



OFFICE OF

Oil and Gas Conservation Commission

STATE OF ARIZONA

4515 NORTH 7TH AVE.

PHOENIX, ARIZONA 85013

PHONE: (602) 271-5161

A G E N D A

Meeting
July 21, 1972
Americana Motor Hotel
850 Grand Avenue
Nogales, Arizona

10:00 a.m.

Call to order

1. ✓ Approval of minutes of meeting of
June 16, 1972

2. ✓ Report of Executive Secretary

3. ✓ Report of Enforcement Section

4. ✓ Report of Geology Section

5. Old Business

6. New Business

A. Consider 1973-74 Budget (Travel Policy)

7. Adjourn

IF YOU ARE UNABLE TO ATTEND THIS MEETING, PLEASE NOTIFY
THIS OFFICE AS SOON AS POSSIBLE.

Guests
Dr. Bill Dresher
Bu. of Mines
Cal. of Mines
Dr. J. J. [unclear]

Bul. 186
2 mos or
50

-over
work

July 24, 1972

Dr. Jerome J. Wright
Department of Geosciences
University of Arizona
Tucson, Arizona 85721

Dear Jerry:

I was so pleased to see you and Phyllis Thursday night in Nogales. I am sorry that we did not get to have a little talk; however, it can wait. I think you would have been pleased to hear your praises sung to Ed and to Bill Drescher during the meeting Friday. Personally, I would like to say how pleased I am that you have gone ahead and accepted a contract for the forthcoming year. I am looking forward to seeing you when you get back. I hope your vacation has been a happy one.

Sincerely,

John Bannister
Executive Secretary

JB:st

July 24, 1972

Dr. William H. Dresher
Dean, College of Mines
University of Arizona
Tucson, Arizona 85721

Dear Bill:

I want to thank you for attending this Commission's meeting on the 21st in Nogales. Unfortunately, there was not much business of interest to be conducted; however, your cooperation carried great weight with and made a deep impression on our Commissioners and, needless to say, the staff. I hope that sometime we may be in a position to return this courtesy to you.

If there is any way we may be of help, you have but to ask.

Sincerely,

John Bannister
Executive Secretary

JB:st

July 24, 1972

Dr. Edgar J. McCullough
Head, Department of Geosciences
University of Arizona
Tucson, Arizona 85721

Dear Ed:

I would like to express our appreciation for your attendance at our Nogales meeting. Evidence of cooperation such as your personal attendance certainly carries great weight with our Commissioners. I am looking forward to getting more of "our" plans going.

Please know in any way we can return your hospitality and cooperation, you have but to ask.

Sincerely,

John Bannister
Executive Secretary

JB:st

July 24, 1972

Mr. Robert Stuchen
Americana Motor Hotel
850 Grand Avenue
Togales, Arizona 85621

Dear Bob:

I especially want to say thank you to you and Karen Smith for the warm hospitality you showed us at the Americana last Thursday and Friday. Your wonderful cooperation and generosity made Hogales one of the most pleasant meetings this Commission has enjoyed. All of the Commissioners, as well as the staff, join me in this expression of appreciation.

I personally would like to thank both you and Karen for the warm and interested cooperation you gave me in all respects.

Sincerely,

John Bannieter
Executive Secretary

JB:st

July 24, 1972

Mr. Zellie Capin
Americana Motor Hotel
850 Grand Avenue
Nogales, Arizona 85621

Dear Mr. Capin:

I would like to express the appreciation of the Commissioners and of the staff of the Oil and Gas Conservation Commission for the splendid hospitality your organization showed us last Thursday and Friday. We all particularly appreciated the warmth you and your lovely wife Helen showed to us by inviting us to your home.

I hope that sometime we may be in a position to repay some of these courtesies.

Sincerely,

John Bannister
Executive Secretary

JB:st



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July 12, 1972

Memo: Commissioners
From: John Bannister

Per your instructions, the meeting of Friday, July 21st, will be held at the Americana Motor Hotel, 850 Grand Avenue, Nogales, Arizona, Phone (602) 287-7211. As usual, I have made arrangements for a section of the dining room to be set aside for our use on the evening of the 20th. We have invited Dr. McCullough, Head of the Geology Department of the University of Arizona, as well as Dr. Wright, and Dr. Drescher of the Bureau of Mines to join us.

On June 22nd, the area surrounding the Commission offices was badly flooded and we were somewhat threatened by overflow from the canal immediately to the north, however a break-out to the east relieved the pressure and our building primarily escaped damage. There was some leaking in and around the doors and roof leaks. These have been reported to our landlord.

We met with representatives of the Federal Department of the Interior on June 29th concerning proposed programs to be engaged in by the department and their potential effect on the various agencies, this Commission among them. We discussed some of the problems that operations by the Department of the Interior create within the State of Arizona.

A copy of our proposed budget is enclosed so that you may be prepared to discuss this at our meeting. I would like to point out that the submission of our budget must be accompanied by an agency statement of policy concerning use of automobiles assigned to us. There has been no firm written policy established and I feel this must be considered at the meeting.



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ACTIVITY REPORT

July 12, 1972

Memo from W. E. Allen, Director
Enforcement Section

Following the adoption by the Commission of the Rules and Regulations pertaining to geothermal resources, we have busied ourselves with the preparation of the forms that will be necessary for reporting the various activities during the drilling for, production and utilization of this resource. Bids should be received for the printing of the Rules and Regulations and also the printing of the forms by the time of this coming Commission Meeting.

As you know, the writer attended the Geothermal Resource Meeting in Las Vegas on the 19th and 20th of June (a report of this meeting is attached). While in Las Vegas, I had the opportunity of visiting with several people connected with Magma Power, Union Oil Company, and Geothermal Energy Institute. All these people had received copies of our proposed Rules and Regulations. Magma Power and Geothermal Energy Institute were mostly complimentary. Union was very critical of the confidentiality that was adopted. They seem adamant that a minimum of 5 years is necessary. I cannot share their opinion and neither do a number of the operating companies.

Union Oil has recently completed a geothermal resource well on the Bicol Peninsula of Luzon, Philippine Islands. Union announced that results of the initial test are encouraging and indicate a source of commercial power.

Leasing has been very active within recent weeks. Humble has acquired an additional 234,807 acres. This is primarily in Pinal and Pima County, with some acreage in Yuma County. Phillips Petroleum has gotten into the act taking some 123,420 acres in Maricopa, Pinal and Yuma County. A local citizen, whom I am told is representing some oil company, has taken 61,576 acres in Pinal and Maricopa County. An independent operator has acquired 25,408 acres in Pinal.

John Harvey, who heads the Land Department for Southland Royalty, Cactus Forest Oil Company and Cochise Limited, has taken a total of 117,741 acres in Cochise County. A large part of this Cochise acreage was through assignment from Dowdle Oil Company of Midland.

These lessees are going in and around Humble. It appears that whenever Humble has left a hole, someone jumps in.

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Activity Report - July 12, 1972
Mr. W. E. Allen

The Humble No. 1 State, NW/SE Section 2-T8S-R8E, Pinal County, is drilling ahead. The last time I visited this location, they had experienced no hole difficulty at all. They had a little mechanical trouble with the rig. This type of thing can be expected with a new rig. Humble has been using 4½" drilling pipe. I had been told that they would switch to 3½" drilling pipe between 9,000 feet and 10,000 feet. The change over will lighten the load on the rig.

The Humble drilling superintendent told me he was going to stake a location in Yuma County the week of July 2. We have not received an application to drill this location as yet.

P & H Development, Inc., Federal No. 1, NW/SW Section 30-T2S-R9W, Maricopa County, is drilling below 1700' at the last report. The operator also reports some shows from 1495' to 1625'. I am inclined to doubt the authenticity of these reports. In my many trips to this location, I have never seen anything resembling a show of oil or gas in spite of their claims.

Astro-Tex Federal No. 1, NW/NE Section 31-T5N-R17E, Gila County, is moving in their rotary.

Eastern Petroleum Santa Fe Dreck No. 1, SW/SW Section 25-T20N-R27E, Apache County has been plugged and abandoned. Eastern has been issued Permit No. 587 for the drilling of the Kiva No. 3 in the SW/NE Section 14-T20N-R28E, Apache County. This will be a helium test to the Coconino.

Cities Service Oil Company Monsanto-Navajo C-1, SE/NW Section 16-T40N-R29E, Apache County, has set 5½" casing at 5752' and is presently testing four zones in the Pinkerton Trail section of the Pennsylvanian. As of now, these combined zones have tested slightly over one and a half million cubic feet of gas with six barrels of oil per day.



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July 10, 1972

ACTIVITY REPORT

J. N. Conley
Director, Geology Section

COMMISSION PUBLICATIONS

The new Well Location Map of Arizona was printed this past month. The preliminary compilation of geologically significant water wells drilled in counties in the Basin and Range province was completed this past month and should be printed soon.

EXPLORATION ITEMS

Drilling --

Humble Oil & Refining Company commenced drilling operations June 8, 1972 on its stratigraphic test hole in Section 2, Township 8 South, Range 8 East. This hole was permitted for a projected depth of 12,000 feet.

The penetration of several thousand feet of sediments by this well near Eloy without apparently reaching basement rocks has confirmed, at least in part, Humble's interpretation that some of the valleys in the Basin and Range province are underlain by sedimentary rocks that could be hydrocarbon-productive. While this development may be of only local significance, it could be applicable to other basins.

Geological - Geophysical --

The Four Corners Regional Commission approved June 8, 1972 Governor Jack Williams' request for technical assistance grants in the amount of \$14,000 for the investigative projects recommended by this Commission. The funds will probably

Activity Report
July 10, 1972
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be available soon after August 15th. In the meantime, plans for implementation of the geophysical projects have been discussed with Dr. John Sumner, Geophysical Laboratory, and other U. of A. personnel. R. H. Bruns started work on his geological project June 13th, under another grant.

Side-Looking Radar Imagery --

Mention was made in the June, 1972 ACTIVITY REPORT of the possibility of obtaining some radar imagery in portions of Arizona. Prior to requesting imagery from Goodyear Aerospace Corporation, Dr. C. W. Barnes, Assistant Professor of Geology, NAU, Dr. Troy L. Péwe, Chairman, Geology Department, ASU, and Dr. H. Wesley Peirce, Geologist, Arizona Bureau of Mines, were contacted as to areas in which they would like to have coverage. There was fair to good coincidence of desired coverage along and north of the Mogollon Rim. All of the areas are of interest to this Commission.

Goodyear made a computer search of three large areas along and north of the Mogollon Rim. The print-outs indicated that numerous missions had been flown. Dr. Barnes, Robert Hesse (ARIS representative) and I visited Goodyear's radar laboratory to view some of the imagery. After plotting the flight passes affecting his area of interest, Barnes will return to the Goodyear laboratory to make a selection of imagery desired. Copy negatives of the imagery at a scale of 1:200,000 will be furnished.

Goodyear, although actively engaged in various phases of radar for many years with the U. S. Air Force and other Defense agencies, entered the commercial field about two years ago. Since then it and International Aero Service Corporation have flown large areas in Columbia, Venezuela and Brazil in South America and Malaya in Indonesia for oil companies and governmental agencies. These particular countries have continual cloud-cover problems seriously hampering aerial photographing. Radar "sees-through" clouds. Goodyear is now attempting to promote the use of side-looking radar imagery in various industrial fields in the United States. It is interested in furnishing such imagery to academic institutions and state agencies that have the "know-how" to use it in research currently underway or planned. After Dr. Barnes gets the imagery he needs, this Commission and ARIS can probably get additional coverage for the other academic institutions and the Bureau of Mines if they have current or planned research projects where it would be of value.

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ARIZONA RESOURCES INFORMATION SYSTEM (ARIS)

State-Wide Mapping --

Carl Winikka, Director of ARIS, reports that NASA will soon complete photographing the State. Some unexpected cloud cover in June delayed the project; also, some photography rejected by the U. S. Geological Survey will have to be re-flown.

State Land Inventory Project --

Representatives of the U. S. Department of Interior from Washington, D. C. had a series of conferences this past month here in Phoenix with representatives of various state agencies as to their needs and problems. A land use bill has been favorably reported out of the Senate Interior Committee. The bill would authorize more than \$800 million by 1980 to provide for the creation and implementation for plans for land use in every state. It would require states to develop and implement plans for land use in four major categories. It would allocate \$100 million annually for the next eight years, on a nine to one matching basis, and establish an office of land use policy administration in the Department of Interior to coordinate the plans.

The Working Committee of ARIS has completed a preliminary draft of the Arizona Land Inventory System. The major categories are: Barren Lands, Water Resources, Natural Vegetation, Agricultural Lands and Residential-Industrial-Commercial. This Commission is interested in the formulation of a digit code that will be adequate for our needs geologically in the exploration for and exploitation of hydrocarbon, helium and geothermal resources. The final inventory system adopted will be compatible with one being prepared by the Department of Interior.

LEASING ACTIVITY

Leasing by Phillips Petroleum Company and smaller companies and individuals continues unabated. Some of this leasing is in blocks large enough to justify future drilling. The knowledge that sediments of considerable thickness occur in the Eloy area may spur drilling on these lease blocks.

CURRENT COMMISSION PROJECTS

1. Subsurface studies in the northeast part of the State. Emphasis will be placed on the general Holbrook area. Much of this area has, for Arizona, fair to good subsurface control offered by holes drilled for hydrocarbons, helium, water and potash.

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Oil shows have been noted in enough wells to suggest that commercial accumulations are present. It contains a large volume of lands owned by the State. It is an area in which Dr. John Sumner will prepare interpretations of existing magnetometer and gravity meter control under a grant from the Four Corners Regional Commission.

2. Tabulation of geologically significant water wells in the Plateau province.

3. Preparation of a series of county maps in the Basin and Range province showing all wells drilled for hydrocarbons and geologically significant water and stratigraphic wells. These maps will supplement the county water well tabulations recently prepared and the new small-scale well location map of Arizona.

4. Preparation of geological base maps at scales suitable for both densely and sparsely drilled areas.

5. Revision and updating of the booklet pertaining to sources of information in Arizona.

GEO THERMICS

General --

As a representative of the Geology Section of this Commission I attended the geothermal sessions of the annual meeting of the American Nuclear Society in Las Vegas, Nevada June 20-21. I submitted a report on the sessions soon afterwards.

The Arizona Republic, Thursday, July 6, 1972 printed an article from the New York Times Service concerning a paper prepared by scientists at Los Alamos, New Mexico. This paper was directed primarily towards getting steam or hot water for the generation of electricity from hot but dry rocks within the earth's interior.

State --

One paper presented at the American Nuclear Society's annual meeting dealt with exploration techniques utilized in exploring for geothermal resources. Our principal academic institutions are well-qualified from the standpoints of scientific personnel, laboratories and geophysical equipment to make investigations for these resources in Arizona, but unfortunately lack the necessary funds for a long-range program. Hopefully, some of the "by-products" of the geophysical investigative pro-

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July 10, 1972
Page Five

jects to be performed by the Geophysical Laboratory, U. of A., will be some leads to potentially favorable areas for geothermal resources. Dr. Sauck, geophysicist, ASU, this past Spring was making a gravity meter survey of a caldera between the Goldfields and Superstition mountains east of Phoenix. NAU may also have some restricted programs underway.

The planned Skylab space flight will furnish photography that should be useful in detecting large calderas not easily seen on normal photography obtained from aircraft. Any such calderas revealed by the Skylab photos would warrant geological and geophysical investigation.



J. N. C.

JNC:st



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June 21, 1972

Memo: Commissioners
From: John Bannister

Pursuant to your authorization, John Bannister, Bill Allen and Jack Conley attended the 18th annual Session of the American Nuclear Society in Las Vegas, Nevada. The portion of the program attended by the Commission personnel concerned geothermal energy.

During the three sessions, i.e., Monday, June 19th, a.m. and p.m. and Tuesday, June 20th, a.m., we heard sixteen papers. The first session on Monday, in general, covered the current status of geothermal exploration, both world-wide and locally, as well as current research being conducted both here and abroad.

The Monday afternoon session concerned the production of geothermal energies and the environmental effects of the use of geothermal resources.

Tuesday morning papers were concerning various methods of stimulating geothermal resources, such as the introduction of waters, fracturing of the formation, etc.

I will not bother to list the titles or authors of all the papers given, however they are available should you be interested. On registration we were furnished a brief of the papers to be given and will receive the complete text later. The technical information given to us came at such a fast and furious pace that there was too much to digest it all. We are looking forward to receiving the complete text to study at a more leisurely pace.

It was interesting to meet various people from throughout the Nation who are interested in geothermal resources and to note that our statutes and regulations have apparently received a wide distribution that I had not anticipated at this time, inasmuch as we received numerous congratulations on this particular line of our work.



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GEOHERMAL RESOURCES MEETING

LAS VEGAS, NEVADA

June 19th and 20th, 1972

July 11, 1972

Memo from W. E. Allen, Director
Enforcement Section

The writer, together with John Bannister and Jack Conley, attended the meeting on Geothermal Resources in Las Vegas on June 19th and 20th. These sessions were held in connection with the annual meeting of the American Nuclear Society.

There were a total of sixteen papers presented. These papers covered topics ranging from the initial exploration for geothermal resources to utilization of the resource and reservoirs stimulation. Because of the lack of sound and proven scientific data regarding this resource the papers were primarily theoretical in nature.

Exploration for geothermal resources is under way in some 25 to 30 countries. The so called "underdeveloped nations" are particularly interested in this resource. Their demand for electrical power is small and generating plants using this resource is adaptable to their needs.

At this stage of development this resource is normally associated with the generation of electricity and in some cases the desalination of water, however, there are a number of industrial and agriculture uses. It is also used for heating. New uses of this resource will undoubtedly be discovered as development progresses.

The Imperial Valley area in California is estimated to have a potential to produce upward of 20,000 MW of electricity and two million acre feet of desalted water per year. There is also speculation that some of the exhausted steam might be used for crop fogging during periods of frost.

The only paper delivered by an engineer at this meeting brought out the fact that well spacing, hole size, reserves and production practices were still matters of conjecture - as a matter of fact such a little is actually known concerning the exploration for, developing and utilization of this resource that even the experts readily admit that their ideas are based largely on theory instead of fact.

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Geothermal Resources Meeting
Mr. W. E. Allen

Almost all the papers touched on depletion. Whether this was reservoir depletion or well depletion was not clear. Some authors mentioned a well life of seven to ten years. This could be due to scaling and precipitation of particulate matter within the well bore. In my opinion this condition would not be considered reservoir depletion. Earlier information had led me to believe that a geothermal resource reservoir would be practically inexhaustible.

There are several methods being studied for both stimulating and creating a geothermal reservoir. As of now a nuclear device seems to offer the most attractive possibilities for increasing recovery of this resource.

The entire theme of this meeting emphasised the vast amount of power potentially available from the many geothermal areas in the world. The prime problems are locating the areas and then developing the technology to fully exploit this resource.

The meetings ran straight through without a break. This did not allow the opportunity to discuss the many questions and ideas that we would have liked to.

In general this meeting was informative. However, this office still needs to have the opportunity of discussing the actual drilling and production practices related to this resource in order to administer our newly adopted rules in a completely intelligent and efficient manner.



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June 21, 1972

TO: Ralph W. Bilby, Chairman
Robert A. Bledsoe
F. Keith Benton
W. Roger Hafford

FROM: J. N. Conley

SUBJECT: 1972 ANNUAL MEETING, LAS VEGAS, NEVADA,
JUNE 18-22, 1972 -- AMERICAN NUCLEAR SOCIETY

The geothermal energy resources sessions had the best attendance of any of the numerous sessions being held concurrently. In addition to members of the host society, numerous representatives of oil, power, and geophysical exploration companies were present.

The theme of the sessions was essentially a "state-of-the-art" report on all phases of geothermal energy resources. The first five papers dealt with geothermal energy production; the next six with stimulation concepts for geothermal energy production; and the final paper with nuclear explosion engineering.

As the representative of the Geology Section of this Commission I was most interested in the papers pertaining to the occurrences of geothermal resources, geothermal resources research, characteristics of geothermal resources, exploration for geothermal resources, and the environmental aspects which must be considered before applications to drill for geothermal resources can be approved.

There were no direct references to geothermal resources in the State of Arizona. However, some of the papers presented information relative to geothermics that could be or actually are applicable to Arizona. Some of these informational items are mentioned or discussed in the balance of this report.

Memo: Commissioners
June 21, 1972
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Types of geothermal energy systems.

Dry steam, hot water, and hot dry rock. Hot dry steam has been discovered at The Geysers area of California and at Yellowstone National Park in Wyoming. The hot rock resource exists everywhere. The only question is the depth to practically useful temperatures which start at 170°C (338°F) - 180°C . Hot water geothermal resources are known to be widespread in the western third of the continental United States.

Arizona has hot water occurrences in wells and springs, but none at present with temperatures of 170°C or greater. In view of the numerous periods of volcanism, the State should have some undiscovered hot water and hot rock resources of economic value. It may have some dry steam resources. The general consensus of opinion, however, was that the occurrence of this type of resource will be extremely rare.

Exploration for geothermal resources.

Geothermal exploration is the combination of science and technology that attempts to find and delimit concentrations of geothermal energy. The thermal energy sought is stored in both the solid rock and in water and steam filling pores and fractures.

Preliminary exploration entails inventory of hot springs, wells, evaluation of volcanological and structural setting, and assessment of regional geophysics. Geochemical and isotopic analyses of the hot waters can provide information about the fluids and temperatures at depth and the origin and circulation of the fluids.

Final definition of a prospect utilizes various geophysical methods. The authors of the paper pertaining to exploration for geothermal resources stated that thermal, electrical, and passive seismic methods are the most useful geophysical tools. They also stated that..."both gravity and explosion seismology are useful in defining subsurface geologic structure, but do not help in defining the limits of a geothermal reservoir. Magnetic surveys have proved of little value."

I concur with their statements as to the usefulness of the gravity meter, seismograph and magnetometer in defining the limits of a geothermal reservoir. It is my belief, however, that these three geophysical tools can be of great value in isolating or semi-isolating areas favorable for the occurrence of geothermal reservoirs.

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June 21, 1972
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The final phase of geothermal exploration, of course, is the drilling of a test well. This is the most expensive phase. Generally, within the overall Rocky Mountain Region, oil and gas test holes cost between \$10.00 and \$15.00 per foot. Geothermal test holes can be much more expensive. This is particularly the case for holes drilled in metamorphic rocks, and where several strings of pipe are required.

Environmental aspects.

Producing geothermal power plants operating on dry steam or hot water present no serious environmental problems.

Land impact. Because steam or hot water cannot be moved far without serious heat loss, the generating plant must be located near the steam or water wells. Since only a small part of the geothermal field is required for the plant facilities, the rest can be utilized for other purposes, such as farming or grazing.

Air impact. A dry steam system can emit some non-condensable gases, such as carbon dioxide and hydrogen sulfide. The latter gas would be objectionable, if present in appreciable concentrations. The very small volume released to the atmosphere at The Geysers field is not harmful, but is objectionable as to odor. This problem is being solved technologically.

Hot water systems can be designed to prevent the release of objectionable gases.

Water impact. Unlike coal-fired and nuclear-powered thermal power plants, geothermal plants are unique in that they do not require a supplementary source of cooling water. At The Geysers field, for example, about 20% of the fluid brought to the surface is returned to the underground reservoir where it originated. Of importance to Arizona, a geothermal plant (dry steam or hot water system) is not competing with other water users but is producing from a previously untapped supply.

There are some hot water geothermal resource prospects where large volumes of water containing objectionable substances can be expected. There is now sufficient technology "know-how" available to prevent the release of such waters on the surface or into subsurface aquifers.

The stimulation of hot rock geothermal systems, or to improve productive rates of dry steam or hot water wells by nuclear underground explosions presents many serious environmental hazards. The principal one would be the release of radioactivity to the atmosphere and to ground water. This

Memo: Commissioners
June 21, 1972
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hazard would exist long after abandonment of plant operations. Other hazards would include the possibility of seismic damage to natural formations and man-made structures.

Chemical explosives and hydraulic-fracturing methods of stimulation present no environmental hazards. However, although a vast amount of knowledge is available in the use of these techniques to stimulate oil and/or gas production, very little experimental work has been done in the geothermal field.

Water from geothermal energy.

Of interest to Arizona was a paper discussing the possibility of using geothermal resources as pollution-free energy supplies for power production and desalting. The Imperial Valley, California, geothermal resource area offers a hot-brine system estimated to have the potential to produce upwards of 20,000 MW of electricity and two million acre-feet per year of desalted water. Most of the electricity that could be produced in the Imperial Valley would likely be used to supply increased power needs of California. The diversion of 20,000 MW of electrical energy could be expected to produce 18 million acre-feet of fresh water. This volume could satisfy the projected needs of Southern California and help relieve water resources in the Lower Colorado River Basin.

A news release by the U.S. Bureau of Reclamation in the ARIZONA REPUBLIC edition of May 15, 1972 stated that drilling could now be started on a geothermal prospect about 40 miles west of Yuma. A subsequent news release stated that a contract for the drilling of a 6,500-foot well 7 miles southeast of Holtville, California had been let.

Federal, state, and industry co-operation; regulation.

One paper mentioned that the federal and state governments, the University of California, and industry were co-operating in exploring the possibilities of developing the Imperial Valley geothermal resource. None of the speakers mentioned regulation of geothermal exploration and exploitation by federal or state agencies. One or two of the speakers did mention that two courts had ruled that geothermal resources are depletable, and therefore entitled to a depletion allowance.

Memo: Commissioners
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Economics.

The production costs of electric power from geothermal energy at The Geysers compare favorably with those of PG&E's largest nuclear and supercritical fossil-fueled units. The Geysers' power plants operate on dry steam. The cost figures for hot water systems are considerably higher currently, but are expected to be competitive as the prices for fossil fuels, particularly natural gas, continue to escalate. Cost figures for hot rock systems are largely guesses at this stage.

Conclusions.

Although Arizona was not specifically mentioned by any of the speakers, the information presented certainly was highly indicative that the State does have potentialities for geothermal fields. Perhaps the most encouraging aspect is the depth factor. Most of the potentially productive hot rock and hot water geothermal resource areas mentioned would require drilling depths of 12,000 to 30,000 feet. Such resources, if present, can be probably expected in Arizona at appreciably shallower depths.


J.N.C.

JNC:st

cc: John Bannister



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June 14, 1972

Memo: Commissioners
From: John Bannister

I recently attended the Interstate Oil Compact Commission meeting held in Hot Springs, Arkansas. Commission Chairman, Governor Stanley Hathaway of Wyoming, attended, as did Bruce King, Governor of the Mexico; Governor Robert Docking of Kansas; and Governor Dale Bumpers of Arkansas, our host.

As you are aware, I am the representative of Governor Williams to this Compact Commission. In addition to this, I am a member of the Regulatory Practices Committee, member of the Environmental Protection Committee, and a member of the Subcommittee on Water Injection of the Environmental Protection Committee.

This latter sub-committee had a meeting at 2 p.m. on Sunday, June 11th, which I attended, wherein a questionnaire which will go to all regulatory agencies concerning handling of water injection by each state, from an environmental protection position, was discussed and approved by the sub-committee. This report and recommendation were submitted on Monday to the meeting of the full committee and approved and adopted.

On Monday morning, June 12th, I attended the meeting of the Regulatory Practices Committee and then the joint technical session. This joint technical session had a most interesting paper on micellar solution flooding in order to stimulate additional protection from reservoirs. In addition to the paper on the technical aspects of this particular type of flooding, a panel composed of members from the Federal Power Commission and the National Gas Survey discussed the forthcoming program of the Federal Power Commission wherein it will go to the regulatory offices in the states of the various members in order to try to determine the amount of gas reserve contained in the United States. This will be a very large undertaking. This Commission has indicated that it will cooperate in the study and, at some future date, a team from FPC will come to this Commission for information.

Memo: Commissioners
From: John Bannister
6-14-72
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As I have indicated, Monday afternoon the Environmental Protection Supervisory Committee met and, after the usual business, we enjoyed a very informative film on the proposed trans-Alaska pipeline.

Following this meeting was the first of two general business sessions held by the Commission and presided over by Governor Hathaway.

On Tuesday, June 13th, the second general business session was conducted. Addresses were given to the delegates by the above-mentioned Governor, as well as some remarks by General George Lincoln, Director of the Office of Emergency Preparedness, concerning international security and the effects of our oil and gas crisis on this problem. General Lincoln expressed the opinion that the United States is close to its total producing capacity and that, short of additional discoveries, we will have to look elsewhere for energy needs. He urged the use of such conservation tools as unitization to do all possible to keep the production capacity of the United States at a safe level.

Harry True, President of True Oil Company, and Michael Halbouty, internationally famous geologist, addressed the group. Both expressed the feeling that America has great potential and can buy sufficient energy, should ample financial rewards be present.

OIL AND GAS CONSERVATION COMMISSION
4515 N. 7th Avenue
Phoenix, Arizona 85013

Minutes of Meeting
June 16, 1972

Present:

Mr. Ralph W. Bilby, Chairman
Mr. Robert A. Bledsoe, Member
Mr. F. Keith Benton, Member

Absent:

Mr. W. Roger Hafford, Member

The regular Commission meeting for the month of June, 1972 was called to order by Chairman Ralph Bilby at 10:00 a.m.

Mr. Bilby introduced Mr. F. Keith Benton of Yuma, Arizona, new Member of the Commission.

Minutes of meeting of May 9, 1972 were approved as written.

Reports of Executive Secretary, Enforcement Section and Geology Section were accepted.

Executive Secretary reported on the Midyear Meeting of the Interstate Oil Compact Commission in Hot Springs, Arkansas, June 10 to 13, 1972.

Executive Secretary advised that the Four Corners Regional Commission has approved a \$14,000 technical assistance grant for geophysical and geological exploration to be conducted by the University of Arizona under the direction of the Commission.

Motion was made and passed that the July meeting of the Commission be held in Nogales, Arizona. Executive Secretary was instructed to make necessary arrangements for the meeting.

Executive Secretary advised that a tentative budget will be prepared for the July meeting. As the books for the 1971-72 year do not close until July 31, 1972, a final budget cannot be completed for the July meeting.

Mr. J. N. Conley, Director of Geology Section, advised that the cores stored in Holbrook, Arizona, which were given to the Commission by Arkla Exploration Company, have been transported to Phoenix and are being stored by Arizona State University at Tempe, Arizona. Letters of appreciation have been written to the National Guard of Arizona for the trucks and personnel who made the move possible. Arizona State University has employed a geologist

Minutes of Meeting
June 16, 1972
Page 2

who is primarily a stratigrapher and paleontologist and it is anticipated that he will begin investigation of the cores.

Mr. Conley advised that Goodyear Aerospace Corporation, with offices and laboratories in Litchfield, Arizona, may be able to secure a declassification on some airborne radar imagery of the State of Arizona which was performed under contract with the United States Air Force. This would be a useful supplementary tool in the interpretation of land forms, structures, etc.

Meeting adjourned at 11:30 a.m.

APPROVED July 21, 1972

Ralph W. Bilby, Chairman

AGENCY Oil & Gas Conserv. Comm.

DIVISION

IDENTIFICATION CODE NO.

1	2	3	4
CLAIMS PAID YEAR TO DATE	OBJECT CODE NO.	DISTRIBUTION OF EXPENDITURES CLASSIFICATION	CLAIMS PAID MONTH OF
			<u>June 1972</u>
1,770.00	7111	1 Per Diem: Board Members	1 180.00
86,325.94	7112	2 Salaries: Employees	2 7,603.18
212.16	7113	3 Wages: Summer Aides	3
235.12	7151	4 Industrial Insurance	4
3,056.49	7153	5 F.I.C.A.	5 395.88
4,316.59	7155	6 Retirement	6 380.18
301.00	7159	7 Personnel Commission	7
	7215	8 Professional Services: Engineer	8
964.12	7219	9 " " Other	9 768.00
770.20	7221	10 Travel - State: Mileage	10 87.80
1,935.72	7222	11 Subsistence	11 379.72
76.61	7223	12 Public Transp.	12
2,332.89	7224	13 Vehicle Exp.	13 339.11
50.45	7225	14 Reg. Fees, Parking, etc.	14 3.00
1,023.00	7233	15 Travel-Out of State: Subsistence	15 270.00
1,760.88	7232	16 Public Transp., Taxi	16 402.96
	7234	17 Airport Parking	17
412.50	7235	18 Reg. Fees, Tel., etc.	18 185.00
22,193.52	7251	19 Occupancy: Office Rent	19
1.00	7261	20 Warehouse Rent	20 1.00
	7263	21 Warehouse Mtn. & Repair	21
239.50	7272	22 Mtn. & Repairs: Furn. & Equip.	22 21.00
1,959.29	7280	23 Office Supplies	23 168.02
455.63	7300	24 Field Supplies, Film, Am.Strat, P.I., etc.	24 34.99
1,506.64	7331	25 Printing: Reports, Large Maps, etc.	25 589.36
219.76	7332	26 Legal Advertisement	26 126.41
90.00	7333	27 Court Reporter	27 27.00
856.60	7334	28 Postage	28 1.05
2,354.25	7335	29 Telephone	29 333.39
8.75	7337	30 Drayage, Express, etc.	30
67.27	7349	31 Rental, Misc.	31
145.60	7360	32 Dues and Subscriptions	32
623.37	7431	33 Capital Outlay: Office Equip., Tpr., etc.	33
907.92	7433	34 Reproduction Equip.	34
554.39	7434	35 Spec. Equip.	35
	7913	36 Revolving Fund	36 (250.00)
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137,757.16

TOTAL

12,047.05

OFFICE

(DO NOT WRITE BELOW THIS LINE)

FIELD

MONTHLY FINANCIAL REPORT

1 RECEIPTS MONTH OF <i>June 1972</i>	2 CLASSIFICATION	3 APPROPRIATED RECEIPTS	4 UNAPPROPRIATED RECEIPTS	5 TOTAL ALL RECEIPTS YEAR TO DATE
<i>50 00</i>	1 Permits to Drill		<i>50 00</i>	<i>675 00</i>
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<i>50 00</i>	TOTAL CURRENT MONTH RECEIPTS		<i>50 00</i>	XXXXXXXX
	TRANSFERS IN			
XXXXXXXX	BALANCES BROUGHT FORWARD		<i>2,326 83</i>	XXXXXXXX
<i>50 00</i>	TOTALS - MONTH AND YEAR TO DATE		<i>2,376 83</i>	<i>675 00</i>

6 CLAIMS PAID MONTH OF <i>June 1972</i>	7 EXPENDITURES FUND TITLES	8 TOTAL AMOUNT AVAILABLE YEAR TO DATE	9 CLAIMS PAID YEAR TO DATE	10 OUTSTANDING ENCUMBRANCES	11 UNENCUMBERED BALANCE
<i>7,783 18</i>	1 Personal Services	<i>90,369 00</i>	<i>88,305 10</i>		<i>2,060 90</i>
<i>776 06</i>	2 Emp. Related Exp.	<i>8,759 00</i>	<i>7,909 20</i>	<i>300 00</i>	<i>549 80</i>
<i>1,052 22</i>	3 Other Operating Exp.	<i>30,900 00</i>	<i>30,097 81</i>	<i>437 57</i>	<i>364 62</i>
<i>768 00</i>	4 Prof. & Outside Serv.	<i>1,700 00</i>	<i>964 12</i>		<i>735 88</i>
<i>809 63</i>	5 Travel - State	<i>7,500 00</i>	<i>5,115 87</i>	<i>501 76</i>	<i>1,832 37</i>
<i>857 96</i>	6 Travel - Out of State	<i>3,500 00</i>	<i>3,226 38</i>		<i>273 62</i>
-	7 Cap. Outlay - Equip.	<i>2,100 00</i>	<i>2,085 68</i>		<i>14 32</i>
-	8 Salt Monitoring	<i>2,000 00</i>			<i>2,000 00</i>
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<i>12,047 05</i>	TOTALS	<i>146,828 00</i>	<i>137,757 16</i>	<i>1,239 33</i>	<i>7,831 51</i>