



September 10, 2019

Mr. Nadim Hosn
 Chevron U.S.A. Inc.
 9525 Camino Media
 Bakersfield, CA 93311

**TECHNICAL REPORTS REQUIRED Regarding Chevron U. S. A. Inc. [C5640], Cymric Field
 Cyclic Steam Operations**

Dear Mr. Hosn:

By this letter, pursuant to Public Resources Code (PRC) section 3357, subdivision (b)(1), the Division of Oil, Gas, and Geothermal Resources (DOGGR), is requiring **Chevron U.S.A. Inc.** (Chevron) to provide technical reports relating to its cyclic steam operations in the in the Cymric oil field. DOGGR is requiring these reports of Chevron in connection with its ongoing to investigation and response to the surface expressions occurring in that field.

Effective April 01, 2019, DOGGR's revised Underground Injection Control (UIC) regulations prohibit the occurrence of surface expressions. (Cal. Code Regs., tit. 14, (CCR) § 1724.11, subd. (a).) Chevron is the operator of approximately 350 active cyclic steam injection wells in the Cymric field, and since April 1, 2019, there have been at least eight surface expressions intermittently or continuously active within the Cymric field within three areas that DOGGR has identified as: 1Y, 36W, and GS-5. The delineation of these areas and the location of the surface expressions are detailed in the attached map (Exhibit A).

DOGGR to date has issued five Notices of Violations in response to these surface expressions, as follows:

Area	Event Date	CAL-OES #	NOV #	Date of Issued NOV
1Y	May 10, 2019	19-3040	V19-0008	May 20, 2019
	June 08, 2019	19-3668	V19-0016	June 13, 2019
36W	June 05, 2019	19-5263	V19-0017	June 13, 2019
	August 21, 2019	19-5407	V19-0033	August 24, 2019
GS-5	Ongoing	N/A	V19-0032	August 23, 2019

DOGGR twice amended NOV V19-0016 (on July 01 and 17, 2019) to address subsequent surface expressions in the same area. In addition, DOGGR issued Order 1159 on July 12, 2019, requiring Chevron to perform remedial work and undertake all necessary measures to stop the flow from the established surface expressions near the subject well 1405S (API: 029-80898).

Chevron's has presented DOGGR with four separate root cause analyses (June 20, July 11 x2 and August 27th) and data regarding the surface expressions occurring in Cymric field. DOGGR has evaluated the analyses and data and determined that the submitted material does not demonstrate to DOGGR's satisfaction that Chevron has taken all possible steps to mitigate and prevent the occurrence of surface expressions in the Cymric field, as required under DOGGR's UIC regulations. For these reasons, in conjunction with all other past and future regulatory responses, DOGGR is requiring Chevron to provide the technical reports described below.

AUTHORITY

PRC section 3106 authorizes DOGGR to supervise the drilling, operation, maintenance, and abandonment of wells and facilities attendant to oil and gas production so as to prevent, as far as possible, damage to life, health, property, and natural resources.

PRC section 3357, subdivision (b)(1), authorizes DOGGR to require an operator to furnish necessary technical or monitoring reports, provided the burden bears a reasonable relationship to the need for and benefit of the reports. In requiring a report, DOGGR must explain the need for the report and identify the rationale that supports requiring that the operator to provide the report.

RATIONALE AND NEED FOR THE REQUESTED INFORMATION

As outlined in CCR section 1724.6, it is incumbent on an underground injection project operator to demonstrate that all aspects of a project for injection meets regulations to provide and demonstrate effective zonal isolation of the approved injection zone and

is approved by DOGGR. CCR sections 1724.7, 1724.7.1, and 1724.8 detail the analysis and data that are required to support an underground injection project. These regulations require demonstration that injected fluid will be confined to the approved injection zone and that the underground injection project will not cause damage to life, health, property, or natural resources. Chevron's cyclic steam injection operations in the Cymric field fail to meet these criteria for the following reasons:

1. Approval of Underground Injection Projects

Chevron's cyclic steam injection operations in the Cymric field are not supported by a comprehensive Project Approval Letter (PAL), nor have they undergone review to ensure all aspects of sections 1724.6 through 1724.13 have been satisfied. The continuing occurrences of surface expressions outlined above demonstrate the need to conduct full underground injection project evaluation. As a result of the most recent events, a cumulative amount of fluid (oil and water) in excess of 30,000 barrels has expressed to the surface, with flows not yet abated in some of the expressions since their initiation.

2. Evaluation of Wells Within the Area of Review

All of the root cause analyses that Chevron has submitted to DOGGR indicate that several wells may have attributed to the surface expressions occurring in Cymric field. Thus, review is needed of all wells within the area of review of the cyclic steam injection wells in the Cymric field. CCR section 1724.8 requires such review to ensure that an underground injection project does not cause or contribute to the migration of fluid outside the approved injection zone, or otherwise have an adverse effect on the underground injection project or cause damage to life, health, property, or natural resources.

REQUESTED ACTIONS AND INFORMATION

DOGGR HEREBY REQUIRES that Chevron submit the following technical reports:

A. Within 30 days of this letter: A Complete Set of Underground Injection Project Data

- a. Complete data in support of all present or contemplated cyclic steam injection in the Cymric field as necessary to wholly demonstrate to DOGGR's satisfaction that injected fluid will be confined to the approved injection zone and otherwise comply with CCR section 1724.7.
- b. Provide all data in a digital format, including well logs in Log ASCII Standard (.las) with any and all directional data for all wells within the area of review.
- c. Daily production and injection data for all wells within the project review boundary, including GS-5 pump rates.
- d. Maps and cross sections defining the reservoirs with associated well data all provided in digital format.

B. By December 13, 2019: A Surface Expression Monitoring and Prevention Plan

- a. A Surface Expression Monitoring and Prevention Plan as previously required under NOV's V19-0008 and V19-0016 for review and approval by DOGGR. This plan must comprehensively address all current or contemplated cyclic steam injection in the Cymric field, and, per CCR section 1724.11, subdivision (b)(1), the plan shall include the following:
 - i. A subsurface injection-production mass balancing surveillance system utilizing a continuous tilt meter array or other ground monitoring system approved by DOGGR; or implementation of a real-time pressure/flow monitoring system that will give adequate warning to prevent surface expressions.
 - ii. A map of the project area with all surface expressions, including cracks, fissures, and sink holes related to underground injection, and containment measures prominently marked. A current map of these features shall be provided to DOGGR and shall be updated as these features are discovered, installed, or changed.
 - iii. Pressure data for the reservoir over a five-year history, and a system to provide regular monthly updates to the pressure maps.
 - iv. Protocols for restriction of access to areas where there are surface expressions or surface expression containment measures.
 - v. Training, including safety measures and identification of possible hazards, for field personnel working in areas where there are surface expressions or where surface expressions may occur.

C. Within 30 days of this letter: A Report of All Previously Collected Surface Monitoring Data

- a. A report providing all tilt meter grids for a period covering 10 years prior to the surface expressions occurring after April 01, 2019, including all X, Y, Z localities of tilt meter stations, and processing information used to generate grids.
- b. A report providing all InSAR data (11- or 22-day) cycles, as collected to review and parallel the tilt meter data.

Please coordinate with and send all required information to:

William Long
Supervising Oil and Gas Engineer
Inland District Oversight and Technology

Division of Oil, Gas and Geothermal Resources
California Department of Conservation
4800 Stockdale Hwy; Suite 100
Bakersfield, CA 93309
Main: 661-322-4031
E: William.Long@conservation.ca.gov

Please contact me at your earliest convenience to discuss any questions or concerns Chevron has regarding the requirements of this letter. Discussion and consultation with DOGGR will be important to ensure that expectations are met.

Sincerely,



Cameron Campbell
Inland District Deputy
On Behalf of Acting Supervisor Jason Marshall

Exhibit A: Cymric 1Y/36W Surface Expressions

