Statement of

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Before the

House Committee on Resources

March 19, 2003

Thank you for the opportunity to present the views of members of the Geothermal Energy Association (GEA) regarding geothermal energy potential on public lands and the obstacles to developing this important national energy resource. GEA is a trade association that represents 60 companies and organizations involved in the U.S. geothermal industry, from power plant owners and operators to small drilling and exploration companies.

Geothermal Energy's Potential

Geothermal energy provides a significant amount of the energy and electricity consumed in the Western U.S. Geothermal heat supplies energy for direct uses in commercial, industrial and residential settings in 26 states. Geothermal resources furnish substantial amounts of electricity in California, Nevada, Utah and Hawaii. Indeed, 6 percent of California's electricity comes from geothermal energy.

There has been renewed interest in geothermal power. A small-scale power facility has started operation in New Mexico, and the BLM reports that there is an active interest in leasing and permitting in eleven western states. In part this is due to the adoption in many states of renewable production standards to ensure a market for new renewable power. We believe it is also due to the interest shown in the Congress in expanding the Section 45 production tax credit to include geothermal energy through, for example, legislation introduced in the Senate by Senators Grassley, Domenici, Baucus and Bingaman, S. 597, as well as legislation introduced in the House by Representatives Duncan Hunter (R-CA) and Mark Udall (D-CO), H.R. 991.

But needless to say, financial incentives and market portfolios can only go so far if companies interested in developing geothermal resources are unable to obtain leases and secure the permits necessary for development in a timely manner and under reasonable conditions. The high-level of interest shown in expediting the processing of geothermal leases and permits by this Committee and federal and state governments has been a major contributor to renewed interest in tapping the undeveloped geothermal resources of our Nation. Discussions about amending and updating the Geothermal Steam Act have been received with excitement by many in the geothermal industry.

Expanded use of geothermal resources will provide additional clean, reliable energy to the West. Thousands of megawatts of new geothermal power, and an equal amount of direct-use energy, could be developed in the immediate future; however, obstacles created by public land agencies must be removed.

Geothermal energy contributes directly to both state and local economies and to the national Treasury. To date, geothermal electricity producers have paid over $600 million in rentals, bonus bids and royalties to the federal government. Moreover, according to an analysis performed by Princeton Economic Research, it would be reasonable to estimate that the geothermal industry has paid more than 6 times that amount in federal income tax, for a combined total of over $4 billion.[1] If the economic multiplier effects were considered, the total contributions of geothermal energy to the local and national economy would be substantially greater.

What is the potential for geothermal energy on public lands? What are the benefits of developing these resources? These questions are difficult to answer, in part because the efforts of the U.S. Geological Survey ("USGS") and the Department of Energy to define the U.S. resource base have not been funded for many years. In fact, as the USGS pointed out in its testimony before the Energy Subcommittee in May, its last assessment was undertaken roughly 30 years ago.

In order to produce a more current picture of the near-term potential of the geothermal resource base, GEA Executive Director Karl Gawell together with Dr. Marshall Reed of DOE and Dr. Michael Wright of the Energy and Geosciences Institute at the University of Utah, conducted a systematic survey of known geothermal experts from business, academia and government in 1999. The results of this survey were assessed and a brief report was released in April of that year entitled “Preliminary Report: Geothermal Energy: The Potential for Clean Power from the Earth.”

That report concluded that the U.S. geothermal resource base could support significantly increased production. U.S. geothermal electric capacity, now at about 2,600 MW, could triple and, with expected improvements in technology, could reach nearly 20,000 MW in 20 years.

These figures would appear to be fairly consistent with the estimates presented to the Subcommittee on Energy and Minerals by the U.S. Geological Survey. Their testimony indicated a potential for 22,290 MW of geothermal electricity production (see Attachment #1). As GEA’s Executive Director testified before the Energy and Minerals Subcommittee, these figures also concur with the results of the planning workshop that helped produce the current DOE Strategic Plan – an effort that brought together many of the leading experts from industry, laboratories and academia. At that workshop, there was a consensus that, with market support, as much as 10,000 MW of electric capacity could be brought on-line in the West by 2010 by expanding existing resource production and developing new facilities.[2]

Achieving this additional geothermal production would have substantial economic and environmental benefits in the western United States. If the goal of the DOE Strategic Plan could be reached, the cumulative federal royalties from the new power plants would reach over $7 billion by 2050, and estimated income tax revenues would exceed $52 billion in nominal dollars.[3] The state share in these royalties alone would result in an additional investment of $3.5 billion in schools and local government facilities in the western states.

Expanded use of geothermal resources can also contribute to the President's goal of a hydrogen future. Using geothermal resources to drive catalytic processes is ideal for generating hydrogen. In fact, Iceland is expected to be the first country in the world to make a significant transition to hydrogen fuels, which it will achieve by using its geothermal and hydropower resources.

Recent Efforts To Address Barriers To Geothermal Energy Use

We were very pleased by the Administration’s interest in enhancing the use of renewable resources on public lands. Vice President Cheney, Secretary Norton, and Secretary Abraham have all shown a strong interest in promoting renewable energy use, and addressing the problems the geothermal industry has experienced.

Vice President Cheney met with leaders of the renewable energy industry. The National Energy Policy release in May of 2001 by the National Energy Policy Development Group included several key recommendations. The NEPDG recommended that the Secretaries of Interior and Energy re-evaluate access limitations to federal lands in order to increase renewable energy production. It also recommended that the Secretary of the Interior determine ways to reduce the delays in geothermal lease processing and permitting.

Twelve days after the release of the Vice President's report, the President signed Executive order 13212-Actions to Expedite Energy-Related Projects. This order established the White House Task Force on Energy Project Streamlining to ensure interagency collaboration.

In response to the Vice president's report, the Secretaries of Interior and Energy convened at a conference entitled "Opportunities to Expand Renewable Energy on Public Lands" in November 2001. This meeting brought together over 200 senior executives from industry with state and federal agency representatives as well as a wide range of other interested groups.

This interest and initiative from the Administration has been supported by Congressional action. The House Resources Committee and its Energy Subcommittee have held hearings on renewable energy development on public lands, and specifically on geothermal energy issues. The Congress has included funding for key activities by the Bureau of Land Management, US Geologic Survey and Department of Energy.

We appreciate the interest and attention of the Senate Energy Committee, and hope that these hearings will build upon the progress being made. We are pleased to say that there is progress being made, although we must report that there are still problems and obstacles to overcome.

Geothermal Energy on Public Lands

Whether and when the economic benefits of further geothermal development are realized will greatly depend upon the action, or inaction, of the federal land management agencies. Today, about 75% of U.S. geothermal electricity production takes place on federal public lands since that is where most of the resource is located. If we expect to see significant increases in geothermal energy production in the United States, we will have to access resources yet to be developed on public lands

New geothermal development requires the timely and reasonable oversight of federal leasing, permitting, and rights-of-way and environmental reviews by public land management agencies. Unfortunately, the previous administration's management of federal geothermal resources was marked by bureaucratic delay and indecision by public land agencies; as a result, there has been a rapid decline in new geothermal energy development.

To understand the impact that delays can have, it is important to recognize that all of the estimates discussed earlier are nothing more than that – estimates. A company interested in developing a geothermal resource will have to invest millions of dollars in defining the resource before construction of a power plant can even begin. Unfortunately, there are few reliable surface exploration techniques for geothermal energy that can provide any degree of confidence. Confirmation and definition of the resource involves drilling, which means the investment risk is high and may remain high until after several wells have been drilled.

Geothermal wells are more expensive to drill than oil and gas wells, and if successful have a payback period substantially longer than oil and gas wells. They are drilled in hot, hard, fractured, abrasive rocks where problems are frequent and expensive. For "green field" development, resource definition work may account for as much as 40% of the cost of the project, and that considerable expense must be borne before the resource is sufficiently confirmed in order to secure financing for a project – making the risk to the developer even greater.

Companies will not take on such a considerable expense and risk without assurance that if they are successful they will be able to develop a power plant. To begin with, they need a lease to ensure their rights to develop the particular resource identified.

This brings us to bureaucratic problem number one: tens of thousands of acres of geothermal leases were applied for in the West, to which federal agencies failed to respond. Lease applications languished, often for years.

Because this Administration has made renewable energy development on public lands a priority, and with Congress support, we have seen some progress. The de facto moratorium on geothermal development on public lands appears to be lifting. Last year, BLM was able to make substantial inroads on the lease backlog in Nevada, and the Secretary of Interior has committed the agency to eliminating the backlog entirely.

But while progress is made in some areas, BLM clearly still lacks the resources to eliminate the problem. In addition to a lack of resources to complete lease processing, and the necessary land-use planning and environmental reviews, BLM is still seeking the active cooperation of other agencies, particularly the Forest Service. Lease applications that have been pending for years, some for as long as a decade, still await action in Washington and other states. We understand that persistent pressure from the BLM has resulted in some progress being made on pending lease applications on Forest Service lands, but still, new leases are not being been issued.

If you wonder why there are not more geothermal projects being developed in the West, these delays are a big part of the answer. If a company cannot obtain a lease, it will not spend millions of dollars on the exploration needed to determine whether or not there are adequate subsurface geothermal resources to

support a geothermal power project.

Furthermore, once a company obtains a lease, the administrative processing of permit applications and environmental reviews can be expected to take years. As GEA testified before the House Resources Committee's Energy Subcommittee, it has been our members' experience that "environmental reviews have been unnecessarily extensive, costly, and repetitive; and in areas where an EIS has been completed, decisions by federal agencies have been subject to years of delay and appeal."

During the House Resources Energy Subcommittee hearing in May of 2001, an official from Calpine Corporation, the largest geothermal energy company in the United States, testified about his company's experience in trying to develop geothermal resources on Forest Service land in Northern California. The area in question was leased by BLM in the 1980s, with the approval of the Forest Service, for geothermal development. In fact, the area is situated in the Medicine Lake Known Geothermal Resources Area, one of the first KGRAs to be designated after the Geothermal Steam Act was passed in 1970.

Despite the fact that BLM and the Forest Service encouraged development in this area for more than two decades, and the Bonneville Power Administration supported the project and agreed to buy the electric power, it took over seven years to complete the initial permitting and EIS on the project. The project was approved with some of the most extensive and onerous conditions ever imposed on a geothermal project. Despite approval of the project, the Calpine official declared in his statement before the Subcommittee "…if Calpine knew in 1994 what it knows now, it is safe to say that it never would have invested its time and capital in the Fourmile Hill project." He continued: "…Unless the situation changes, Calpine is unlikely to embark on a similar project ever again. This should concern this Subcommittee because many of the geothermal resources in the United States are located on federal land. As long as the federal permitting process remains as time-consuming and costly as what Calpine has experienced, private companies will be severely discouraged from developing these resources."

The message is clear: Extensive and expensive administrative processing is having a significant negative impact on geothermal development on public lands.

The years of delay and uncertainty in moving forward at these sites sent shock waves through the geothermal industry. It sends the message to every company considering a new geothermal project on public lands -- expect many years of arduous and expensive bureaucratic processing.

Geothermal Energy on Military Lands

In addition, there are millions of acres of public land in the West that are reserved for use by the military. These lands potentially hold significant geothermal resources. GEA fully recognizes the importance of the military's use of public lands, and believes that leasing or development should occur on military lands only with their consent, and under such terms and conditions as they deem necessary and/or advisable to meet the military mission.

However, where development occurs, GEA believes geothermal leasing and development on lands subject to military reservation there should be:

(1) Uniform policies on securing and maintaining the leasehold estate;

(2) Uniform royalty structures and consistency with policies affecting development on non-military lands; and

(3) Centralized administration of the lease and royalty programs.

What we are asking for is that standard, uniform policies be developed regarding leasing and royalties on military lands so that a potential developer knows what to expect. The current situation, which allows ad-hoc decisions to be made on a case-by-case basis, deters geothermal development on military lands. Essentially, we believe geothermal resources should receive treatment similar to other oil, gas and mineral activities on military lands.[4]

A New National Resource Assessment is Needed

One of the proposals made during the last Congress was to direct a new national resource assessment by the US Geologic Survey, and we strongly support this proposal. The importance of USGS resource

assessment was affirmed by the National Research Council, which reports that, "effective and timely scientific information from [the USGS] programs is needed to help the nation determine its energy options through the year 2000 and beyond.[5]

The last assessment of the US geothermal resource base was conducted in the late 60s and early 70s. A lot has happened in thirty years, including our fundamental understanding of the earth's geology. The lack of an up-to-date resource assessment is a fundamental barrier to expanded geothermal development in the United States. The USGS has initiated a new assessment for the Great Basin; however, Congress funded this work only for its first year. This assessment should be a priority. The USGS should be authorized, directed, and funded to complete an entire national resource assessment over the next three years.

Updating The Geothermal Steam Act

While we applaud the efforts made to date by the Administration to promote the development and use of geothermal resources on public lands, industry has begun to recognize that there are some fundamental problems with the Geothermal Steam Act that need to be addressed. The House Resources Committee proposed a series of amendments to the Steam Act during the 107th Congress that have been the basis for an on-going discussion about how to improve the underlying law. Following is a summary of our views on some positive amendments to the Steam Act that would help encourage new geothermal development.

KGRAs and Competitive Leasing:

To begin with, the Steam Act was written at a time when government experts were expected to determine where the best resources were located. The federal government would determine what areas would be designated "Known Geothermal Resource Areas," and these would be subject to competitive bidding. This method is not too different from the approach taken by the oil and gas leasing laws prior to their modification by Congress in the 1980s. Similar modifications should be made to the Geothermal Steam Act.

We recommend that KGRAs be eliminated as a criterion for determining where bidding is held on a competitive basis, and that the law should be modified to resemble the current oil and gas leasing statutes where lands are offered first for competitive bidding and then made available on a non-competitive basis. In states where there are expressions of interest in bidding, BLM should hold a competitive lease sale at least once every two years. Prior to scheduling the sale, companies should be asked to submit any nominations they may have for specific lease blocks upon which they wish to bid.

Royalties:

The current royalty requirements should be modified to reduce administrative costs and promote new power and direct use development. Instead of the complex and administratively expensive net back formula now used, royalties should be based upon a simple percentage of gross proceeds. We estimate that currently that would be roughly a 3-1/2% gross royalty. To encourage new development, federal royalties could be “stepped,” or be set at 2% of gross revenues for the first four years of production with an increase to 3-1/2% for the remaining term of the lease. Recognizing that local governments rely upon royalty payments for essential services, if a stepped royalty is adopted, we would further recommend that the state share of the royalty should be increased to 100% for the initial period.

For direct use operations, there should be no royalty or a simple, nominal fee. Experts on direct use operations believe that the current royalty requirement is perhaps the major impediment to greater direct use of geothermal energy in commercial, mining, ranching and similar operations in the West. Kevin Rafferty of the Geo-Heat Center in Klamath Falls, Oregon states, “The really telling statistic in my opinion is that we now have hundreds of direct use projects in operation across the West and we are only able to identify 3 that use resources on the public lands. The users are out there and so are the Federal resources but no one is using them. It seems pretty obvious that something is wrong.” According to Mr. Rafferty, the high cost of direct use royalties was the most commonly cited problem at a recent meeting held to discuss how to expand geothermal energy use in the West.[6]

Similarly co-production of mineral by-products from geothermal sites should be subject to no royalty or a nominal fee. Mineral production from geothermal sites should be treated the same as mineral production elsewhere on the federal lands. It is sadly ironic that under the existing law a federal lessee producing metals from the fluid used in a geothermal plant would have to pay the federal government a royalty on the mineral (in addition to a royalty on the power), but producing that same metal by open pit mining on the

public lands would not be subject to a royalty. There is significant potential to produce minerals from geothermal sites that should be encouraged. Doing so will not only help the economy and national security but will reduce the overall environmental impacts of mineral production.

Royalty Revenues:

A fundamental problem facing the federal governments' efforts to promote geothermal production on federal lands is the lack of resources to support the efforts urgently needed by the BLM, USGS, and others. To help address the substantial backlog of leasing, permitting and related environmental and land-use reviews and to support a new geothermal resource assessment we would propose that the federal share of geothermal royalties be dedicated to these efforts on a temporary basis.

For the next five years, the federal share of geothermal royalties, bonus bids, and rentals should be used to fund the USGS resource assessment above, to eliminate the backlog in BLM planning, leasing and permitting activities, and to complete targeted environmental reviews for areas with significant new development potential. These environmental reviews should be conducted cooperatively with state and, as appropriate, tribal land authorities and should seek to minimize subsequent permitting and related project delays. For military lands, the share of federal royalties should be dedicated for their geothermal development efforts.

Payments/Due Dates Lease/Reinstatement for Inadvertent Lapses:

Again, unlike the oil and gas leasing law, there is no flexibility in the existing geothermal statute for inadvertently late lease rental payments. If a payment were even one hour late, the law would impose termination of the lease. This is not only unreasonable, it can seriously disrupt lease development.

We would recommend that a standard 30-day grace period be applied for all payments due to the BLM, with a penalty as prescribed by regulations, similar to oil and gas.

Lease Consolidation, Unitization/Pooling:

For a number of reasons, including efficient development of the resource, a geothermal area should be developed under common terms and agreements. In some cases, this would mean lease consolidation where a single company has multiple leases. In other cases, this could mean unitization or pooling where there are multiple leaseholders or perhaps a mix of federal, state or other leases.

The current law and regulations do not facilitate these developments. For example, the BLM cannot unitize a group of leases unless they have exactly the same lease terms. Also, they do not have the same degree of authority to prompt pooling arrangements or unit agreements as they have for oil and gas leases.

We would recommend that the law be modified to provide BLM the authority to consolidate leases that do not have exactly the same terms (issued same day, same royalty rate, etc.…) BLM should be authorized to renegotiate lease terms in order to have common terms for a lease block. BLM should also be given broader authority to initiate unitization or pooling agreements when it would facilitate development of the resource.

BLM as Lead Federal Agency:

There continues to be significant problems with leasing and development of geothermal resources where there are multiple agency jurisdictions involved. We applaud the efforts of the BLM to work cooperatively with the Forest Service and the Navy, and encourage all parties to work together. However, the law should be amended to provide BLM greater authority to ensure that timely decisions are made.

We would recommend that the Steam Act be amended to make it clear that BLM has lead status for all decisions under the Steam Act. BLM should be authorized to establish, by regulation, specific timeframes for actions by other agencies where their consent or consultation is required.

Agency Appeals Process:

Finally, appeals of agency decisions under the Steam Act should be expedited. The U.S. Forest Service has a more expeditious process governing appeals of their actions as compared to the BLM. The BLM should consider modifying its regulations to be more like the Forest Service.

Specifically,

1) The BLM should adopt regulations similar to those of the Forest Service whereby only National Environmental Protection Act (NEPA) decisions can be appealed, such as a Decision Notice or Record of Decision. Implementing actions, such as the issuance of a permit or sundry notice, cannot be appealed. The current BLM regulations allow for the appeal of the NEPA decision, and then for the further appeal of any permit that is issued subsequently. The delays can be endless.

2) Regulations should be modified to set a time limit for the Interior Board of Land Appeals (IBLA) to decide appeals. The regulations should provide that if the IBLA does not make a decision within the time limit, then the appeal is deemed denied. The Forest Service regulations set a 45 day time limit for deciding an appeal. In contrast, an appeal of the BLM Record of Decision for Calpine's Fourmile Hill geothermal project (referenced earlier) took 22 months before a decision was reached to deny the appeal.

Transmission

Since most geothermal power facilities must be located where the resource occurs, they are often in rural areas. The benefits of this coincidence for rural economic development are substantial and positive. In nearly every county that currently has a geothermal power plant, it is the largest taxpayer in that county and provides substantial long-term employment as well.

However, for the developer this adds a potentially significant problem – the location may or may not be near transmission lines. This obstacle needs to be recognized by the federal agencies, and they need to place a priority on processing rights-of-way and permits for transmission lines. It also raises the need to plan transmission systems to optimize their availability for power production from geothermal and other renewable resources.

Just this week, the Departments of Interior and Energy issued a report entitled Assessing the Potential for Renewable Energy on Public Lands. This is an important and positive step forward for agency land-use planning efforts, and should provide important information for state, regional and federal agencies that are undertaking transmission planning. When the USGS completes a new geothermal resources assessment, we expect its findings will provide even more reliable resource information for transmission planning purposes.

Conclusion

Geothermal resources on the public lands can contribute significantly to our Nation's energy supplies. Solid progress is being made through the initiatives of the White House, Secretary Norton and Secretary Abraham to achieve the expanded use of our geothermal resources. Congress' support for these efforts, and for funding these efforts, will be critical to their success.

We urge this Committee to consider amendments to the Geothermal Steam Act that will build upon the Administration's efforts. These amendments could help streamline the existing law, and ensure that the resources are available to eliminate the backlog of leasing and permitting decisions, and to complete a new national geothermal resource assessment.

Geothermal energy can help address the critical energy problems of our Nation. With the tax, regulatory and legal changes we have discussed, there would be a dramatic revival in the use of geothermal energy use for electric power production, greenhouse heating, aquaculture, and other purposes. This would reduce our dependence upon foreign oil, reduce our spiraling demand for natural gas, and provide a substantial and immediate stimulus for the economy.

Thank you.

Attachment #1

Table #1 STATES USING GEOTHERMAL RESOURCES TODAY
(Source: Geo-Heat Center, Oregon Institute of Technology)

Alabama

Alaska

Arizona

Arkansas

California

Colorado

Georgia

Hawaii

Idaho

Louisiana

Mississippi

Montana

Nevada

New Mexico

New York

Oregon

South Dakota

Texas

Utah

Virginia

Washington

West Virginia

Wyoming

Table #2 GEOTHERMAL ELECTRIC PRODUCTION POTENTIAL

(Based Upon US Geologic Survey Testimony[7])

Alaska 250 MW

Arizona 1,000 MW

California 12,000 MW

Hawaii 250 MW

Idaho 540 MW

Montana* 400 MW

Nevada 2,000 MW

New Mexico 2,700 MW

Oregon 2,200 MW

Utah 1,350 MW

Washington* 300 MW

TOTAL 22,990 MW

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[1] Princeton Economic Research, Inc., Review of Federal Geothermal Royalties and Taxes, December 15, 1998. (Figures expressed in 1998 dollars.)

[2] U.S. Department of Energy, Office of Geothermal Technologies, Strategic Plan for the Geothermal Energy Program, June 1998, page 21.

[3] Princeton Energy Research Inc, Op. Cit., Volume I, page 17.

[4] See 43 U.S.C. 158. The Engle Act of 1958 placed mineral resources on withdrawn military lands under jurisdiction of the Secretary of the Interior and subject to disposition under the public land mining and mineral leasing laws.

[5] Energy-Related Research in the USGS, National Research Council, 1998, National Academy Press, Washington, DC

[6] Email communication from Kevin Rafferty, Associate Director, Geo-Heat Center, Klamath Falls Oregon, February 24, 2004.

[7] Testimony of the U.S. Geologic Survey before the Subcommittee on Energy and Mineral Resources of the House Resources Committee, U.S. House of Representatives, May 3, 2001. Note: resource assessments have not been conducted for all states with geothermal potential. *Montana per Dr. John Lund and Washington state estimated by Prof. Gordon Bloomquist