REPORT BY THE

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Comptroller General

OF THE UNITED STATES

How To Speed Development Of Geothermal Energy On Federal Lands

Eight years after enactment of the Geothermal Steam Act, there is no commercial production of geothermal energy under a Federal lease. Leasing delays are one of several important reasons for this slow pace.

Since Federal lands are critical to the development of geothermal energy, GAO is making several recommendations, including changes in the act. Even without these changes, there are administrative improvements the Departments of the Interior and Agriculture can make.

This report was requested by the Chairman, Senate Committee on Energy and Natural Resources.

EMD-80-13
OCTOBER 26, 1979

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

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The Honorable Henry M. Jackson
Chairman, Committee on Energy
and Natural Resources
The Honorable Mark O. Hatfield
Ranking Minority Member
The Honorable Frank Church
The Honorable Wendell H. Ford
The Honorable James A. McClure
United States Senate

In an April 2, 1979, letter, you expressed concern about the pace of geothermal development in the United States and requested that we investigate the Federal geothermal leasing program. In response to the request, we looked specifically at

--the amount of geothermal lands owned and leased by the Federal Government, and activities on these lands;

--reasons for the relatively slow development of geothermal energy, and whether there is any evidence to suggest that the pace of development is being deliberately slowed;

--whether the Geothermal Steam Act of 1970 contains any provisions which are major impediments to geothermal development, particularly the acreage limitation of 20,480 acres per State, and whether diligence provisions assure development;

--geothermal development on Federal lands in California and whether or not the application of a phased environmental assessment would be advantageous; and

--whether or not a major industry could be established on private and State-owned lands if the Federal Government were not to encourage development on Federal lands.

Detailed information on these and other issues is included in appendix I of this letter.

In summary, although the Geothermal Steam Act was enacted over 8 years ago in 1970, there still is no commercial geothermal production from a Federal lease. Reasons offered for the slow pace of development are many and varied, but certainly delays in Federal leasing have been an important factor. And, since Federal lands are critical to the future of geothermal development, we believe certain actions--indicated below and beginning on page 20 of appendix I--need to be taken. But to place these in proper perspective, it is important to recognize that Federal leasing delays are not the only or even necessarily the primary reasons for the slow pace of geothermal development. As we stated in recent testimony before Senate and House Subcommittees, 1/ the main reasons probably have more to do with ecomomic and technological considerations. As you know, legislation now being considered includes various financial incentives and other initiatives addressing this part of the problem.

Since 1974, after a slow start, a substantial amount of Federal land has been offered and leased for geothermal development. About 815,000 acres, or 37 percent of federally owned "known geothermal resource area" (KGRA) lands, have been so offered and, of this, over 444,000 acres were under lease as of June 1979. Another 2.25 million acres of other potentially valuable geothermal resource lands have also been leased, 1.67 million of which were still under lease as of June 1979. Most of the land leased has been under the jurisdiction of the Bureau of Land Management.

The Forest Service, which also manages a significant portion of Federal lands with high geothermal development potential, has made considerably less progress in leasing its lands, particularly in California. While considerable interest has been shown by industry in leasing such lands

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1/Subcommittee on Energy Resources and Materials Production, Senate Committee on Energy and Natural Resources, and Subcommittee on Mines and Mining, House Committee on Interior and Interior Affairs, July 20, 1979, and Sept. 6, 1979, respectively.

in California, no lease sales have yet been held and no leases have been issued. Unless geothermal leasing is given higher priority within the Forest Service, we believe it could be a matter of concern for future geothermal development.

We found no indication that the pace of geothermal development was being deliberately slowed. As of June 30, 1979, however, close to 2,000 noncompetitive lease applications were awaiting action, about half involving Forest Service lands. We also noted that over 1/2 million acres of land on which leases have been relinquished or terminated are not being made available for re-leasing in a timely manner. We believe the Bureau of Land Management needs to determine the extent of any interest in such lands and make them available for re-leasing.

In addition, certain provisions of the Geothermal Steam Act of 1970--particularly the acreage limitation and the present method of designating KGRAs--may act as impediments to future development. Thus, as we have stated in recent testimony, we favor certain changes that are being considered in current legislation.

Finally, to help expedite geothermal development--particularly since the vast number of leases will never be commercially exploitable--we believe that in certain instances the Government ought to give developers the option of accepting leases based on separate (phased) environmental assessments for exploration and development. Legislation may be needed to clarify this issue.

PENDING LEGISLATION

Several bills introduced by Senator Church, Senator McClure, Representatives Udall and Santini, and Representative Symms (S. 1388, S. 1330, H.R. 5187, and H.R. 4471, respectively), relating to Federal geothermal leasing activities, appear to be patterned after recommendations included in a recent report by the Interagency Geothermal Streamlining Task Force. Our review disclosed many of the same problems and generally led to the same kinds of recommendations. Thus, as indicated in our most recent testimony before the House Interior's Subcommittee on Mines and Mining (see app. IV), we generally support the Task Force recommendations as well as legislation currently being considered. Whether or not legislation is adopted, however, the Secretaries of Agriculture, Energy, and the

Interior should implement those changes that they can make administratively. In addition, the Interagency Geothermal Coordinating Council should monitor the actions taken on these recommendations by the respective Departments and include in its 1980 annual report a summary of the specific steps taken.

AGENCY COMMENTS

We submitted a draft of our analysis to the Departments of Agriculture (Forest Service) and the Interior for their review and oral comment. Neither Department expressed major disagreements or raised other problems. Forest Service officials acknowledged the problem of excessive delays in processing lease applications and presented us with a memorandum (see app. V) being sent to all Regional Foresters which, the Service hopes, will speed up processing. Interior officials provided further views on the re-leasing of lands with relinquished or terminated leases and the application of a phased environmental review process. These comments, along with our evaluation of them, appear in more detail on page 21 of appendix I.

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This report is also being sent to the Honorable Henry M. Jackson, Chairman, Senate Committee on Energy and Natural Resources, and Senators Hatfield, Church, and McClure who along with you formally requested this information. We are sending copies of this report to the Secretaries of Agriculture, the Interior, and Energy; appropriate House and Senate energy committees; and the Director, Office of Management and Budget. Copies will also be made available to other interested parties who request them.

Comptroller General
of the United States

Contents

ABBREVIATIONS

BLM	Bureau of Land Management
C.F.R.	Code of Federal Regulations
IGCC	Interagency Geothermal Coordinating Council
KGRA	Known Geothermal Resource Area
KGS	Known Geologic Structure
USGS	U.S. Geological Survey

LEASING AND DEVELOPMENT OF FEDERAL GEOTHERMAL RESOURCES

FEDERAL LEASING PROGRAM ESTABLISHED BY GEOTHERMAL STEAM ACT OF 1970

The Geothermal Steam Act of 1970 (30 U.S.C. 1001 et seq.) effective December 24, 1970, authorizes the Secretary of the Interior to lease Federal lands for geothermal resources exploration, development, and production. Interior, through its Bureau of Land Management (BLM) and and U.S. Geological Survey (USGS), conducts the Federal leasing program. BLM is responsible for selecting lands for lease and holding lease sales. USGS classifies the lands according to its appraisal of their geothermal value before lease issuance, and supervises development of the lands. Lands which may be leased under the act include

--open public, certain withdrawn, and acquired lands administered by the Secretary of the Interior,

--National Forests and other lands administered by the Forest Service, and

--lands which have passed from Federal ownership, subject to a reservation to the United States of mineral resources.

Lands such as national recreation areas, National Park Service lands, fish hatcheries, wildlife refuges and ranges, and other similarly protected areas are exempt from leasing under the act, as are Indian lands. Leases on Indian lands may be obtained, however, under the separate leasing authority of the Bureau of Indian Affairs.

The amount of land which may be held under geothermal leases by any person, association, or corporation in any one State is limited to 20,480 acres. The Secretary may, in 1985, 15 years after passage of the Geothermal Steam Act, increase the maximum allowable holding in any one State to 51,200 acres.

APPENDIX I

Applicable Federal regulations

Group 3200 of title 43, Code of Federal Regulations (C.F.R.), establishes the leasing procedures for competitive and noncompetitive leases, lands available for leasing, qualifications of lessees, leasing terms, surface management requirements, rentals and royalties, and rules for exploration operations on unleased lands. Part 270, title 30, establishes the jurisdiction and function of the geothermal supervisor, engineering requirements for operators designed to promote safety and to minimize waste and environmental damage, pollution control measures, methodology for computing royalties, reports to be filed by the lessees, and enforcement procedures. Part 271, title 30, establishes the general procedures to be followed and the requirements to be met by lessees who enter into a cooperative or unit plan for collectively developing a geothermal field.

Section 3200.0-5 of 43 C.F.R. defines known geothermal resource areas (KGRAs) as areas "in which the geology, nearby discoveries, competitive interests, or other indicia" indicate that the geothermal resource prospects are good enough to warrant expenditures of money for their extraction. "Competitive interest" occurs when the lands covered by two or more noncompetitive lease applications filed in the same filing period overlap by 50 percent or more. Such land is automatically classified as a KGRA subject to competitive leasing. The KGRA concept is similar to the known geologic structure (KGS) approach in oil and gas leasing, except that designation of a field as a KGS requires a producing well.

The environmental impact review procedures used by the agencies involved (formalized by two memoranda of understanding) call for an environmental review at each step in the geothermal development process on Federal lands, i.e., before a competitive lease sale is held, before noncompetitive leases are issued, and before each postlease plan of operation is approved.

The regulations to implement the program went into effect in January 1974, and the first leases were issued in 1974. The first commercial production of geothermal energy from Federal lands is scheduled to begin in the Imperial Valley in California in the near future.

APPENDIX I

INTERAGENCY GEOTHERMAL STREAMLINING TASK FORCE

The President, in his April 1977 energy message, directed the Departments of the Interior and Agriculture to streamline their procedures for leasing and environmental reviews "to remove unnecessary barriers to development of geothermal resources." In response to this direction, an Interagency Geothermal Streamlining Task Force was formed under the already established Interagency Geothermal Coordinating Council (IGCC). The IGCC (formally the Geothermal Energy Coordination and Management Project) was created by the Geothermal Energy Research, Development, and Demonstration Act of 1974 (30 U.S.C. 1101 et seq.) to coordinate geothermal activities scattered among various Federal agencies.

Since its inception, the Streamlining Task Force has conducted an in-depth study of Federal leasing and permit procedures and has held a series of public meetings to solicit suggestions and comments. Several special studies on development of geothermal resources on Federal lands were also accomplished under contract in support of the Task Force's work. The Task Force report to the IGCC included 19 specific legislative, regulatory, and administrative recommendations expected to improve Federal geothermal leasing procedures. (See app. III.) Sixteen of the 19 recommendations were approved by the IGCC in January 1979, while the remaining 3 were remanded for further study.

GEOTHERMAL LEASING PROGRAM ACTIVITIES

USGS has identified 3.4 million acres as KGRAs and another 106 million as potentially valuable geothermal acreage. USGS records show that 64 percent, or about 2.2 million acres of KGRAs, are on federally owned lands, as shown on the following page.

	Geothermal Acreage		
	KGRA		Potentially valuable geothermal acreage (note a)
	Federal	Non-Federal	
Alaska	88,160	-	11,913,000
Arizona	3,700	-	2,960,000
California	897,698	573,939	15,990,000
Colorado	12,453	8,372	3,322,000
Idaho	131,224	46,794	18,093,000
Montana	40,318	18,337	3,910,000
Nevada	414,728	220,734	14,074,000
New Mexico	191,822	136,030	8,071,000
Oregon	249,552	182,384	15,187,000
Utah	97,716	31,342	5,855,000
Washington	28,978	6,635	6,063,000
South Dakota	-	-	435,000
Wyoming	-	-	906,000
Total	2,156,349	1,224,567	106,779,000
Percent	64	36	

a/Based on USGS estimates and includes Federal, State, and private acreage.

Of the federally owned KGRA lands, 37 percent, or 815,000 acres, has been offered for lease. Of those lands offered for lease, 54 percent, or 444,000 acres, is under lease as of June 1979. Regarding other potentially valuable geothermal lands, about 2-1/4 million acres have been leased. As of June 1, 1979, about 1.67 million of these acres remain under lease, as follows:

	Leases			Current acres leased	
	Issued	Active	Ended	Total acreage	Portion in National Forest
Noncompetitive	1,320	988	332	1,672,562.61	90,017.75
Competitive	296	265	31	444,416.20	43,524.62
Total	1,616	1,253	363	2,116,978.81	133,542.37

Competitive leases

During the past 5-1/2 years (1974 through May 1979), there have been a total of 59 competitive public lease sales held in nine States. These sales have resulted in over $73.6 million in total bonus bids and about $36 million in total winning bonus bids. Acreage in five western States--California, Idaho, Nevada, Arizona, and Oregon--accounted for most of the sales (72 percent), most of the money (83 percent), and most of the competitive acreage (63 percent) leased between 1974 and 1978. The Geysers KGRA (California) alone has accounted for over $24 million in total accepted bonus bids, or more than 68 percent of all bonus bids accepted since the first Federal geothermal lease sale in 1974.

Noncompetitive leases

The leasing program began with a surge of 2,000 noncompetitive lease applications in January 1974. The number of applications filed in later years has been less, and has been more evenly spaced. The Streamlining Task Force used data as of June 1978 to evaluate BLM's performance in handling the lease applications. Their results show that since 1974 the average number of months from application to lease issuance has been reduced from 23 to 8 for those applications that resulted in leases. Since only 2 percent of all Forest Service applications have resulted in leases, the Task Force concluded that there is insufficient data by which to measure any appreciable changes in its performance.

As of June 30, 1979, there were 1,956 noncompetitive lease applications awaiting action for the following reasons:

--Awaiting KGRA report from USGS (34).

--Pre-lease plan of development (1).

--Pending preparation of Environmental Assessment Report (BLM only) (597).

--Awaiting comment of other agencies (1093 from Forest Service and 15 from other agencies).

--Lease forwarded for signature (30).

--Processing (adjudication) (186).

Processing time still a major deterrent to leasing of Forest System lands

While evaluating the President's National Energy Plan, we reported in July 1977 that the time taken to process leases by the Departments of the Interior and Agriculture seemed to be one of the major deterrents to geothermal energy development. 1/ We found in this review that the leasing of Federal lands under the jurisdiction of Agriculture's Forest Service has not improved. Unless geothermal leasing is given higher priority within the Forest Service, we believe it could be a matter of concern for future development.

Based upon USGS designations, the Forest Service estimates that about 900,000 acres of National Forest System lands are within KGRAs. In addition, the geothermal industry has submitted many applications involving several hundred thousand acres outside of KGRAs. As of June 1, 1979, about 43,500 acres of Forest System lands have been leased competitively and about 90,000 acres of other potentially valuable geothermal lands are under lease. According to BLM records, 989 noncompetitive lease applications are currently pending for Forest System lands.

The Chief of the Forest Service recently testified that development of geothermal resources on National Forest lands is "generally compatible" with the Service's overall management program. However, Forest System lands in California

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1/"An Evaluation of the National Energy Plan," EMD-77-48, July 25, 1977.

have generated considerable interest (233 noncompetitive lease applications are pending), but no lease sales have been held and no leases--competitive or noncompetitive--have been issued in California. We noted that the Forest Service Regional Office in California has not been provided the resources to deal with geothermal leasing activity in recent years.

Relinquished or terminated leases not being made available for noncompetitive leasing

We found that lands on which leases have been relinquished or terminated are not being made available for noncompetitive leasing. USGS records as of June 1, 1979, show the following:

	Number	Acres
Noncompetitive leases relinquished or terminated	332	528,158
Competitive leases relinquished or terminated	31	66,037
Total	363	594,195

The re-leasing of noncompetitively leased lands is covered in 43 C.F.R. 3211, but BLM officials have instructed their State offices not to make these lands available for re-leasing. Apparently, BLM headquarters officials believe that making these lands available would lead to the formation of overlapping or competitive-interest KGRAs (i.e., lands covered by two or more noncompetitive lease applications filed in the same filing period which overlap by 50 percent), requiring leasing competitively through a lease sale (a dilemma further discussed beginning on p. 13). We believe that Interior should, at a minimum, determine the extent of any interest in these lands and make them available for re-leasing.

Interior plans to lease withdrawn lands

There have been some disagreements regarding the authority of the Department of the Interior under the Geothermal Steam Act of 1970 to issue leases for certain withdrawn and

acquired lands, particularly lands withdrawn for the Department of Defense. BLM initiated an environmental assessment of 72,460 acres in and around the Coso KGRA in August 1978. Some 41,560 acres of the Coso Study Area are located within the boundaries of the China Lake Naval Weapons Center, California, and 2,920 acres are Navy-acquired lands. The assessment is scheduled to be completed next year and will cost over $700,000. Until recently, BLM officials believed that the Geothermal Steam Act of 1970 did not authorize the leasing of geothermal resources in lands withdrawn for or acquired by the Department of Defense, and they instructed the California BLM office to reject promptly any application for development of resources on such lands. The Solicitor in the Department of the Interior has been looking into this problem, and we understand that BLM now plans to lease these lands on a priority basis.

REASONS CITED FOR THE RELATIVELY SLOW PACE OF GEOTHERMAL ENERGY DEVELOPMENT

Responses from Government and industry were mixed in explaining the relatively slow development of geothermal energy. Several developers told us that resource uncertainty was a primary factor, and they felt that geothermal exploration has not borne fruit to become a major future industry. Unless more promising sites are discovered for future development, the industry will not grow beyond its current size and may lose the large capital investment some major developers currently have in geothermal energy. In fact, lack of sufficient capital for development was mentioned by three large developers as a factor for the slow rate of geothermal development to date.

Other reasons given were that (1) Federal agencies have assigned low priority to processing geothermal leases, (2) these agencies lack sufficient staff and money to process leases, (3) there are too many review levels within and among these agencies, (4) there is too much concern with environmental matters, especially in California, and (5) Federal agencies took too long to implement the act.

The Forest Service was singled out by industry as the biggest offender. It was said to be lacking interest in and knowledge of geothermal resources, and interested only in surface resources. Several developers said that Forest Service personnel have not been sufficiently trained in geothermal resources.

On the other hand, several developers also said BLM, and particularly USGS, have been very professional in carrying out their responsibilities. One developer said that USGS personnel on several occasions worked overtime and through weekends to complete lease requirements. Providing Federal agencies with more staff and money and easing the environmental process was suggested by several developers as the most appropriate solution for the leasing delays. Also, delays in the environmental review process could be reduced by requiring concurrent reviews by Federal agencies rather than the current practices of sequential agency review.

More uniformity in leasing practices among BLM offices was also suggested as a remedy to the leasing backlog. According to several developers, the activities of BLM offices are too heavily influenced by the personalities of the office directors. The case cited was the California BLM State Director, who was very sensitive to environmental interests, which resulted in an overly cautious approach toward geothermal development by the California BLM office. The result has been an elongated leasing approval process in California.

USGS officials believe that--considering the time necessary to develop a new industry--geothermal development appears to be proceeding at a reasonable rate (it has only been 5 years since the issuance of the first Federal lease. However, they indicate the following factors have prevented more rapid development:

--Lack of "off the shelf" technology has inhibited large-scale development and, to a certain extent, each project is an research and development project.

--Lack of trained people in the industry has caused both Government and industry staffing shortages.

--There are overlapping and sometimes conflicting requirements of county, State, and Federal regulatory agencies.

USGS also noted that extremists from both the pro-environment and the pro-energy development groups have opposed each other, using the checks and balances built into the laws affecting geothermal development to the point of stifling those voices of moderation which seek an equitable compromise between environmental and pro-energy concerns.

In addition, other delays are inadvertent products of the manner in which national goals, such as wilderness preservation, are being pursued.

Other reasons, given by both industry and Government officials, for the relatively slow pace of geothermal development were

--the price controls on oil and gas, making those resources more economical than geothermal resources;

--the lack of desire (emphasis) at the local level to issue leases and too much discretion in lower level Federal offices;

--extremely low priority given to geothermal activities at the field level;

--fear of legal action by environmental groups, especially in California;

--the lack of technological advancements allowing favorable economics for development;

--finding a market so the developers can count on a demand for their product;

--the need for direct Federal assistance to the first-generation utilities in the field--specifically, financing to prove out demonstration projects and to install transmission lines;

--the lack of time limitations on issuing leases or permits; and

--the lack of reliable information on the extent and locations of resources.

At no time in our discussions or in our review of available records did we find indications that the pace of geothermal development is being deliberately slowed. One industry spokesman summed up the major problems quite well,

we believe, during a recent hearing before the Senate Energy Committee when he stated: 1/

> "The key issues are that the first time around on everything, it takes a lot longer. There is no policy that exists. Policy is being made as the various steps are taken, and that is one of the obstacles; in addition, we find that when the Congress has an intent to provide the financial incentive, such as the alternative energy tax credit, then the implementation of the regulations * * * is delayed by a year or more. This has happened sequentially in every one of the steps that has taken place in the past. Also, we are finding flaws in the legislation itself so that there is the need for cleanup. I think as this is done, we will find these projects going, and I think we will see that with adequate funding for the various environmental and institutional steps that have to be taken, we will see future projects come along at a better pace."

SOME PROVISIONS OF THE GEOTHERMAL STEAM ACT OF 1970 SEEN AS IMPEDIMENTS

The acreage limitation, KGRA designation, and readjustment of lease terms are cited most often as impediments to development built into the Geothermal Steam Act itself.

Acreage limitation

Our work at three BLM State offices as well as discussions with Government and industry officials indicated that the acreage limitation of 20,480 acres per State, as established by the Geothermal Steam Act of 1970, is being enforced and does delay development of geothermal resources.

Our analysis showed that the primary impediment resulting from the acreage limitation is that it prevents developers from developing more than one project at a time. Some of of the major developers wish to invest in multiple projects; however, they claim that the current acreage limitation prevents this.

1/Comment by Dr. Robert Rex, President of Republic Geothermal, Inc., July 20, 1979, before Subcommittee on Energy Resources and Materials Production, Senate Energy and Natural Resources Committee.

Other reasons cited for increasing the limitation include:

--There are only a handful of companies in the United States financially and technically capable of exploring and developing such acreage for the production of geothermal energy, and limiting these companies to 20,480 acres of Federal geothermal lands--less than one-twelfth of the 246,080 acres allowed for oil and gas leasing--makes no sense.

--Technology for discovering and defining geothermal resources has not been developed to nearly the degree of sophistication now found in oil and gas exploration; consequently, each project to explore for geothermal resources in a given area should consist of 15,000 to 20,000 acres. And since many companies wish to invest in multiple projects they require more than 20,480 acres per State.

--Although as little as 1,000 acres of prime geothermal acreage, after reservoir characteristics and size are established, may technically be sufficient to supply one 50-megawatt powerplant, utilities considering a commitment to purchase geothermal resources can be expected to require up to 10 or more times that acreage in order to assure the availability of sufficient reserves to make the commitment to construct transmission capacity economical.

The Department of the Interior believes the present acreage limitation may be low and supports an increase to 51,200 acres, as proposed in H.R. 740. This of course differs from the proposal in S. 1388 and H.R. 5187 for a combined oil, gas, and geothermal lease acreage per State of 266,560 acres, and 248,000 acres in S. 1330 and H.R. 4471. The Department of Energy also does not consider it desirable to couple geothermal acreage limits with oil and gas limits; however, it does recommend an increase to 51,200 acres, but without any overall limit on developed plus undeveloped acreage. Although the proposed limit in S. 1388 and H.R. 5187 might restrain large oil companies from monopolizing geothermal areas, Interior believes it could provide the

opportunity for other parties to totally dominate geothermal leasing and development. The Department of Energy has testified that there is a reasonable mix of oil and non-oil companies leasing geothermal resources at present, and that smaller acreage limits for oil companies would deter some of the more active developers in an industry already growing at too slow a pace.

We believe that while the present limitation of 20,480 acres per State might be unduly restrictive and an increase is needed, the provisions allowing the leasing of over 200,000 acres per State may be excessive for non-oil companies concentrating on geothermal development, while also inhibiting oil companies from further increasing their geothermal development if they have to do it at the expense of oil and gas development. Thus, we believe a combined total limitation for oil, gas, and geothermal development could hinder some of the exploration and development of geothermal resources. Due to the infancy of the geothermal industry and its technology, we believe that increasing the limitation to an overall 51,200 acres, as introduced in H.R. 740, would be appropriate.

KGRA designation

The KGRA designation criterion was also prominently mentioned as a major impediment to geothermal development.

The Geothermal Steam Act defines a KGRA as:

> "An area in which the geology, nearby discoveries, competitive interests, or other indicia would, in the opinion of the Secretary (of the Interior), engender a belief in men who are experienced in the subject matter that the prospects for extraction of geothermal steam or associated geothermal resources are good enough to warrant expenditures of money for that purpose."

Forty-seven of the 108 existing KGRAs were designated as such entirely on the basis of "competitive interest." This term, as defined in the regulations, actually means "competitive overlap" (i.e., the entire acreage covered by a noncompetitive lease application is designated a KGRA if at least one-half of the lands are also covered by another application filed during the same calendar month). This approach was derived on the premise that if more than one party expressed interest in an area, the area must be put up for competitive bid.

Several industry spokesmen voiced the opinion that many times KGRAs are arbitrarily established under questionable circumstances by USGS. In one notable case, a company inadvertently created a KGRA through erroneously filing twice on some of the same land in a calendar month. Inappropriate KGRA designations are also very costly for the Federal Government since Federal agencies are required to complete all the steps necessary for leasing, including environmental assessments, even though developers are not interested in competitively bidding for these lands. Oftentimes these lands go through several lease offerings without any bids being submitted--305,000 acres in past lease sales have received no bids.

Several developers also object to the overlapping lease application criteria for KGRA designations. They said that this is not sufficient justification for KGRA classification. Generally, applicants know very little concerning the actual geothermal potential of these lands when they file their applications. When two developers with limited knowledge apply for the same area, or areas which overlap by at least 50 percent, such lands suddenly become KGRAs and, therefore, are available only through competitive bidding.

Several developers also said that the period in which USGS can classify lands as KGRAs after a noncompetitive lease application is submitted is too long and prevents developers from moving ahead with more extensive exploration efforts. According to these developers, the risk of having their noncompetitive applications rejected through KGRA classification during the lease approval process is too great for them to spend their money exploring these lands. They said they could lose their total investment should something trigger USGS to designate the area as a KGRA. This jeopardy has been, and continues to be, a major constraint to early-on geothermal exploration of Federal lands. We believe, as stated in recent testimony, future KGRA designations should be limited to an area in which a well has been drilled and demonstrated to be capable of producing geothermal resources suitiable for the production of electric power in commercial quantities.

Many companies favor readjustment of lease terms

We were told that the provision in the Steam Act--subsection 8(a)--which allows the Secretary of the Interior to unilaterally readjust the terms of a lease after 10 years, has

led to caution and restraint by many companies (primarily utilities) who are reluctant to invest in the construction of a powerplant under such conditions. They favor, instead, a readjustment of these terms 30 years from the time construction of a plant is finished to allow for amortization of costs.

The Interagency Geothermal Coordinating Council has recommended eliminating the subsection 8(a) provision on the basis that it is both an impediment to geothermal development and redundant to other provisions in the Steam Act. It is noted that subsection 8(b) of the act already authorizes the Secretary to adjust rentals and royalties on geothermal leases every 20 years after production begins. In addition, section 24 of the act gives the Secretary blanket authority to establish rules and regulations to protect the public interest, conserve natural resources, and protect water and other environmental qualities.

Present diligence provisions not a serious impediment

The geothermal leasing regulations provide the following incentives to lessees for early exploration and development during the initial 5 years of a lease.

--Rental fees on the leased acreage will be increased after the fifth year if there is no production.

--Rental fees will be eliminated once production begins.

--Certain expenditures for diligent exploration in the first 5 years may be credited against rental fees after the fifth year.

For succeeding years, however, the regulations provide a formula for computing the minimum expenditures necessary to qualify as a diligent exploration. The following table summarizes the minimum rents and expenditures necessary to maintain a lease for 2,560 acres, 1/ if no commercial production takes place during the 10-year lease.

1/The law provides that a geothermal lease shall embrace a reasonably compact area of not more than 2,560 acres.

Year of the primary lease	Annual and escalating rent (note a)	Minimum expenditures for diligent exploration (note a)	Total
1 to 5	$12,800	$ -	$ 12,800
6	5,120	10,240	15,360
7	7,680	15,360	23,040
8	10,240	20,480	30,720
9	12,800	25,600	38,400
10	15,360	30,720	46,080
Total	$64,000	$102,400	$166,400

a/No minimum has been established for diligent exploration during the first 5 years. After the fifth year, the minimum expenditure is twice the sum of the annual rental and the escalating rental due.

Interior officials feel that it is difficult to say whether the diligence provisions are adequate because few of the leases have reached the escalation point (after the fifth year the minimum expenditure is twice the rent). Another Interior official said that the provisions were neither a hindrance nor a stimulant and even if the rental is stiffened it would have little effect because exploration costs are so high. Several developers told us that diligence requirements were relatively unimportant in terms of other problems they must face.

The Department of Energy currently supports the diligence provisions proposed in S. 1388 and H.R. 5187. These provisions (1) require that a plan of operation for exploration be filed within 3 years of the issuance of a lease, or in the case of a no-surface-occupancy lease, within 3 years after the removal of the no-surface-occupancy limitation, and (2) provide that drilling commence no later than 2 years after approval of such plan.

While we support strict diligence provisions for the development of Federal resources, it is not clear that such diligence will potentially affect the speed of geothermal

resource development. The rationale is that geothermal development is primarily constrained by economic and technological considerations. Nevertheless, we believe the diligence provisions in pending legislation are reasonable and will assist geothermal development in the future.

SLOW GEOTHERMAL DEVELOPMENT IN CALIFORNIA--WOULD PHASED ENVIRONMENTAL ASSESSMENT HELP?

USGS feels three factors contribute to the relatively slow rate of development in California. First, the most resources in California occur in areas of exceptional aesthetic, biological, and recreational value (Lassen and Mono-Long Valley), or in regions where minor subsidence could result in potentially severe economic problems (Imperial Valley). Second, California has developed exceptionally elaborate environmental review procedures at both the State and county levels. Third, a portion of the resource is in National Forests which have competing land uses.

Developers generally feel that leasing in California has been more difficult because of environmentally sensitive lands. Also, BLM's California office has taken more of a pro-environmental stance than other State offices because of strong environmental pressure from public officials. Developers also believe that both BLM and the Forest Service have given geothermal leasing a low priority because they lack sufficient funds and staff to increase their efforts.

In order to reduce the delays in lease issuance on all Federal lands, especially in California, phased environmental assessments have been recommended by several study groups and Government agencies. The Secretary of Agriculture has recommended a similar approach through the use of a "conditioned development lease" which would allow a lessee to receive a lease and engage in casual (essentially non-surface-disturbing) use and controlled exploration but would condition development of any discovery, including actual operations, on a second decision to proceed. The Secretary believes this procedure would expedite leasing of geothermal resources on lands administered by the Forest Service and still fulfill the environmental protection mandate of various statutes.

The Streamlining Task Force has recommended a similar approach, i.e., to provide, as an alternative to developers, leases based upon separate environmental assessments of the exploration and development phases. The Task Force recommendation is intended as an elective option and would allow developers to also obtain leases under the current system. According to the Task Force report, the present leasing process involves the issuance of leases that grant rights to development of any discovered resource subject to terms, conditions, and special stipulations. It has been estimated that 24 out of 25 geothermal leases will never be developed because no commercially exploitable resource will be found. But current practice is to conduct a pre-lease environmental review which evaluates the potential effects of full development from exploration through production.

Interior's Associate Solicitor (Energy and Resources) concluded in June 1979 that the Secretary may issue geothermal leases which withhold subsequent development rights until further approval is given. The Solicitor further concluded that detailed environmental impact consideration can be deferred until a time when concrete information about the nature and extent of activities is available. In addition, the Director of BLM recently testified that the Department supports the concept of phased leasing, and that authority exits under the Geothermal Steam Act. Legislation may be necessary to clarify this issue.

The phased review process does offer further risk to a developer in an already high-risk business. If a developer accepts a conditional lease and finds that he has a commercial resource, he could (1) be denied the opportunity to develop because of environmental sensitivity of the land or 2) have such severe restrictions imposed that development in the areas is no longer economical. To help expedite geothermal development, however--particularly since the vast portion of leases will never be commercially exploitable--we believe that in certain instances the Government ought to give developers the option of accepting leases based on separate environmental assessment of the exploration and development phases. However, where such an option is exercised, it should be incumbent upon the Government agencies involved to provide the most comprehensive assessment possible in the initial stages in order to minimize uncertainties for the lessees. After decades of land management experience, 10 years of environment assessment experience, and at least 5 years of geothermal leasing experience, last minute changes should occur infrequently, if at all.

GEOTHERMAL DEVELOPMENT WITHOUT FEDERAL GOVERNMENT INVOLVEMENT NOT ADVISABLE

The consensus of both Federal and industry officials is that private and State-owned lands alone do not have sufficient geothermal resources to support a viable industry (recognizing the development that has taken place in the Geysers). We were also told that most of the land with potential geothermal resources is owned by a mixture of State and Federal governments and private parties; therefore, it would not be economically feasible to develop only the private and State-owned lands.

According to USGS, the likelihood of developing a major geothermal industry on private and State-owned lands without encouraging development on Federal lands is remote. Many areas of geothermal potential contain private and Federal lands as a result of early homesteading laws. Since all types of land can occur in an area of geothermal potential, the Office of the Area Geothermal Supervisor (Menlo Park) feels the Federal lands must be inter-locked with private and State lands to realize our Nation's total geothermal potential.

CONCLUSIONS AND RECOMMENDATIONS

Although over 8 years have passed since the Geothermal Steam Act was enacted, there still has been no commercial geothermal production from a Federal lease--this despite the fact that the Geological Survey estimates that the Federal Government owns close to two-thirds of this Nation's total geothermal resources. Reasons offered for the slow pace of development are many and varied, but certainly delays in Federal leasing have been an important factor. And, since Federal lands are critical to the future of geothermal development, we believe certain actions--indicated below--need to be taken. However, it is important to remember that Federal leasing delays are not the only or even necessarily the primary reasons for the slow pace of geothermal development. As we stated in recent testimony before Senate and House Subcommittees, 1/ the main reasons probably have more to do with economic and technological considerations. Legislation now being considered includes various financial incentives and other initiatives addressing this part of the problem.

1/See footnote, page 2 of letter preceding this appendix.

Since 1974, after a slow start, a substantial amount of Federal land has been offered and leased for geothermal development. About 815,000 acres, or 37 percent of federally owned KGRA lands, have been so offered and, of this, over 444,000 acres were under lease as of June 1979. Another 2.25 million acres of non-KGRA lands have also been leased, 1.67 million of which were still under lease as of June 1979. Most of the land leased has been under the jurisdiction of BLM.

The Forest Service--which also manages a significant portion of Federal lands with high geothermal development potential--has made considerably less progress, however, in leasing its lands, particularly in California. While considerable interest has been shown by industry in leasing such lands in California, no lease sales have yet been held and no leases have been issued. Unless geothermal leasing is given higher priority within the Forest Service, we believe it could be a matter of concern for future development.

We found no indication that the pace of geothermal development is being deliberately slowed. As of June 30, 1979, however, close to 2,000 noncompetitive lease applications were awaiting action, about half involving Forest Service lands. Quicker action is needed on these applications. We also noted that over 1/2 million acres of land on which leases have been relinquished or terminated are not being made available for re-leasing in a timely manner. We believe BLM needs to determine the extent of any interest in such lands and make them available for re-leasing.

We recommend that the Secretary of Agriculture assure that geothermal leasing is given appropriate priority within the Forest Service. We also recommend that both the Forest Service and BLM process lease applications in a more timely manner and that BLM make available for re-leasing lands on which leases have been relinquished or terminated.

In addition, we believe certain provisions of the Geothermal Steam Act of 1970--particularly the acreage limitation and the present method of designating KGRAs--may act as impediments to future development. Thus--as we have stated in recent testimony--we favor:

--Increasing the acreage limitation per State for any person, association, or corporation from 20,480 to 51,200 acres--as introduced in H.R. 740.

--Limiting future KGRA designations to an area in which a well has been drilled and demonstrated to be capable of producing geothermal resources suitable for the production of electric power in commercial quantities.

Finally, to help expedite geothermal development--particularly since the vast portion of leases will never be commercially exploitable--we believe that in certain instances the Government ought to give developers the option of accepting leases based on separate environmental assessments of the exploration and development phases. Legislation may be necessary to clarify this issue.

Several bills introduced by Senator Church, Senator McClure, Representatives Udall and Santini, and Representative Symms (S. 1388, S. 1330, H.R. 5187, and H.R. 4471, respectively) relating to Federal geothermal leasing activities appear to be patterned after recommendations included in a recent report by the Interagency Geothermal Streamlining Task Force. As indicated, our review disclosed many of the same problems and generally led to the same kinds of recommendations as included in the Task Force report. Thus, as indicated in our most recent testimony before the House Interior Subcommittee on Mines and Mining (see app. IV), we generally support the Task Force recommendations as well as legislation currently being considered. Whether or not legislation is adopted, however, we recommend that the Secretaries of Agriculture, Energy, and the Interior implement those changes they can make administratively. In addition, the Interagency Geothermal Coordinating Council should monitor the actions taken on these recommendations by the respective Departments and include in its 1980 annual report a summary of the specific steps taken.

AGENCY COMMENTS AND OUR EVALUATION

We submitted a draft of our analysis to the Department of Agriculture (Forest Service) and the Department of the Interior for their review and oral comment. Neither Department expressed major disagreements or raised other problems.

Forest Service officials acknowledged the problem of excessive delays in processing lease applications and presented us with a memorandum dated October 11, 1979 (see app. V) sent to all Regional Foresters, expressing concern about

this problem and proposing specific time limits for environmental reviews and other leasing decisions. We believe this is a step in the right direction and, in this connection, have suggested in recent testimony that time limits such as are being considered in current bills may increasingly be needed as part of the energy regulatory reform process.

With regard to the re-leasing of lands on which leases had been relinquished or terminated, an Interior official stated that the BLM State offices were instructed not to make these lands available for re-leasing in order to allow BLM headquarters a chance to promulgate new regulations which would provide for a more efficient, effective procedure for re-leasing these lands. He stated these new rules have been finalized and will soon appear in the Federal Register. He felt that expeditious processing of those lease applications which have been pending as a result of this problem could result if legislation calling for a 60-day deadline, from the day the new regulations are issued, was established. We agree that this recommendation should be given serious consideration.

Another Interior official felt that the phased environmental review should not be an option of the lessee. Rather, Government should retain the option of deciding on whether or not to do an Environmental Impact Statement or an Environmental Assessment Review. He suggested that in areas of great resource uncertainty the lessee should not be allowed to dictate the environmental review procedure to be used. We agree that the Government should determine when the option should be offered.

APPENDIX II

United States Senate

COMMITTEE ON
ENERGY AND NATURAL RESOURCES
WASHINGTON, D.C. 20510

April 2, 1979

The Honorable Elmer B. Staats
Comptroller General of the United States
General Accounting Office
Washington, D. C. 20548

Dear Mr. Staats:

Several members of the Committee on Energy and Natural Resources have expressed concern about the pace of geothermal energy development in the United States.

It is my understanding that the Interagency Geothermal Coordinating Council, established by the Geothermal Energy Research, Development, and Demonstration Act of 1974, has been examining the question of impediments to geothermal development through a specific panel created for that purpose.

Some of the impediments identified by the panel involve performance of the Federal agencies which manage the geothermal leasing program. It has also been argued that the Geothermal Steam Act of 1970 contains impediments to development.

While it is possible that the Federal leasing law or the manner in which it is being carried out are the principal impediments to development, it is also disturbing that those corporations which have obtained access to Federal lands are not moving faster to develop them. Whether this is due to the perceived impediments or other factors is unclear.

I request that you initiate an immediate investigation of the Federal geothermal leasing program which will answer the following questions:

1. Does the Geothermal Steam Act of 1970 contain any provision which is a major impediment to geothermal development?

2. Is the manner in which this Act is being carried out impeding geothermal development?

3. Are the diligence provisions of the Geothermal Steam Act of 1970 adequate to assure development of leases within a reasonable period of time?

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4a. Does the acreage limitation of 20,480 acres per state per corporation require change to stimulate geothermal development? For example, should the provision of the 1970 Act which would allow an increase to 51,200 acres after 15 years be accelerated?

4b. Is this acreage limitation being enforced? Is it being abused such that it requires tightening?

5. Approximately what portion of the geothermal resource is owned by the Federal government? How much has been leased and what type of activity has been performed on these lands?

6. If the Federal government were not to encourage development on Federal lands, are there any reasons why a major industry could not be established on private and state-owned lands?

7a. Is there any evidence to suggest that the pace of geothermal development on public (or other) land is being deliberately slowed?

7b. What are the reasons for the relatively slow development of geothermal energy?

8. Federally-administered lands in California offer perhaps the best prospects in the country for geothermal development, yet California has had the least amount of Federal leasing. Apparently, little progress has been toward environmental assessment of the hundreds of pending lease applications. Given that as many as 9 out of 10 Federal geothermal leases do not lead to development, phased environmental assessment has been recommended in some quarters to lessen the backlog of applications and reduce the unnecessary delay in lease issuance. Phased environmental assessment would amount to a minimal analysis at lease issuance with full on-site assessment prepared if and when the lessee submits an application for a drilling permit.

What are the problems associated with geothermal development on Federal lands in California and would the application of phased environmental assessment be advantageous?

Henry M. Jackson
Chairman

Mark O. Hatfield
Ranking Minority Member

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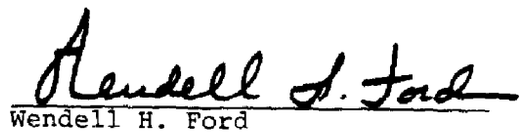
Frank Church

James A. McClure



Wendell H. Ford

APPENDIX III

INTERAGENCY GEOTHERMAL STREAMLINING

TASK FORCE RECOMMENDATIONS

1) Establish a Permanent Task Group to Review and Make Recommendations to Review DOI/DOA/DOE Geothermal Regulations and Special Lease Stipulation Policy

2) Compile a Comprehensive Handbook of Regulations With Flow Diagrams

3) Initiate a Training and Education Program for Federal Field Managers with Management Responsibilities in the Geothermal Program

4) Establish Coordinators, Modify Agreements, and Improve Coordination Among and Within Federal, State, and Local Government Agencies

5) Increase Program Priority for and Management Committment to Geothermal Development

6) Require a Response Within 30 Days for Non-Competitive Lease Applications and Indicate Anticipated Actions and Time Requirements

7) Require a 30-Day Time Limitation on Post-Lease Response to Permit Applications and Allow Lease Extension and Rental Suspension Commensurate With Agency Delay

8) Revise Geothermal Lease Form

9) Modify BLM Nationwide-Statewide Geothermal Resource Exploration Bond Form So as To Be Acceptable to All Surface Management Agencies

10) Modify Proposed Power Plant Siting Regulations to Clarify Readjustment Rentals

11) Review and Revise KGRA Designation Criteria

12) Subject to Normal Adjudication, Issue a Non-Competitive Lease Unless the Area is in a KGRA at the Time of Application

13) Provide, as an Alternative, Leases Based Upon Separate Environmental Assessment of Exploration and Development Phases

14) Use Generalized, Areawide Environmental Assessments Through the Land Management Planning Process in Pre-Lease Review and Detailed Site Specific Studies Only for Post-Lease Actions

15) Expedite the Wilderness/Roadless Review Process and Prioritize Study Areas Where Geothermal Potential is High

16) Provide Preferential Treatment for Local Government Entities, Non-Profit Organizations and Individuals to Use Geothermal Resources for Direct Thermal (Non-Electric) Applications

17) Encourage DOE to Tier Environmental Assessments Concerned with the Loan Guaranty Program

18) Enable Federal Government Agencies to Develop and Use Geothermal Resources Contained on Their Own Lands for Their Own Purposes

19) Urge Prompt Implementation of the Foregoing Recommendations and Provision for the Needed Capability to Do So

Note: Sixteen of these recommendations have been approved by the Interagency Geothermal Coordinating Council. Recommendations 7, 12, and 16 have been remanded for further study.

APPENDIX IV

FOR RELEASE ON DELIVERY
Expected At 9:45 a.m.
Thursday, September 6, 1979

United States General Accounting Office
Washington, D.C. 20548

Statement of
Douglas L. McCullough
Deputy Director, Energy and Minerals Division

Before the Subcommittee on Mines and Mining
House Committee on Interior
and Insular Affairs
on
Omnibus Geothermal Legislation

Mr. Chairman and Members of the Subcommittee:

I appreciate the opportunity to be here this morning to discuss the proposed omnibus legislation as well as our work on the Federal Geothermal program. First, I would like to cover our most recent effort involving geothermal leasing activities. I also have a few comments about the omnibus legislation proposed by Chairmen Udall and Santini as well as H.R. 4471, the bill introduced by Congressman Symms.

FEDERAL GEOTHERMAL LEASING ACTIVITY

At the request of the Chairman of the Senate Energy Committee, we looked at the manner in which Federal lands are leased for geothermal development. Our work was aimed at the Geothermal Steam Act of 1970; the methods used to carry it out; and whether its implementation has impeded development on Federal lands. We have concluded that leasing and permitting delays are not in themselves the only or even the primary

reasons for the slow pace of geothermal development. On the whole, economic and technical constraints are considered to be the major impediments to geothermal development. There are exceptions which I will address in my testimony, and we certainly believe that leasing improvements are needed. The regulations to implement the Federal program went into effect in January 1974, and the first leases were issued in 1974. According to the Department of Energy, the first commercial production of geothermal energy from Federal lands is scheduled to begin in the Imperial Valley in California in the near future.

Although it started out slow, in terms of the end result, the pace of geothermal leasing has resulted in considerable areas being offered and leased. For example, over one-half of all Federal "known geothermal resource area" (KGRA) lands (about 1.2 million acres) have been offered for lease, and over one-third of these lands have been leased (about 440,000 acres/265 leases). In addition, about two and one-quarter million acres of non-KGRA lands have been leased. As of June 1979, about 1,670,000 acres remain under lease (988 active leases).

Leasing rates of Federal lands under Forest Service jurisdiction, however, could become a matter of concern for future geothermal development (900,000 acres of Forest Lands

are in KGRA's; yet only 43,500 acres have been leased). We believe the Secretary of Agriculture needs to set a higher priority for leasing of promising Forest Service geothermal lands.

In addition, other lands on which leases have expired or have been relinquished are not being made available for non-competitive leases (over 1/2 million acres). This appears to be a management decision problem within the Interior Department.

INTERAGENCY STREAMLINING TASK FORCE REPORT

The President, in his April 1977 energy message, directed the Departments of Interior and Agriculture to streamline their procedures for leasing and environmental reviews of geothermal resources. In response to this direction, an Interagency Streamlining Task Force was formed and, since its inception, has conducted a study of issues and problems suggested by Task Force members, industry representatives, and Government agencies. It has also held a series of public meetings to solicit suggestions and comments. The Task Force released its report in January 1979, which includes a comprehensive set of legislative, regulatory, and administrative remedies expected to improve Federal geothermal leasing procedures.

The Interagency Geothermal Coordinating Council approved sixteen of the nineteen Task Force recommendations in January 1979. Both the Interagency Streamlining Task Force Report and

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the bills being introduced by Chairmen Udall/Santini and Congressman Symms propose recommendations and revisions to the Geothermal Steam Act of 1970 to remove unnecessary barriers to the development of geothermal resources. Although we have not fully reviewed these bills it seems that they incorporate, for the most part, the Task Force recommendations. Further, our analysis uncovered many of the same problems and suggested solutions as found in the Task Force Report. Therefore, we believe that the Task Force recommendations have merit and should be given close consideration.

PROPOSED OMNIBUS GEOTHERMAL LEGISLATION

The most significant changes to be found in both H.R. 4471 and Chairmen Udall's/Santini's bill appear to be the provisions for increasing the Federal acreage limits, setting time limits for leasing and permitting decisions, and authorizing phased leasing procedures.

Acreage limitation

Interior believes the present lessee acreage limitation of 20,480 acres per state may be low and supports an increase to 51,200 acres as proposed in H.R. 740. This of course differs from the proposal in Chairmen Udall's/Santini's bill of a combined oil, gas, and geothermal lease acreage per state of 266,560 acres and 248,000 acres in Congressman Symms' bill. DOE also does not consider it desirable to couple geothermal acreage limits with oil and gas limits; however, they do recommend an increase to 51,200 acres, but without any overall

(i.e. total) limit on developed plus undeveloped acreage. Although the proposed limit in Chairmen Udall's/Santini's bill might restrain large oil companies from monopolizing geothermal areas, Interior believes it could provide the opportunity for other parties to totally dominate geothermal leasing and development. DOE has testified that there is a reasonable mix of oil and non-oil companies leasing geothermal resources at present, and smaller acreage limits for oil companies would deter some of the more active developers in an industry already growing at too slow a pace.

We believe that while the present limitation of 20,480 acres per state might be unduly restrictive and an increase is needed, the provisions allowing the leasing of over 200,000 acres per state--as presently worded in both Chairmen Udall's/ Santini's and Congressman Symms' bills--may be excessive for non-oil companies concentrating on geothermal development, while also inhibiting oil companies from further increasing their geothermal development if they have to do it at the expense of oil and gas development. Thus, we believe a combined total limitation for oil, gas, and geothermal development could hinder some of the exploration and development of geothermal resources. Due to the infancy of the geothermal industry and its technology, we believe that increasing the limitation to an overall 51,200 acres, as introduced in H.R. 740, would be appropriate.

Time limits for issuing leases and permits

Interior, Energy, and Agriculture have all suggested that the provisions for time limits on processing leases and permits should be established as goals or targets rather than fixed requirements, and that such goals should provide for decisions and not specifically lease or permit issuance. Interior suggested that environmental reviews could be terminated prematurely because of meeting an inflexible deadline. Agriculture argues that responsible agencies must have discretion to schedule actions and decisions according to local conditions and changing national goals.

Under normal circumstances, we would probably concur with Interior's and Agriculture's reasoning. However, these are not normal circumstances, and Interior and Agriculture need to recognize it.

The Secretary of Treasury early this year, for the second time since 1975, under the authority of Section 232 of the Trade Expansion Act, found that the nation was importing oil in such quantities and under such circumstances so as to threaten to impair the national security. The Congress, in the DOE Organization Act of 1977, found that the increasing dependence on foreign energy supplies presents a serious threat to the national security of the United States and called for an energy program to meet our future needs to eliminate that threat.

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We do not believe, of course, that the geothermal resource of and by itself will eliminate our over dependence on imported oil, however, it is clear that Interior and Agriculture should consider the national security issue when they schedule their funds and resources on energy programs which are part of the nation's overall energy plan. Geothermal resources are part of that plan.

H.R. 4471 allows one year for all action to be completed on a geothermal lease application. Chairmen Udall's/Santini's bill allows up to three years. For Interior and Agriculture to argue that environmental reviews could be terminated prematurely under these time frames does not, we feel, give credit for their potential to act.

For example, the land managers have learned a considerable amount about geothermal resource leasing since the Act was passed about nine years ago, and over 2 1/2 million acres and over a 1,000 leases later. The land managers have learned a lot about the other resource values on the public lands, after tens of years of resource inventorying through Interior's management framework planning and Agriculture's forest management planning systems. And, the land managers have gained considerable experience working on environmental stipulations and reclamation requirements under the authority of NEPA and other environmental legislation the past ten years or so.

It, therefore, seems that Interior and Agriculture are shortchanging their ability to effectively act under tight timeframes, especially when their top management can exercise their responsibility to give priority to programs which respond to national security threat issues.

In summary Mr. Chairman, we would generally agree that time limits in the energy regulatory process may increasingly be needed as part of the regulatory reform process. However, the Committee may want to consider very carefully the clauses which address what happens when delays occur beyond the set time limits. Currently, H.R. 4471 generally negates the time limit requirement by merely extending the term of the lease equivalent to the time delay and by removing the obligation of the lessee to pay the annual rental.

Chairmen Udall's/Santini's bill is generally silent on what happens when the time frames are exceeded by the Government. Only with permit applications to conduct exploration and development activities are they "deemed to be approved as submitted" if no action is taken by the Government within the time limits. The Committee may wish to carefully consider using this latter clause to provide "teeth" to the other time limit requirements.

"Staged or phased" leasing

There has been considerable attention given to the concept of "staged or phased" leasing which would allow the separation

of exploration rights and development rights, thereby staging the environmental review process. It is argued that this would allow the land management agencies to issue exploration rights much faster if they knew they had another opportunity for environmental reviews should the developer find an economic resource.

Both Interior and Agriculture support the concept of "staged or phased" leasing and both have testified that they believe this feature can be implemented administratively. Interior believes that the authority for phased leasing currently exists under the Geothermal Steam Act of 1970 but both Departments do not object to explicit statutory authority for staged leasing procedures.

We would agree with the concept of phased leasing if, in fact, it would speed up the process--and we believe it could in some instances. We would point out, however, that it could also retard geothermal development. For example, some companies probably would accept a permit under a phased approach with the assumption that they would be able to comply with whatever environmental stipulations are necessary. Other investors might not be so willing to buy the "pig-in-the-poke" arrangement, or the amount of their investment might not be as large as otherwise might be the case. Either of the latter instances could work against expeditious geothermal development.

Other leasing provisions

Another provision in Chairmen Udall's/Santini's bill would limit future known geothermal resource areas (KGRA's) to an area in which a well has been drilled and demonstrated to be capable of producing geothermal resources suitable for the production of electric power in commercial quantities. Interior believes this definition needs to be more inclusive while DOE recommends limiting new KGRAs to resources with temperatures which represent a reasonable lower limit for use in electric power generation. Although most of the KGRA's in this country have been so designated and--considering current technology--few others remain, we believe that the prudent man approach to a KGRA designation as proposed in Chairmen Udall's/Santini's bill is appropriate.

Finally, we believe that the provisions that call for (1) alternative bidding systems in ten percent of the lease sales and (2) possible competitive leasing of non-KGRA lands following a public notice period, if applications are filed for the same land, need to be carefully reviewed. Both would seem to add additional time to the leasing process and, given the state of the art of geothermal resource development, would appear to be premature and not needed at this time to assure competition. Further, it appears that the requirement for a public notice period could encourage speculation.

Financial incentives and initiatives

I would like now to address my testimony to some of the financial incentives and initiatives proposed in these bills. As I mentioned earlier, geothermal development has proceeded at a slow pace. The two bills would provide several financial incentives and other initiatives to help accelerate the development of geothermal energy.

We agree with the objective of accelerating development of geothermal energy to help increase its supply contribution. And since the primary reasons for the slowness in geothermal development appear to be technological and/or economic, we would generally favor financial incentives which would most directly overcome those constraints and thus promise the most development for the funds expended.

We believe that before any new incentives are enacted, DOE should make the Congress fully aware of the impact each incentive could have on all phases of geothermal development, and the estimated annual costs of each incentive. In this way, the Congress would be in a better position to judge and decide on which incentives or other initiatives are best for aiding geothermal development.

In this regard, we understand DOE is considering (1) the possible use of forgivable loans studying the feasibility

of direct use of geothermal energy for space heating and industrial and agricultural purposes, and (2) the use of cost-sharing grants to fund the drilling of geothermal wells for reservior confirmation. Before the forgivable loans legislative provision is considered by the Congress, we believe DOE should provide the Congress with an analysis of the impacts these different incentives could have on aiding and accelerating reservior confirmation, their estimated annual costs, and how the incentives tie in with DOE's existing geothermal loan guarantee program.

We would like to point out that the geothermal loan guarantee program, which was established in 1974 to encourage and assist the commercial development of geothermal resources, has had only limited participation and effect on accelerating geothermal development. Only four loan guarantees have been approved to date. DOE, however, expects increased interest in this program due to the tax incentives for geothermal energy provided in the Energy Tax Act of 1978, and amendments made to the loan guarantee program in 1978. We believe the limited participation in this program to date, however, indicates a need to carefully consider and design new incentives and initiatives so that that they can help geothermal development in the most effective and timely manner.

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Other matters relating to financial incentives and initiatives

There are two other matters which we would like to comment on relating to the incentives and initiatives mentioned in these bills.

H.R. 4471 requires the Secretary of Energy to establish new procedures for processing of loan guarantee applications, and requires that all such applications be approved or disapproved within 4 months of the date of filing.

We have noted that the four loan guarantees approved to date required an average of 11 months from the date submitted to the date approved. These delays frustrate and discourage geothermal developers who have significant funds tied up in these applications and projects. Although some projects may require more time than other to review, DOE already recognizes this long review process as a problem and is working towards reducing its review time frames. We are not prepared at this time to say that 4 months is or is not the appropriate period but would suggest that DOE's current assessment be eyed very carefully to be sure no "fat" remains in the review process. We would generally agree that time limits in the energy regulatory process may increasingly be needed as part of the regulatory reform process.

H.R. 4771 would also amend various provisions of the Energy Tax Act of 1978 for the purpose of removing discentives to geothermal development. One amendment would offer utilities an additional 10 percent investment tax credit for geothermal equipment. We understand that DOE and the Electric Power Research Institute favor such tax credits. Since most applications of geothermal energy involve an electric utility or a hot water distribution utility, it appears this credit could be a substantial incentive for utilities. However, if these tax credits end up being passed through to consumers by State regulatory commissions, we question whether they would act as an incentive to the public utilities. Before this provision is enacted, its impact on geothermal development needs to be considered.

- - - -

Mr. Chairman that concludes my prepared statement. We would pleased to answer any questions.

APPENDIX V

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
WO

REPLY TO. 2820 Leases and Permits

OCT 1 1 1979

SUBJECT: Reorientation of Mineral-Related Activities

TO: Regional Foresters

REPLY DUE DECEMBER 1

With the deepening of our Nation's energy problems, we are faced with the need for a deliberate Service-wide reorientation of our minerals program, especially in regard to leasable energy minerals. While we have made great progress in the past few years in effectiveness, we still have problems. Some of these are reflected in current litigation and proposals for legislation, the outcome of which could substantially affect our programs.

Our primary concerns at this time are with excessive delays in the processing of lease applications (and similar leasing actions), duplicative stages of review for leasing, and too conservative leasing decisions. Our objectives must be to (1) make National Forest System lands available for mineral development at levels commensurate with national needs, (2) make decisions on leasing and operations promptly with a minimum of paperwork and without duplicative reviews, (3) make our decisions with full consideration of the potential value of mineral deposits, and (4) protect our limited discretionary authority through its prudent application.

We understand that some units have been delaying leasing decisions pending completion of land management plans under the National Forest Management Act. That may be a reasonable approach if plans are nearly completed and there is no urgency in the leasing decision. However, leasing decisions need not be delayed pending plan completion. We interpret Section 6(c) of NFMA as allowing continuation of all normal activities by whatever plans or process available prior to NFMA. You may continue to process oil and gas or other lease applications through the NEPA process whether or not leasing was specifically covered in former plans and regardless of the lack of a completed Forest plan under NFMA.

Several pending legislative bills provide for time limits on leasing/permitting decisions, and for some new or interagency body to have jurisdiction over schedules. The Departments of Agriculture and the Interior, in response to this issue, promised--as an alternative--to initiate effective means within our organizations to accomplish the same purposes. We intend to set reasonable time limits for decisions,

APPENDIX V

to require prompt scheduling of environmental reviews on leasing proposals and notification of applicants if there will be significant delays in decisions, and to make scheduling decisions appealable through our normal appeal process.

We plan to revise the FSM 2820 chapter to accomplish this, after receiving your comments on the concepts. Unless we can be persuaded otherwise, we intend to set the following time limits for decisions:

1. For leasing proposals on known geothermal resource areas or other competitive leasing proposals--2 years.

2. For applications to lease or for simultaneous leasing inquiries--1 year if not covered by a Land Management Plan or existing leasing EAR/EIS; 2 months if so covered.

3. For action on concurrence with operating plans--1 month for routine exploration or operations which were considered (directly or by implication) in prelease reviews; 1 year for major development proposals such as geothermal power plants.

We presently have a backlog of approximately 6,000 oil and gas lease applications. Some of these have been pending for several years. Our objective is to eliminate this backlog within 2 years, while keeping current (within above-stated time limits) on new applications.

Please inform us by December 1 of your comments on these issues, of your plans for implementation, and of the impact on your total program.

Thomas C. Nelson

THOMAS C. NELSON
DEPUTY CHIEF

APPENDIX V

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

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Oct. 16 1979

REPLY TO 2820 Leases and Permits

SUBJECT: Reorientation of Mineral-Related Activities (Amend. to 10/11/79 ltr.)

TO: Regional Foresters

In the next to last paragraph of the letter, we inadvertently left out reference to a backlog of several hundred geothermal lease applications. Our intention is that the time limits and two year period for elimination of the backlog shall apply to all minerals.

J. B. HILMON
Associate Deputy Chief

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