PROPOSED REGULATION OF THE
COMMISSION ON MINERAL RESOURCES

LCB FILE NO. R093-25I

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AGENCY DRAFT

PROPOSED ADMINISTRATIVE REUGLATIONS OF THE

NEVADA DIVISION OF MINERALS

CHAPTER 534A

Geothermal

EXPLANATION - Language proposed for removal in red and bracketed -{remove}, additions in blue italics - *addition*

AUTHORITY: NRS 534A & 513

Completion Defined

A geothermal well is completed 30 days after drilling operations have ceased and the well is capable of producing a geothermal resource or being utilized as a service well, unless drilling operations are resumed before the end of the 30- day period.

CHAPTER 534A - GEOTHERMAL RESOURCES

GENERAL PROVISIONS

534A.010 **Definitions.**
534A.012 **"Administrator" defined.**
534A.015 **"Annular space" and "annulus" defined.**
534A.020 **"Aquifer" defined.**
534A.031 **"Blowout" defined.**
534A.033 **"Casing" defined.**
534A.035 **"Commission" defined.**
534A.037 **"Division" defined.**
534A.040 **"Geothermal resource" defined.**
534A.045 **"Guide shoe" defined.**
534A.XXX ***"Induced seismicity" defined.***
534A.061 **"Injection well" defined.**
534A.063 **"Observation well" defined.**
534A.064 **"Operator" defined.**
534A.065 **"Person" defined.**
534A.066 **"Production well" defined.**
534A.067 **"Reservoir" defined.**
534A.XXX ***"Stimulation" defined***
534A.069 **"Thermal gradient well" defined.**
534A.083 **"Well bore" defined.**
534A.085 **"Well log" defined.**
534A.110 **Drilling rig: License to operate. [Replaced in revision by NAC 534A.188.]**
534A.170 **Types of wells.**

534A.173 "Natural heat of the earth" construed for purposes of NRS 534A.010.
534A.175 Authority of Administrator to grant exception to certain requirements of chapter.
534A.180 Applicability of NAC 534A.170 to 534A.690, inclusive.

LICENSES, PERMITS, FEES AND OTHER REQUIREMENTS FOR DRILLING

534A.185 License required to drill geothermal well that uses water consumptively and geothermal domestic well.
534A.188 Drilling rig: License to operate in compliance with licensing procedures of State Contractors' Board.
534A.190 Application for permit for individual geothermal well.
534A.193 Application for permit for geothermal wells in a project area.
534A.196 Application for permit for injection well; operator required to obtain permit pursuant to Nevada Water Pollution Control Law before operating well.
534A.200 Location of well: Limitations; application for exception.
{534A.205 Location of well: Survey required; filing of certified plat of location.**}**
534A.210 Fees for permits for individual geothermal wells.
534A.212 Fees for permits for geothermal wells in project areas.
534A.214 Annual fee for industrial or commercial geothermal production well, geothermal injection well or thermal gradient or observation well.
534A.216 Payment of fee based on *total measured* depth of well.
534A.220 Expiration of permits.
534A.240 Assignment of permits.
534A.250 Bond: Filing requirements; amount; form; effect of transfer of ownership of well; duration.
534A.260 Requirements for casing; alternate requirements for surface casing; exception for certain thermal gradient wells.
534A.270 Prevention of blowout; testing of equipment for prevention of blowout; submission of test data and supporting information to Division; recording of results in daily drilling log.
534A.280 Measurements of temperature requirement for mud cooling equipment.
534A.310 Taking of cuttings; submission to Bureau of Mines and Geology.
534A.330 Identification of producing wells by sign; modification for good cause; assignment of U.S. Well Number.

Stimulation & Induced Seismicity

534A.7xx Definitions.
534A.7xx "Area of review" defined.
534A.7xx "Available water source" defined.
534A.7xx "Water source" defined.
534A.7xx Applicability.
534A.7xx Stimulation Baseline sampling and monitoring; exceptions.
534A.7xx Induced Seismicity Baseline Monitoring. Forecast, and Risk-Based Monitoring Plan.
534A.7xx Induced Seismicity Reporting.
534A.7xx Induced Seismicity Orders.
534A.7xx Application to drill; area of review.
534A.7xx Additional requirements for geothermal wells planned to be stimulated, including casings and casing strings.
534A.7xx Duties of operator.
534A.7xx Request to simulate a geothermal well drilled and spudded before Month Day, Year.

GENERAL PROVISIONS

NAC 534A.010 Definitions. (NRS 513.063**,** 534A.090**)** As used in this chapter, unless the context otherwise requires, the words and terms defined in NAC 534A.012 to 534A.085, inclusive, have the meanings ascribed to them in those sections.

(Supplied in codification; A by Comm'n on Mineral Resources, 11-12-85; R032-19, 12-30-2019)

NAC 534A.XXX "Induced Seismicity" defined*. (NRS 513.063, 534A.090) "Induced Seismicity" means earthquakes or seismic events caused or triggered by human activities relating to geothermal operations during or after simulation efforts, rather than natural tectonic processes.*

NAC 534A.061 "Injection well" defined. (NRS 513.063**,** 534A.090**)** "Injection well" means any well used to *place* {dispose of} fluids {derived from geothermal resources} into an underground *geothermal* {reservoir} *resource*.

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85)

NAC 534A.XXX "Stimulation" defined. (NRS 513.063, 534A.090) *"Stimulation" means the process of pumping a fluid at pressures exceeding the mechanical strength of the rock into or beneath the surface of the earth to induce fractures in rock to promote or enhance the production or recovery of a geothermal resource.*

NAC 534A.180 Applicability of NAC 534A.170 **to** 534A.690**, inclusive. (**NRS 513.063**,** 534A.090**)**

1. Only the provisions of NAC 534A.170 to 534A.690, inclusive, listed below apply to geothermal domestic wells:
   (a) NAC 534A.190;
   (b) NAC 534A.200;
   (c) NAC 534A.210;
   (d) NAC 534A.220;
   (e) Paragraphs (a) and (e) of subsection 1 of NAC 534A.260;
   (f) Subsections 1 and 2 of NAC 534A.270;
   (g) NAC 534A.280;
   (h) Subsection 3 of NAC 534A.330;
   (i) NAC 534A.420;
   (j) NAC 534A.470;
   (k) NAC 534A.490 (except subsection 9 of that section);
   (l) NAC 534A.500;
   (m) NAC 534A.465;
   (n) Subsections 5 and 6 of NAC 534A.540;
   (o) NAC 534A.550;
   (p) NAC 534A.560; and
   (q) NAC 534A.590 to 534A.690, inclusive.
2. All provisions of NAC 534A.170 to 534A.{690}*xxx*, inclusive, apply to commercial wells except subsection 1 of NAC 534A.200.
3. Except as otherwise specifically provided in NAC 534A.170 to 534A.{690}*xxx*, inclusive, all of the provisions apply to industrial wells.

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85; A 12-16-92; 8-22-94; R057-15, 12-21-2015; R032-19, 12-30-2019)

NAC 534A.190 Application for permit for individual geothermal well. (NRS 513.063**,** 534A.070**,** 534A.090**)** An application for a permit to drill or operate an individual geothermal well must be submitted to the Division on a form provided by the Administrator. Except as otherwise provided in NAC 534A.196, an application must:

1. Include a statement of the purpose*, estimated top and bottom hole locations, as well as planned well trace,* and estimated depth of the well;
2. Include a description of the kind of casing, equipment for the prevention of a blowout and drilling rig which will be used;
3. Include the name of the owner of the land or designated lot on which the well will be located and the owner of the geothermal resource;
4. Include the name and address of the operator and drilling contractor;
5. Be accompanied by the bond required pursuant to NAC 534A.250;
6. Include a description of the location of the proposed well by the quarter-quarter section, section, township and range. For domestic and commercial wells a street address may be used, if available;
7. Include the global positioning coordinates of the location of the well which:

(a) Are identified by latitude and longitude using decimal degrees or coordinates of the Universal Transverse Mercator system; and

(b) Specify the datum used; and

8. Include the business identification number assigned to the operator by the Secretary of State.

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85; A 12-16-92; R032-19, 12-30-2019)

NAC 534A.193 Application for permit for geothermal wells in a project area. (NRS 513.063**,** 534A.090**)** An application for a permit to drill or operate geothermal wells in a project area must be submitted to the Division. Except as otherwise provided in NAC 534A.196, the application must:

1. Include a statement of the number, purpose*, estimated top and bottom hole locations, as well as planned well trace,* and estimated depth, of the proposed wells in the project area;
2. Include a description of the kind of casing, equipment for the prevention of a blowout and drilling rig which will be used;
3. Include the name of the owner of the land or designated lots on which the proposed wells will be located;
4. Include the name of the owner of the geothermal resource;
5. Include the name and address of the operator and drilling contractor;
6. Include a description and map of the project area by section, township and range; and
7. Be accompanied by the bond required by NAC 534A.250.

(Added to NAC by Comm'n on Mineral Resources, eff. 12-16-92; A 8-22-94)

{NAC 534A.205 Location of well: Survey required; filing of certified plat of location. (NRS 513.063**,** 534A.090**)**

1. Except as otherwise provided in subsection 3, the location of an individual geothermal well or the geothermal wells in a project area must be surveyed by a professional land surveyor who is licensed pursuant to chapter 625 of NRS.

2. Except as otherwise provided in subsection 3, a certified plat of the location must be filed with the Division within 30 days after the completion of the construction of the well. The plat must:

(a) Be of a standard size;

(b) Show the location of any designated lots; and

(c) Contain a description of the location of the proposed well:

(1) Within a 40-acre legal subdivision; or

(2) Which includes an accurate course and distance tied to an established corner of a section or quarter section and a full description of the corner to which the tie is made, together with all markings thereon.

3. The provisions of this section do not apply to a thermal gradient well.}

NAC 534A.210 Fees for permits for individual geothermal wells. (NRS 513.063**,** 534A.080**,** 534A.090**)** A person who files an application for a permit to drill, {or} operate, *or stimulate* an individual geothermal well shall pay to the Commission a fee according to the following schedule:

INDUSTRIAL WELLS	
Production Well	${500} *1,000*
Injection Well	{500} *1,000*
Observation Well	{300} *600*
Thermal Gradient Well	{100} *200*
Stimulation operation as put forth in the permit application of a Geothermal Well (Separate of production or injection fee)	*1,500*
COMMERCIAL WELLS	
Production Well	
Injection Well	{200} *400*
	{200} *400*
GEOTHERMAL DOMESTIC WELLS	{50} *100*

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85; A 12-16-92; R032-19, 12-30-2019)

NAC 534A.212 Fees for permits for geothermal wells in project areas. (NRS 513.063**,** 534A.080**,** 534A.090**)**

1. Except as otherwise provided in subsection 2, a person who files an application for a permit to drill or operate geothermal wells in a project area shall pay to the Commission an application fee of $ {500} *1,000* and an additional fee per well according to the following schedule:

	First Well	Each Subsequent Well of the Same Type
Production Well	$ {500} *1,000*	$ {300} *600*
Injection Well	{500} *1,000*	{300} *600*
Stimulation of Geothermal Well	*1,500*	*900*
Observation Well	{300} *600*	{150} *400*
Thermal Gradient Well	{100} *200*	{50} *150*

2. A person who files an application for a permit to drill or operate a thermal gradient well in a project area need not pay the application fee, but shall pay the applicable additional fees listed in subsection 1.

(Added to NAC by Comm'n on Mineral Resources, eff. 12-16-92; A by R032-19, 12-30-2019)

NAC 534A.214 Annual fee for industrial or commercial geothermal production well, geothermal injection well or thermal gradient or observation well. (NRS 513.063**,** 534A.080**,** 534A.090**)** On or before January 31 of each year:

1. The owner of the geothermal resource or the operator of an industrial or commercial geothermal production well or geothermal injection well shall submit to the Division a fee of $ {600} *800* for each well which produced or was used to dispose of fluids derived from geothermal resources into an underground reservoir during the preceding calendar year. The provisions of this subsection do not apply to an industrial well which produced fluids during the preceding calendar year if no power was generated at the well and the production was only for the purpose of testing the well.

2. The owner or operator of a thermal gradient or an observation well shall submit to the Division a fee of $ {100} *200* for each such well unless the well has been abandoned and plugged. (Added to NAC by Comm'n on Mineral Resources, eff. 12-16-92; A by R069-99, 8-19-99; R057-15, 12-21-2015; R032-19, 12-30-2019)

NAC 534A.216 Payment of fee based on *total measured* depth **of well. (**NRS 513.063**,** 534A.080**,** 534A.090**)** Within {30} *60* days after the completion of the construction of a geothermal well listed in this section and the removal of the drill rig from the location of the well, the person who holds a permit to drill or operate an individual geothermal well or a permit to drill or operate geothermal wells in a project area shall pay to the Division a fee based on the *total measured* depth of the well according to the following schedule:

300 to 1,000	1,001 to 5,000	{Over 5,000} *5,001 to 10,000*	*Over 10,000*

	{Feet Deep} *Total Measured Depth*	{Feet Deep} *Total Measured Depth*	{Feet Deep} *Total Measured Depth*	*Total Measured Depth*
INDUSTRIAL WELLS				
Production Well	${1,000} *1,500*	${2,000} *3,000*	${2,500} *3,750*	*$5,000*
Injection Well	{1,000} *1,500*	{2,000} *3,000*	{$2,500} *3,750*	*5,000*
Observation Well	{300} *450*	{500} *750*	{2,500} *3,750*	*5,000*
COMMERCIAL WELL	{200} *400*	{200} *400*	{200} *400*	*N/A*

1. If the completion report and associated fee are not remitted to the Division within 60 days of completion, a 5% fee will be assessed for each month the report or fee are delinquent.

(Added to NAC by Comm'n on Mineral Resources, eff. 12-16-92; A by R032-19, 12-30-2019)

NAC 534A.220 Expiration of permits. (NRS 513.063**,** 534A.090**)** Unless operations have been commenced or the operator is proceeding with due diligence, a permit to drill an individual geothermal well or a permit to drill geothermal wells in a project area expires 24 months after the date on which it was issued unless extended by the Administrator for good cause shown.

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85; A 12-16-92)

NAC 534A.240 Assignment of permits. (NRS 513.063**,** 534A.090**)**

1. A permit to drill or operate an individual geothermal well or a permit to drill or operate geothermal wells in a project area may be assigned, subject to the conditions of the permit, upon the written approval of the Administrator. The transferee must furnish a bond as provided in NAC 534A.250.
2. Approval by the Division of the transfer is the authority for release or cancellation by the transferor of his or her surety.

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85; A 12-16-92)

NAC 534A.250 Bond: Filing requirements; amount; form; effect of transfer of ownership of well; duration. (NRS 513.063**,** 534A.090**)**

1. Except as otherwise provided in this section, the operator shall provide a sufficient bond in favor of the State of Nevada for each geothermal well, conditioned on the plugging of the well upon abandonment in accordance with NAC 534A.170 to 534A.690, inclusive. The bond must be:

(a) In the sum of:

(1) For a thermal gradient well, not less than $10,000; and

(2) For a commercial or industrial well, not less than $25,000.

(3) For stimulation of a commercial or industrial geothermal well, not less than $50,000.

(b) Submitted with the application for a permit to drill or operate an individual geothermal well or an application for a permit to drill or operate geothermal wells in a project area.

2. An operator may file a blanket bond, in the sum of at least $100,000, to cover all wells to be drilled or operated by the operator in a project area for which the operator has received a permit pursuant to NAC 534A.193.

3. If a project area includes one or more stimulated geothermal wells, the operator must file a blanket bond in the sum of at least $200,000, to cover all wells to be drilled or operated by the operator in a project area for which the operator has received a permit pursuant to NAC 534A.190 to 534A.196 and 534A.XXX(Stimulation and Induced Seismicity section)

{3.} *4.* A bond must be:

(a) In cash;

(b) Issued by a surety authorized to do business in Nevada; or

(c) In the form of a savings certificate or time certificate of deposit which is:

(1) Issued by a bank or savings and loan association operating in Nevada; and

(2) Payable to the State of Nevada.

{4.} *5.* An operator who has deposited a performance bond with the Federal Government for wells drilled on federal property shall submit evidence of that bond with the Division.

{5.} *6.* If an operator transfers ownership of a well, the Division may review the bond filed pursuant to this section to determine whether the existing amount of the bond for the well is sufficient.

{6.} *7.* The bond required by this section must remain in effect until the well is properly abandoned, the surface is properly restored and the bond is formally released by the Division.

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85; A 12-16-92; R032-19, 12-30-2019)

NAC 534A.270 Prevention of blowout; testing of equipment for prevention of blowout; submission of test data and supporting information to Division; recording of results in daily drilling log. (NRS 513.063**,** 534A.090**)**

1. An operator shall take all precautions which are necessary to keep wells under control and operating safely at all times. Well control and wellhead assemblies used in any geothermal well must meet the minimum specifications for assemblies prescribed by the American Petroleum Institute, or its successor organization, in the most current edition of Standard 53, "Well Control Equipment Systems for Drilling Wells," or as may be otherwise prescribed by the Administrator. {The most current edition is available by mail from Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado 80112-5776, by telephone at (800) 854-7179 or at the Internet address **http://global.ihs.com**, for the price of $160.}

2. Equipment for the prevention of a blowout, capable of shutting in the well during any operation, must be installed on the surface casing and maintained in good operating condition at all times. This equipment must have a rating for pressure greater than the maximum anticipated pressure at the wellhead. Equipment for the prevention of a blowout is required on any well where temperatures may exceed 200°F.

3. An operator shall test the equipment for the prevention of a blowout under pressure. A representative of the Division must observe the test in person or otherwise approve the results of the test before the operator drills the casing shoe out of the casing. An operator shall notify the Division not less than 24 hours before conducting a test pursuant to this subsection.

4. The operator shall submit to the Division the pressure data and supporting information for the equipment for the prevention of a blowout as soon as practicable after the conclusion of the test conducted pursuant to subsection 3. The operator shall record the results of each test in the daily drilling log of the operator.

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85; A by R011-14, 10-24-2014; R032-19, 12-30-2019)

NAC 534A.310 Taking of cuttings; submission to Bureau of Mines and Geology. (NRS 513.063**,** 534A.090**)** The operator shall take two sets of cuttings at least every 30 feet. The cuttings and a split of any core must be:

1. Cleaned, dried, marked for location and depth and placed in envelopes; and
2. Submitted to the Bureau of Mines and Geology of the State of Nevada within {30}*90* days after the well is completed.

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85; A by R032-19, 12-30-2019)

INACTIVE WELLS; ABANDONMENT AND PLUGGING

NAC 534A.465 Inactive well: Order to show cause why well should stay open; declaration of abandonment and order to plug; notice to operator; effect of failure of operator to respond. (NRS 513.063**,** 534A.090**)**

1. If a well is inactive for 2 years or more, the Administrator may issue an order to the operator to show cause as to why the well should remain open and that such action is consistent with:
   (a) The policies specified in NRS 445A.305 and 445B.100;
   (b) The purposes of chapters 533 and 534 of NRS; and
   (c) The purposes specified in chapter 501 of NRS.
2. If the Administrator finds that good cause has not been shown, the Administrator may declare the well abandoned and order the well to be plugged.
3. The Administrator shall send written notice of the order to plug the well to the operator by registered or certified mail with return receipt requested.
4. If the operator fails to respond in writing within 45 days after the written notice is mailed pursuant to subsection 3 with a plan for plugging the well and:
   (a) The well is bonded by a federal agency, the Administrator must notify the federal agency and coordinate with the federal agency to ensure that the well is plugged.
   (b) The well is not bonded by a federal agency, the Administrator may, without further notice, take such steps necessary to plug the well. The costs of plugging the well, including labor and material, may be paid from the bond filed pursuant to NAC 534A.250. Any costs above the bond are a lien upon the land on which the well is located.

(c) If the Division takes action to plug any well(s) within a project area or individual well on private land, the Division will issue an invoice for the total cost of plugging the well(s). The Division will not issue any additional drilling permits to that owner of the geothermal resource or operator until the Division is made whole of the complete cost of plugging any well(s). (Added to NAC by Comm'n on Mineral Resources by R032-19, eff. 12-30-2019)

NAC 534A.540 Permission to engage in certain activities; fee; report of progress or completion; release of nonconfidential information by Division. (NRS 513.063**,** 534A.080**,** 534A.090**)**

1. A person shall not engage in an activity listed in subsection 3 or 4 without the permission of the Division.

2. The owner of the geothermal resource or operator shall submit an application for permission to engage in an activity listed in subsection 3 or 4 on Form 4 (Sundry Notices and Reports on Wells) *or Form 4a (Sundry Notices and Reports on Stimulated Geothermal Well)* . Upon request, the Administrator may, as he or she deems appropriate in extraordinary circumstances, grant oral permission to engage in an activity listed in subsection 3 or 4. Oral permission to engage in an activity listed in subsection 3 or 4 does not relieve the owner of the geothermal resource or operator of his or her obligation to submit an application pursuant to this section.

3. The fee is $ {300} *600* to file an application for permission to engage in any one of the following activities:

(a) Increasing the depth of a well;
(b) Testing of water shut-off;
(c) Entering or opening a plugged well;
(d) Shooting, acidizing or fracture treating *a non-stimulated geothermal well*;
(e) Drilling in a direction which is not intended to be vertical, including directional drilling;
(f) Changing the construction of a well bore or well, including:
(1) Placing a plug in the well bore or well; and
(2) Recovering or altering the casing;
(g) Conducting a major work over or cleaning of a well; and
(h) Any other proposed activity for which the Division:
(1) Conducts an extensive review;
(2) Conducts a field inspection; or
(3) Evaluates information or documentation regarding the construction of a well bore or well.
(i) Minor modification to an Geothermal Stimulation Permit

4. The fee is $ {100} *200* to file an application for permission to engage in any one of the following activities:

(a) Extending a permit;
(b) Changing the ownership of a well;
(c) Changing the status of a well;
(d) Changing the name of a well;
(e) Changing the location of a proposed well; and
{(f) Abandoning and plugging a well.}

5. The fee is $1,500 to file an application for permission to engage in any one of the following activities under Form 4a:

(a) Requesting to Stimulate a previously drilled well with approval under NAC534A.xxx (Request to stimulate a geothermal well drilled and completed before Month day, year (TBD).)
(b) Major modification to a Stimulation permit
(c) Re-stimulate a previously permitted well

6. There is no fee associated with the application for abandoning and plugging a well, however, an application to abandon and plug a well must be submitted to and approved by the Division prior to initiation of plugging and abandonment activities.

{5.} *7.* The owner of the geothermal resource or operator shall report to the Division any progress regarding or the completion of an activity for which permission was required pursuant to this section and any supplemental history of the well.

{6.} *8.* In the case of a geothermal domestic well, the owner of the geothermal resource or the operator shall:

(a) Not engage in an activity listed in paragraph (a) or (c) of subsection 3, subparagraph (1) of paragraph (f) of subsection 3 or paragraph (f) of subsection 4 without the permission of the Division; and

(b) Submit to the Division an application for permission to engage in an activity listed in paragraph (a) or (c) of subsection 3, subparagraph (1) of paragraph (f) of subsection 3 or paragraph (f) of subsection 4. The owner or operator shall file the application on Form 4 (Sundry Notice and Report on Wells) *or Form 4a (Sundry Notice and Report on Stimulation Geothermal Well)* and is not required to pay a fee to file.

{7.} *9.* The Division may, as it deems appropriate, observe and release information which is not confidential regarding activities for which permission was required pursuant to this section.

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85; A 12-16-92; R057-15, 12-21-2015; R032-19, 12-30-2019)

NAC 534A.550 Required filings: Report of completion; directional survey; lithologic log; well logs. (NRS 513.063**,** 534A.090**)**

1. Within {30}*60* days after the completion of the construction of a well, the owner of the geothermal resource or the operator shall file with the Division:

(a) A report setting forth the manner in which the well was completed on a form designated by the Division;

(b) For a directionally drilled well, a directional survey, which must include, without limitation, a plat obtained by the method used to survey the well;

(c) A lithologic log, which must include the lithologic characteristics and depths of the formations, the depths and temperatures of water-bearing and steam-bearing strata and the temperatures, chemical compositions and other characteristics of fluids encountered during drilling; and

(d) The following well logs, if applicable:

Well Log Type	Industrial or Commercial Production Well	Industrial or Commercial Injection Well	Geothermal Domestic Well	Thermal Gradient Well
Gamma or similar log	Required	Required	Submit if run	Submit if run
Cement bond log	Submit if run	Submit if run	Submit if run	Submit if run
Temperature log	Required	Required	Required	Required
Other logs	Submit if run	Submit if run	Submit if run	Submit if run

2. Within {30}*60* days after the well is plugged, the operator shall file with the Division a well plugging report on a form designated by the Division.

3. The survey and well logs filed pursuant to subsection 1 must include {two paper copies, one} *a clear and concise* digital copy *of all logs* and for any electric logs, one copy in LASer (LAS) file format *or other readily accessible format*.

4. The Division shall file one set of the well logs filed pursuant to subsection 1 with the Bureau of Mines and Geology of the State of Nevada.

(Added to NAC by Comm'n on Mineral Resources, eff. 11-12-85; A 12-16-92; R032-19, 12-30-2019)

STIMULATION & INDUCED SEISMICITY

NAC 534A.7xx Definitions. *As used in NAC 534A.012 to 534A.170, inclusive, unless the context otherwise requires, the words and terms defined in NAC 534A.7xx to 534A.7xx (area of review to water source), inclusive, have the meanings ascribed to them in those sections.*

NAC 534A.7xx "Area of review" defined. *"Area of review" means:*

1. The area of land located within a radius of 1 mile of a proposed geothermal well and any surface projection of any lateral component of the wellbore that is proposed for stimulation;

NAC 534A.7xx "Available water source" defined. *"Available water source" means a water source for which the person who owns, holds or has the right of use to the water source has consented to the sampling and testing of the water source and to making the results of the sampling and testing available to the public.*

NAC 534A.7xx "Magnitude" defined. *"magnitude" means a number that characterizes the relative size of an earthquake, measured by the maximum motion recorded by a seismograph using the Moment Magnitude scale (Mw).*

NAC 534A.7xx "Water source" defined. *"Water source" means a water well or spring that is regulated by the Division of Water Resources of the State Department of Conservation and Natural Resources.*

NAC 534A.7xx Applicability. *Except as otherwise provided in NAC 534A.7xx (Request to conduct simulate a geothermal well drilled and spudded before Month day, year (TBD)), the provisions of NAC 534A.7xx to 534A.7xx(area of review to water source), inclusive, apply for each geothermal well for which the operator intends to engage in geothermal stimulation.*

NAC 534A.7xx Stimulation Baseline sampling and monitoring; exceptions.

1. Except as otherwise provided in subsections 2 and 4, an operator shall collect an initial baseline sample and subsequent monitoring samples from each available water source, not to exceed six available water sources, located within area of review. If more than six available water sources are located within area of review, the operator shall select the six available water sources for sampling in concurrence with the Division based on:

(a) The proximity of the available water sources to the proposed geothermal well. Available water sources closest to the proposed geothermal well are preferred.

(b) The orientation of the sampling locations relative to the available water sources. To the extent that the direction of the flow of groundwater is known or can reasonably be inferred, sample locations from both down-gradient and up-gradient locations are preferred over cross-gradient locations.

(c) The depth of the available water sources. The sampling of the deepest of the available water sources is preferred.

(d) The condition of the available water sources. An operator is not required to sample an available water source if the Administrator determines that the available water source is improperly maintained or nonoperational or has physical characteristics which would prevent the safe collection of a representative sample or which would require nonstandard sampling equipment.

(e) The construction and use of the water source. If an operator constructs a temporary well or observation well within the area of review to use as a water source for the purpose of supporting the drilling or operation of a geothermal well, the operator must include the water source as an available water source for the purpose of sampling and monitoring pursuant to this section.

2. An operator may, before a well is spudded or drilled for geothermal, request an exception from the requirements of this section by filing a Sundry Notice and Report on Stimulated Geothermal Well (Form 4a) with the Administrator. The Administrator may grant the request for an exception if the Administrator finds that:

(a) No available water sources are located within the area of review;

(b) The only available water sources are unsuitable pursuant to paragraph (d) of subsection 1; or

(c) Each owner of a water source that is suitable for testing and located within the area of review has refused to grant the operator access to the water source for sampling and additionally finds that the operator has made a reasonable and good faith effort to obtain the consent of the owner to conduct the sampling.

➥ *An operator seeking an exception on the grounds set forth in paragraph (b) shall provide to the Administrator documentation of the conditions of each available water source which is deemed unsuitable. An operator seeking an exception on the grounds set forth in paragraph (c) shall provide to the Administrator documentation of the efforts of the operator to obtain the consent of each owner of a water source.*

3. Except as otherwise provided in subsections 2 and 4, an operator shall collect from each available water source for which the operator is required to collect samples pursuant to this section:

(a) An initial sample during the 12-month period immediately preceding the commencement of stimulation at a geothermal well, or series of wells within project development.

(b) A first subsequent sample, collected not earlier than 3 months but not later than 12 months after the commencement of stimulation. If a well that has been drilled produces geothermal fluids for a period of less than 6 months after the commencement of stimulation and the well is subsequently plugged and abandoned, or if the well is plugged and abandoned without having produced geothermal fluids after the commencement of stimulation, the operator shall collect each first subsequent sample at the time the well is plugged.

(c) A second subsequent sample, collected not earlier than 18 months but not later than 24 months after the commencement of stimulation. If a well that has been drilled produces geothermal fluids for a period of less than 24 months and the well is subsequently plugged and abandoned, the operator shall collect each second subsequent sample at the time the well is plugged. An

operator is not required to collect second subsequent samples if a well that is drilled is plugged and abandoned without having produced geothermal fluids.

(d) The operator or owner of a geothermal resource may propose an alternative sampling plan that must meet the intent of (the direct sections above, 3 a-c) to the Administrator for approval if the proposed geothermal resource simulation plan can be properly represented with less samples for a multiple stimulation well operation.

4. For the purposes of satisfying the requirements for sampling available water sources pursuant to paragraphs (a) and (b) of subsection 3, an operator may rely on the test results of a previous sample from an available water source if:

(a) The previous sample was collected and tested during the respective period prescribed for sampling pursuant to paragraph (a) or (b) of subsection 3.

(b) The procedure for collecting and testing the sample, and the constituents for which the sample was tested, are substantially similar to those required by this section.

(c) The Administrator receives the test results not less than 30 days before the commencement of simulation.

5. The Administrator may require an operator to collect and test samples of an available water source in addition to the collection and testing protocol prescribed by this section if the Administrator finds that additional testing is warranted.

6. The testing of a water sample pursuant to this section must be conducted by a laboratory certified pursuant to NAC 445A.0552 to 445A.067, inclusive. Upon request, an operator shall provide his or her protocol for collection and testing to the Administrator.

7. The test results of initial and subsequent samples collected pursuant to this section must include the constitutions found under NDOM Stimulation Sampling Form 4b.

8. An operator shall notify the Administrator and the owner of an available water source within two (2) business days if the test results of a sample collected pursuant to this section indicate:

(a) The presence of hydrocarbons or hydrogen sulfide in a concentration greater than the specified maximum contaminant level set forth in the primary and secondary standards for drinking water pursuant to NAC 445A.453 and 445A.455.

(b) If the sample is a subsequent sample, any change in water chemistry exceeding the background water quality established under Section 1.

9. An operator shall provide copies of the test results of each sample collected pursuant to this section to the Administrator and to the respective owner of the available water source not later than 30 days after the operator receives the test results from a laboratory. The Division will, upon request, make the test results available to a member of the public for inspection at the office of the Division located in Carson City.

10. An operator shall include with the copy of the test results of a sample provided pursuant to subsection 10 a description of the location of the available water source and any field observations recorded by the operator during the collection of the sample. The operator shall describe the location of the available water source by public land survey and the county assessor's parcel number and shall include the global positioning system coordinates of the available water source in the manner prescribed by subparagraph (2) of paragraph (b) of subsection 2 of NAC 534.340.

11. An operator shall not commence stimulation at a well until the operator has complied with subsections 1, 2 and 4 to 10, inclusive, and paragraph (a) of subsection 3.

12. As used in this section, "public land survey" has the meaning ascribed to it in NAC 534.185.

NAC 534A.7xx Induced Seismicity Baseline Monitoring, Forecast, and Risk-Based Monitoring Plan.

This Section applies to all geothermal wells that are planned or have been stimulated for geothermal recovery operations.

1. The owner of the geothermal resource or operator of a proposed stimulation well or series of stimulation wells shall provide the Division with an Induced Seismicity Monitoring Plan with all information necessary to evaluate the induced seismicity impact of stimulation and injection activities on the geothermal reservoir and other natural resources. At a minimum, the information shall include:

(a) Existing reservoir conditions, if any,

(b) Geologic zones, formations, and any known subsurface geological structures that are within the area of review.

(c) Baseline seismic activity of the hydrographic basin

1. Location(s) and ownership of nearest active seismic monitoring stations to include:

(a) All regional monitoring stations that are on the Advanced National Seismic System

(b) All local or regional monitoring systems publicly available that are not on the Advanced National Seismic System

(c) All planned or recently installed monitoring systems that have enough elements, sensitivity, and aperture to capture seismicity at least as small as a magnitude 1.0 within the region specified by paragraph (c) of section (1).

(d) All project specific installed seismic monitoring stations installed with into record seismic activity within the area of review must be maintained during the life of the geothermal operation.

1. Any removal or replacement of a project specific seismic monitoring station shall be approved by the administrator before removal or replacement.

2. Provide the Division with a model to forecast seismicity and demonstrate that the seismic monitoring stations listed in section 1 will collect enough information to characterize background seismicity and identify any active faults that have the potential to be affected by the geothermal activities to include:

(a) Historical seismicity and baseline data

1. At least 5 years of publicly available regional seismic events

2. At least 6 months of local seismic activities from monitoring systems that have enough elements, sensitivity, and aperture to capture seismicity at least as small as a magnitude 1.0 specific to the area of review.

3. Number of seismic events with their respective magnitude for both the regional and local seismic activities before any stimulation occurs.

(b) Estimate the baseline hazard from natural seismicity.

(c) Estimate the potential hazard from induced seismicity.

(d) Create and characterize the risk of induced seismic events

(b) Partnerships, if any, with either the United States Geological Survey or local University Seismologic Programs for third party monitoring

(c) or partnerships to make seismic monitoring data publicly available.

3. The owner of the geothermal resource or operator shall continue to monitor and make available to the public the depth and magnitude of all seismic events over a magnitude of 2.5 within the area of review plus an additional 2-mile buffer for a total of 3 miles around any operating well and the surface projection of any lateral component of the well for the life of the project.

4. The owner of the geothermal resource or operator shall follow the traffic light risk-based monitoring plan for induced seismic events. Each operation will use the data and information collected under section (1) to work with the Division to establish magnitude levels for Green, Amber, and Red light alerts of the traffic light monitoring system for each individual project. Below is an example of a traffic light monitoring system.

"Green Light Alert" means the Division received notice from the United States Geological Survey, University of Nevada Reno Seismological Laboratory, the owner of the geothermal resource or operator's seismic monitoring stations, or other reputable source, that there was an seismic event with an epicenter within the area of review plus an additional 2-mile buffer for a total of 3 miles around any operating well and lateral component with a magnitude less than or equal to X.X.

"Amber Light Alert" means the Division received notice from the United States Geological Survey, University of Nevada Reno Seismological Laboratory, the owner of the geothermal resource or operator's seismic monitoring stations, or other reputable source, that there was an seismic event with an epicenter within the area of review plus an additional 2-mile buffer for a total of 3 miles around any operating well and lateral component with a magnitude greater than X.X, but less than Y.Y.

"Red Light Alert" means the Division received notice from the United States Geological Survey, University of Nevada Reno Seismological Laboratory, the owner of the geothermal resource or operator's seismic monitoring stations, or other reputable source, that there was an seismic event with an epicenter within the area of review plus an additional 2-mile buffer for a total of 3 miles around any operating well and lateral component with a magnitude of Y.Y or greater.

(a) A traffic light monitoring plan must be submitted by the operator and approved by the Division for each individual project area before stimulation of any well within the project area.

5. All injector and producer Geothermal wells regulated by this section shall be equipped with a flow meter capable of monitoring the rate of flow of fluids injected into the well on a per day basis consistent with the Geothermal permit issued by the Division.

(a) All permittees shall record and maintain pressure and flow data for each injector or producer Geothermal well and report the flow data to the Division on a monthly basis. The report shall include the average and maximum monthly injection rates, pressures, and any use of makeup water added to the geothermal resource. The records shall be maintained by the operator for at least 5 years and shall be available to the Division for inspection upon request.

NAC 534A.7xx Induced Seismicity Reporting

1. The owner or operator of a geothermal resource shall report the occurrence of any Amber Light Alert seismic event located within a 2-mile radius of the area of review to the Division within 24 hours of the event.

2. After reporting a Amber Light Alert, the owner of the geothermal resource or operator has the discretion to operate the permitted well according to the terms of the permit, or adjust the operation of the permitted well by reducing the volume of fluids injected into the well and consult with the Division about the implications of the Amber Light Alert as it relates to the operation of the well.

3. After receiving a third Amber Light Alert within six continuous months, an identified Geothermal well, the owner of the geothermal resource or operator must immediately consult with the Division on measures proposed to reduce the likelihood of additional Amber Light Alerts.

(a) Measures proposed to reduce the likelihood of additional Amber Light Alerts must be submitted for approval on Sundry Form 4a.

4. The owner of the geothermal resource or operator shall report any Red Light Alert seismic event located within a 2-mile radius of the area of review to the Division within 24hours of the event.

(a) If a Red Light Alert occurs, the owner of the geothermal resource or operator must also notify the local County Emergency Management office.

(b) If a Red Light Alert occurs, the owner of the geothermal resource or operator must also notify any Geothermal, Oil, or Gas well permittees with wells located within a 10-mile radius of the seismic event's epicenter.

(c) When an identified well is suspected of triggering induced seismic activity meeting the criteria of a "Red Light Alert", the permittee shall immediately decrease the injection pressure and step down to a stop of injection use of the well and consult with the Division to develop a plan for future use of the geothermal well.

NAC 534A.7xx Induced Seismicity Orders

1. The Administrator shall issue an order to the owner of the geothermal resource or operator of a Geothermal well for the immediate reduction in injection pressure or cessation of operations due to conditions that create imminent danger to the health and safety of the public, or significant damage to property, under any of the following conditions:

(a) If an identified well receives a third Amber Light Alert within two continuous month timeframe after injection or production fluids have already been reduced.

(b) If an identified well or wells regulated by this Section receives a Red Light Alert from a seismic event with an epicenter within the area of review plus an additional 2-mile buffer for a total of 3 miles around any operating well and surface projection of any lateral component.

(c) The Division has discretion to issue orders to reduce the likelihood of seismic events to permittees with well(s) regulated by this Section within a 5-mile radius of any seismic event epicenter, when necessary, if induced seismicity conditions warrant.

3. Induced Seismicity Mitigation Requirements

(a) After receiving an order, in addition to the requirements of the order, the permittee shall schedule a meeting with the Division at the Division's Carson City office, to be held within 30 calendar days after issuance of the order and before the order hearing. Once

scheduled, the permittee shall confirm the meeting in writing to the Division and provide the last 6 months of well data required in NAC 534A.7xxx (Induced Seismicity Baseline Monitoring, Forecast, and Risk-Based Monitoring Plan) Subsection 5 for Division staff to review prior to the meeting. The purpose of the meeting will be to determine possible ways to mitigate induced seismicity events near the permitted well.

(b) If the permittee and Division reach agreement on how to test induced seismicity mitigation, the Division shall present the agreement as a settlement before the Commission on Mineral Resources.

NAC 534A.7xx Application to drill; area of review.

1. Before drilling a production or injection well that is planned to be stimulated, the application must contain, in addition to the information required by NAC 534A.190 – 534A.196, as applicable:

(a) The water appropriation permit number(s) and the name of the owner of each water source within the area of review that is on file with the Division of Water Resources of the State Department of Conservation and Natural Resources.

(b) The well log number, well depth and the diameter of the water well casing.

(c) The static water level below the surface of the ground or the rate of flow of the water, if any.

(d) A description of the location of each water source located within the area of review in the manner prescribed by subsection 11 of NAC 534A.7xx (Stimulation Baseline sampling and monitoring; exceptions).

(e) Publicly available maps and cross-sections of the area of review which describe the surface and subsurface geology of the area of review, including, without limitation, the location of known or suspected faults.

(f) A map showing the location of each water source or perennial stream located within the area of review, the overall project area or lease holdings, the boundaries of the area of review, all known well locations, land ownership and applicable assessor parcel numbers.

(g) The source and estimated volume of water required for stimulation in each well.

(h) A plan for the management and disposal of all fluids to be used in the proposed stimulation operation.

2. If an operator discovers inconsistencies with respect to publicly available and proprietary hydrologic or geologic information within an area of review that the operator reasonably believes to be relevant with respect to potential contamination from stimulation, the operator shall disclose the inconsistencies to the Division.

3. The Division may prescribe or an operator may specify an area of review that includes an area of land in addition to that area of land located within a radius of 1 mile of a proposed geothermal well and any surface projection of any lateral component of the wellbore that is proposed for stimulation for the purposes of compliance with this section or the collection of additional data based on population density, residential locations, water source locations or for other good cause as the Division or an operator may deem reasonable.

NAC 534A.7xx Additional requirements for geothermal wells planned to be stimulated, including casings and casing strings. *In addition to the requirements prescribed by NAC 534A.185 to 534A.196, the operator of a geothermal well shall:*

1. Ensure that:

(a) The surface location of the well is at a lateral distance of not less than 300 feet from any known perennial water source or existing water well.

(b) The edge of the drilling pad is at a lateral distance of not less than 100 feet from any known perennial water source or existing water well.

➥ An owner or an operator may request and the Division may approve an exception to the requirements prescribed by this subsection.

2. For the intermediate casing string installed in the well directly below the surface casing, install the intermediate casing string through the surface casing from the installed depth of the intermediate casing string to the surface of the ground.

3. For a production casing string, conduct a pressure test of the casing string in which the casing is pressurized to 3,000 pounds or more per square inch gauge (psig), not to exceed 70 percent of the burst-pressure rating of the casing, for a period of not less than 30 minutes. A pressure test must be conducted and the results of the test must be reported to the Division within 24 hours of the test. The operator must provide a 48 hour notice to the Division before conducting a pressure test.

NAC 534A.7xx Duties of operator.

1. An operator of an stimulated geothermal well shall:

(a) Not less than 14 days before the commencement of stimulation:

(1) Provide written notice to each owner of real property and any operator of an oil, gas or geothermal well located within the area of review of the stimulation operation.

(2) Submit for approval by the Division a sundry notice (Form 4a) and a report describing all specific aspects of the proposed stimulation operation. The report must identify each stage of the stimulation operation, the measured depth and true vertical depth below the surface of the ground for each stage, the duration of each stage, all intervals to be perforated in measured depth and true vertical depth below the surface of the ground, the number and diameter of perforations per foot and the estimated hydraulic pressures to be utilized.

(b) Maintain a record as to the manner in which each owner and operator were notified pursuant to subparagraphs (1) and (2) of paragraph (a), including, without limitation, the method of notification.

(c) Before the commencement of stimulation:

(1) Ensure that each chemical used in the process is identified on the Internet website maintained by the Division as a chemical which is approved by the Division for stimulation. An operator may request, and the Division may approve the use of a chemical that is not identified as an approved chemical if the operator submits the request to the Division on a sundry notice (Form 4a) not less than 30 days before the commencement of stimulation.

(2) Disclose to the Division each additive that the operator intends to use in the stimulation fluid, including, without limitation, any additive that may be protected as a trade secret. The operator shall include with the identity of each additive the trade name and vendor of the additive and a brief description of the intended use or function of the additive.

2. The operator shall monitor and record all well head pressures, including each annular space pressure, during the stimulation operation. The maximum hydraulic pressure to which a segment of casing is exposed must not exceed the burst-pressure rating of the casing, but the Division may require a lower maximum hydraulic pressure as the Division determines is necessary. The operator shall immediately stop the stimulation process and notify the Division if

any change in annular space pressure is observed, which suggests communication with the stimulation fluids. The operator shall provide the Division with a report documenting all recorded stimulation pressures for each stage of the stimulation operation not later than 15 days after the completion of each stage.

3. The operator shall contain all liquids that are returned to the surface and discharged from the wellbore at the conclusion of each stage of the stimulation operation. The operator shall contain the liquids in enclosed tanks or in the manner prescribed by the Division of Environmental Protection pursuant to chapter 445A of NRS and chapter 445A of NAC.

*4. Except as otherwise provided in subsection 5 and not later than 60 days after the completion of a stimulation operation, the operator shall report, at a minimum, to the Internet website **www.fracfocus.org** for inclusion in FracFocus, or its successor registry:*

(a) The name of the operator, the well name and well number and the American Petroleum Institute well number.

(b) The date of the stimulation treatment, the county in which the well is located, any public land survey location information relevant to the location of the well and the global positioning system coordinates of the well.

(c) The true vertical depth of the well and the total volume of water used in the stimulation treatment of the well or if the operator utilizes a base fluid other than water, the type and total volume of the base fluid used in the stimulation treatment.

(d) The identity of each additive used in the stimulation fluid, including, without limitation, the trade name and vendor of the additive and a brief description of the intended use or function of the additive.

(e) The identity of each chemical intentionally added to the base fluid.

(f) The maximum concentration, measured in percent by mass, of each chemical intentionally added to the base fluid.

(g) The Chemical Abstracts Service Registry Number for each chemical intentionally added to the base fluid, if applicable.

5. Proprietary information with respect to a trade secret does not constitute public information and is confidential. An operator may submit a request to the Division to protect from disclosure any information which, under generally accepted business practices, would be considered a trade secret or other confidential proprietary information of the business. The Administrator shall, after consulting with the operator, determine whether to protect the information from disclosure. If the Administrator determines to protect the information from disclosure, the protected information:

(a) Is confidential proprietary information of the operator.

(b) Is not a public record.

(c) Must be redacted by the Administrator from any report that is disclosed to the public.

(d) May only be disclosed or transmitted by the Division:

(1) To any officer, employee or authorized representative of this State or the United States:

(I) For the purposes of carrying out any duties pursuant to the provisions of this chapter or chapter 534A of NRS; or

(II) If the information is relevant in any judicial proceeding or adversary administrative proceeding under this chapter or chapter 534A of NRS or under the provisions of any federal law relating to geothermal wells or stimulation, and the information is admissible under the rules of evidence; or

(2) Upon receiving the consent of the operator.

➥ *The disclosure of any proprietary information pursuant to this subsection must be made in a manner which preserves the status of the information as a trade secret.*

6. The Division shall make available to the public for inspection any information, other than a trade secret or other proprietary information that is maintained confidentially pursuant to subsection 5, that is submitted by an operator pursuant to this section.

7. As used in this section, "trade secret" has the meaning ascribed to it in NRS 600A.030.

NAC 534A.7xx Request to stimulate a geothermal well drilled and completed before Month day, year (TBD).

1. Notwithstanding any provision of NAC 534A.xxx to 534A.xxx (Stimulation and Induced Seismicity section), inclusive, to the contrary, an operator of an geothermal well that was drilled and spudded before Month day, year (TBD), may request approval from the Division to conduct a stimulation operation at the geothermal well by submitting a sundry notice (Form 4a) to the Division. The sundry notice must include, without limitation:

(a) A cement evaluation log of the production casing string that has been conducted not less than 5 years before the submission of the sundry notice.

(b) A pressure test of the production casing string conducted in the manner prescribed by subsection 7 of NAC 534A.260 and 543A.270.

(c) Any other information required by the Division.

2. The Division will, upon receipt of a request pursuant to subsection 1, evaluate each well design which is the subject of the request and approve or disapprove the request.