

FROM: Donald F. X. Finn
Geothermal Energy Institute
San Francisco, Calif.

CONTROL NUMBER **5811**

FILE LOCATION

DATE OF DOCUMENT
6/22/73

ACTION COMPLETION DEADLINE:
7/13/73

TO: **Chairperson and Gentlemen**

ACTION PROCESSING DATES
Acknowledged _____
Interim Report _____
Final _____

PREPARE FOR SIGNATURE OF:

Chairman

Director of Regulation
X **Giambusso**

DESCRIPTION **Ltr** Original Copy Other

Submits comments in response to final environmental statement on Diablo Canyon 1 and 2, especially with respect to geothermal alternatives - states this oversight is a pattern in regulatory statements

REMARKS
Send Chairman's Office 2 cys of reply

REFERRED TO: **Giambusso f/action**
DATE: **6/29/73**

IS NOTIFICATION TO THE JCAE RECOMMENDED? _____

Cys:
O'Leary
Shapar
Docket Files }
PDR } **50-275**
Local PDR } **50-323**

ENVIRON, FILE (NEPA)

EMERSON LIFE (1855)

Logging date: 6/27/73

OFFICE OF THE CHAIRMAN
Atomic Energy Commission

June 28, 1973

TO : Regulatory
INCOMING
FROM : Donald Finn 6/22/73
Geothermal Energy Inst. (Date)
New York
SUBJECT: Diablo Canyon Nuclear Station
Units 1 & 2 - comments in response
to Final Environmental Impact
Statement

Prepare reply for signature of:

- Chairman
- Commissioner
- GM, DR, GC, PA, IS
- Signature Block Omitted

Please return original with response

- For Direct Reply
- Send Copy of Reply to:
 - Chairman
 - Commissioners
 - Secretary

- For Appropriate Action
- For Information
- For Recommendation

REMARKS:

For the Chairman:

Minnie Earl Gargett

When separated from enclosures, handle this document as _____

ACTION SLIP

EMW
Copy sent PDR
J6



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OFFICE OF THE CHAIRMAN

June 22, 1973

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680 Beach Street
San Francisco, CA 94109

U. S. Atomic Energy Commission
Washington, D. C. 20545

Re: Diablo Canyon Nuclear Station
Units 1 and 2
San Luis Obispo County, California
AEC Docket No. 50-275, 50-323

Dear Madame Chairperson and Gentlemen:

We submit the following comments in response to the Final Environmental Impact Statement prepared by your Staff in respect of the proposed Diablo Canyon nuclear generating station sought to be licensed by the Pacific Gas and Electric Company and to be located near San Luis Obispo, California on the California coast:

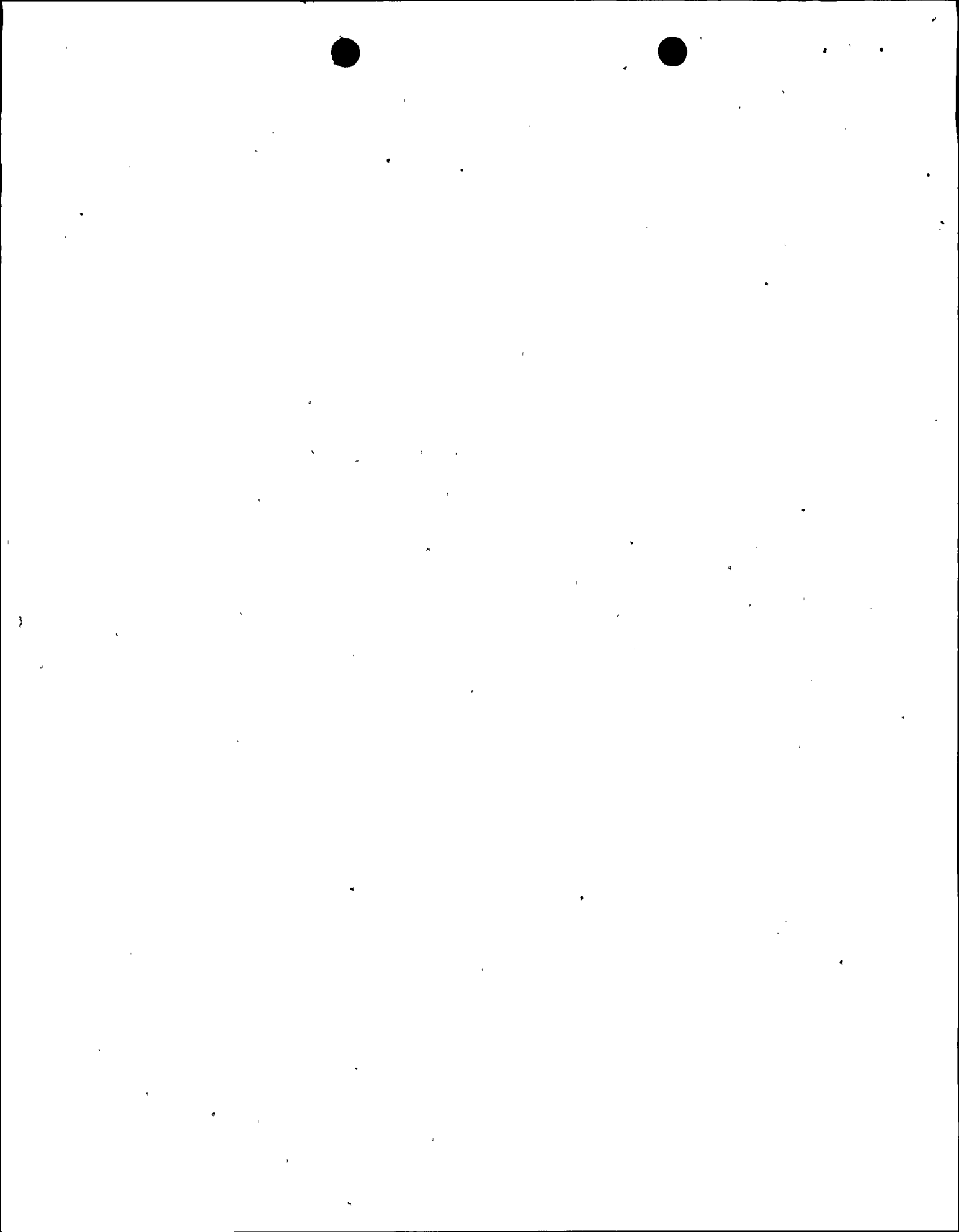
1. The two units are proposed to deliver an output of "up to" 2300 MW of electrical power. (p. 1). Their capacity is otherwise referred to by the Staff as 2120 MW (p. 11-5; 13-8). The Staff assumes that the units will operate about 80% of the time (i.e. 8640 hours annually) at full capacity (i.e. for a total of 14,857 billion kwh annually) (p.13-8). In view of the experience to-date from poor operating factors from nuclear power plants this assumption seems somewhat questionable.

2. The Staff offers to 'update' the 'proven reserve' of geothermal steam at The Geysers geothermal field in Sonoma County, California "to any amount that can be documented by credible references or experts". (p.14-17).

This is an abnegation of the Staff's responsibility under Section 102 (2) (C) of the National Environmental Policy Act of 1969, 42. U.S.C.A. Section 4332 (2) (C), the Environmental Protection Agency's Interim Regulation In Respect of The Preparation of Environmental Impact Statements, 38 Fed. Reg. 1696-1712, January 17, 1973 and the Rules of the Commission as set forth at Appendix D, Section A (11) of 10 C.F.R. Part 50, 37 Fed. Reg. 15143 and AEC Regulatory Guide 4.2, Chapter 9, to independently assess and evaluate the available geothermal sources which constitute an alternative to the proposed nuclear facility.

PG&E's own consultants have determined that there is at least 1300 MW in proven reserves on a very limited geographical area of The Geysers field (the same area Mr. Budd of Union testified has 750 MW in proven reserves).

The Staff has ignored and failed to comment on or respond to my comments



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(p. A14-1-68) that the Pacific Energy Corporation has acquired 20,000 acres of geothermal leases within the The Geysers 'KGRA' (as defined by U.S.G.S. Circular 647 as a 'Known Geothermal Resource Area') and has established proven reserves in that field. The Staff does not reproduce the independent report on those reserves. I attach a copy of that report hereto as Exhibit A.

Nor does the Staff refer to or in any way attempt to assess the properties under development within the Geysers KGRA by Signal Oil and Gas Company, Sun Oil Company, Standard Oil Company of California, and Cinta Oil Company. Certainly these companies are not acquiring expensive leasehold interests because they have not to some degree been able to assess the geothermal potential of the area for themselves. See also, U. S. Senate Committee on Interior-Serial No. 92-31, p.43.

The Staff does not inform the commission of the many estimates of reserves at The Geysers or of the standards by which it has determined that some estimates may have been rejected by them because the 'geothermal experts' of the Staff have concluded that undocumented references or unnamed experts have not been deemed to be credible.

The Geothermal Resources Board of the State of California has identified over 30 geothermal areas in the State, including one in San Luis Obispo County, which the Staff does comment on. Geothermal Resources Board of the State of California, The Economic Potential of Geothermal Resources in California, 1971.

The Staff does not refer to the capacity of The Geysers as being estimated at 4000 MW by the California Assembly Science and Technology Advisory Council, A Report to the Assembly General Research Committee, Geothermal Resources in California, May 1972. Although the Staff does refer to the estimate of 25,000 MW made by Dr. Robert W. Rex (p. 12-2) it does not spell out Dr. Rex's expressed views and bases for his estimate. The Staff apparently dismisses him as non-credible although he is one of the most learned and experienced geothermal experts in the world - and it is doubtful that there is any geothermal expert on the Staff at all.

Even PG&E estimates a 3000 MW capacity for The Geysers on the basis of present knowledge. See Exhibit B.

The "near-term" potential has been estimated by independent engineers as being up to 4800 MW. W. A. Brewer, L. F. Eriksen and R. D. Prindle, Discovery and Development of Geothermal Resources, 1972, Joint Power Conference of IEEE, ASME and ASCE, Boston, Massachusetts. The longer-term potential is obviously much larger since it is a known fact that the entire Geysers-Clear Lake region has high temperatures and heat flows and contains other geotechnical indicia of its geothermal potential. The Geysers is now known to be within an elliptical negative anomaly which is 21 miles long and 17 miles wide. See. U. S. Senate Committee on Interior, Serial No. 92-31, p. 372-379 (June 1972).

The Staff's approach to the assessment of geothermal alternatives is the one termed "decimation by quotation", which is part of the new purportedly scientific vogue of attacking an opposing point of view by selective quotations or references, and which purports to give the Staff's analysis an aura of objectivity which it does not deserve.

3. The Staff entirely ignores and fails to assess the many areas available to the applicant which could utilize the geothermal resources that are classified as known geothermal resource areas by the U. S. Geological Survey.

U. S. G. S. Circular 647. See also, A. L. Austin et al., The total flow concept for recovery of energy from geothermal hot brine deposits,



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4. The Staff's EIS is also inadequate because it addresses itself to only the first two proposed units at Diablo Canyon, when the applicant admittedly has "now planned for development of 6000 mw or more" at that site. Pacific Gas and Electric Company, January 30, 1973, Responses to California Assembly Committee on Planning and Land Use, Subcommittee on State Electrical Energy Problems.

5. The Staff does not respond (notwithstanding its reference at p. A14-1-67 at para. 2 to Sect. 14-12 of the Statement) to my comment of January 30, 1973 that:

"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".

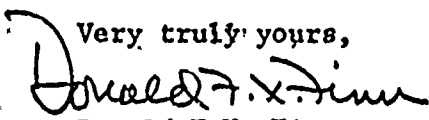
The National Environmental Policy Act requires not only a "rigorous exploration" and description of alternative courses of action but also "an analysis of their costs and impact on the environment." President's Council On Environmental Quality, Environmental Quality--Third Annual Report, p. 243. August 1972. While we note that the comments from EPA did not at all reach the subject of alternative sources, and are delinquent in that respect, we also note that the EPA does require that "Special Care" be taken to respond "fully" to comments that are at variance with the Staff's position. We are of the opinion that this has not been done in this case. See also, Note, Cost-Benefit Analysis and the National Environmental Policy Act of 1969, 24 Stanford L. Rev. 1092-1116 (June 1972).

The Atomic Energy Commission, like all Federal agencies, is required to comply with the procedural provisions of NEPA "to the fullest extent possible". 42 U.S.C.A. Section 4332. This is not a discretionary matter as "agency procedural responsibilities under NEPA are mandatory." Electricity and the Environment, p. 56 (West Publishing Co., 1972).

The Staff's inadequate assessment of geothermal alternatives is not an isolated experience in this case. The Staff has consistently failed to adequately assess geothermal alternatives in environmental impact statements- e.g. Trojan (Oregon), Hanford (Washington), Grand Gulf (Mississippi), Lake Dardanelle (Arkansas), Fort St. Vrain (Colorado). "

The import and ramifications of this pattern regulatory oversight are such that they raise questions as to the integrity of the statement itself.

Very truly yours,


Donald F.X. Finn
Managing Director
Geothermal Energy Institute
680 Beach Street



DEGOLYER AND MACNAUGHTON
5625 DANIELS AVENUE
DALLAS, TEXAS 75206

July 17, 1972

TELEPHONE
AREA CODE 214
388-6391
CABLE DEMAC

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.

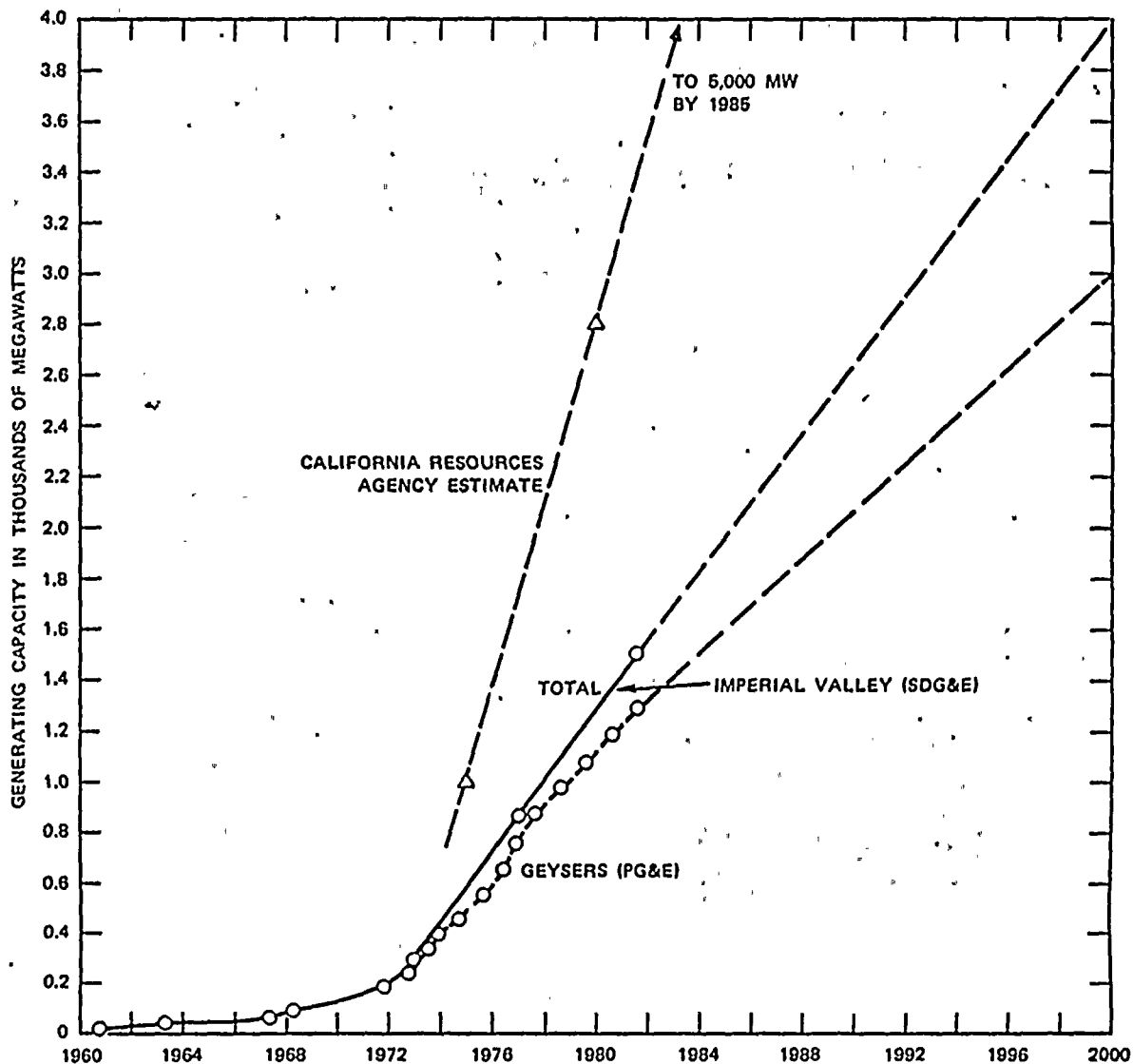
For your further information, we estimate that the development of the 373 acres will produce, through 1990, 1.2 trillion pounds of steam which is equivalent to 60 million kilowatt hours of electrical energy and which will yield a future net revenue (gross revenue less drilling and operating costs and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

Submitted,

De Golyer and MacNaughton
DeGOLYER and MacNAUGHTON

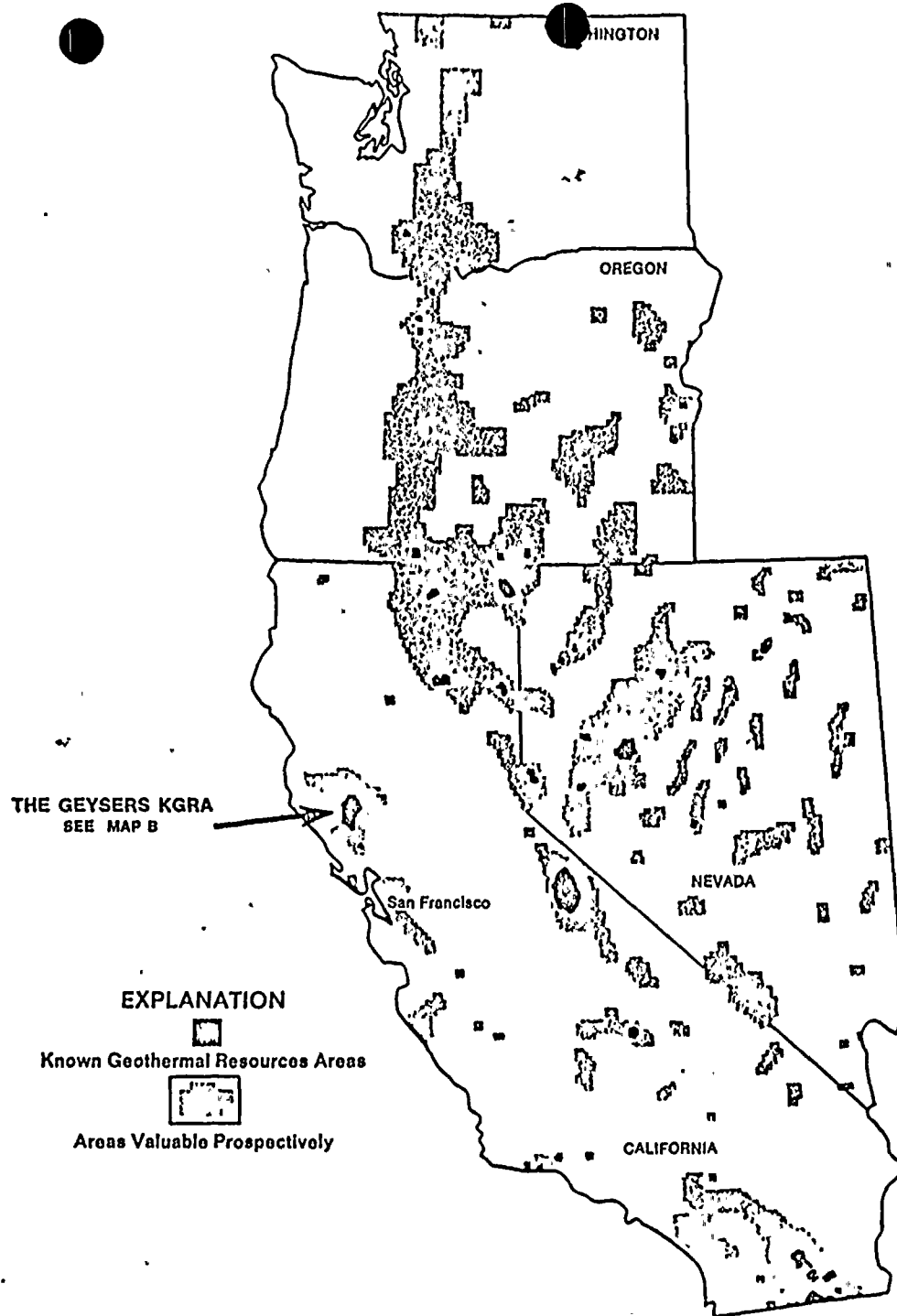


FIGURE B1-5 PROJECTED CALIFORNIA GEOTHERMAL CAPACITY (CUMULATIVE)



SOURCE: Stanford Research Institute, using data from PG&E Application No. 53485, July 19, 1972, SDG&E, and the California Resources Agency.





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.

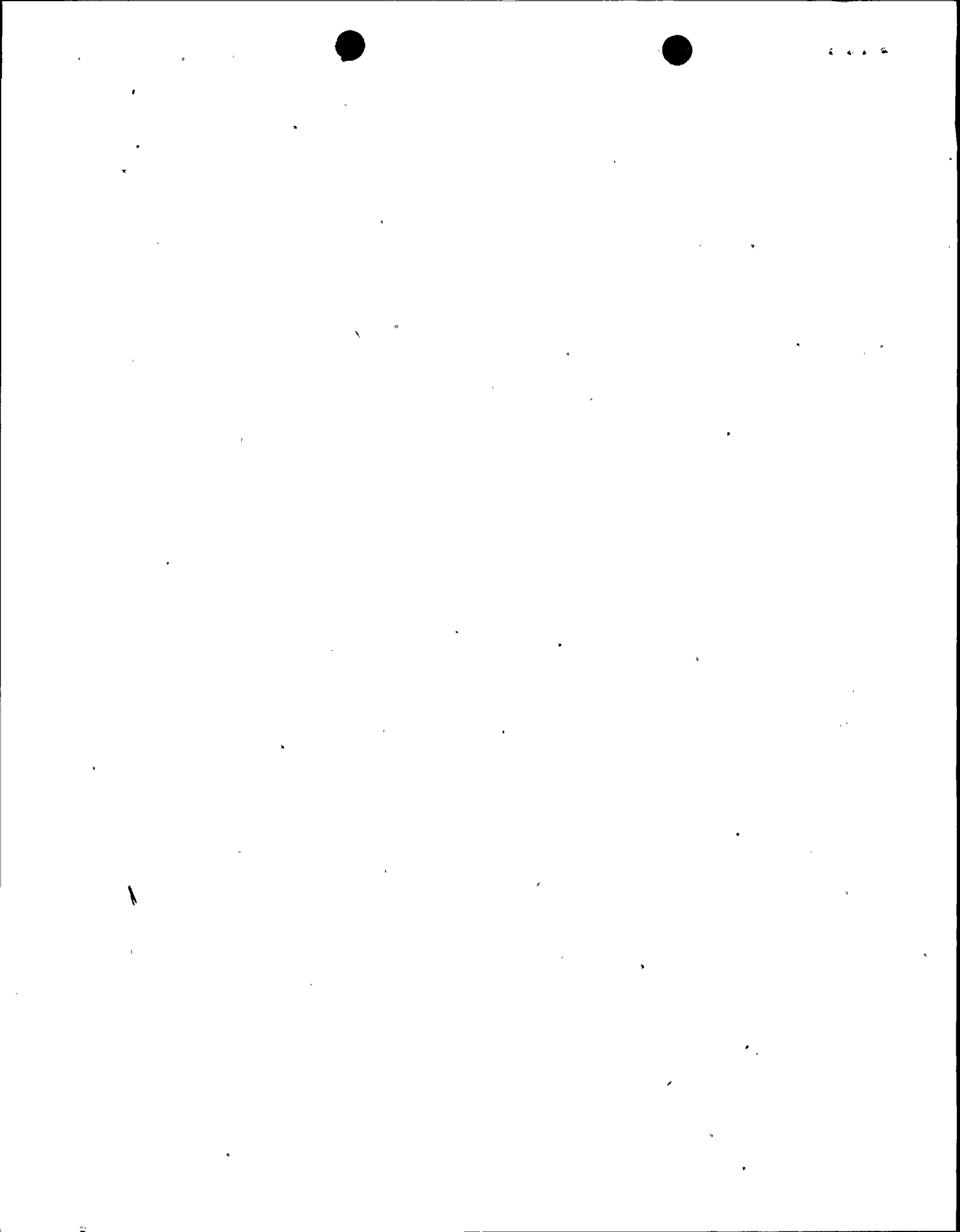
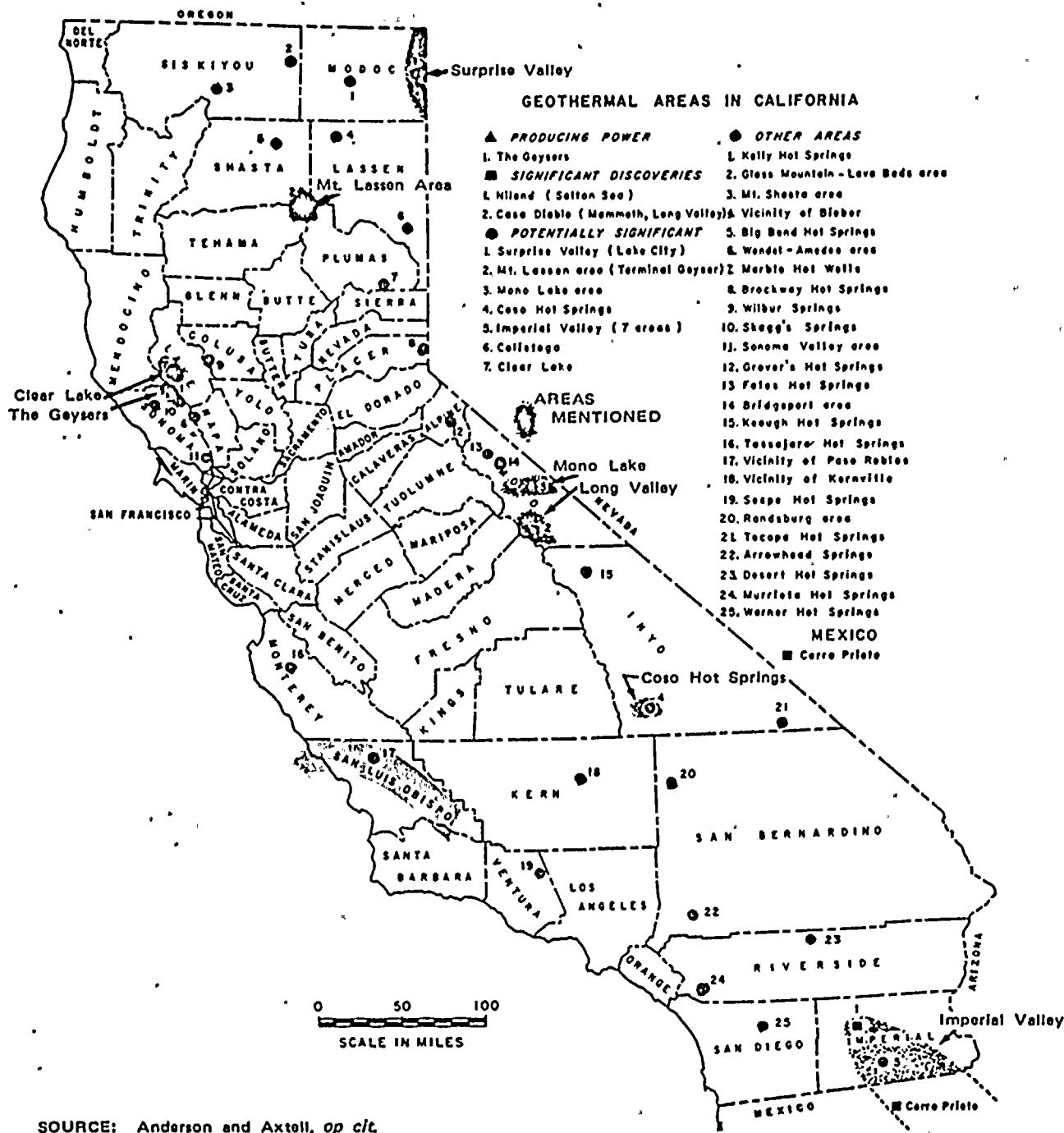


FIGURE B1-1 GEOTHERMAL AREAS IN CALIFORNIA





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