor George Buljan and Redding City Attorney Earl Murphy. Other officials represented the cities of Santa Clara, Lodi, Palo Alto, Alameda, Ukiah, Healdsburg and Lompoc — all members of the NCPA.

The agency has several lawsuits pending in its effort to secure rights to the Sonoma Geysers but so far has been unsuccessful in its attempts to secure the valuable resource.

Santa Clara Mayor Gary Gillmore said that the state "should get involved to expedite and develop the Sonoma Geysers." He and the others were critical of the state's inaction in aiding their effort.

"You would think Union Oil would be wining and dining them (the Northern California Power Agency)," Alioto said.

"But the company is treating them like they have leprosy."

Union Oil, the company landholder at Sonoma Geysers, has contended that they are researching the development of the steam power field and can generate only enough power to meet current needs pending completion of their research.

But Northern California Power Agency officials say their research indicates the geyser field could generate 25 times as much power as is currently being done, officials said yesterday.

If the NCPA could have operated its own plant since 1968, officials contend, it could have saved over 7 million barrels of oil in a period when oil reserves apparently are being depleted.

The city officials yesterday said they want the California Public Utilities Commission to express public support for the power agency's proposal, Atty. Gen. Evelle Younger to initiate antitrust investigations if necessary, and State Controller Houston Flournoy, as chairman of the State Lands Commission to revoke the lease of 4,000 acres of state land in 1971 to Union Oil is the Geysers area.

SAN PEDRO NEWS-PILOT Nov. 29, 1973

State must become self-sufficient in electrical energy, Alioto says

By TIM LEMM

California must become self-sufficient in generating electrical energy, San Francisco Mayor Joseph Alioto said Wednesday in San Pedro.

If not, the state will run the risk of continuing to be dependent on foreign oil suppliers, he told members of the Propeller Club of the Los Angeles-Long Beach Harbors, which met at the Ports O' Call Restaurant.

The Democratic gubernatorial candidate said geothermal steam and nuclear power represent the cleanest and cheapest ways of achieving that goal.

Alioto said the economic health of California can not be assured unless a crash research and development program is implemented by energy strategists.

He said the state's vast geothermal steam resources remain virtually untapped and atomic energy facilities are being blocked by the fears of environmentalists.

Alioto said the Sonoma geysers in northern California are one of the three largest dry steam deposits in the world.

He accused the Union Oil Co. of measured, controlled development of geother-

mal geysers beneath much of the 4,000 acres it was leased in 1971 by the state Lands Commission.

Alioto said he knows of 11 cities in Sonoma County which have unsuccessfully attempted to negotiate a contract with Union Oil to generate their own electricity.

He said the state should rescind its 40-year lease with Union Oil on antitrust grounds and reopen the area to competitive bidding for development of its resources.

Alioto said he has been told by leading geologists that the Sonoma geysers could generate electrical energy equivalent to that of from eight to 10 nuclear power plants.

He said this could represent a savings of up to 100 million barrels of oil per year which otherwise would be required to operate electrical power plants.

Alioto said there are also extensive geothermal fields in Southern California in the form of hot water deposits in Riverside and Imperial counties.

Unlike the geothermal deposits in northern California, the Southland's hot water must be "flashed" into steam.

Alioto said development of the geother-

mal resources alone would not be enough for the state to become self-sufficient in generating electrical energy.

He advocated a crash program to begin development of atomic energy facilities on private lands.

Alioto contends, however, that nuclear energy is being held back by the fears of extremists in the conservation movement.

He counters their protests by saying the nuclear power industry has the best safety record of any industry in the nation.

Alioto discounts the spectre of earthquakes and radio-activity as only remote possibilities and not dominant probabilities.

Nuclear wastes, he said can be put in containers and buried in the earth.

Alioto said he would like to see a crash program within the next two years to go ahead and locate nuclear plants on private property.

He admits that geothermal steam and nuclear power plants will not dramatically offset the current energy crisis.

Alioto said heavy rains this winter could spur increased production at hydroelectric plants which would compensate for the energy shortage.

STATE LANDS DIVISION

STATE LANDS ASPECTS OF GEOTHERMAL RESOURCES

Status Report

Permits to prospect for geothermal resources on State lands were first issued by the State Lands Commission in 1961. By 1967, twenty-six (26) permits had been issued. These permits were issued under the provisions of the Public Resources Code and the California Administrative Code for minerals other than oil and gas. Four (4) of the permits have been converted into leases; all others have expired.

The Geothermal Resources Act of 1967 enacted by the California Legislature, in addition to amending Division 3 of the Public Resources Code administered by the Division of Oil and Gas, also amended Division 6 of the Public Resources Code to establish a basic framework within which the State Lands Commission may lease State-owned lands for purposes of geothermal exploration and development. The Act included incentives for private industry to pursue active exploration and development programs on State-owned lands. Such incentives include:

1. Prospecting Permit terms were lengthened from two years to three years, and extendible for an additional two years.
2. Nominal rent at one dollar (\$1.00) per acre per year.
3. Preferential right to a lease upon commercial discovery.
4. Royalty established at ten per cent (10%) for steam (with minimum of two dollars (\$2.00) per acre per year).

The act defines "geothermal resources" as the natural heat of the earth, the energy that may be extracted from such heat, and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases, and steam found below the surface of the earth, but excluding oil, hydrocarbon gas or other hydrocarbon substances.

The Commission may issue permits and leases on all lands owned by the State. In the case of lands where the surface is under the jurisdiction of a State department or agency other than the Commission, however, such permit must be with the consent of the other department, and subject to such reasonable conditions as may be prescribed by that department.

The law is very specific in that management of the resource must be under the principle of multiple use. The Commission has, in the past, properly interpreted this to mean that all resources must be considered, and that all State departments' and agencies' interests, as well as the public interest, should be considered.

Permits may be issued for prospecting on lands not known to contain geothermal resources. Upon classification of an area as a known geothermal area by the Commission (acting either independently or upon the advice of the Geothermal Resources Board) procedures are provided for preferential and bid-leasing.

Monopoly is prevented by limiting the size of permit or lease, and the total interest that may be held or controlled either directly or indirectly by one individual or organization is 25,600 acres. Primary term is set. Commingling of production from State and non-State wells is permitted, and unitization is allowed. Finally, it presupposes management under full multiple-use concepts.

Prior to the enactment of the Geothermal Resources Act of 1967, the Commission had acted to encourage the exploration for geothermal resources by issuing prospecting permits on State lands under provisions of the Public Resources Code concerning minerals other than oil or gas. A permit to conform to the new law was prepared and adopted by the Commission on May 29, 1969. Rules and regulations were adopted on April 23, 1970, and a geothermal resources lease form was adopted on May 27, 1971.

Under the new Rules and Regulations, forty (40) prospecting permits have been issued, covering 55,420 acres, and as a result of steam discoveries,

six geothermal resources leases containing 4,523 acres have been issued, and at present, twenty-three permits covering 24,924 acres are in effect, located in the following areas (details attached):

The Geysers Area	16 permits (5,493 acres) and 2 leases (3,988 acres)
Owens Lake Area	3 permits (14,738 acres)
Salton Sea Area	2 permits (3,893 acres) and 4 leases (535 acres)
Surprise Valley	2 permits (800 acres)

The increased interest in geothermal resources is indicated by the forty-two (42) pending applications for prospecting permits, covering approximately 55,600 acres, as follows: Surprise Valley, Modoc County (32,300 acres); Lake County (7,200 acres); Mono Lake area (4,300 acres); Salton Sea area (3,800 acres); Napa County (2,600 acres); Honey Lake area, Lassen County (2,000 acres); Randsburgh area (1,100 acres), Mendocino County (700 acres); and Sonoma County (1,600 acres).

Leasing has been active in The Geysers area. Presently, Union Oil Company, Cordero Mining Company, Geothermal Electric Corporation, and Signal Oil and Gas Company have prospecting permits. Other companies that have applications pending for prospecting permits are Natomas Company, Geothermal Power Corporation, and Petroleum Leasing and Development Corporation.

The developed area in The Geysers, is approximately seven (7) miles long and two-and one-half (2-1/2) miles wide, covering an area of 11,200 acres. It is anticipated that future outstep wells will considerably enlarge the area of proven development in The Geysers steam field. The State owns the mineral rights to 4,580 acres of land in the area which is forty-two percent (42%) of the total developed area.

Only a small portion of State land in The Geysers area has been explored for steam. Over 15,000 acres of potential State geothermal land remain unexplored and could provide substantial royalty income to the State when developed.

The first well on State lands in The Geysers area was completed in May 1969 (at a rate of 200,000 pounds of steam per hour). So far, the only wells drilled on State lands in The Geysers area have been drilled by Union Oil Company. As of October 1, 1973, forty-three (43) wells were drilled on State leases in The Geysers area (14 producing; 18 idle waiting for completion of Power Plant No. 5; four (4) suspended; two (2) shut-in; three (3) water injectors; and two (2) abandoned).

In July 1972, the first steam from State lands was delivered to Unit 7 (of the Generating Plant No. 4), and in October 1972 to Unit 8; at present all fourteen (14) producing State wells supply Plant No. 4 with steam energy. Plant No. 4 is located within State Lease PRC 4596.2, and generates 60-65 MM Kwh of electricity per month, and State royalty amounts to \$16,000 to \$17,000 per month. Plant No. 5 (Units 9 and 10) is currently under construction. Unit 9 went on-stream in October with Unit 10 to go on stream in late November. The addition of this plant will double the State lands electricity generating capacity to 220,000 kw. Plant No. 6 (Unit 11) to be completed in the later part of 1974 will also operate on steam produced from State lands, and will increase the total generating capacity of State land to 330,000 kw.

The royalty is held in suspense, pending a court decision regarding the ownership of steam on lands in which the State has retained one-hundred per cent (100%) mineral reservation but has released the surface to private ownership. A complaint for declaratory relief to quiet title was filed on March 6, 1973, in the Superior Court, San Francisco County (Harry Pariani, et al v. The State of California). The plaintiffs claim that they are the successors in interest

to three patents issued by the State and that these patents conveyed to their successors geothermal rights to the land in question. They contend that they are now the Owners of the geothermal rights and that the State therefore has no interest in the geothermal rights in question. On July 6, 1973, the Attorney General filed a cross complaint. The cross complaint is an action for declaratory judgment that State patents with mineral reservations reserve to the State ownership of geothermal resources, that leases between the State and Union are valid and that the lease between Union and the Surface Owners are invalid. The cross complaint is also an action to quiet title to all geothermal resources in the State.

The State owns the mineral rights in approximately 20,000 acres of school land and approximately 5,500 acres of Fish and Game land in the Salton Sea area. The school land is scattered throughout the southern part of Imperial County in units of 640 acres or less. The Fish and Game land is concentrated along the southeastern shore of the Salton Sea. Only one well has been drilled on State land in the Salton Sea area. The well was tested on May 19, 1964 for 256,000 pounds of brine per hour and 50,000 pounds of steam per hour at 455 psia at 450°F. The State leases have not been developed due to economic and technical problems. A pilot project was conducted in the area to determine if potash and other salts could be extracted from the brine economically, but the results of the project to date have not been encouraging.

Prospecting permits have been issued on State lands within the Wister Waterfowl Management Area, administered by the Department of Fish and Game. Drilling will be conducted directionally from drillsites located outside of the Management area. After several years of inactivity, a revival of interest in the Imperial Valley generally, is indicated by the drilling of twelve new wells in 1972, and six wells in 1973 on lands other than State lands. This increase in activity may result in increased interest in State lands in the Imperial Valley.

Three new permits covering 14,738 acres have been issued within Owens Lake, Inyo County. It is hoped that drilling will confirm geophysical data which indicates the presence of geothermal resources.

The geothermal potential of Surprise Valley, Modoc County, manifested in scores of active hot springs and confirmed last year by a well drilled in the vicinity of Middle Alkali Lake. This discovery will undoubtedly open that area to more extensive exploration.

Many technical problems hindering geothermal exploration and development have been successfully solved. The statutes, rules, and regulations of the State of California have been used as standards by many states in the preparation of their own legislation. Ecological aspects of geothermal exploration and production have been thoroughly investigated, and the environment of the affected areas is protected to the maximum extent by the execution of regulations incorporated in permit and lease forms.

One of the problems in the development of a geothermal resource is the necessity of a long lead time between the discovery of the resource and the generation of electricity. The 45-month average delay from site selection to power production at The Geysers is in addition to an 18-month drilling phase. At least one year of the total elapsed time is due to extended governmental permitting procedures.

Geothermal wells near the Salton Sea in the Imperial Valley produce hot water containing approximately thirty per cent dissolved solids. In addition to a power generation potential, it may also be possible to economically extract minerals from the brine. The brine residue must be injected into a subsurface formation to prevent contamination of the shallow ground water. Production of energy or minerals will be difficult because of the corrosion and scale-forming properties of the brine. Development of geothermal resources in

this area will be accelerated when techniques are developed to cope with the brines.

Although relatively free of adverse environmental qualities, geothermal resources do not necessarily represent an environmental panacea. As an example, all natural geyser areas in the world are potential sites for the commercial development of geothermal energy. Development in these or other areas may be objected to on esthetic grounds. Large scale disposal of brines can cause both thermal and chemical damage. Large land areas are needed for ponding if solar evaporation is used in chemical manufacture. Noncondensable gases produced with the geothermal effluent contain hydrogen sulfide and ammonia. Small quantities of mercury may be produced. Noise levels may be objectionable if not controlled. Steam blown to the air, or dust from drilling activities can cause damage to vegetation. If not controlled, large-scale geothermal fluid withdrawal may exceed the natural recharge rate resulting in reduced reservoir pressure and, possibly, land-surface subsidence.

Geothermal power plants do not produce radioactive waste, or particulate matter to the atmosphere. Development of geothermal resources on Federal lands has been impeded pending adoption of environmental impact statements, and leasing and operating regulations. The regulations when finally adopted will open over one million (1,000,000) acres of Federal lands in California to geothermal exploration and development. The first lease sale is expected in early 1974. The one million (1,000,000) acres, classified as known geothermal resources areas (KGRAS) by the Department of Interior, contains approximately 95,000 acres of State lands within their boundaries. Although the State has had an active geothermal leasing program since 1961, the opening of Federal land to leasing should promote geothermal development and exploration throughout the State and encourage further development of State lands. Attached is a list of State-owned potential geothermal areas.

The Geysers field in Northern California is the only area producing power from geothermal energy in the United States. By the end of November, The Geysers field will surpass Italy's Larderello steam field in capacity, and become the largest geothermal energy producing field in the world. By 1977, an additional 500 megawatts of geothermal power is planned, boosting the geothermal electric power to approximately 850 megawatts. The ultimate capacity of this area has been variously estimated to range from 1,000 to 5,000 megawatts. The higher range of such estimates can only be rated as pure conjecture at this point. Similar estimates of the generating potential for the Imperial Valley range from 3,000 to 30,000 megawatts capacity. The Mono Lake - Long Valley area potential has been estimated at 1,750 megawatts capacity.

Based on such conjecture, some authorities are now forecasting that by 1985, as much as ten per cent (10%) of United States power generating capacity will be geothermal. Since the greatest potential for geothermal energy exists in the western part of the United States, geothermal energy should play an important role in the energy supply of California. By 1985, a conservative estimate, geothermal energy should supply five per cent (5%) of the generating capacity of California.

STATE LANDS DIVISION

Active Geothermal Leases and Permits

GEOHERMAL RESOURCES LEASES

<u>PRC</u>	<u>Lessee</u>	<u>County</u>	<u>Acreage</u>	<u>Lease Date</u>
3143.1	Imperial Thermal Products	Imperial	55	5-28-64
3144.1	Imperial Thermal Products	Imperial	160	5-28-64
3145.1	Imperial Thermal Products	Imperial	160	5-28-64
3146.1	Imperial Thermal Products	Imperial	160	5-28-64
4596.2	Union	Lake & Sonoma	2543.43	5-27-71
4597.2	Union	Lake & Sonoma	1444.87	5-27-71

GEOHERMAL PROSPECTING PERMITS

<u>PRC</u>	<u>Permittee</u>	<u>County</u>	<u>Acreage</u>	<u>Permit Date</u>	<u>Extension to</u>
4336.2	Cordero, Geoth. Elec. Corp.	Mendocino	1480	10-2-69	10-1-74
4337.2	Cordero, Geoth. Elec. Corp.	Mendocino	200	10-2-69	10-1-74
4338.2	Cordero, Geoth. Elec. Corp.	Mendocino	40.04	10-2-69	10-1-74
4339.2	Union	Lake	120	10-2-69	10-1-74
4340.2	Cordero, Geoth. Elec. Corp.	Mendocino	360	11-14-69	11-13-74
4341.2	Cordero, Geoth. Elec. Corp.	Mendocino	440	11-14-69	11-13-74
4342.2	Cordero, Geoth. Elec. Corp.	Lake	120	11-14-69	11-13-74
4343.2	Cordero, Geoth. Elec. Corp.	Lake	40	11-14-69	11-13-74
4344.2	Cordero, Geoth. Elec. Corp.	Sonoma	200	11-14-69	11-13-74
4345.2	Cordero, Geoth. Elec. Corp.	Lake & Mendocino	292.75	11-14-69	11-13-74
4346.2	Cordero, Geoth. Elec. Corp.	Sonoma	200	11-14-69	11-13-74
4347.2	Glebe	Lake	600	11-14-69	11-13-74
4348.2	Seghesio	Mendocino	160	11-14-69	11-13-74
4349.2	Signal	Sonoma	80	11-14-69	11-13-74
4350.2	Forbes, et al.	Lake	760	1-7-70	1-6-75
4351.2	Forbes	Lake	400	1-7-70	1-6-75
4700.1	Atlantic	Imperial	1854	8-31-72	
4701.1	Atlantic	Imperial	2039	8-31-72	
4739.1	American Thermal Resources	Modoc	640	3-29-73	
4740.1	American Thermal Resources	Modoc	160	3-29-73	
4802.1	Getty - Mono Power Co.	Inyo	3332	8-30-73	
4803.1	Getty - Mono Power Co.	Inyo	5646	8-30-73	
4804.1	Getty - Mono Power Co.	Inyo	5760	8-30-73	

STATE LANDS WITHIN POTENTIAL GEOTHERMAL AREAS
(Approximate Acreage)

County	<u>Under Lease</u>	<u>Under Pros- pecting Permit</u>	<u>Under Appli- cation</u>	<u>Vacant Land</u>	<u>State Land</u>	<u>State Minerals Reserved</u>	<u>COUNTY TOTAL</u>
Imperial	535	3,893	3,794	23,982	23,787	8,417	32,204
Inyo	0	14,738	0	68,612	80,350	3,000	83,350 ^a
Lake	712	2,293	7,228	39,933	40,185	9,981	50,166 ^b
Lassen	0	0	1,953	98,310	95,390	4,873	100,263 ^c
Mendocino	0	2,720	690	2,298	3,995	1,713	5,708
Modoc	0	800	32,332	125,204	155,880	2,456	158,336 ^d
Mono	0	0	4,291	56,475	57,886	2,880	60,766 ^e
Napa	0	0	2,559	1,720	400	3,379	4,279
Owens	0	0	0	1,640	1,640	0	1,640
San Bernardino	0	0	1,132	823	995	960	1,955
Sonoma	<u>3,276</u>	<u>480</u>	<u>1,582</u>	<u>1,360</u>	<u>6,658</u>	<u>40</u>	<u>6,698</u>
TOTALS	<u>4,523</u>	<u>24,924</u>	<u>55,561</u>	<u>420,357</u>	<u>467,166</u>	<u>38,199</u>	<u>505,365</u>
					<u>(92.44%)</u>	<u>(7.56%)</u>	

a. Including Owens Lake (71,310 acres)

b. Including Clear Lake (39,607 acres)

c. Including Honey Lake (57,490 acres)

d. Including Upper, Middle and Lower
Alkali Lake, Goose Lake, and
Wright Lake (152,680 acres)

e. Including Mono Lake (51,960 acres)

MARTIN McDONOUGH
 ALFRED E. HOLLAND
 MILTON L. SCHWARTZ
 BRUCE F. ALLEN
 HENRY TEICHERT
 PAUL A. BERG
 V. BARLOW GOFF
 JOSEPH E. COOMES, JR.
 WILLIAM G. HOLLIMAN, JR.
 DAVID J. SPOTTISWOOD
 ELMER R. MALAKOFF
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November 19, 1973

OUR FILE NUMBER
 05366

Mr. Robert Testa
 Consultant, Senate Committee
 on Natural Resources and Wildlife
 Room 2203, State Capitol
 Sacramento, California 95814

Dear Mr. Testa:

When I testified before your Committee on November 15, I was asked about writs of review sought by Northern California Power Agency from the California Supreme Court on orders of the California Public Utilities Commission granting certificates for geothermal power projects to PG&E. The following is a history of these matters.

PG&E filed its application for Units Nos. 7 and 8 on May 11, 1970, Application No. 51892. The Commission issued Decision No. 77918 on that application on November 10, 1970. NCPA's petition for writ of review was granted on March 31, 1971 (S.F. 22795) by the California Supreme Court, and on July 13, 1971, the decision was annulled (5 Cal. 3d 370). Thereafter the matter was remanded to the Commission, which consolidated it with PG&E's then pending application, for Units Nos. 9 and 10, which had been filed November 23, 1970, Application No. 52325. The Commission granted the certificates sought by both applications by Decisions Nos. 79402 and 79403, issued November 23, 1971. NCPA's petition for writ of review of these two decisions was denied by the California Supreme Court on June 7, 1972 (S.F. No. 22879).

PG&E's application for Unit No. 11 was filed on February 4, 1972, Application 53127. The Commission granted a certificate by its Decision 80479 issued September 12, 1972. The Findings of Facts were almost

Mr. Robert Testa

- 2 -

November 19, 1973

identical to the findings in Decisions Nos. 79402 and 79403, and NCPA did not seek a writ of review.

PG&E's application for Unit No. 12, filed about July 19, 1972, Application No. 53465, is still pending; it is not clear whether all the necessary evidence has been received.

PG&E's application for Unit No. 14 filed July 24, 1973, Application No. 54201, is also pending. The application for Unit No. 13 is scheduled to be filed at a later date.

At one point in the questioning Senator Dills indicated that my testimony on appeals taken by NCPA might be in conflict with that of some other witness given at your San Diego hearings. I would appreciate receiving a copy of the witness's testimony on that point.

I am enclosing additional copies of this letter for Senators Nejedly and Dills.

Sincerely yours,

Martin McDonough
Attorney

MMcD:pa

enc.

cc: Legal Committee
Norman P. Ingraham