State of New Mexico
Energy, Minerals and Natural Resources
Department

NOTICE TO OPERATORS

IMMEDIATE RESPONSE PLAN FOR SEISMIC EVENTS RELATED TO CLASS II UNDERGROUND INJECTION CONTROL WELLS

November 23, 2021

The New Mexico Energy, Minerals and Natural Resources Department, Oil Conservation Division ("OCD") has the authority under the Oil and Gas Act (Section 70-1-1 *et seq*., NMSA 1978) and pursuant to delegated authority from the U.S. Environmental Protection Agency under the Safe Drinking Water Act (42 U.S.C. 300f *et seq*.) to regulate all aspects of Underground Injection Control ("UIC") Class II well development and operation, and decommissioning, including their contribution to induced seismic activity. See 19.15.26 NMAC. This Notice sets forth OCD's framework for responding to seismicity related to UIC Class II injection well operations wherever it may occur across New Mexico.

The USGS and New Mexico Bureau of Geology has detected increasing seismic activity over the last two years in the vicinity of several UIC wells located across New Mexico, including:

- Seven earthquakes of magnitude from M2.5 to M4.0 between March 2021 and September 2021, in an area known as the County Line Seismic Response Area ("County Line SRA") located approximately 35 miles east southeast of Malaga, NM;
- Thirteen earthquake events ranging from M1.8 to M2.7 in a location approximately six miles northeast of Jal, NM, that started in August 2020 and have occurred periodically to the present;
- A swarm of 21 earthquakes ranging between M2.3 and M3.3 over a three-day period in June 2020 located in an area approximately 12 miles southwest of Lovington, NM; and,
- A collection of earthquakes in the last month, including:
  - A M3.2 event in an area approximately 24 miles southwest of Monument, NM;
  - A M4.0 event in an area approximately 15 miles North of Cimarron, NM; and,
  - A M2.5 event in an area approximately 15 miles north northeast of Ute Park, NM.

OCD has actively engaged with UIC well operators in these areas to gather data on the seismic events and to understand their causes. Based on the available data, the location of the seismic activity, and its proximity to existing UIC injection activities, as well as the experience of other states managing oil and gas related induced seismicity, OCD believes that these seismic events are directly related to UIC injection activities. These seismic events demonstrate the need for OCD to marshal available tools and data to mitigate induced seismicity and ensure that appropriate measures are established to manage it going forward.

To that end, the OCD announces the following statewide induced seismicity mitigation and response framework (see Attachment A). The framework incorporates requirements that will be implemented either through voluntary actions by operators and/or orders issued by the OCD. The OCD has the authority to institute the framework under the Oil and Gas Act, including 19.15.26.11 NMAC, which provides for:

1) "more comprehensive testing of [an] …injection well when deemed advisable, including the use of tracer surveys, noise logs, temperature logs or other test procedures or devices;" and,
2) "special tests [of an injection well] …if the division believes conditions so warrant."

Testing under this authority may include but is not limited to: (1) operational curtailment of injection volumes and shut-ins,[1] (2) pressure monitoring, (3) well communication testing, and (4) phased-in reinstatement of operational activities. Consistent with this authority, the OCD expects the following actions in response to seismic events depending on the timing and magnitude of the observed event:

1. Following the occurrence of two seismic events equal to or greater than M2.5 within a 30-day period and within a 10-mile radius, OCD expects all UIC well operators within 10 miles of the epicenter of the seismic events (the "Seismic AOI") to:
    a. comply with the Category 1 Seismicity Response Protocols identified in Attachment A to this notice until such time as OCD determines appropriate mitigation actions in response to the observed seismic events have occurred.
2. Following the occurrence of one seismic event equal to or greater than M3.0, OCD expects all UIC well operators within the Seismic AOI to:
    a. Implement all the monitoring and reporting requirements in the Category 1 Seismicity Response Protocols set forth in Attachment A, plus
    b. The additional operational controls in the Category 2 Seismicity Response Protocols set forth in Attachment A.
3. OCD expects the duration the of any measures identified above will be until such time as OCD determines, in its sole discretion, that appropriate mitigation actions in response to the observed seismic events have occurred. Factors the OCD will consider, without limitation, including the lack of additional seismic activity for 6 months after the triggering event and/or approval of an operator/industry response plan to the seismic activity.
4. Attachment B contains OCD's Seismicity Response Protocol Information Form, which OCD in its discretion may convert into an online form.

OCD may add additional requirements in any order issued in response to a seismic event as it deems necessary and appropriate to address the specific circumstances.

Finally, OCD will consider an operator's voluntary implementation of the measures outlined in this Notice when deciding whether and when to issue an order. For additional information, contact OCD.Engineer@state.nm.us.

Attachments:

Attachment A: OCD, Seismicity Response Protocol
Attachment B: OCD, Seismicity Response Protocol Information Form (*form shall be submitted using OCD's e-permitting system*)

[1] Operational controls are intended to test the geologic response to reductions in disposal volumes.

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Seismicity Response Protocol (rev. date November 23, 2021)

Category 1: Seismicity Response Protocol:

Effective when Two M2.5 Events Occur Within 30 Days and Within a 10 mile Radius

Within 10 Miles

Monitoring & Reporting Protocols

- Weekly reporting of daily injection volumes and average daily surface pressure
  - Reporting in addition to C-115 reporting, on form provided by OCD
  - Digitally measure injection volume and pressure. The Data must be recorded on an hourly basis at a minimum. Operator shall archive digital injection data and deliver upon request
- Operators must provide an analysis identifying the perforated injection interval and formation tops.
- Operator must monitor seismicity (magnitude >~M2.5 for 10 miles around well using USGS/NMTSO data)
  - Operators shall share monitor data with OCD when requested
- Additional requirements may be added if determined appropriate by the OCD.

Category 2: Seismicity Response Protocol:

Effective with one M3.0+ Event

M3.0+ event

All Category 1 Monitoring & Reporting protocols, and

- 50% rate reduction within 0-3 miles
- 25% reduction between 3-6 miles
- Reductions to rate should start immediately and be completed within a week
- Notify OCD of pertinent information within 24 hours or next business day, whichever is latest, of an event using the OCD form.

M3.5+ event

All Category 1 Monitoring & Reporting protocols, and

- Shut in at 0-3 miles
- 50% rate reduction at 3-6 miles
- 25% rate reduction at 6-10 miles
- Reductions to rate should start immediately and be completed within a week
- Notify OCD of pertinent information within 24 hours or next business day, whichever is latest, of an event using the OCD form.

- **All rates should be reduced from the previous 6-month daily average of active injection days**
- **Notifications should be made to the OCD by submitting to the OCD Permitting within 24 hours of receiving monitoring data of a seismic event within 10 miles of its facility.**
- **Such notification can be based on private or public seismic network data; however, final actions will be determined by USGS data concerning magnitude and location. All distances in this document are based on determined Epicenter.**
- **Pertinent information will be submitted to the OCD by an OCD form which is in development and will be submitted to the OCD via OCD.Engineer@state.nm.us**
- **OCD my reduce or eliminate disposal volumes within the curtailment radii above, at its sole discretion, if after 6 months no M3.0 events have occurred within 10 mi. of the original triggering event and/or OCD approves an operator/industry response plan within the response radii.**

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit electronically
Via E-permitting

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Seismicity Response Protocol Information Form

This form must be completed as part of OCD's Seismicity Response Protocol and updated after any qualifying event thereafter.

Applicability: This form must be completed for each well classified as an Underground Injection Control (UIC) Class II disposal wells or Class II enhanced recovery injection well with active injection authority (wells). "Active injection authority" means a well that is authorized to inject pursuant to an administrative permit or hearing order. This includes wells that have an approved Application for Permit to Drill and have and approved injection permit but have not yet been drilled or commenced injection.

Well Information

I. Operator: _____ **OGRID:** _____ **OCD notification date**_____

Well Name_____ **API#** _____

II. Type of Notification: ☐ Original ☐ Amendment ☐ Other

If Other, please describe: _____

III. Seismic event information: Magnitude _____ **Location** _____**lat,** _____**long. , Date of occurrence** _____

Source of information (i.e. USGS, NMTSO, TexNet, other) _____ **Depth of occurrence** _____

IV. Well(s): Provide the following information for each well permitted within a 10-mile proximity of the epicenter.

Injection Order	Distance from epicenter	Perforated and/or open-hole interval (Vertical Depth)	Formation/s completed

V. ☐ An updated well bore diagram is required to be attached, which identifies the current injection intervals (perforations and/or open hole), formation tops, measured depth, vertical depths and Sub-Sea True vertical depths.

VI. Well Information Prior to Injection Volume Reduction: Provide the following information for each well identified in Section IV. Daily rates and pressures are based on the active injection days during the prior 6-month period.

Avg daily injection rate (prior to reduction)	Avg injection daily pressure (prior to reduction)	Well Type (Commercial, lease only, single operator)

VII. Well Information After Injection Volume Reduction: Provide the following information for each well identified in Section IV.

Avg daily injection rate limit (post reduction)	Avg injection daily pressure limit (post reduction)	Reduction %	Reduction start date	Reduction achieved date

Acknowledgments

Operator acknowledges that it must take the following actions as part of its seismic response protocol:

☐ Operator shall report the daily injection volumes and pressures for each well on a weekly basis on the form prescribed by the OCD. The report is due on the Wednesday the week following the weekly monitoring interval.

☐ Operator shall start or continue to digitally measure injection volumes and pressures for each well at a minimum of an hourly basis, and shall archive the data and make it available to OCD upon receipt of a written request.

☐ Operator shall monitor seismicity events with magnitudes equal to or greater than M2.5 within a radius of 10 miles around each well using USGS / NMTSO data, and shall archive the data and make it available to OCD upon receipt of a written request.

☐ Operator shall notify OCD and provide updated pertinent well information within 24 hours of an event greater than M 2.5 within a radius of 10 miles around each well using this OCD form.

☐ After each event greater than M 2.5 within a radius of 10 miles around each well, Operator shall inspect well head and well equipment of each well to ensure proper working order. As part of this inspection, Operator should evaluate whether a Bradenhead test or MIT is warranted to ensure wellbore integrity.

I certify that, after reasonable inquiry and based on the available information at the time of submittal, this Seismic Information Form is true and correct to the best of my knowledge, and I acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature:
Printed Name:
Title:
E-mail Address:
Date:
Phone:

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
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CONDITIONS

Action 315743

CONDITIONS

Operator: NEW MEXICO ENERGY MINERALS & NATURAL RESOURCE 1220 S St Francis Dr Santa Fe , NM 87504	OGRID: 264235
	Action Number: 315743
	Action Type: [IM-SD] Admin Order Support Doc (ENG) (IM-AAO)

CONDITIONS

Created By	Condition	Condition Date
pgoetze	None	2/19/2024