
SENATE COMMITTEE ON NATURAL RESOURCES AND WATER

Senator Josh Becker, Chair

2025 - 2026 Regular

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Author:	Papan		
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Urgency:	No	Fiscal:	Yes
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Subject: California Environmental Quality Act: geothermal exploratory projects

SUMMARY

This bill would revise the definition of a geothermal exploratory project in the California Environmental Quality Act to include certain aboveground equipment and activities and specify that exploratory project wells can be located within one-half mile from a commercial scale geothermal development well so long as the owner or operator of the commercial scale geothermal development well provides written consent, as provided.

BACKGROUND AND EXISTING LAW

Geothermal Energy

Geothermal energy comes from heat stored in rocks and fluids in the Earth's crust, according to the Geologic Energy Management Division (CalGEM). Geothermal fluids include both hot water and steam¹. There are more than 650 active, high temperature wells in the state's geothermal fields. Fluids from these wells are used to generate electricity at adjacent power plants.

California is the single largest generator of electricity from geothermal energy in the country. As of 2018, there were 43 operating geothermal power plants in the state with an installed capacity of about 2.7 gigawatts (GW). In 2022, about 5% of the state's electrical energy came from geothermal resources.

Of note in California, the Geysers is the single largest geothermal field and geothermal electrical operation in the world and has been in commercial operation for over 60 years. Calpine owns and operates 13 geothermal plants within the 45-square-mile complex, primarily located in Sonoma County, representing approximately 725 megawatts (MW) of electrical generation capacity currently. There have been considerable efforts made in the last few decades to recharge the water (and hence steam) supply at the Geysers after the resource had become degraded in which both Calpine and the Northern California Power Agency (NCPA) were involved. NCPA also operates in the Geysers.

Geothermal energy is considered to be a renewable energy resource, and is anticipated to be an important clean energy-producing component of the state meeting its 2045 carbon neutrality target. Geothermal energy provides baseload renewable energy which can help fill in the evening and winter gaps in renewable power generation capacity when solar and wind are not generating sufficient energy to meet the state's needs. Advances in technology suggest that many more locations will have sufficient subsurface geothermal resources in the near future to viably produce energy. New

¹ Fluids at temperatures higher than the boiling point of water are considered "high temperature."

technology may also allow geothermal power plants to provide more than baseload services.

Geothermal wells in the state – except for those on federal leases – are permitted, drilled, operated, and permanently sealed under CalGEM’s auspices. Any proposed well must demonstrate compliance with the California Environmental Quality Act (CEQA) prior to CalGEM permitting the well. CalGEM would have to approve a notice of intention (NOI) for the exploratory well to be drilled. In all likelihood, CalGEM would also have to issue a project approval letter (PAL) as geothermal injection wells are considered Class V Underground Injection Control (UIC) wells.² The PAL may include operational restrictions on the well or wells, and for an exploratory well would be of limited duration.

Prior to a large-scale geothermal development project, one or more exploratory wells would be drilled to map out the subsurface environment and assess exactly where development wells would be best located. The subsequent “geothermal field development” phase involves determining the locations of all of the injection and development wells, and any associated powerplant, grid connections, and associated infrastructure. The geothermal field development would likely necessitate an additional CEQA review. Other agencies, such as the State Water Resources Control Board and Regional Water Quality Control Boards, may also have a permitting role for a geothermal project.

Geothermal energy projects generally have two phases. There is an exploratory phase – where the resource is evaluated and mapped – and a field development phase. A geothermal exploratory project is limited to wells and certain necessary surface support equipment. A geothermal field development project would be much larger in scope and include a power plant.

Next generation geothermal energy development

Conventional geothermal energy wells depend upon very specific geology – comparatively hot, permeable rock formations relatively near the surface. The geothermal brine is heated by the formation, and pumped up to the surface by a well. The heat is used to generate electricity.

There are at least two “next generation” geothermal energy techniques which are less limited geologically than conventional geothermal energy development:

- “Enhanced geothermal” typically uses hydraulic fracturing (i.e. fracking) of comparatively hot geologic formations relatively near the surface to make them permeable for the working fluid. Thermal or chemical stimulation can also be used to improve the permeability of the geologic reservoir/formation. Once the reservoir permeability is improved, the geothermal working fluid (typically water) is injected into the reservoir/formation by one well and pumped out by another after heating. Fervo Energy has reported successful pilot projects in Utah that use enhanced

² Following the federal passage of the Safe Drinking Water Act, the UIC program regulations were developed. There are currently six classes of UIC well. California has a “primacy” agreement for Class II UIC wells with the U.S. Environmental Protection Agency (U.S. EPA) for oil and gas wells. California also has a Memorandum of Agreement with the U.S. EPA governing geothermal wells.

geothermal as has the U.S. Department of Energy backed “Frontier Observatory for Research in Geothermal Energy” (FORGE) project, similarly located in Utah.

- “Advanced geothermal” is a broad category and includes additional methods to fracture the geologic formation than hydraulic fracturing, such as microwave technology; closed-loop systems; or the drilling of very deep wells. Drilling very deep wells has technological challenges, but can result in conditions that are relatively more efficient for subsequent energy production.

The U.S. Department of Energy estimates these next generation geothermal systems can produce up to 90 GW of renewable power by 2050, and up to 300 GW depending upon storage and other emerging technologies. In 2025, the federal government cut some renewable energy tax credits and support, but left those for geothermal energy intact.

CEQA

CEQA provides a process for evaluating the environmental effects of applicable projects undertaken or approved by public agencies. If a project is not exempt from CEQA, an initial study is prepared to determine whether the project may have a significant effect on the environment. If the initial study shows that there would not be a significant effect on the environment, the lead agency must prepare a negative declaration (ND). If the initial study shows that the project may have a significant effect on the environment, the lead agency must prepare an environmental impact report (EIR).

Generally, an EIR must accurately describe the proposed project, identify and analyze each significant environmental impact expected to result from the proposed project, identify mitigation measures to reduce those impacts to the extent feasible, and evaluate a range of reasonable alternatives to the proposed project. If mitigation measures are required or incorporated into a project, the agency must adopt a reporting or monitoring program to ensure compliance with those measures.

Under existing law, CalGEM is the default lead agency for geothermal exploratory projects, but provides that CalGEM can delegate its lead agency responsibility to a county that has adopted a geothermal element in its general plan.³ In addition, at the request of an applicant, the county assume responsibilities as the lead agency regardless of the existence of a geothermal element. In this instance, the county and CalGEM confer regarding necessary information to be included in the environmental review for the project to facilitate CalGEM's exercise of its authority as a responsible agency. A geothermal exploratory project is a project composed of no more than six wells and associated equipment whose chief and original purpose is to evaluate the geothermal resources prior to geothermal field development. Under existing law, the geothermal exploratory project must be located at least one-half miles from geothermal development wells producing geothermal resources in commercial quantities.

³ Imperial and Siskiyou counties have adopted geothermal elements.

Existing law:

- 1) Establishes CalGEM within the Department of Conservation as the state's geothermal well regulator. The State Oil and Gas Supervisor (supervisor) leads CalGEM.
- 2) Proclaims that Californians have a direct and primary interest in the development of geothermal resources, and the state should exercise its power and jurisdiction to require that wells for the discovery and production of geothermal resources be drilled, operated, maintained and abandoned in such manner as to safeguard life, health, property, and the public welfare, and to encourage maximum economic recovery. (Public Resources Code (PRC) §3700)
- 3) Requires the supervisor to so supervise the drilling, operation, maintenance and abandonment of geothermal resources wells as to encourage the greatest economic recovery of geothermal resources, to prevent damage to life, health, property, and natural resources, and to prevent damage to, and waste from, the underground geothermal deposits, and to prevent damage to underground and surface waters suitable for irrigation or domestic purposes by reason of the drilling, operation, maintenance, and abandonment of geothermal resources wells. (PRC §3714)
- 4) Requires the supervisor to also supervise the drilling, operation, maintenance, and abandonment of wells so as to permit the owners or operators of such wells to utilize all methods and practices known to the industry for the purpose of increasing the ultimate recovery of geothermal resources, and to allow the operator to do what a prudent operator using reasonable diligence would do, as provided. (PRC §3715)
- 5) Requires an owner or operator before drilling or re-drilling, abandoning or deepening or altering the casing of a well to file with the supervisor or CalGEM district deputy a written notice of intention to drill the well containing certain information and pay a fee. (PRC §3724)
- 6) Requires, upon the completion or abandonment of any geothermal well, that true copies of the log, core record, history, and other materials, as specified, be provided to the CalGEM district deputy, as provided. (PRC §3735)
- 7) Defines geothermal resources to mean the natural heat of the earth, the energy, in whatever form, below the surface of the earth present in, resulting, from, or created by, or which may be extracted from, such natural heat, and all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases, and steam, in whatever form, below the surface of the earth, but excluding oil, hydrocarbon gas, or other hydrocarbon substances. (PRC §6903)
- 8) Defines a geothermal exploratory project to be not more than six wells and for the purpose of evaluating the presence and characteristics of geothermal resources prior to starting a geothermal field development project. For purposes of preparing an environmental document the environmental impacts shall be limited to the proposed drill sites, the proposed wells, and any roads or other facilities that may be required before the exploratory wells can be drilled. Wells included within a geothermal exploratory project must be located at least one-half mile from

geothermal development wells which are capable of producing geothermal resources in commercial quantities. Application requirements include a narrative description including the probable short-term and long-term impacts of the project, and acceptable mitigation measures. (see PRC §21065.6; Title 14, California Code of Regulations, §§1680 *et seq.*)

- 9) CEQA requires a lead agency to spearhead an EIR for a project that may have a significant effect on the environment. CEQA also requires a lead agency to prepare an ND for a project that will have no significant effects on the environment, or a mitigated negative declaration (MND) for projects that have no significant effects after mitigation. (PRC §§21000 *et seq.*)
- 10) Specifies that CalGEM is the default lead agency for geothermal exploratory projects, but that CalGEM can delegate its lead agency responsibility to a county that has adopted a geothermal element in its general plan. In addition, at the request of an applicant, the county in which a geothermal exploratory project is located shall assume responsibilities of the lead agency, regardless of whether or not the county has a geothermal element. In this case, the county and CalGEM confer regarding necessary information that should be included in the environmental review for the project to facilitate CalGEM's exercise of its authority as a responsible agency. (PRC §3715.5)
- 11) Defines "geothermal field development project" as a development project composed of geothermal wells, resource transportation lines, production equipment, roads, and other facilities which are necessary to supply geothermal energy to any particular heat utilization equipment for its productive life, all within an area delineated by the applicant. (Government Code §65928.5)

PROPOSED LAW

This bill would:

- 1) Revise the definition of "geothermal exploratory project" to:
 - a) Include "equipment and activities necessary to establish interconnectivity between wells and reservoirs, temporary roads, electric distribution lines, and infrastructure to provide power for drilling and testing equipment"; and
 - b) Specifies that wells can be located within one half mile from a commercial scale geothermal development well, as measured from the bottom of the wells interaction point, so long as the owner or operator of the commercial-scale geothermal development provides written consent for its location within that one-half mile.

ARGUMENTS IN SUPPORT

According to the author, "California has a massive underground network of untapped geothermal energy. Innovations like closed-loop and enhanced geothermal systems (EGS) have the potential to generate many gigawatts more energy than previous technologies, as conventional geothermal developers are limited by their need for naturally occurring groundwater."

“However, the outdated statutory definition of geothermal exploratory projects restricts the deployment of these new technologies. AB 2234 will modernize the definition of geothermal projects by updating the application of the half-mile restriction and recognizing that all equipment and infrastructure necessary for modern development should be considered part of a project, not separate. By revising the geothermal exploratory project definition, AB 2234 can expand access to firm, clean energy and signal that California is open for exploration.”

ARGUMENTS IN OPPOSITION

The Northern California Power Agency (NCPA) writing in opposition states “While we appreciate efforts to encourage innovation and reduce barriers to responsible renewable energy development, we are very concerned that AB 2234 could adversely impact existing geothermal resources.”

“As California evaluates new geothermal technologies, policymakers should ensure that the development of one extraction system does not inadvertently diminish the productivity, efficiency, or sustainability of another operating within the same geothermal resource. For NCPA and its members, these concerns are particularly significant because The Geysers represents a substantial, long-term public investment in renewable energy infrastructure.”

NCPA suggests amendments to require that the geothermal exploratory project monitor the non-degradation of the resource, demonstrate that it will not impose any undue harm on existing commercial reservoir pressure, and accepts all costs of safeguarding an existing resource.

COMMENTS

This bill is double-referred. This bill was referred to both the Senate Environmental Quality Committee and this Committee. This Committee is the committee of second referral, and elements of the bill under the Senate Environmental Quality Committee’s jurisdiction are included here for completeness and context only. The Senate Environmental Quality Committee heard this bill on June 24, 2026 where it passed on a vote of 6 – 0 – 1.

The CEQA, NOI, and PAL processes are different and each has distinct criteria.

The CEQA process scopes out the environmental impacts of the proposed geothermal exploratory project. As proposed herein, the proposed site of the geothermal exploratory project could be within one-half mile of a geothermal commercial development well. However, after CEQA is completed, CalGEM would perform a technical review on any proposed geothermal exploratory project well prior to issuing a NOI and PAL. It is at this point that risks of subsurface interaction between the exploratory well and any nearby commercial development well will be thoroughly evaluated. If interference occurs, it is difficult to control. NCPA is concerned that they would potentially lose some of their geothermal resource due to interaction with a proposed geothermal exploratory project well nearby. The one-half mile distance between a geothermal exploratory project well and a commercial development well, however, is not a hard buffer or setback. It is unclear what the written consent required under the proposed bill during the CEQA would necessarily mean for the subsequent NOI and PAL.

In view of this, the Committee may wish to amend the bill to affirm CalGEM's regulatory authority specific to well permitting. [Amendment #1]

Negotiations underway. The author is engaged with the opposition in an effort to address the concerns raised.

Technical amendment. In the term "wells interaction point," "wells" is possessive. The Committee may wish to amend the bill accordingly. [Amendment #2]

SUGGESTED AMENDMENTS

AMENDMENT 1

Add to PRC §21065.5 at the end:

Nothing in this section alters the Geologic Energy Management Division's discretionary authority over well permitting pursuant to Chapter 4 of Division 3 of this code (commencing with Section 3700).

AMENDMENT 2

Revise "wells interaction point" to read "wells' interaction point"

SUPPORT

Sonoma Clean Energy (sponsor)
California Resources Corporation
The Nature Conservancy

OPPOSITION

Northern California Power Agency

-- END --