Office of Senate Floor Analyses
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THIRD READING

Bill No: AB 527
Author: Papan (D), et al.
Amended: 7/23/25 in Senate
Vote: 21

SENATE ENVIRONMENTAL QUALITY COMMITTEE: 6-1, 7/2/25
AYES: Blakespear, Valladares, Dahle, Gonzalez, Hurtado, Padilla
NOES: Pérez
NO VOTE RECORDED: Menjivar

SENATE NATURAL RES. & WATER COMMITTEE: 7-0, 7/16/25
AYES: Limón, Seyarto, Allen, Grove, Hurtado, Laird, Stern

SENATE APPROPRIATIONS COMMITTEE: 7-0, 8/29/25
AYES: Caballero, Seyarto, Cabaldon, Dahle, Grayson, Richardson, Wahab

ASSEMBLY FLOOR: 76-0, 5/27/25 - See last page for vote

SUBJECT: Oil and gas: California Environmental Quality Act: geothermal exploratory projects: geothermal field development projects: enhanced geothermal system wells

SOURCE: Author

DIGEST: This bill would provide an exemption from the California Environmental Quality Act (CEQA) for geothermal exploratory projects that meet certain criteria, as provided, and requires the Geological Energy Management Division (CalGEM) to update their regulations regarding geothermal projects.

ANALYSIS:

Existing law:

1) CEQA requires a lead agency to spearhead an environmental impact report (EIR) for a project that may have a significant effect on the environment.

CEQA also requires a lead agency to prepare a negative declaration (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. (Public Resources Code (PRC) §§ 21000 et seq.)

2) Defines "geothermal exploratory project" as a project composed of not more than six wells and associated drilling and testing equipment, whose chief and original purpose is to evaluate the presence and characteristics of geothermal resources prior to commencement of a geothermal field development. 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. (PRC § 21065.5)

3) Specifies that the Geological Energy Management Division (CalGEM) shall be the default lead agency under CEQA for geothermal exploratory projects, but that CalGEM can delegate its lead agency responsibility to a county that has adopted a geothermal element as part of its general plan.

4) 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)

5) Establishes CalGEM within the Department of Conservation as the state's geothermal well regulator. The State Oil and Gas Supervisor (supervisor) leads CalGEM.

6) 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)

7) 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)

8) 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)

9) 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)

This bill:

1) Establishes a CEQA exemption for geothermal exploratory projects that meet certain criteria, as provided. Specifically, this bill would:

2) Includes, expressly as part of a geothermal exploratory project, among other things, equipment and activities necessary to establish interconnectivity between wells and reservoirs.

3) Excludes certain wells connecting to geothermal reservoirs from the one-half mile limit described above.

4) Exempts, until January 1, 2031, from CEQA geothermal exploratory projects that meet specified conditions and for which the county is the lead agency. Before the lead agency determines that a geothermal exploratory project is exempt from CEQA, the bill would require a project developer to supply the lead agency with a survey that includes specified information.

5) Authorizes the lead agency to require the project applicant to file an indemnity bond, as specified, before the lead agency determines that a geothermal exploratory project is exempt from CEQA.

6) Requires the lead agency, at least 30 days before making a determination to approve or carry out a change in use pursuant to this exemption, to post a written notice on its internet website and at the project site.

7) Requires the lead agency to post the entire project application on its internet website.

8) Requires, if the lead agency determines that the project is exempt from CEQA, the lead agency to file a notice with the State Clearinghouse in the Office of Land Use and Climate Innovation and with the county clerk of the county in which the project is located, as provided, and to provide a copy of the notice to specified entities.

9) Imposes a state-mandated local program because the exemption would apply to projects where the county is the lead agency and the county would be required to determine if a project qualifies for this exemption.

10) Requires a geothermal field development project located on a site where a geothermal exploratory project was deployed pursuant to the above-described CEQA exemption to use a baseline for CEQA review that reflects the site before the geothermal exploratory project occurred.

11) Requires, on or before January 1, 2029, the Geologic Energy Management Division to promulgate regulations for enhanced geothermal system wells, as provided. Before the promulgation and implementation of those regulations, the bill would require an operator to provide specified information to the supervisor when the operator files the notice of intent to commence drilling for a well in a CEQA-exempt geothermal exploratory project that employs enhanced geothermal system technology.

Background

1) *The a, b, c's of CEQA*. CEQA is designed to (a) make government agencies and the public aware of the environmental impacts of a proposed project, (b) ensure the public can take part in the review process, and (c) identify and implement measures to mitigate or eliminate any negative impact the project may have on the environment. CEQA is enforced by civil lawsuits that can challenge any project's environmental review.

   Under CEQA, projects (unless they have a specific exemption) must undergo environmental analysis. This process starts with an initial study which determines what level of further environmental review is needed for a given project. If a project has no significant effects on the environment, or if those effects can be fully mitigated, the project can move forward with a negative

declaration (ND) or mitigated negative declaration (MND). If the initial study finds that the project has potentially significant effects on the environment, then the lead agency submits a notice of preparation (NOP) that they are going to conduct an EIR. An EIR provides a thorough environmental review of a proposed project. Under the law, projects have one year to complete an EIR, except in extenuating circumstances.

2) *Advanced geothermal systems.* According to the U.S. Department of Energy (U.S. DOE), many more areas may be able to utilize geothermal resources through the use of advanced geothermal systems. These new systems may be able to utilize any area where there are relatively hot rocks – not just in the well-known high-temperature geothermal resource areas such as those in Imperial County. These new systems include:
   - Closed loop systems where water is circulated in a below-ground loop to gain heat energy;
   - Hydrothermal systems where water is injected into subsurface strata with existing cracks in it to gain heat energy as it flows through before it is produced by a different well; and
   - Enhanced geothermal systems which are similar to hydrothermal systems except the cracks are made in the subsurface strata by hydraulic fracturing or other similar techniques.

   Enhanced Geothermal Systems (EGS) use three general types of well stimulation: thermal, hydraulic, and chemical stimulation. Thermal stimulation relies on the introduction of chilled water, and thus cold stress, to a geothermal reservoir. Hydraulic stimulation relies on the introduction of water or a combination of water and sand or water and gel-proppant fluids to a geothermal reservoir. Chemical well stimulation techniques involve the use of aqueous solutions to allow acids, bases, and chelating agents to be introduced into geothermal reservoirs.

   The U.S. DOE estimates these next generation geothermal systems can produce up to 90 gigawatts (GW) of renewable power by 2050, and up to 300 GW depending upon storage and other emerging technologies. The U.S. DOE estimates that the cost of this power should fall to $60 - $70 per megawatt-hours (MWh) by 2030. Because of its ability to provide clean, firm power, geothermal has some comparative advantages to solar and wind, however current estimates suggest that it is likely to remain a more expensive source of energy in the foreseeable future.

3) *CEQA streamlining for energy projects.* The Legislature has taken several measures in recent years to streamline environmental review for clean energy projects. In 2023, the Legislature passed SB 149 (Caballero, Chapter 60, Statutes of 2023), which offered CEQA judicial streamlining for certain clean energy and infrastructure projects. The CEQA judicial streamlining caps the amount of time it takes for CEQA lawsuits to move through the courts to 270 days, with all appeals, as feasible.

   In the 2022 budget, the Legislature established a new, opt-in environmental review certification program at the CEC that offered streamlined CEQA environmental review of just 270 days ("AB 205"). Under existing law, EIRs much be completed in one year, except in extenuating circumstances. AB 205 only applies to certain clean energy projects, including for solar photovoltaic, terrestrial wind, geothermal, and other non-fossil, non-nuclear power plants with a generating capacity of 50 megawatts (MW) or more, for energy storage systems capable of storing 200-megawatt hours or more of electricity, and for transmission lines from those facilities to a point of connection with an electrical transmission system. Before AB 205, the CEC's siting authority was limited to thermal power plants with capacities of 50 MW or more.

   Geothermal projects are eligible for both CEQA judicial and environmental streamlining established in SB 149 and AB 205, respectively, if the specific projects meet the eligibility criteria established in those laws.

Comments

1) *Purpose of Bill.* According to the author, "AB 527 will accelerate the development of geothermal resources and advance California's climate goals by expediting exploratory well projects which have a de minimis impact on the environment. In order to gather essential subsurface data to determine the viability of a potential geothermal field, developers must drill exploratory wells. Currently, this exploratory endeavor is treated as a separate project, subject to its own environmental review process. The federal government has previously allowed latitude concerning exploratory wells. In October 2024, the Biden Administration created a new categorical exclusion under NEPA for these de minimis exploration projects. AB 527 seeks to align California's approach with this federal exclusion, allowing carefully vetted exploratory geothermal projects to be exempt from CEQA. This alignment will eliminate redundant regulatory hurdles, ensuring projects move forward more quickly and efficiently bringing us that much closer to our renewable energy goals."

2) *What happens if an exploration is successful?* AB 527 only creates a CEQA exemption for exploratory geothermal projects. Exploratory geothermal projects are the necessary first step to determine if a site is appropriate for a full geothermal energy project. Those future full geothermal projects will then go through necessary environmental review under CEQA.

   However, CEQA determines whether or not a project has significant impacts compared to the existing physical conditions in the project's vicinity when environmental review begins. If the baseline for environmental review is an existing wellpad, then the required mitigation measures are likely to be much less rigorous than if the baseline was a pristine desert environment. Because the size of the area that is eligible for CEQA exemptions under AB 527 is 12 acres, full energy generating geothermal operations could be deployed within the exploratory geothermal project site.

   To ensure that an exploratory geothermal project's exemption does not become, in effect, an exemption for an entire geothermal power plant, the baseline for future CEQA review should reflect what the physical environment looked like before the exploratory geothermal drilling began. AB 527 establishes the requirement for such a baseline, which could be informed through the surveys on natural, hydrological, and tribal resources conducted as part of the eligibility criteria for the CEQA exemption.

4) *A CEQA exemption for fracking?* Geothermal exploration is the first phase of developing new geothermal energy resources, including next-generation geothermal energy resources. However, while geothermal energy may be an important part of a clean energy portfolio, EGS, which can include hydraulic fracturing, can have pernicious impacts on the environment, including on water quality.[1] While EGS fracking differs from traditional fracking for natural gas technology in that EGS fracking typically injects only water, some sites can use water and sand or water/proppant/gel mixtures. Internationally, EGS has also used chemical fracturing, using chemicals including regular mud acid (RMA), acid solutions, basic solutions, and chelating agents. AB 527 specifies a process by which geothermal exploratory projects will disclose the composition of fluids injected into the well to add transparency to this fracking process.

[1] Garcia-Gonzales DA, Shonkoff SBC, Hays J, Jerrett M. Hazardous Air Pollutants Associated with Upstream Oil and Natural Gas Development: A Critical Synthesis of Current Peer-Reviewed Literature. Annu Rev Public Health. 2019 Apr 1;40:283-304. doi: 10.1146/annurev-publhealth-040218-043715. PMID: 30935307.

5) *Jimmy Carter was President and Disco was King.* CalGEM promulgated its geothermal well regulations in 1976 with some limited updates in 1979. The regulations call for certain information about well depth and construction to be disclosed to CalGEM, and provides for certain information – such as the observed temperature profile with depth – to be treated as confidential information. While well stimulation – i.e. fracturing treatments performed above the fracture pressure of the reservoir formation to increase or restore the permeability of the formation and provide for fluid flow – is utilized in some reservoirs by operators, and allowed under the supervisor's existing authority, the existing regulations do not require disclosure of well stimulation operations or the materials used.

   CalGEM has recognized that its geothermal regulations are outdated. In 2018, a discussion draft of updated geothermal regulations was circulated for comment and a revised version was circulated in 2022. It is more than overdue to finish that effort and ensure that CalGEM is well poised to regulate the new techniques used for geothermal energy development.

   Recognizing that CalGEM's geothermal regulations are out of date and that updating those regulations is important to establishing good policy, especially when removing project-specific environmental review provided by CEQA, AB 527 requires that CalGEM finish updating its geothermal well regulations by January 1, 2029.

FISCAL EFFECT: Appropriation: No Fiscal Com.: Yes Local: Yes
According to the Senate Appropriations Committee "The Department of Conservation (DOC) estimates one-time costs of $3.28 million in year one for internal infrastructure development and ongoing costs of about $432,000 annually for two positions (the Oil, Gas, and Geothermal Administrative Fund [OGGA]) to implement the provisions of this bill, including developing and applying specialized expertise in enhanced geothermal systems; leading collaborative efforts with similarly focused agencies from other states; reviewing and permitting of advanced geothermal wells differentiated from enhanced geothermal system wells where additional methods other than hydraulic fracturing is proposed; reviewing seismic monitoring plans; reviewing disclosures of anticipated composition and disposition of well stimulation fluids; technical support for regulatory development; and administrative support. CalGEM notes OGGA is partially funded by fees assessed on geothermal operators. In the absence of an identified funding source, to fund the work required in this bill, CalGEM would need to assess fees on geothermal operators."

SUPPORT: (Verified 8/29/25)

California Community Choice Association
California State Association of Electrical Workers
California State Pipe Trades Council
Geothermal Rising
International Union of Operating Engineers, Cal-nevada Conference
San Jose Clean Energy
Solano County Democratic Central Committee
Sonoma Clean Power
Western States Council Sheet Metal, Air, Rail and Transportation

OPPOSITION: (Verified 8/29/25)

Associated Builders and Contractors of California
California Native Plant Society
Center for Biological Diversity
Defenders of Wildlife
Mount Shasta Bioregional Ecology Center
Planning and Conservation League

ASSEMBLY FLOOR: 76-0, 5/27/25
AYES: Addis, Ahrens, Alanis, Alvarez, Arambula, Ávila Farías, Bains, Bauer-Kahan, Bennett, Berman, Boerner, Bonta, Bryan, Calderon, Caloza, Carrillo, Castillo, Chen, Connolly, Davies, DeMaio, Dixon, Elhawary, Ellis, Flora, Fong, Gabriel, Gallagher, Garcia, Gipson, Mark González, Hadwick, Haney, Harabedian, Hart, Hoover, Irwin, Jackson, Kalra, Krell, Lackey, Lee, Lowenthal, Macedo, McKinnor, Muratsuchi, Ortega, Pacheco, Papan, Patel, Patterson, Pellerin, Petrie-Norris, Quirk-Silva, Ramos, Ransom, Celeste Rodriguez, Michelle Rodriguez, Rogers, Blanca Rubio, Sanchez, Schiavo, Schultz, Sharp-Collins, Solache, Soria, Stefani, Ta, Tangipa, Valencia, Wallis, Ward, Wicks, Wilson, Zbur, Rivas
NO VOTE RECORDED: Aguiar-Curry, Jeff Gonzalez, Nguyen

Prepared by: Brynn Cook / E.Q. / (916) 651-4108
8/29/25 20:39:01

****** END ******