



Central Valley Regional Water Quality Control Board

13 September 2023

Keri Cimarolli
EHS – Environmental Manager
Aera Energy, LLC
1000 Ming Avenue
Bakersfield, CA 93311

CERTIFIED MAIL
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ORDER PURSUANT TO CALIFORNIA WATER CODE SECTION 13267, AERA ENERGY, LLC, SOUTH BELRIDGE OIL FIELD, KERN COUNTY

You are legally obligated to respond to this Order. Read this Order carefully.

Aera Energy, LLC (herein referred to as Aera) is the owner of the groundwater monitoring well MW-12G1 (MW-12G1) and the operator at the Dow Chanslor and Sections 12,13, and 18 leases in the North and South Belridge Oil Fields in Kern County. MW-12G1 is one of four monitoring wells used by Aera for monitoring groundwater as required by Senate Bill 4. Beginning in early 2017, the groundwater monitoring results at MW-12G1 showed abrupt increases and detections of constituents of concern, and abrupt increases in groundwater elevation.

Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff received a document from Aera dated 10 August 2022 with the subject line, “*Aera Energy LLC Response to State Water Resources Control Board and Central Valley Regional Water Quality Control Board Staff Review of report submitted by Aera Energy, LLC (Aera) via email on March 19, 2021 titled “Aera Energy Technical Report, Item 3 Further Evaluation of Increasing Concentrations in MW-12G1”*” (hereafter Aera’s Response). The State Water Resources Control Board and the Central Valley Water Board (collectively, Water Boards) reviewed Aera’s Response and provided a preliminary response in a letter dated 10 January 2023 (hereafter Water Boards’ Response).

Enclosure 1 of the 10 January 2023 Water Boards’ Response describes the additional information that Aera was required to submit. The Water Boards’ Response stated:

Water Boards staff still have concerns regarding the abrupt increases and detections of constituents of concern, and the abrupt increases in groundwater elevation at MW-12G1. Although these changes are potentially unrelated to well stimulation activities, further evaluation of these changes is still needed. Future requests for additional information regarding this will be provided under separate cover by the Central Valley Regional Water Quality Control Board.

MARK BRADFORD, CHAIR | PATRICK PULUPA, ESQ., EXECUTIVE OFFICER

Central Valley Water Board staff have concerns about assertions made by Aera staff in Aera's Response that indicated the main cause of the abrupt increases in groundwater elevations and constituent concentrations in samples from MW-12G1 are attributable primarily to injections that ceased approximately between 25 to 40 years ago. These historical injections were made into wells positioned at both downgradient and side gradient locations in relation to MW-12G1. Aera staff inappropriately support the assertions using a dispersion-based pressure analysis designed for oil and gas formations. Aera staff did not consider basic groundwater properties such as advection in the unconfined aquifer in the alluvium, existing lateral groundwater flow directions, and the fate and transport of constituents of concern in a groundwater aquifer. Therefore, further evaluation is needed to fully assess the cause of the increases to MW-12G1.

In Aera's 19 March 2021 document titled "*Further Evaluation of Increasing Concentrations in MW-12G1*," Aera, concluded that their review of "187 proximate wells," "revealed no assignable mechanical integrity causes with respect to fluid column and constituent changes in MW-12G1." The previous review by Aera did not provide sufficient information and thus additional work is necessary to fully evaluate the wells in proximity to MW-12G1. Specific details for the required information will be provided in this Order's Item 1.

The Central Valley Water Board's authority to require additional information in the form of a technical report derives from Section 13267 of the California Water Code, which specifies, in part, that:

(a) A regional board...in connection with any action relating to any plan or requirement authorized by this division, may investigate the quality of any waters of the state within its region.

(b)(1) In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region...that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

The Central Valley Water Board is concerned about the potential impacts to water quality and threats to human health posed by the migration of groundwater containing constituents of concern, such as highly saline groundwater, into a high quality groundwater. This California Water Code Section 13267 Order (Order) is designed to

assess the cause/source of the release, and to determine the lateral and vertical extent of the release and potential impacts to water quality. The technical information and reports required by this Order are necessary to assess the potential threat to human health and potential impacts to water quality. The need to understand the potential threat to human health and potential impacts to water quality justifies the need for the information and reports required by this Order. Based on the nature and possible consequences of the discharges of waste, the burden of providing the required information, including reporting costs, bears a reasonable relationship to the need for the report, and the benefits to be obtained. Aera is required to submit this information and reports because it is the owner/operator of the leases in the vicinity of MW-12G1 that are subject to this Order.

The Central Valley Water Board staff estimates that completion of initial work required by this Order may cost up to \$500,000 and is dependent on an approved work plan. This cost is based upon the following: staff cost for completion of the conduit analysis and the development and implementation of a work plan for the needed groundwater investigation work, which may include the need for groundwater monitoring well installations, and the collection and analysis of groundwater samples. This cost burden is reasonable when compared to the potential costs associated with mitigating the effects of polluting beneficial use groundwater, and other costs that could be incurred by property owners and downgradient users of groundwater. Based on previous responses to requests for information associated with MW-12G1, it is likely that much of the work required by this Order will be completed by Aera staff.

Central Valley Water Board staff issued Aera an Order pursuant to California Water Code Section 13267 dated 28 August 2020 (2020 Order). The 2020 Order was sent to Aera for identified injection wells located in or near the Lost Hills, South Belridge, and North Belridge Oil Fields completed in the Tulare Formation. The 2020 Order did not consider the alluvium in proximity to the injection wells identified. This Order pertains to the constituents of concern identified in the alluvium in proximity to MW-12G1.

Under the authority of California Water Code section 13267, the Central Valley Water Board hereby orders Aera Energy, LLC to:

1. **By 11 January 2024 (within 120 days)**, submit a technical report that addresses and contains the following:
 - a. The results of a conduit analysis of all active, inactive, and abandoned wells within a radius of a quarter mile from MW-12G1. The conduit analysis needs to include for each well, at minimum, the following information in tabular format:
 - 1) Well name and API number.
 - 2) Construction and abandonment details such as cemented intervals and how it was determined. This includes cement returns, cement tops,

cement bond log descriptions, drilling or abandonment anomalies, casing damage intervals, and compromised annular seal intervals.

- 3) Abandonment history of the identified wells and identification if they were abandoned to current standards.
 - 4) Testing or lack of testing for each well, such as Mechanical Integrity Tests (MIT), Standard Annular Pressure Tests (SAPT), etc. This includes the latest available radioactive tracer survey results.
 - 5) All wells analyzed and identification of each well that has a risk of being a conduit to the overlying alluvium. The latitude and longitude of each well head identified is needed.
 - 6) Distance from MW-12G1, rates of injection, any changes in volume, pressure changes, and date(s) of injection(s).
 - 7) A map showing the surface and bottom hole locations of each well.
- b. Individual isobar maps for the diatomite zone and for the Tulare Formation (at a minimum half mile radius around MW-12G1) and an evaluation as to whether pressures in the diatomite zone or the Tulare Formation are great enough to cause formation fluids from these zones to migrate into the overlying alluvium, including at locations in proximity to injection wells. Aera must include maps for pre and post 2017.
 - c. An evaluation of the isotopic groundwater data as part of a source identification evaluation. Collect and analyze representative sample(s) of injectate from nearby injection well(s) for comparison with constituents found in MW-12G1. The injectate sample(s) must be analyzed for the same suite of constituents analyzed for when sampling MW-12G1. If there are existing analyses of injectate available, it cannot be used for current analysis if it is more than one year old. The injectate sample(s) are needed to determine current conditions of the area. The Central Valley Water Board must be notified when sampling is scheduled to occur.
 - d. An updated analysis of the potential causes of the constituents of concern detections and groundwater elevation changes at MW-12G1. This must include historical and current injections including injections to the alluvium.
 - e. Proposed recommendations for potential mitigation measures for conduit wells identified in Item 1.a.5. Potential mitigation measures may include abandonment of wells with compromised annular seals and/or casing damage, and injection operational changes in the vicinity of MW-12G1.
2. **By 11 March 2024 (within 180 days)**, submit a technical report in the form of a workplan that describes proposed tasks and time schedule to be completed to

investigate the lateral and vertical extent of impacts to groundwater quality in the alluvium associated with the groundwater quality data available for MW-12G1. The workplan must include the tasks of collection (e.g., installation and sampling of groundwater monitoring wells or depth discrete groundwater sampling) and evaluation of water quality data.

3. **Within 60 days** of Central Valley Water Board staff concurrence with the workplan, implement the workplan in accordance with the task descriptions and time schedule described therein.
4. **Within no more than 240 days** of Central Valley Water Board staff concurrence with the workplan (workplan schedule notwithstanding), submit a technical report, providing investigation procedures, laboratory analytical results of groundwater samples collected, evaluation of water quality data, conclusions, and appropriate recommendations for further investigation activities; if needed.

The technical reports and information required by this Order must be uploaded to the State Water Resources Control Board's (State Water Board's) GeoTracker database (<https://geotracker.waterboards.ca.gov/esi/login.asp>) in an electronic format that follows the requirements of California Code of Regulations, title 23, section 3893 (http://www.waterboards.ca.gov/ust/electronic_submittal/docs/text_regs.pdf). Central Valley Water Board staff has provided, in Attachment A, a unique GeoTracker identifier (Global ID number). Your state-certified laboratory will need the assigned Global ID number to upload to GeoTracker the certified analytical results for each well. GeoTracker upload instructions are also provided in Attachment A.

Based on the information submitted in the work plan and/or technical reports, additional information or action may be required. All required technical information must be submitted to the attention of:

Michael Pfister
Central Valley Water Board
1685 E Street
Fresno, CA 93706

Submissions pursuant to this Order need to include the following statement signed by an authorized representative of Aera:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Please note that the information produced in response to this Order will be used to ascertain the extent of the migration, as well as the impacts and any necessary future actions. Investigative orders are iterative in nature, and subsequent orders may be narrower and more precise in scope.

The failure to furnish the required reports by the due dates herein or in a time schedule approved by the Executive Officer, or the submission of a substantially incomplete report or false information, is a misdemeanor, and may result in additional enforcement actions, including issuance of an Administrative Civil Liability Complaint pursuant to California Water Code section 13268. Liability may be imposed pursuant to California Water Code section 13268 in an amount not to exceed one thousand dollars (\$1,000) for each day in which the violation occurs.

In accordance with California Business and Professions Code sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for investigations and studies, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the operator shall bear the professional's signature and stamp.

Any person aggrieved by this Order of the Central Valley Water Board may petition the State Water Board to review the action in accordance with California Water Code section 13320. The State Water Board must receive the petition by 5:00 p.m., within 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations, and instructions applicable to filing petitions are available at the [State Water Board's Website](http://www.waterboards.ca.gov/public_notices/petitions/water_quality/index.shtml) or will be provided upon request.
(http://www.waterboards.ca.gov/public_notices/petitions/water_quality/index.shtml).

Any questions regarding this matter should be directed to Michael Pfister at (559) 444-2418 or at Michael.Pfister@Waterboards.ca.gov.

Original Signed by:
Patrick Pulupa
Executive Officer

Enclosure: Attachment A, Assigned GeoTracker Global Identification Number, and GeoTracker Upload Instructions

cc: [next page, via email]

Keri Cimarolli
Aera Energy, LLC

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13 September 2023

Chris Jones, Acting District Deputy, Central District, California Geologic Energy
Management Division, Bakersfield

Janice Zinky, Groundwater Monitoring Section Manager, State Water Resources
Control Board, Sacramento

Bill Patzelt, Oil and Gas Monitoring Unit Manager, State Water Resources Control
Board, Sacramento

Lisa Alpert, Senior Geologist, Aera Energy, LLC, Bakersfield

Aysel Majidova, Aera Energy, LLC, Bakersfield

ATTACHMENT A
Information Subject to this Order and Assigned GeoTracker Global
Identification Number

Assigned GeoTracker Global ID Number- GAOG10009277

[GeoTracker Upload Instructions](#)

(https://www.waterboards.ca.gov/ust/electronic_submittal/)

Work plans, technical reports and associated data shall be uploaded in an electronic format compatible with the State's GeoTracker system. To begin the process:

- Log in or create a password
- Claim your site(s) (i.e. global ID)
- Add field point name(s)
- Upload the following:
 - Work plan/Technical report and associated data (GeoReport)
 - Laboratory report (EDF)
 - Site Maps (GeoMAP)

For more information, contact the GeoTracker Help Desk at
Geotracker@waterboards.ca.gov.