

**TO:** Administrator Robert Ghiglieri and the Commission on Mineral Resources

**FROM:** C. Brandon Law, Sr. Director – Land, Environment, and Permitting | Fervo Energy

**DATE:** May 5, 2026

**SUBJECT:** Written Comments on Proposed Regulation LCB File No. R093-25 (NAC 534A)

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Fervo Energy is committed to advancing safe, utility-scale "next-generation" geothermal development in the State of Nevada. While we appreciate the Division of Minerals' (NDOM) intent to modernize NAC 534A, several provisions within the proposed LCB File No. R093-25 deviate significantly from established federal scientific protocols and imposed burdens we believe would be prohibitive and result in negative impacts to the burgeoning enhanced geothermal systems (EGS) industry.

While recognizing the value of Induced Seismicity Mitigation Plans (ISMPs) in enabling real-time mitigation, the proposed regulations – though well intentioned – could inadvertently stifle utility-scale geothermal development within the state. Pursuant to the provisions of NRS 233B and the Division's Notice of Intent, Fervo Energy formally requests that the Commission amend the provisions outlined below to align with established Department of Energy (DOE) best practices. If the Division chooses to adopt the regulations as currently drafted, Fervo formally requests a concise written statement from the Division explaining its principal reasons for overruling the federal scientific standards and industry data provided herein.

## **Categorization of Rulemaking and Proposed Improvements**

### **1. Induced Seismicity Monitoring Framework (Sections 12, 13, and 17)**

**The Proposed Rule:** Sections 12 and 13 establish the framework for an Induced Seismicity Monitoring Plan (ISMP) and the data requirements that must accompany it, including baseline seismic characterization, traffic light monitoring thresholds, and public reporting obligations. Section 17 separately establishes the Administrator's authority to issue stop-work orders, including mandatory shutdown triggers for cumulative Amber Light alerts, a blanket 5-mile radius shutdown authority over neighboring operators, and a mandatory 30-day in-person meeting process before operations may resume.

**Fervo's Comment:** Fervo strongly supports the Division's decision to require a comprehensive, project-specific ISMP as a condition of stimulation permitting. The ISMP framework established in Sections 12 and 13 reflects sound regulatory thinking and aligns with the approach taken by the Department of Energy at the Utah FORGE project – one of the most rigorously monitored geothermal operations in the world. Requiring operators to

submit detailed baseline seismic characterization, establish traffic light thresholds in advance, and maintain transparent public monitoring is exactly the right model. Fervo has implemented this approach at Cape Station in Utah and believes it represents the gold standard for responsible EGS development. Further details can be found in Fervo's 'Geothermal Sustainable Development Pact', included as Appendix A.

Our proposed amendments to Sections 12 and 13, detailed below, are intended to strengthen this framework – not diminish it – by ensuring that thresholds and mitigation protocols are negotiated collaboratively between the operator and the Division on a site-specific basis, consistent with the DOE's recommended protocol (Document Number DOE/EE-0662 – *Protocol for Addressing Induced Seismicity Associated with Enhanced Geothermal Systems*, Majer et al., January 2012).<sup>1</sup> Remote, low-population sites carry fundamentally different risk profiles than projects near existing infrastructure, and the ISMP process is the appropriate vehicle to account for those differences rather than applying blanket statewide parameters.

With respect to Section 17, Fervo respectfully submits that it should be stricken in its entirety. A well-constructed, mutually agreed-upon ISMP – as contemplated by the improved Sections 12 and 13 proposed herein – already provides the Division with all the regulatory tools it needs to protect public safety. The ISMP establishes pre-negotiated, objective thresholds that define precisely when operational changes are required. It specifies the mitigation measures the operator must take at each alert level and it creates a transparent, data-driven record against which compliance can be measured. Section 17, as drafted, is therefore redundant to that framework while simultaneously undermining it.

Specifically, Section 17's mandatory shutdown trigger for a third cumulative Amber Light alert is internally inconsistent with the rule's own predicate. It requires the Administrator to find "imminent danger to the health and safety of the public," yet multiple Amber Light alerts, by definition, do not constitute imminent danger. They are precisely the low-level operational signals that the traffic light system was designed to manage through measured, proportional responses. Codifying an automatic statutory shutdown for this scenario strips away the site-specific flexibility that makes the ISMP framework scientifically sound and replaces it with a blunt instrument that bears no relationship to actual risk.

Similarly, Section 17's authority to issue blanket cease-operation orders to any operator within a 5-mile radius of a seismic epicenter – regardless of whether that operator's activities have any demonstrated connection to the event – is arbitrary and would expose

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<sup>1</sup> U.S. Department of Energy. Protocol for Addressing Induced Seismicity Associated with Enhanced Geothermal Systems. January 2012.  
[https://www1.eere.energy.gov/geothermal/pdfs/geothermal\\_seismicity\\_protocol\\_012012.pdf](https://www1.eere.energy.gov/geothermal/pdfs/geothermal_seismicity_protocol_012012.pdf)

compliant operators to catastrophic project disruption caused by neighboring operations or natural seismic activity entirely outside their control. Lastly, the requirement to hold a formal 30-day in-person settlement meeting before operations may resume transforms what should be a rapid, data-driven safety pause into a prolonged bureaucratic proceeding with no scientific basis.

Importantly, the ISMP-based framework proposed herein provides the Administrator with significantly greater operational flexibility than the current draft of Section 17 affords. As written, Section 17 constrains the Administrator with rigid, one-size-fits-all statutory triggers – mandatory shutdowns at prescribed thresholds regardless of site conditions, geology, or actual risk – leaving little room for professional judgment. By contrast, a collaborative, project-specific ISMP negotiated in advance gives the Administrator the discretion to calibrate thresholds and responses to the actual conditions of each site, to engage meaningfully with operators before problems arise rather than after, and to make enforcement decisions grounded in objective, project-specific data rather than blanket statutory mandates. The Division is not diminished by this approach – it is empowered by it.

This flexibility is particularly critical for EGS, which remains an emerging technology. Every project generates new scientific and operational knowledge. Rigid statutory thresholds codified today cannot anticipate what the industry and the Division will learn from tomorrow's projects. Given the infrequency of regulatory amendment cycles in Nevada, locking in inflexible rules now risks enshrining today's incomplete understanding into law for years or decades – precisely when the field is evolving most rapidly. An ISMP framework preserves the Administrator's ability to incorporate new learning into each successive project's terms, rather than forcing both regulator and operator to operate under rules that may already be outdated.

The Administrator retains full authority to review and approve each ISMP, to reject proposed thresholds that are insufficiently protective, and to enforce the terms of any approved plan. What is eliminated is not the Division's authority, but the administrative burden of applying inflexible rules to highly variable conditions – a burden that serves neither the regulator nor the regulated community. Operators who submit an ISMP and subsequently fail to operate within its negotiated parameters provide the Division with objective, documented grounds for enforcement action under existing statutory authority.

Section 17, as written, adds no meaningful additional protection. It only adds uncertainty, subjectivity, and operational risk to a regulatory environment that Nevada's emerging geothermal industry needs to be predictable and investable.

### **Proposed Amendments:**

- **Strike Section 17 in its entirety.** The ISMP framework established in the amended Sections 12 and 13, as proposed herein, provides a comprehensive, objective, and site-specific mechanism for managing induced seismicity that renders Section 17 unnecessary.
- **Amend Section 12** to require that ISMP thresholds and mitigation protocols be established through a collaborative process between the operator and the Division prior to stimulation, ensuring that amber and red light responses – including any operational pauses or reductions – are proportional, site-specific, and grounded in objective seismic data. See proposed redline amendments to Section 12 below.
- **Amend Section 13** to ensure baseline data requirements are workable for multi-well EGS project areas and that third-party monitoring agreements are encouraged but not mandatorily prescribed where no suitable partner exists. See proposed redline amendments to Section 13 below.
- **Please see Appendix C and D** for the proposed mechanical redline and clean text of Sections 12 and 13 for the Commission's adoption.

## **2. Redundant Baseline Water Sampling (Section 11)**

**The Proposed Rule:** Section 11 requires operators to test up to six water sources within the area of review on a static timeline: an initial sample, a 3-12-month sample, and an 18-24-month sample following the "commencement of stimulation".

**Fervo's Comment:** The Division drafted this timeline assuming a single, isolated stimulation event. For utility-scale EGS multi-well pads that undergo sequential stimulations over a multi-year development campaign, this rigid statutory timeline will trigger a cascading loop of redundant, overlapping water sampling events that offer zero additional environmental protection.

### **Proposed Amendment (Redline):**

- Amend Section 11 to explicitly authorize operators of multi-well project areas to submit a consolidated, project-wide water sampling schedule that satisfies the intervals without forcing redundant sampling for subsequent boreholes on the same pad.

### **3. Excessive Fee Scaling (Sections 24, 25, 27, and 32)**

**The Proposed Rule:** The draft introduces a new stimulation fee of \$1,500 per well (plus \$900 for subsequent wells of the same type), doubles base application fees from \$500 to \$1,000, and increases completion fees for deep wells to \$5,000.

**Fervo's Comment:** Fervo fully supports the Division's efforts to adequately fund its permitting and oversight program. As Administrator Ghiglieri noted during the August 2025 public workshop, NDOM anticipates a significant increase in geothermal applications and permits in the coming years, and it is entirely reasonable that fee structures reflect the actual cost of administering a more active and technically complex program. Fervo wants NDOM to be well-resourced. A well-funded Division is a more effective regulatory partner, and that benefits the industry as much as it does the state.

That said, the proposed fee increases – particularly the \$5,000 completion fee for deep wells – are significantly out of step with comparable programs in neighboring states. By contrast, Utah's Division of Water Rights, which administers a comparable geothermal permitting program that includes active EGS development such as the DOE FORGE project and Fervo's own Cape Station facility, does not impose equivalent application, stimulation, or depth-based completion fees. If Utah can administer a rigorous, active geothermal permitting program at substantially lower cost to operators, Nevada's proposed fee schedule warrants careful recalibration to ensure it reflects actual program costs and does not inadvertently discourage the capital-intensive investment NDOM is seeking to attract.

Fervo does not object to meaningful fee increases that are calibrated to actual administrative costs. We would respectfully request that NDOM consider benchmarking its fee schedule against Utah and other peer state programs, with particular attention to the deep well completion fee in Section 27, which has the most significant impact on the capital-intensive projects NDOM is seeking to attract.

#### **Proposed Amendment:**

- **Amend Section 27** to recalibrate the tiered completion fee schedule – particularly for deep wells exceeding 10,000 feet – against peer state benchmarks, including the fee structure administered by Utah's Division of Water Rights under the Utah Geothermal Resource Conservation Act.

### **4. Lateral Setback From Water Sources (Section 14)**

**The Proposed Rule:** Section 14(a)(1) requires that the surface location of a geothermal well be at a lateral distance of not less than 300 feet from any known perennial water source or existing water well. Section 14(a)(2) further requires that the edge of the drilling pad be at a

lateral distance of not less than 100 feet from any known perennial water source or existing water well. Section 14(2) provides that an operator may submit a request to the Division for an exception to these requirements.

**Fervo's Comment:** Both setback requirements, as written, are not calibrated to actual subsurface risk and are fundamentally incompatible with modern multi-well pad operations.

First, both provisions apply exclusively to *surface* location and pad geometry, which are the least meaningful measures of potential impact to a water source in the context of directionally drilled EGS wells. The relevant risk parameter is subsurface proximity and trajectory relative to freshwater-bearing formations – not surface spacing. A well drilled directionally away from a water source poses no greater risk at 200 feet of surface separation than one drilled at 400 feet. The rule as written does not account for this fundamental characteristic of modern geothermal drilling.

Second, both the 300-foot wellhead setback and the 100-foot pad edge setback render co-located water supply wells impermissible. Co-located water wells are a standard feature of efficient, low-disturbance multi-well pad design – siting water wells on the same pad as geothermal wells reduces cost, minimizes road construction, and limits overall surface disturbance. Requiring operators to site water wells beyond both the pad boundary and an additional 100-foot buffer necessitates construction of a separate water well pad with associated roads and infrastructure, increasing surface disturbance rather than reducing it. This outcome is contrary to responsible development practice and Nevada's broader land stewardship interests.

Finally, the exception process under Section 14(2) provides insufficient protection for either requirement. Operators cannot design pads around an exception they have not yet been granted. Infrastructure decisions – including water well siting – must be made during initial project design, long before an exception application could be reviewed and approved. Project-by-project uncertainty at this stage is operationally unworkable.

**Proposed Amendment:**

- **Amend Section 14(a)(1) and 14(a)(2)** to apply setback requirements to subsurface proximity from freshwater-bearing formations rather than surface wellhead location or pad geometry, as demonstrated in the well design submitted with the permit application.
- **Amend Section 14(a)** to explicitly exempt co-located water supply wells serving the same drilling pad from both the surface location and pad edge setback requirements. If the Division retains the surface setbacks, amend Section 14(2) to

require that the Division issue a determination on any exception request not later than 30 days after submission, with an exception deemed granted if the Division fails to act within that period.

## **5. Wellhead Pressure Monitoring Requirements (Section 16)**

**The Proposed Rule:** Section 16(2) requires operators to monitor and record all wellhead pressures, including each annular space pressure, during stimulation. The maximum hydraulic pressure to which a segment of casing is exposed must not exceed the burst-pressure rating of the casing, though the Division may require a lower maximum hydraulic pressure as it determines necessary. The operator must immediately stop stimulation and notify the Division if any change in annular space pressure is observed that suggests communication with stimulation fluids. A report documenting all recorded stimulation pressures for each stage must be provided to the Division not later than 15 days after the completion of each stage.

**Fervo's Comment:** This section raises two significant operational concerns.

First, the requirement to monitor and record *all* annular space pressures – including surface casing annulus pressure – goes beyond current industry practice and would require new instrumentation and associated costs. Operators routinely monitor intermediate casing annulus pressure as the operationally and scientifically relevant data point during stimulation. Surface casing annulus pressure is not currently recorded during stimulation operations and adding this requirement would necessitate additional equipment and procedures without a demonstrated corresponding safety benefit.

Second, the provision granting the Division authority to require a lower maximum hydraulic pressure than the casing burst-pressure rating – without any defined standard, trigger, or procedural guardrail – presents serious operational risk. Stimulation operations are engineered to precise pressure parameters. If the Division exercises this authority to mandate a maximum pressure below what the operator's well design requires to achieve stimulation, it could render the operation technically infeasible, damage the wellbore, or result in an incomplete stimulation that itself creates safety and integrity risks. The rule provides no guidance on what conditions would justify such a requirement, no opportunity for the operator to respond or provide engineering data, and no appeal mechanism. As written, this is an unconstrained grant of authority that could effectively allow the Division to halt or invalidate a stimulation operation through a pressure mandate rather than a formal stop-work order – without any of the procedural protections that accompany such an order.

### **Proposed Amendment:**

- **Amend Section 16(2)** to limit the annular pressure monitoring requirement to the intermediate casing annulus, consistent with current industry practice and the operationally relevant data point for stimulation integrity.
- **Amend Section 16(2)** to replace the Division's open-ended authority to require lower maximum hydraulic pressures with a defined standard – specifically, that any Division-mandated pressure reduction must be supported by written findings identifying a specific, documented well integrity concern, provided to the operator not less than 48 hours before stimulation, and subject to operator response with supporting engineering data before taking effect. This ensures the Division retains meaningful oversight authority while protecting operators from operationally unworkable pressure mandates issued without technical basis or procedural recourse.

### **Conclusion**

Fervo Energy appreciates the Commission's commitment to building a modern, rigorous regulatory framework for next-generation geothermal development in Nevada. The comments submitted herein are offered in that same spirit. Fervo does not seek to diminish NDOM's oversight authority or reduce the safety standards that responsible EGS development demands. We seek a regulatory structure that is scientifically sound, operationally workable, and built on the same data-driven principles that have made the DOE FORGE program a model for the industry.

Nevada has an extraordinary opportunity. The state's geothermal resources, regulatory leadership, and emerging operator community can position it as the nation's foremost hub for next-generation clean energy development, but only if the regulatory environment matches the ambition. The amendments proposed herein – particularly the strengthened, site-specific ISMP framework in Sections 12 and 13 – are designed to give both operators and the Division the tools to realize that potential safely and responsibly.

Fervo remains committed to working collaboratively with NDOM, the Commission, and fellow stakeholders to finalize a regulatory framework that Nevada and the geothermal industry can be proud of. We respectfully request that the Commission adopt the amendments proposed herein, and we welcome the opportunity to discuss any of these comments further at the May 14th hearing.

## **APPENDIX A: FERVO ENERGY'S 'GEOHERMAL SUSTAINABLE DEVELOPMENT PACT'**

**Fervo Energy's 'Geothermal Sustainable Development Pact' – October 2025:**

<https://fervoenergy.com/geothermal-sustainable-development-pact/>

**Page 8:** Induced Seismicity – Mitigating seismic risk through real-time monitoring and operational guardrails.

**5.1** Ensure compliance with all regulatory guidelines and industry protocols on induced seismicity, including the DOE's induced seismicity mitigation protocol, and integrate these standards into project planning.

**5.2** Identify and proactively engage local communities and stakeholders early in project development, educating them on induced seismicity risks and maintaining transparent, two-way communication channels throughout the project's life cycle.

**5.3** Prior to field development, conduct comprehensive induced seismicity screening by analyzing historical seismicity, modeling ground motions for potential earthquake scenarios, and performing seismic hazard and risk assessments supported by detailed geologic mapping and fault characterization.

**5.4** Conduct a baseline monitoring period before drilling and stimulation to establish natural seismicity level at the site and distinguish which events are induced by the project.

**5.5** Maintain a continuous seismic monitoring network operating 24/7 to detect and analyze induced seismic events in real time, providing early warning of any elevated seismic hazard and ensuring data-informed decision making.

**5.6** Implement a risk-based Traffic Light System with clearly defined seismic magnitude or peak ground motion thresholds that trigger immediate operational responses. Utilize ground motion modeling from earthquake scenarios to establish Traffic Light System thresholds.

**5.7** Define clear emergency response protocols aligned with the Traffic Light System, so that appropriate authorities and community stakeholders are notified when an induced seismic event exceeds normal levels.

**5.8** Publicly report induced seismicity monitoring results and mitigation actions on a regular basis (e.g., via project websites, community meetings, and sustainability reports) to ensure transparency and keep local communities and regulators informed.

## APPENDIX B: DOE ISMP (BEST PRACTICES) VS. NDOM PROPOSED RULE (LCB FILE R093-25)

Regulatory Component	DOE ISMP / Industry Standard	NDOM Proposed Rule (LCB File R093-25)	Industry Impact
Amber Light Response	<b>Independent Pause:</b> Amber alerts trigger a temporary, mandatory pause proportional to the event. Once seismicity stabilizes, operations safely resume per the approved ISMP.	<b>Cumulative Strikes:</b> As proposed, the 1st and 2nd alerts allow continued operation, but a 3rd alert within 6 months mandates a formal mitigation plan. A 3rd alert within 2 months of reducing fluids triggers an automatic, mandatory shutdown.	Punishes cumulative events rather than actual severity. Turns standard operational pauses into statutory project-killers.
Red Light Response	<b>Data-Driven Resumption:</b> Operations pause per ISMP protocol. Operator implements site-specific mitigation measures, submits stabilization data to the regulator, and safely resumes once thresholds are met.	<b>Bureaucratic Gridlock:</b> As proposed, the Administrator issues a cease-operation order. The operator must then schedule a formal in-person meeting in Carson City within 30 days, and the Commission must vote to approve a formal "settlement" before operations may resume.	Transforms a rapid, data-driven safety pause into a multi-month legal proceeding, severely threatening project financing and timelines with no corresponding safety benefit.
Shutdown Discretion	<b>Objective &amp; Pre-negotiated:</b> Stop-work triggers are based explicitly on violating the site-specific magnitude thresholds mutually agreed upon in the ISMP prior to stimulation.	<b>Subjective Discretion:</b> As proposed, the Administrator may order shutdowns based on a subjective finding that activities "may pose an immediate danger," regardless of whether approved ISMP thresholds were actually breached.	Strips regulatory certainty from operators and investors. Multi-million-dollar EGS operations can be halted on subjective judgment rather than objective, empirical data.
Collateral Proximity Shutdowns	<b>Targeted:</b> Only the specific well or lateral demonstrated by seismic data to be inducing the event is subject to mitigation or shutdown protocols.	<b>Blanket Radius:</b> As proposed, the Administrator may issue cease-operation orders to any operator within a 5-mile radius of an epicenter, regardless of any demonstrated connection to the seismic event.	Exposes compliant, unrelated operators to catastrophic project disruption caused by neighboring operations or natural seismic activity entirely outside their control.

<p>Notification Radius (Red Alerts)</p>	<p><b>Scientifically Relevant:</b> Notifications are localized to the area of risk as defined in the site-specific ISMP, accounting for geology, depth, and population density.</p>	<p><b>Massive 10-Mile Radius:</b> As proposed, operators must notify the county and every oil, gas, or geothermal permit holder within a 10-mile radius within 24 hours of a red light event.</p>	<p>Administratively unworkable and scientifically unwarranted. A 10-mile radius around existing Nevada plants such as Steamboat could capture up to 100,000 residents for highly localized EGS micro-seismic events.</p>
<p>Baseline Water Sampling</p>	<p><b>Event or Phase-Driven:</b> Baseline samples are established prior to stimulation, with subsequent sampling tied to actual project phases or observed changes in groundwater quality.</p>	<p><b>Rigid Statutory Timelines:</b> As proposed, operators must collect an initial sample, a 3-12 month sample, and an 18-24 month sample following the "commencement of stimulation" for each individual well.</p>	<p>Unsuitable for EGS multi-well pads undergoing sequential stimulations. Forces a cascading loop of redundant, overlapping sampling events that provide no additional environmental protection.</p>
<p>Bonding (Project Area)</p>	<p><b>Parity:</b> Blanket bonds align with regional oil and gas standards – typically \$50,000 for an entire project area blanket bond in Nevada and neighboring states.</p>	<p><b>Punitive Increases:</b> As proposed, a minimum \$50,000 bond per individual stimulated well, or a \$200,000 blanket bond for a stimulated project area – regardless of project scale or demonstrated safety record.</p>	<p>A 600% increase over standard fossil fuel bonding in the same state, imposing a uniquely punitive financial burden on clean energy development with no equivalent applied to conventional extraction.</p>

## APPENDIX C: PROPOSED REDLINE AMENDMENTS TO SECTIONS 12 AND 13 OF LCB FILE NO. R093-25

Sec. 12.

1. Before the Division will approve an application for permission to engage in stimulation, the owner of the geothermal resource or the operator must, except as otherwise provided in this subsection, submit to the Division, for each geothermal well which the owner or operator plans to stimulate, an Induced Seismicity Monitoring Plan to monitor the induced seismicity resulting from any stimulation or injection activities on the reservoir or other natural resources located within the area of review. The owner of the geothermal resource or the operator of more than one geothermal well may submit an Induced Seismicity Monitoring Plan for all geothermal wells which are planned to be stimulated in a project area.

2. The Induced Seismicity Monitoring Plan must use the traffic light monitoring system to monitor induced seismicity and, based on the information provided pursuant to section of this regulation, establish thresholds approved by the Division for the magnitude of a seismic event to provide amber and red light alerts based on such thresholds for any seismic event with an epicenter located within a **specified 3-mile** radius of a geothermal well or surface projection of a lateral component of the geothermal well, **as-specified in the ISMP. The specified radius shall consider the buildings, structures, residences, population, and other relevant factors in proximity to the geothermal well.** ~~with each alert indicating that the Division has received notice of a seismic event~~ **Seismic monitoring methods specified in the ISMP shall be conducted via** ~~from~~ a reputable source, which may include, without limitation, the United States Geological Survey, Nevada Seismological Laboratory at the University of Nevada, Reno or a seismic monitoring system of the owner of the geothermal resource or the operator.

3. **The ISMP shall specify methods for the owner of the geothermal resource or the operator to mitigate induced seismicity in the event of an amber or red light threshold being met within a specified radius of a geothermal well or surface projection of a lateral component of the geothermal well. Example mitigation measures may include the pausing of operational activities for a specified period of time, reducing fluid injection volumes for a specified period of time, adjustments in operations, notification of public stakeholders, and/or other mitigation measures to reduce induced seismicity. Such mitigation measures shall consider the buildings, structures, residences, population, and other relevant factors in proximity to the geothermal well. Proposed mitigation methods must increase in proportion to the**

**severity of the magnitude threshold.** Based on the traffic light monitoring system required pursuant to subsection 2, the owner of the geothermal resource or the operator:

(a) In the event of an amber light alert for a seismic event with an epicenter located within a 3-mile radius of a geothermal well or surface projection of a lateral component of the geothermal well:

(1) Shall report the occurrence of the seismic event to the Division within 24 hours; and

(2) Except as otherwise provided in paragraph (b), may continue to operate the well in accordance with the terms of the permit and any other permission granted for the operation or may consult with the Division regarding the amber light alert and adjust the operation of the well by reducing the volume of fluids injected into the well.

(b) In the event of receiving a third amber light alert within 6 continuous months for a seismic event with an epicenter located within a 3-mile radius of a geothermal well or surface projection of a lateral component of the geothermal well, shall:

(1) Immediately consult with the Division on measures to reduce the likelihood of any additional amber light alerts; and

(2) Submit Form 4a (Sundry Notice and Report on Stimulated Geothermal Wells) to the Division for approval with the proposed measures to reduce the likelihood of additional amber light alerts.

(c) In the event of a red light alert for a seismic event with an epicenter located within a 3-mile radius of a geothermal well or surface projection of a lateral component of the geothermal well, shall:

(1) Report the occurrence of the seismic event within 24 hours to:

(i) The Division;

(ii) The emergency management office of the county in which the geothermal well is located; and

(iii) Any person holding a permit to drill or operate a geothermal well or an oil or gas well located within a radius of 10 miles of the epicenter of the seismic event; and {

2) If the red light alert is suspected to be induced seismicity, immediately decrease the pressure of the fluids injected into the well with the goal of

~~ending the injection of fluids into the well and consult with the Division to develop a plan for the future use of the well.~~

**(a) In the event that an amber or red light threshold established in the approved Induced Seismicity Monitoring Plan is met, the owner of the geothermal resource or the operator shall:**

**(1) implement the mitigation measures specified for that threshold level in the approved Induced Seismicity Monitoring Plan; and**

**(2) report the occurrence of the seismic event to the Division within 24 hours.**

**(b) Following implementation of red light response measures pursuant to the approved Induced Seismicity Monitoring Plan, the owner of the geothermal resource or the operator may resume normal operations upon submitting to the Division data obtained in accordance with the Induced Seismicity Monitoring Plan demonstrating that seismicity has stabilized below the approved thresholds and that resumed operations present no imminent threat to public safety.**

4. The owner of the geothermal resource or the operator shall:

(a) After commencing the stimulation of a geothermal well, monitor all seismic events in accordance with the Induced Seismicity Monitoring Plan and make available to the public on an Internet website maintained by the owner of the geothermal resource or the operator **the amber and red events within the specified** ~~the depth and magnitude of all seismic events that exceed a moment magnitude of 2.5 that occur within a 3-mile~~ radius of the geothermal well or the surface projection of any lateral component of the geothermal well for the life of the geothermal well. **Such event reporting shall be published on a regular basis, as specified in the ISMP.**

(b) Maintain all seismic monitoring systems installed by the owner of the geothermal resource or the operator within the area of review for the life of the geothermal well. The owner or operator may not remove ~~or replace~~ **or diminish** such a seismic monitoring system unless he or she obtains the approval of the Administrator.

Sec. 13. The owner of the geothermal resource or the operator shall include with the Induced Seismicity Monitoring Plan submitted pursuant to section 12 of this regulation:

1. The following information:

- (a) The conditions of the reservoir in the area of review;
- (b) The geologic zones, formations and any other subsurface geological structures in the area of review;
- (c) The baseline seismic activity in the area of review and in any additional area determined by the Division to be necessary;
- (d) The location and ownership of the seismic monitoring system that is active and nearest to the geothermal well;
- (e) ~~All~~ **R**egional seismic monitoring systems on the Advanced National Seismic System published by the United States Geological Survey **or are otherwise available to the public;**

~~(f) All local or regional seismic monitoring systems that are available to the public but are not included on the Advanced National Seismic System; and~~

~~(g) Any other local or regional seismic monitoring systems which have enough elements, sensitivity and aperture to capture the seismicity of a seismic event with a moment magnitude at least as small as 1.0 in the area of review, including, without limitation;~~

**(f) Local or regional seismic monitoring systems which are planned to be installed by the owner of the geothermal resource or the operator.**

2. A model to forecast the seismicity in the area of review which must demonstrate that the seismic monitoring systems listed in paragraphs (d) to ~~(g)~~ **(f)** of subsection 1, inclusive, collect sufficiently accurate data to establish the baseline seismic activity, forecast seismic activity and identify any active faults that could be affected by stimulation or injection activities. The model and demonstration must, without limitation:

(a) Include, **where publicly available**, all regional seismic events captured by a local or regional seismic monitoring system identified in paragraph (e) ~~or (f)~~ of subsection 1 during the 5 years immediately preceding the date the plan is submitted;

~~(b) Include all local seismic events in the area of review captured by a local or regional seismic monitoring system identified in paragraph (g) of subsection 1 within the 6 months immediately preceding the date the plan is submitted;~~

(c) For the seismic events identified in paragraphs (a) and (b), include the moment magnitude for each seismic event;

(d) Estimate:

- (1) The baseline hazard in the area of review from natural seismicity; and
- (2) The potential hazard in the area of review from induced seismicity; and
- (e) Create and characterize the risk of induced seismic events in the area of review.

3. ~~Evidence of a~~ Any agreements with the United States Geological Survey or a seismologic program at a local college or university for third-party monitoring, **if applicable.**

~~4. Evidence of any agreements with a third party to make available to the public data captured by a seismic monitoring system:~~

## **APPENDIX D: PROPOSED CLEAN TEXT OF SECTIONS 12 AND 13 FOR ADOPTION**

### Sec. 12.

1. Before the Division will approve an application for permission to engage in stimulation, the owner of the geothermal resource or the operator must, except as otherwise provided in this subsection, submit to the Division, for each geothermal well which the owner or operator plans to stimulate, an Induced Seismicity Monitoring Plan to monitor the induced seismicity resulting from any stimulation or injection activities on the reservoir or other natural resources located within the area of review. The owner of the geothermal resource or the operator of more than one geothermal well may submit an Induced Seismicity Monitoring Plan for all geothermal wells which are planned to be stimulated in a project area.

2. The Induced Seismicity Monitoring Plan must use the traffic light monitoring system to monitor induced seismicity and, based on the information provided pursuant to section of this regulation, establish thresholds approved by the Division for the magnitude of a seismic event to provide amber and red light alerts based on such thresholds for any seismic event with an epicenter located within a specified radius of a geothermal well or surface projection of a lateral component of the geothermal well as-specified in the ISMP. The specified radius shall consider the buildings, structures, residences, population, and other relevant factors in proximity to the geothermal well. Seismic monitoring methods specified in the ISMP shall be conducted via a reputable source, which may include, without limitation, the United States Geological Survey, Nevada Seismological Laboratory at the University of Nevada, Reno or a seismic monitoring system of the owner of the geothermal resource or the operator.

3. The ISMP shall specify methods for the owner of the geothermal resource or the operator to mitigate induced seismicity in the event of an amber or red light threshold being met within a specified radius of a geothermal well or surface projection of a lateral component of the geothermal well. Example mitigation measures may include the pausing of operational activities for a specified period of time, reducing fluid injection volumes for a specified period of time, adjustments in operations, notification of public stakeholders, and/or other mitigation measures to reduce induced seismicity. Such mitigation measures shall consider the buildings, structures, residences, population, and other relevant factors in proximity to the geothermal well. Proposed mitigation methods must increase in proportion to the severity of the magnitude threshold.

(a) In the event that an amber or red light threshold established in the approved Induced Seismicity Monitoring Plan is met, the owner of the geothermal resource or the operator shall:

(1) implement the mitigation measures specified for that threshold level in the approved Induced Seismicity Monitoring Plan; and

(2) report the occurrence of the seismic event to the Division within 24 hours.

(b) Following implementation of red light response measures pursuant to the approved Induced Seismicity Monitoring Plan, the owner of the geothermal resource or the operator may resume normal operations upon submitting to the Division data obtained in accordance with the Induced Seismicity Monitoring Plan demonstrating that seismicity has stabilized below the approved thresholds and that resumed operations present no imminent threat to public safety.

4. The owner of the geothermal resource or the operator shall:

(a) After commencing the stimulation of a geothermal well, monitor all seismic events in accordance with the Induced Seismicity Monitoring Plan and make available to the public on an Internet website maintained by the owner of the geothermal resource or the operator the amber and red events within the specified radius of the geothermal well or the surface projection of any lateral component of the geothermal well for the life of the geothermal well. Such event reporting shall be published on a regular basis, as specified in the ISMP.

(b) Maintain all seismic monitoring systems installed by the owner of the geothermal resource or the operator within the area of review for the life of the geothermal well. The owner or operator may not remove or diminish such a seismic monitoring system unless he or she obtains the approval of the Administrator.

Sec. 13. The owner of the geothermal resource or the operator shall include with the Induced Seismicity Monitoring Plan submitted pursuant to section 12 of this regulation:

1. The following information:

(a) The conditions of the reservoir in the area of review;

(b) The geologic zones, formations and any other subsurface geological structures in the area of review;

(c) The baseline seismic activity in the area of review and in any additional area determined by the Division to be necessary;

(d) The location and ownership of the seismic monitoring system that is active and nearest to the geothermal well;

(e) Regional seismic monitoring systems on the Advanced National Seismic System published by the United States Geological Survey or are otherwise available to the public;

(f) Local or regional seismic monitoring systems which are planned to be installed by the owner of the geothermal resource or the operator.

2. A model to forecast the seismicity in the area of review which must demonstrate that the seismic monitoring systems listed in paragraphs (d) to (g) of subsection 1, inclusive, collect sufficiently accurate data to establish the baseline seismic activity, forecast seismic activity and identify any active faults that could be affected by stimulation or injection activities. The model and demonstration must, without limitation:

(a) Include, where publicly available, all regional seismic events captured by a local or regional seismic monitoring system identified in paragraph (e) of subsection 1 during the 5 years immediately preceding the date the plan is submitted;

(b) For the seismic events identified in paragraphs (a) and (b), include the moment magnitude for each seismic event;

(c) Estimate:

(1) The baseline hazard in the area of review from natural seismicity; and

(2) The potential hazard in the area of review from induced seismicity; and

(d) Create and characterize the risk of induced seismic events in the area of review.

3. Any agreements with the United States Geological Survey or a seismologic program at a local college or university for third-party monitoring, if applicable.