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		1	50-275 50-323

DESCRIPTION:
Ltr re our 1-24-73 ltr....furnishing comments on Draft Enviro Statement for Diablo Canyon.....

ENCLOSURES:

ACKNOWLEDGED DO NOT REMOVE

PLANT NAMES: Diablo Canyon Units 1 & 2

FOR ACTION/INFORMATION 2-9-73 fod

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LB

GEOTHERMAL ENERGY INSTITUTE
11 EAST 47TH STREET
NEW YORK, NEW YORK 10017
TEL.: (212) 758-5338

January 30, 1973

United States Atomic Energy Commission
Washington, D.C.

Regulatory File Cy.

Re: Draft Environmental Statement prepared by the Directorate of Licensing in respect of proposed Diablo Canyon Nuclear Reactor Power Pants to be located on the California coast
Docket Nos. 50-275, 50-323.

Gentlemen:

We submit the following comments in response to the draft environmental impact statement furnished to us on January 24, 1973:

1. The staff fails to present any adequate qualitative analysis of the environmental impact which will result from the applicant's operation of liquid radioactive waste system, radioactive gaseous waste system and radioactive solid waste system.

2. The staff fails to present any adequate qualitative analysis of the environemental impact which will result from the discharge of chemicals to the environment by the proposed power plant. The staff purports to calculate projected 'dilution' of the expected chemical wastes but does not evaluate the impact of those wastes or reactor coolant chemical 'leaks'.

3. The staff fails to present any qualitative evaluation of the environmental impact which will result from the transport of nuclear fuel from South Carolina, or the transport of irradiated fuel back to South Carolina where it may be reprocessed, or the transport of solid radioactive wastes to a "burial site" (which has not yet been disclosed by the applicant).

4. No evaluation is given with respect to the the environemntal impact which may arise as a result of theft of radioactive materials. See "Preventing Nuclear Theft", Ed., R.B. Leachman and P. Althoff (1972); Safeguard Report of the Institute of Nuclear Materials Mnagement (May, 15, 1970).

5. The staff's evaluation of alternative sources (p.12-1 ff) is vague, unspecific, unfactual and lacking in substantive content.

- The staff refers to a "vendor of the geothermal steam". By this we assume the staff refers to Union Oil Company which is the operator of a joint venture (composed of Thermal Power Company, Magma Power Company and Union) which is delivering geothermal steam to 8 turbine-generator sets owned by the applicant at the Geysers geothermal field in Sonoma County, CALIFORNIA.

The staff ignores the fact that Union has accelerated

the rate of development on the 15,000 acres controlled by the joint venture. A third drilling rig has been placed into operation on that property, so that three rigs will be operating continuously.

In addition, the staff fails to refer to the fact that Magma and Thermal are proceeding independently of Union to develop additional geothermal steam sources. At the Geysers Thermal and Magma are planning a new unit which will be built on top of a large geothermal well heretofore permitted to exhaust to atmosphere and considered merely as a 'rogue bore'.

Magma recently established a substantial geothemmal field in the Suprise Valley of Northern California.

The California Dvision of Oil and Gas estimates of August 1972 are substantially in conflict with the staff's proven reserve figure of 750 MW. See Oil and Gas Journal, January 29, 1973.

The staff ignores the vast proven reserves established at the Geysers by Pacific Energy Corporation, which controls about 20,000 acres within the Geysers KGRA (known geothermal resource area) and the reserve report published in respect thereto. See letter of DeGoyler & MacNaughton attached hereto. PEC has successfully drilled two additional geothermal steam wells since that report was written.

The staff ignores the proven reserves established by Signal Oil & Gas Company at the Geysers and the continuing development program that company and Sun Oil Company are engaged in.

The staff ignores the development program at the Geysers undertaken by Cinta Oil Company of San Francisco.

The staff ignores the geothermal potential at Mono Lake.

The staff ignores the vast geothermal potential of Southern California where Standard Oil Company of California, Phillips Petroleum Corporation and others have exploration programs underway; the staff once agaain fails to evaluate the fact of the establishment of a 75,000 kw geothermal power plant at Cerro Prieto just south of El Centro, California and the fact that drilling operations north of Cerro Prieto have resulted in further geothermal steam discoveries.

The staff suggests that "subsidence" may be a problem in geothermal operations. In New Zealand, where subsidence occured for some years - no difficulties were experienced, no undue environmental impact took place - and the subsidence stopped in 1970. In Iceland where geothermal operations have been conducted for a number of years, no subsidence has occured. At the Geysers in northern Calfiornia, no subsidence has occured.

The staff refers to considerations of land use. It's estimates of land use are erroneous. They are apparently based on the assumption that geothermal steam wells are placed on 20 or 40 acre spacing. PEC has demonstrated that 5 acre spacing is adequate. Signal Oil Company and Phillips Petroleum Corporation are preparing to drill directionally from one position and eliminate several drilling positions. In addition, new technology now in development will permit small generation units to be placed directly on the well-head and eliminate the need for large plant areas.

We might point out that the applicant is nonetheless building larger units. It has ordered a single 140,000 kw unit for use at the Geysers.

In our opinion, the staff is not qualified to make an adequate evaluation of geothermal energy as a viable energy alternative to nuclear power plants and is clearly biased in favor of nuclear power. The staff's recent competitive activities bear this out.

We therefore find the draft environmental statement to be wholly inadequate in the above respects and as failing to meet the standards required by the National Environmental Protection Act.

Very truly yours,

Donald F. X. Finn

Donald F.X. Finn
Executive Director

PLEASE NOTE OUR NEW ADDRESS:

ROOM 429
680 Beach Street
San Francisco, California 94109

Tel.415-885-6663

cc: Environmental Protection Agency
Council On Environmental Quality

P.S. I am particularly concerned over the total lack of consideration demonstrated by the staff evidenced by its total failure to evaluate the obvious geothermal potential of San Luis Obispo County - information readily [illegible] The State Geological authorities.

DEGOLYER AND MACNAUGHTON
5625 DANIELS AVENUE
DALLAS, TEXAS 75206

TELEPHONE
AREA CODE 214
368-6391

CABLE DEMAC

July 17, 1972

Pacific Energy Corporation
4676 Admiralty Way
Los Angeles, California 90291

Gentlemen:

Pursuant to your request, we have conducted an appraisal of your geothermal steam properties within The Geysers "Known Geothermal Resources Area" (KGRA) in Sonoma, Lake and Mendocino Counties in Northern California, as defined by the U. S. Geological Survey. In conducting this appraisal, we have relied upon our past investigations of The Geysers KGRA, our prior evaluations of your Rorabaugh and Bruno subleases, and upon confirmation of our earlier conclusions by subsequent drilling on those leases.

As of this date, you have completed four wells on your Rorabaugh sublease on which two commercial wells were completed by the previous owner. One well currently is being drilled. The combined productive capacity of completed wells is approximately 1,000,000 pounds of steam per hour, which is the amount required to operate one 55,000 kilowatt generating plant.

Based on the foregoing, it is our opinion that 373 acres of the Rorabaugh and Bruno subleases are reasonably classified as proved and probable for commercial steam production. The remaining 807 acres in these two subleases comprise an area for possible geothermal steam development. You also own leases covering approximately 13,000 acres within such KGRA which are more remote from developed and producing geothermal steam properties and which also should be classed as possibly productive. No values have been assigned to such leases.

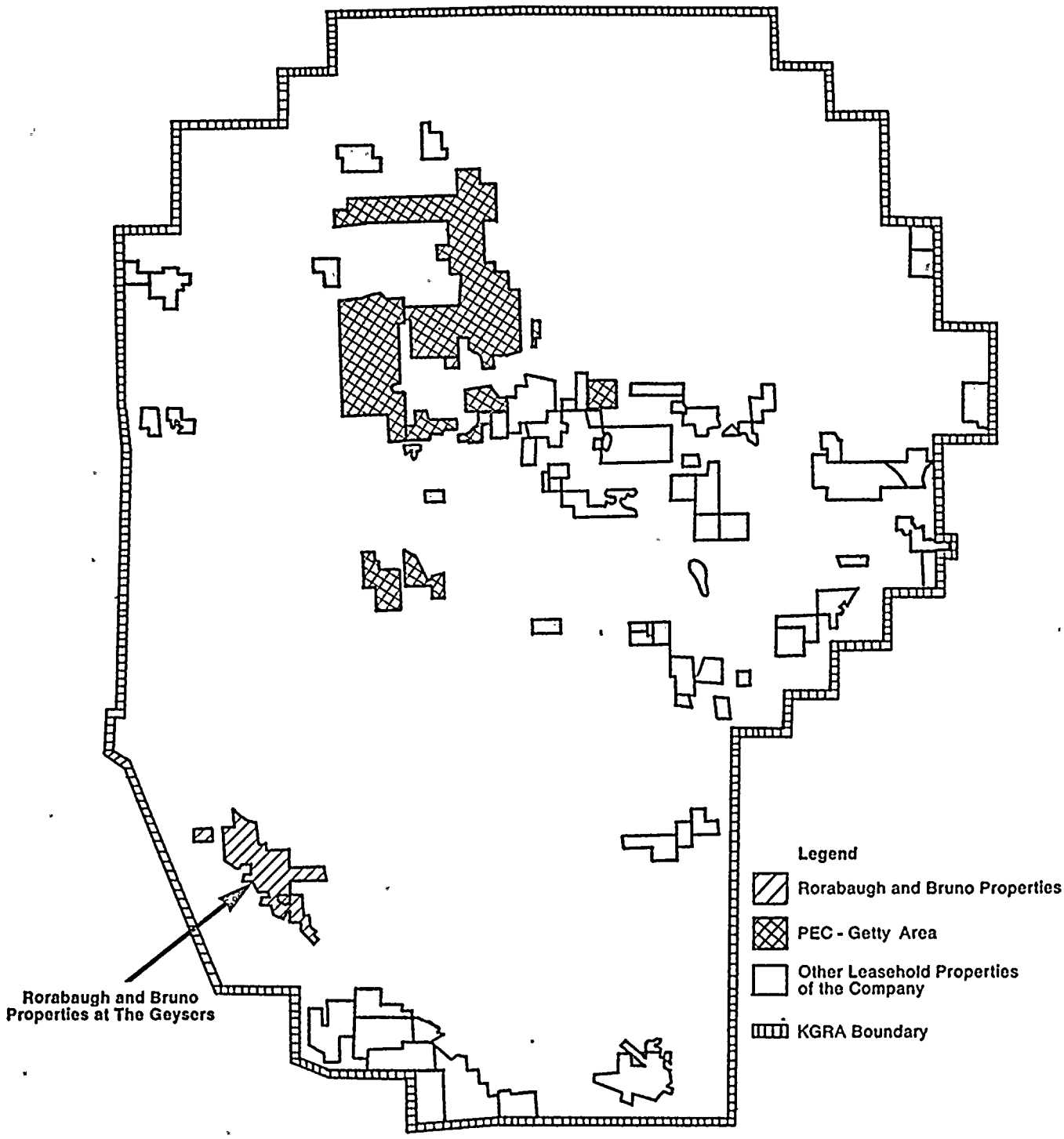
For your further information, we estimate that the development of the 373 acres will produce, through 1990, 1.2 trillion pounds of steam which is equivalent to 60 million kilowatt hours of electrical energy and which will yield a future net revenue (gross revenue less drilling and operating costs and payment of royalties and production payments) of $56 million.

Submitted,

DeGolyer and MacNaughton

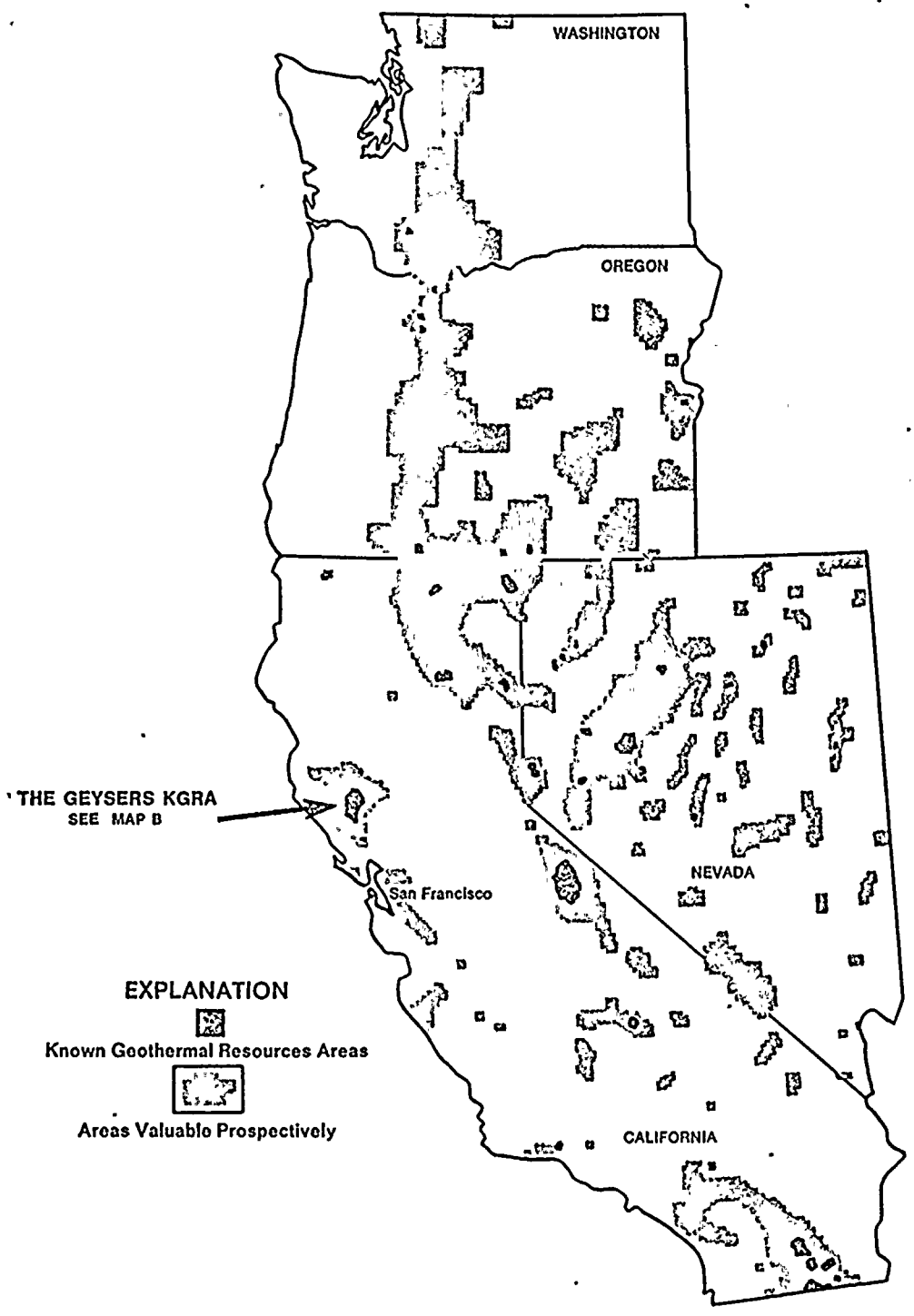
DeGOLYER and MacNAUGHTON

MAP B



THE GEYSERS KGRA

MAP A



Map of the Western States, showing lands classified for geothermal resources effective December 24, 1970—Source: United States Department of the Interior, Geological Survey Circular 647.

productive GRI wells for the disposal of plant condensate and liquid effluent, if any, from producing wells. GRI wells not used for either of the foregoing purposes will be permanently abandoned in accordance with the applicable rules and regulations of the California Division of Oil and Gas.

The Company's development program on its Rorabaugh and Bruno Properties contemplates the drilling of a series of production units with the deliverability of approximately 1,000,000 pounds of steam per hour per unit with each unit to consist of six wells spaced at such intervals as good engineering and producing policies dictate, provided that sufficient quantities of steam are encountered and that arrangements can be made for the sale of such steam. Management anticipates that, subject to the foregoing, additional wells will be completed at the rate of one well each 90 to 120 days for each drilling rig utilized. Although no assurance can be given that commercial quantities of geothermal steam will be discovered in any future well, the Company believes, on the basis of its completed wells and the evaluation of DeGolyer and MacNaughton (see "DeGolyer and MacNaughton Report" at page 13), that the acreage available on the Rorabaugh and Bruno Properties for drilling operations possesses sufficient probabilities for commercial production to warrant continuation of the minimum drilling program indicated above.

Drilling techniques for geothermal steam are similar to those employed for oil and gas but must allow for higher temperature gradients than are normally encountered in oil and gas well drilling. Each of the steam wells completed at The Geysers by the Company has been drilled by an independent, unrelated drilling company on a fixed price, turnkey contract basis. The typical contract provides for additional services, including well deepening, running tests, side tracking and other operations as requested by the Company, at various rates of additional compensation. Each future well drilling contract will be separately negotiated and may be on different terms. The Company does not intend to acquire or operate drilling rigs at any time in the foreseeable future.

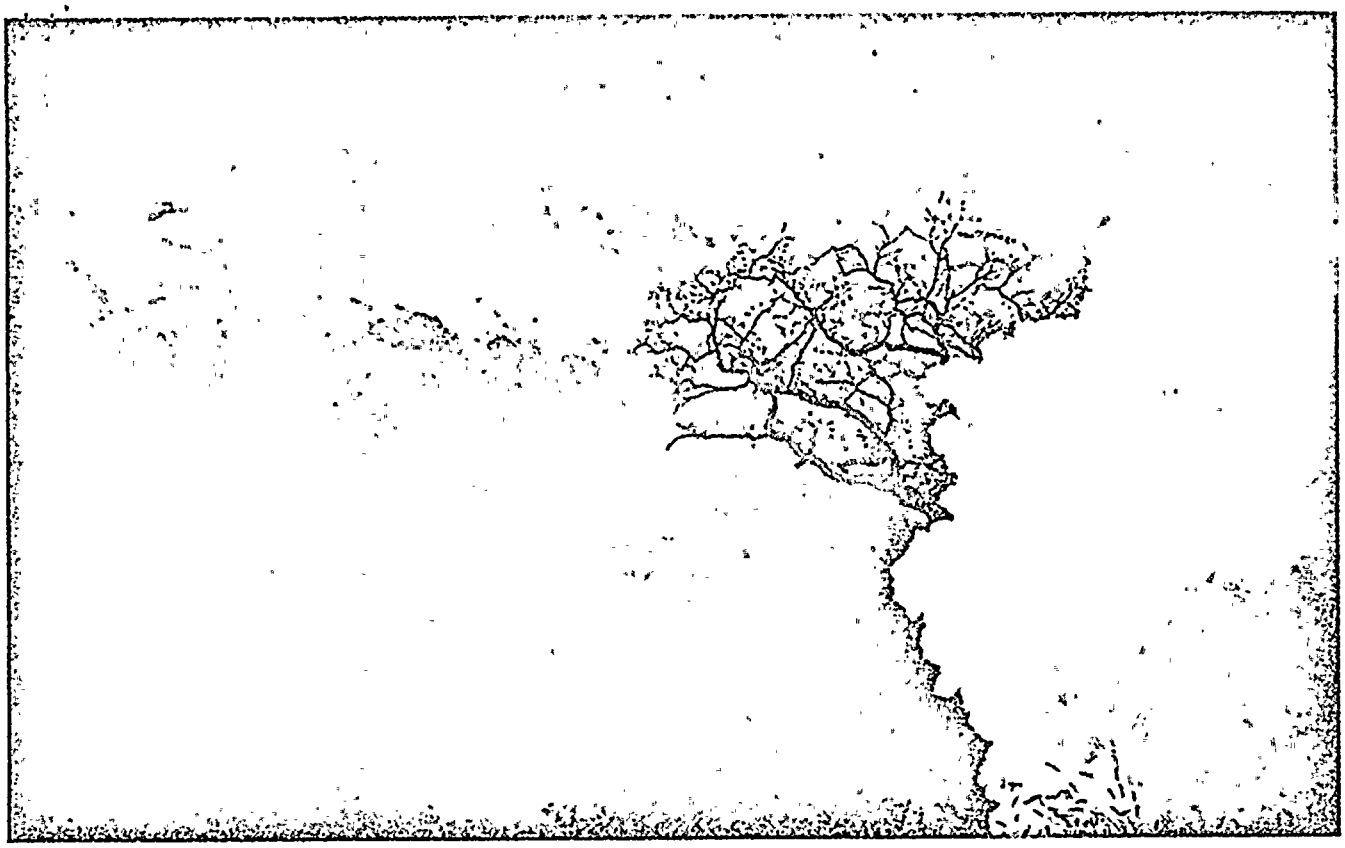
The Company supervises all drilling and well completion operations and expects to maintain and operate its productive steam wells following completion. The Company also will construct and maintain pipes to transmit steam produced from the Company's wells to any electric generating plant which may be installed to utilize steam from the Company's properties.

TABLE A

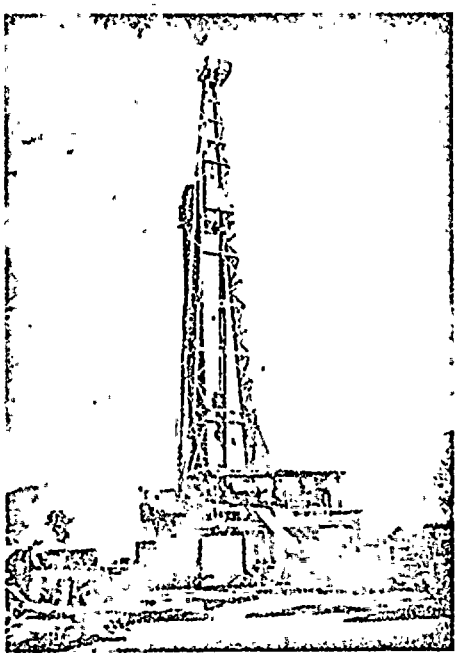
STEAM WELLS DRILLED BY THE COMPANY ON THE RORABAUGH PROPERTY

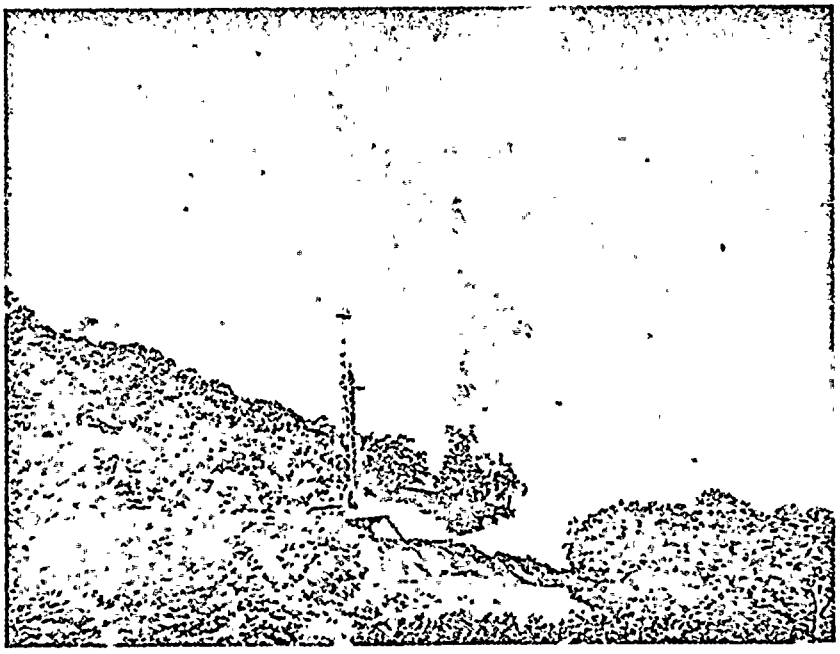
Well Name	Date Drilling Commenced	Date Well Completed	Deliverable Pounds of Steam Per Hour*	Depth of Well
Rorabaugh A-1	5/30/71	8/ 2/71	213,000	6,810 ft.
Rorabaugh A-2	9/ 2/71	10/31/71	226,800	7,150 ft.
Rorabaugh A-3	1/ 4/72	2/23/72	213,300	6,859 ft.
Rorabaugh A-4	4/ 6/72	5/17/72	167,400	7,200 ft.
Rorabaugh A-5	7/ 1/72	(Being drilled at the date of this Prospectus)		

* Per orifice plate tests.



The Geysers geothermal steam field (The Company's Rorabaugh A-1 Well in the foreground)





Drilling Rig at Rorabaugh A-1 Well site

PRELIMINARY PROSPECTUS DATED AUGUST 2, 1972.

PROSPECTUS

1,500,000 Shares

PACIFIC ENERGY CORPORATION

COMMON STOCK

$.10 Par Value

Prior to this offering there has been no public market for the Common Stock of the Company. The price of the shares offered hereby has been determined by negotiations between the Company and the Representative of the Underwriters.

THESE SECURITIES INVOLVE A HIGH DEGREE OF RISK

THESE SECURITIES HAVE NOT BEEN APPROVED OR DISAPPROVED BY THE SECURITIES AND EXCHANGE COMMISSION NOR HAS THE COMMISSION PASSED UPON THE ACCURACY OR ADEQUACY OF THIS PROSPECTUS. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

	Price to Public(1)	Underwriting Discounts and Commissions(1)	Proceeds to Company(1)(2)
Per Share			
Total			

(1) In order to cover over-allotments, if any, the Company has granted to the Underwriters a 30 day option to purchase up to an additional 150,000 shares. To the extent the option is exercised, the price to the public, underwriting discounts and commissions and proceeds to the Company will be correspondingly increased. (See "Underwriting.")

(2) Before deducting expenses payable by the Company estimated at $

This offering involves:

(a) Special risks concerning the Company. (See "Introductory Statement — Risk Factors.")

(b) Immediate substantial dilution of the net book value of the shares offered hereby from the public offering price. (See "Introductory Statement — Dilution.")

(c) The issuance to Advest Co., Representative of the Underwriters, of 5-year warrants to purchase 50,000 shares of the Company's Common Stock at $ per share (see "Underwriting"), indemnification and the right to designate an additional member of the Board of Directors (an employee of the Representative is now a director).

These shares are offered subject to prior sale, when, as and if delivered to and accepted by the Underwriters, and subject to approval of certain legal matters by counsel, the right to reject any order in whole or in part and other conditions.

PUTNAM, COFFIN, DOOLITTLE, NEWBURGER

Division of ADVEST CO.

The date of this Prospectus is , 1972

The Great Land Rush of '73...

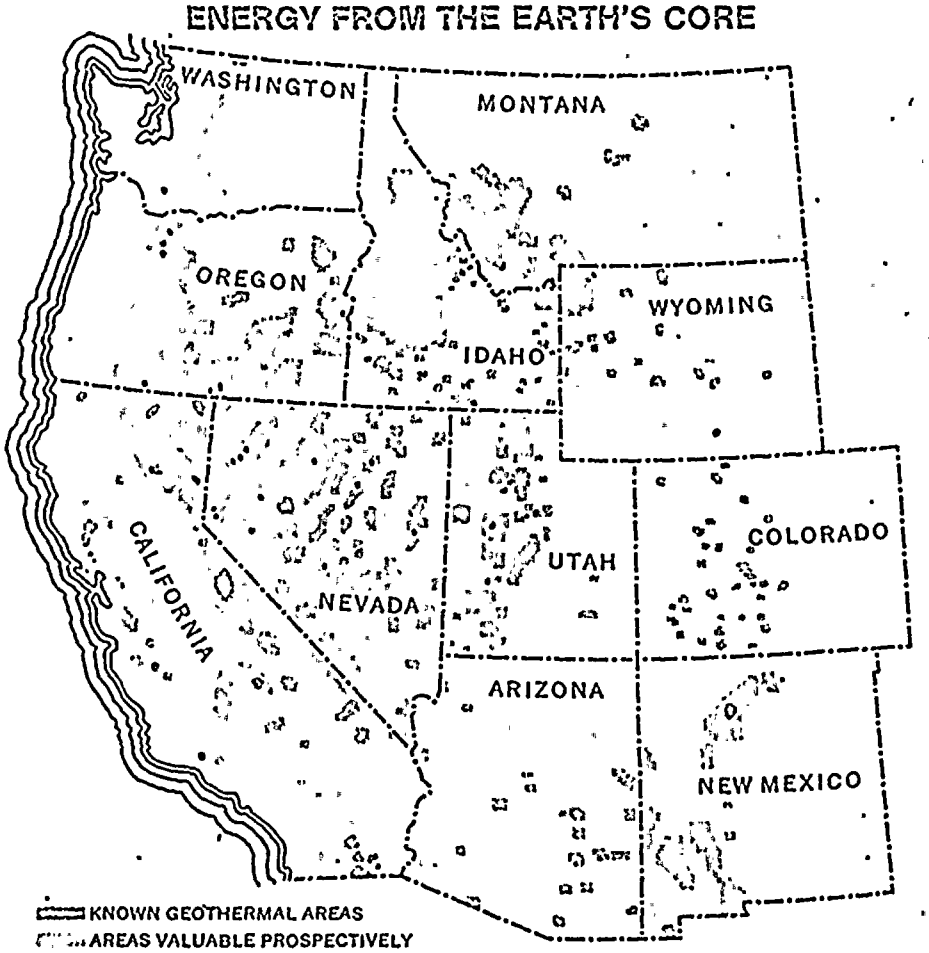
...has nothing to do with farming, little to do with minerals, but everything to do with heat.

IN DAYS OF OLD when newspapers had Sunday supplements filled with wildly improbable stories, a perennial feature showed how it was possible to generate power from the heat of the earth's core. Like as not, it would carry pictures of one of the geysers of the American West, or the installation at Larderello, Italy, that had been generating electricity from natural steam since 1904.

Well, there are some new believers these days. Within two months, the Interior Department will put up for lease 59 million acres of potential geothermal federal land in 14 western states (*see map, which excludes North and South Dakota, Hawaii and Alaska*). About 1 million prime acres—where natural steam vents or hot water pools confirm the existence of thermal wells—are expected to go at competitive bidding for about $15 per acre per year. The rest, without obvious thermal signs but deemed geologically promising, will be leased at $1 per acre per year for ten years. If no geothermal steam is found, the lease can be converted to a mineral lease if anything else of value turns up.

There is, of course, a touch of magic in geothermal power. Wells sunk into the bowels of the earth yield apparently inexhaustible amounts of steam or boiling water whose heat can be used to spin turbines and generate vast amounts of electricity. Vast amounts? A recent study sponsored by the National Science Foundation estimated that the U.S.' geothermal resources could generate 132,000 megawatts of electricity by 1985, *vs.* a current total U.S. capacity of about 350,000 Mw. It uses no foreign exchange, as imported oil would. It would probably be the cleanest power ever generated. And it's cheap: Pacific Gas & Electric already generates power from steam in the Geysers area of California for 5.3 mills per kilowatt hour—just over half a cent—*vs.* 7 mills per kwh for other thermally generated power in California and 8.5 mills to 9 mills for nuclear power.

ENERGY FROM THE EARTH'S CORE



After all, there's no fuel cost for geothermal power.

If geothermal power is so good, why hasn't it been developed already? "Because there were power sources available where the absolute costs were going down and there were no uncertainties," says Dr. Martin Goldsmith of the California Institute of Technology. "Coal and oil were cheap and readily available, and when you built a fossil-fueled plant you knew exactly what it would cost, how much power you would get and how long the plant would last. This wasn't so with geothermal power. Now there are uncertainties with conventional plants, and the costs are rising."

Among the companies currently exploring and drilling for geothermal energy are Union Oil, Standard Oil of California, Getty Oil, Phillips Petroleum, Gulf Oil and Mobil Oil. Most of these are expected to apply for leases on the federal lands, and many not now exploring are also expected to be bidders.

An additional reason for the widespread interest is the promising nature of test surveys to date, such as carried out by Senturion Sciences, a Tulsa-based geothermal research company. "We have found six very likely areas out of 31 tests we have conducted," says Senturion's President John Bailey. "We use the surface geology and underground vibrations to show us the best places to look."

The Geysers area project, like most in operation or under construction around the world, uses natural dry steam to spin its turbine generators. But San Diego Gas & Electric (FORBES, *Apr. 15*), working with Magma Power, hopes to complete a plant this year that will use heat from natural hot water, a far more common natural resource. Its success, says the Center for Energy Information, will make the northern Gulf of Mexico another likely area. Because such hot water often contains corrosive or contaminating minerals, it may be pumped back into the earth after heat has been extracted.

But perhaps the best indication of the potential of geothermal power is rising congressional interest in the subject. Two bills are expected to be introduced this session of Congress to stimulate geothermal development. They will initiate a $10-million, five-year program of research into geothermal power techniques, and establish a loan program, backed by a $20-million revolving fund, to finance private exploration and power generation from geothermal areas, the recovery of mineral by-products and even the possible desalination of water as a side benefit. ■

power under certain conditions.

Known as "Magnamax" or the binary system, the method calls for running a mixture of steam and brine through a heat exchanger to heat isobutane. The isobutane, not the steam, turns the turbines to produce electricity. The isobutane is recycled, and the steam and brine are reinjected. The closed system, while more expensive to install than conventional plants, could prove more efficient and, in the long run, more profitable.

Magma has drilled a half-dozen wells in the Imperial Valley, two of which (one for producing and one for injection) will be used for the new plant in Buttes field southwest of Niland near the southeastern shore of the Salton Sea. San Diego Gas & Electric Co. has pledged $3 million to the project.

Also in Buttes field Phillips has joined forces with Southern Pacific Land Co. and Southern California Edison Co. to develop electric power. A second purpose of the project is to recover chemicals and minerals from the geothermal fluids.

Phillips and Southern Pacific Land have a 10-year agreement to explore jointly for geothermal resources in the U.S., and the Buttes project is their first effort. Edison's role at Buttes is to assist in construction of plant facilities to generate power for its customers.

Across the border 20 miles into Mexico, the Mexican Government is ready to place on stream its own geothermal plant at Cerro Prieto. The plant, of 75,000 kw capacity, will be more conventional than Magma's at Niland. The water and steam used to drive the turbines will not be reinjected but run by gravity northward into the United States and the Salton Sea.

Elsewhere in the Imperial Valley near the Salton Sea wildcatting and developmental boister prospects for more plants. Magma has drilled two wells and Socal one in the Heber area about 5 miles north of the border near Mexicali. Socal is running tests on its 1 Nolan.

Another well of particular interest has been drilled in the East Mesa area east of Holtville, or about 17 miles northeast of Heber. The U.S. Bureau of Reclamation drilled the 8,000-ft well on the Mesa anomaly as the first phase of a $16-million project to determine whether geothermal heat can be used to desalinate water for irrigation and other purposes in the Imperial Valley. A pilot desalination plant soon will be installed. Eventually the Bureau hopes to produce 2.5 million acre-ft of water yearly and generate power at the same time.

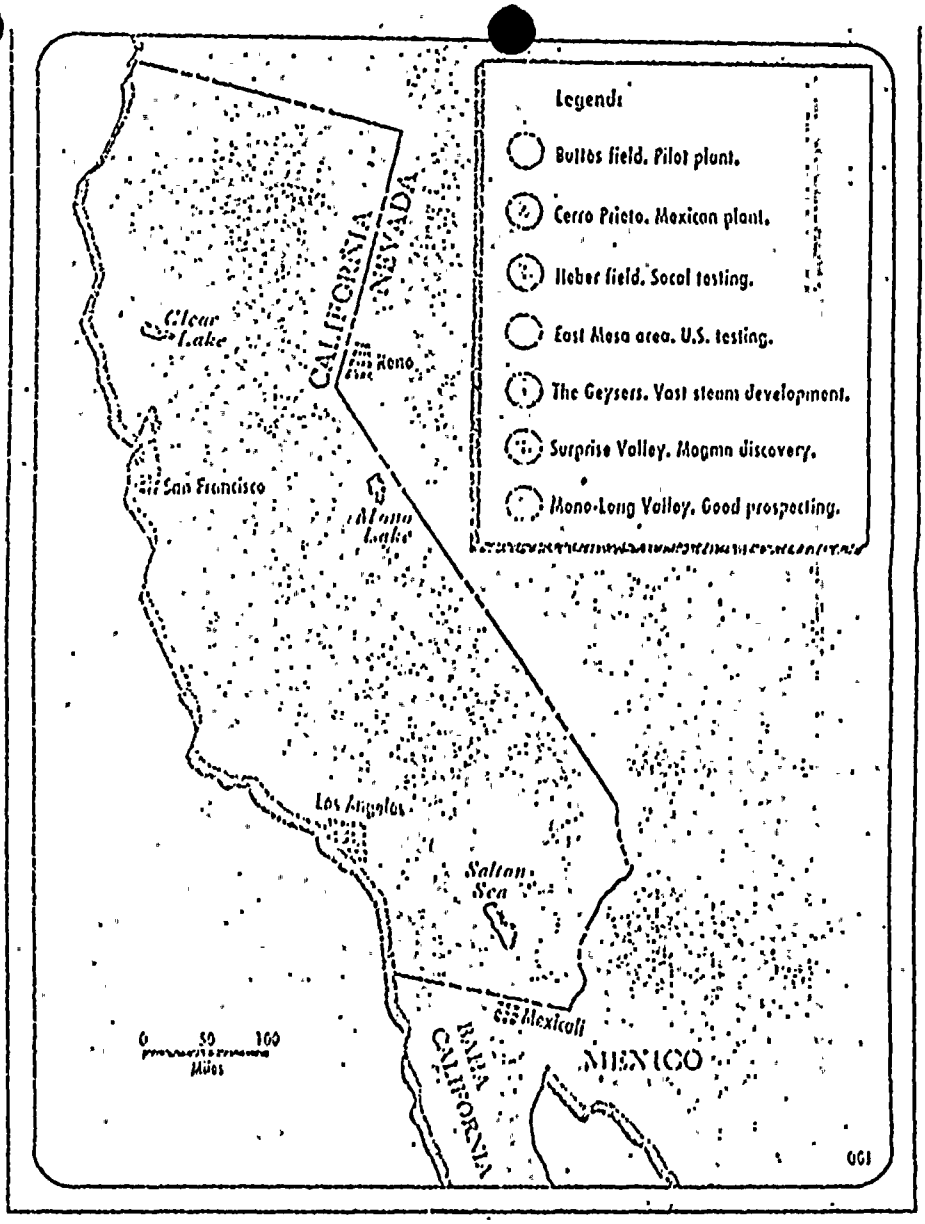
Another public agency, the University of California at Riverside, has drilled a 2,000-ft experimental well on the Dunes anomaly in the East Mesa area. Testing is in progress.

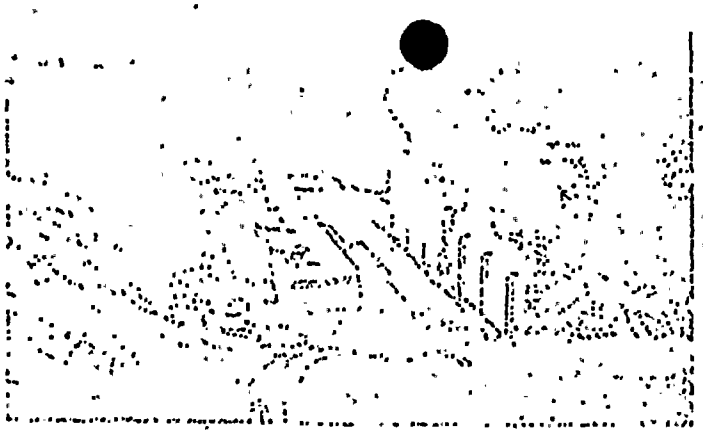
North and east. Several other areas offer geothermal potential in California, particularly in the far north and on the eastern side of the Sierra Mountains.

In the northeastern tip of the state, 120 miles northwest of Reno, Nev., Magma announced a discovery last month at Surprise Valley in Modoc County. Drilled to 4,010 ft, the well has characteristics which make it a candidate for the Magmamax process, the company said.

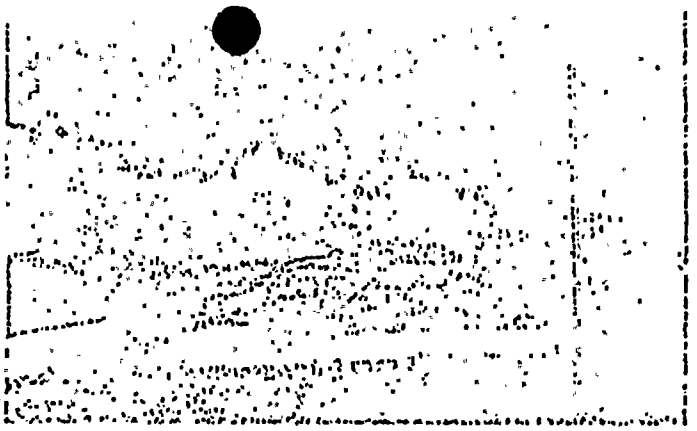
In the Mono-Long Valley area of East Central California, Getty and Gulf have strong acreage positions, along with Geothermal Resources International. Getty has drilled on the north shore of Mono Lake and GRI on the south shore. Both holes were slanted into state lands under the lake. While they found above-normal temperatures, the companies abandoned the wells as noncommercial. The drilling was done under an agreement with Southern California Edison.

The U.S. Government is the major landholder in the area. The U.S. Geo-





PACIFIC Gas & Electric Co.'s Power Plant 3 contains two 55-mw generators. Steam from Union's wells turns turbines at a nominal 100 psig and 355° F.



HOOVER Drilling Co. rig is in the last stage of drilling a steam well for Union at The Geysers. Rig is near target, with a mixture of steam and cuttings blowing from the hole.

California geothermal hunt heats up

HOWARD M. WILSON
West Coast Editor

WHILE drilling for oil and gas languishes in energy-short California, another type of energy search is on the upswing.

Several major oil companies, as well as drilling contractors, are participating in a sizable boom in developing geothermal energy for electric-power generation.

The areas of concentration stretch from the Imperial Valley in the south, into the established Geysers area in the west-north-central part of the state, and to the volcanic regions of the east and far north.

Such majors as Union Oil Co. of California, Standard Oil Co. of California, Getty Oil Co., Sun Oil Co., Signal Oil & Gas Co., Gulf Oil Corp., and Phillips Petroleum Corp. have a stake in the future of steam power. All have substantial lease holdings.

Union is the largest geothermal operator in the state. In The Geysers field, 90 miles north of San Francisco, it supplies steam for four electric-generating power plants, and a fifth plant soon will be built. From its wells in the field—five to eight per plant—Union is producing steam for 360,000 kw of power for Pacific Gas & Electric Co.

David N. Anderson, California's geothermal officer in the Division of Oil and Gas in Sacramento, believes that in less than 20 years geothermal energy will meet 5% of California's total power requirements. This means an output of 6 to 9 million kw.

This, for California oil operators, is a side business that develops naturally from their expertise in finding and producing oil and gas.

The Geysers. The birth of the modern geothermal industry in California took place in 1960 when the first 12,500-kw turbine generator began operating in The Geysers field.

Today more than 110 wells have been drilled in the field. More than 85 are capable of producing, but many are shut in while awaiting construction of generating plants.

In addition to Union, other companies are carving out a share of the potential production. Signal has six wells capable of producing and is negotiating with PG&E for construction of a power plant. The Signal area is about 3 miles southeast of the main field.

Union, Signal, and Pacific Energy Corp. all are drilling wells that would enlarge the field. Wells drilled within the last year indicate expansion to the northwest and southeast.

Leasing is still heavy in the area.

Imperial Valley. The most exciting developments in geothermal energy are taking place in California's Imperial Valley—the desert country in the Salton Sea area near Mexico.

Estimated geothermal-power growth in California

	Megawatts				
	The Geysers	Imperial Valley	Other areas	Total/year	Cumulative total
Capacity at 12/31/71	184			184	184
Additional capacity:					
1972	106			106	290
1973	106	10		116	406
1974	106			106	512
1975	212			212	724
1976	212	200		412	1,136
1977	212	100	100	412	1,548
1978	212	100		312	1,860
1979	212	100	100	412	2,272
1980	212	100		312	2,584
1981	212	100	100	412	2,996
1982-1991				4,504	7,500

Source: California Department of Conservation, Division of Oil and Gas, August 1972.
Note: This estimate reflects only present development trend, not total state potential.

logical Survey has been making research studies and plans a lease sale for development.

The drilling. While drilling to date has been no bonanza, several drilling contractors are sharing in the business that the geothermal search has developed.

Big Chief Drilling Co. has rigs in the northeast and at The Geysers. Beeline Drilling Co. has a rig at Surprise Valley. R. B. Montgomery has a rig north of The Geysers. Hoover Drilling Co. has two rigs at The Geysers, and Californina Production Services has one rig there.

The upswing in drilling is apparent from state records showing that 23 geothermal wells were drilled in the 1971-72 fiscal year, compared with 13 the year before. This fiscal year 12 wells have been drilled so far, and the record of 23 last year should be topped easily by July 1.

Drilling requirements vary with the area, but The Geysers field presents special problems for the driller.

Drilling begins with mud, but as the bit nears steam production, the driller switches to compressed air. Air is used as the drilling medium at this point because pressure from the weight of mud is much higher than the pressure of steam in the reservoir. Mud lost into the producing zone will bake and seal off the steam from the well.

Compressed air carries the cuttings to the surface but does not block the permeability.

John Cromling of Big Chief Drilling says the rig should be overdesigned for the job. The draw works and drilling engines should be a minimum of 1,000 hp to meet hoisting requirements.

The rig needs two 600-hp mud pumps to handle the output of a 17½-in. surface hole properly. The rotating system must be extra heavy duty to tolerate the excessive torque and instantaneous shock loading.

The rotary clutch, shaft, and chain are very susceptible to damage and must be properly designed to match the job.

Cromling recommends that the surface drilling equipment include an independent rotary drive.

Because the formations encountered close to the surface may be as hard as, or harder than, those encountered at 6,000 ft, a second stage steel milltooth bit is required for spudding, and cause of faulted and fractured formations, the bit will jump and bounce unless the weight and revolutions per minute are coordinated properly.

"It is impossible to write an infallable recommended bit program for The Geysers," Cromling told the Society of Petroleum Engineers recently at Bakersfield. "Every well must be drilled as a wildcat due to the tremendous variations of local faulting and lithology. It is a must to have qualified personnel on the rig who are capable of adjusting the drilling program to suit the abruptly changing hole conditions."

The geology. California is particularly blessed with high potential for geothermal energy due to forces of geologic activity that scientists only recently have begun to understand.

Anderson, the geothermal chief, told the SPE meeting in Bakersfield that advocates of plate-tectonics estimate the North American Continent began sliding across an active zone of seafloor spreading about 4.5 million years ago. The spreading centers and related faults caused the Gulf of California to form, and the spreading extends beneath the Imperial Valley.

"The immense heat generated provides the valley with its enormous geothermal potential," Anderson said. "The continuing study of plate-tectonics will undoubtedly aid exploration geologists in their search for geothermal energy."

And, in energy-hungry California, you can be sure geologists will use this new tool—and any other with any promise.