STATE OF NEVADA
DIVISION OF ENVIRONMENTAL PROTECTION

AUTHORIZATION TO INJECT/DISCHARGE

In compliance with the provisions of the Nevada Revised Statutes (NRS) 445A and the Underground Injection Control (UIC) Regulations in the Nevada Administrative Codes (NAC) 445A.810 to 445A.925, inclusive, the Permittee is authorized to inject and discharge from a facility described below in accordance with limitations, requirements and other conditions specified in the permit.

Permit Number:	**UNEV2017201**
Facility Name:	**Tungsten Mountain Geothermal Facility**
Facility Address:	**Northwest Area of Edwards Creek Valley, 80 miles east of Fallon**
Permittee	**ORNI 43, LLC**
Permittee Address:	**6884 Sierra Center Pkwy** **Reno, Nevada 89511**
Property Owner:	**Bureau of Land Management**
Owner Address:	**5665 Morgan Mill Rd** **Carson City, NV 89701**
Legal Description:	**Sections 13, 14, 22-24, 26, 27, T.21N., R.38E., MDB&M,**
County:	**Churchill**
Number of Permitted Wells:	**Five (5)**
Other Permitted Discharges:	**Water discharge to surface basins**
Reporting Frequency:	**Semiannually, due the 28th of January and July**

NOTE: Reference the permit fact sheet for specific details on the facility and wells, and permit history.

This permit shall become effective: December 7, 2026 (tentative)

This permit shall expire at midnight: December 7, 2031 (tentative)

_____ _____

Bret Allen Date
Bureau of Water Pollution Control

PART I INJECTION LIMITATIONS, MONITORING, AND OTHER REQUIREMENTS

I.A SCHEDULE OF COMPLIANCE

I.A.1 **Schedule of Compliance** - Pursuant to NAC 445A.888, this permit, when appropriate, may specify a schedule for compliance. The schedule for compliance must require compliance as soon as possible and in no case later than one (1) year after the effective date of the permit.

a. The permittee shall achieve compliance with the conditions, limitations and requirements of the permit at the commencement of relevant activity.
b. The Division may, upon the request of the permittee, and after public notice, revise or modify a schedule of compliance in an issued permit if they determine good and valid cause.

I.A.2 **Schedule of Compliance Items -** The Permittee shall achieve compliance with the conditions, limitations and requirements of the permit at the commencement of relevant activities.

a. The permittee shall perform part I and II Mechanical Integrity Test (MIT) to verify well integrity before injecting into well 24A-22. The Division shall approve the results of the MITs before injection is permitted. Injection may be permitted to perform an MIT upon Division approval of the MIT plan. Chemical additives may be used during an MIT upon the submission and Division approval of form U240.
d. Within 180 days of permit issuance, update the O&M to reflect the active status of IW 24A-22.

I.B INJECTION LIMITS

I.B.1 **Permitted Injection and Rates -** During the period beginning on the effective date of this permit and lasting through the expiration date, the Permittee is authorized to inject geothermal fluids into injection wells approved and included in this permit under **Table I.B.1** below and within the Legal Description areas listed under the Authorization to Inject. The Permittee is further authorized to discharge geothermal fluids derived from: Well start-ups, testing and maintenance into bermed infiltration basins located at each well site. Injection by the Permittee shall be limited as specified below:

a. The injection pressure at the wellhead shall not exceed the maximum pressure as calculated per NAC 445A.911 (2). Calculations for all future wells and following workovers which introduce new injection zones shall be submitted to and approved by the Division prior to use of the well. Once the well has been approved, the injection well will be added to the table below. Pressure limits for new wells are listed in Injection Well Table below:

TABLE I.B.1 – INJECTION WELL INFORMATION AND PARAMETERS

Injection well	Date Approved	Maximum Wellhead Pressure (psig)	Maximum Flow Rate (gpm)
45A-22	9/21/2017	605	-
56-22	9/21/2017	317	-
56A-22	9/21/2017	318	-
24-22	2/26/18	444	-
24A-22	**TBD**	408	6200

I.B.2 **The Permittee shall comply with the current Memorandum of Understanding between the Nevada**

Division of Minerals and NDEP and notify the Division in accordance with the time frame listed for each activity. Other sections of Part I may list additional requirements. All facilities and ancillaries encompassed by this permit shall conform to the plans and specifications filed with the Division and shall be maintained in good working order at all times.

I.B.4 **Temperature -** The temperature of discharged fluids shall not cause: 1) degradation to ground water; 2) degradation of well integrity; and/or 3) harm to the public, wildlife and/or environment.

I.B.5 **Injection Zone** - Injected water shall remain in the geothermal zone/reservoir that has been identified through the UIC application process. Injected water must not migrate into unauthorized "non-thermal" water zones, shallow formations and/or ground surface.

I.B.6 **Non-degradation -** Degradation (increase in constituent values above limits) shall not occur in non-thermal waters around the project site. Monitoring point constituent limitations shall be as follows: Exceedance of a primary and/or enforceable secondary drinking water standard (as listed in NAC 445A.455), set by federal or state regulations, shall not occur, unless a naturally occurring receiving-aquifer constituent is established by the Permittee to be higher than the drinking water standard.

I.B.7 **Injection Rate -** The injection rate shall not cause an exceedance of the injection pressure limitation in Part I.B.1.

I.B.8 **Injection Fluid Limitations –** Injected fluid shall be limited to the following:

a. The Permittee is authorized to inject only those naturally produced fluids from the project area that have received prior written approval from the Division.
b. Extraction, conveyance and injection of any fluids must be accomplished in a manner that prevents introduction of foreign substances not authorized by this permit. All fluids extracted will be disposed of by injection except for those discharges approved under Part I.B.1 with conditions listed under the Fluids Section.
c. Geothermal fluids shall be disposed of in such a manner that they do not present a hazard to livestock, wildlife or the beneficial use of the waters of the State.
d. **Chemical Additives** - The introduction of any chemical additive to the injectate or surface discharge waters requires written authorization from the Division using UIC Form U240. The use of any type of chemical additive may require modification of monitoring requirements.
e. **Binary Fluid -** Binary fluid may not enter the geothermal waters via leaks or any other means within the operating system; and pursuant to Part III.A.2-3, any leaks within the operating system, including heat exchanger units, must be reported, and the unit taken offline and repaired.

I.B.9 **Discharge to Basins -** Fluids derived from maintenance procedures or well testing may be diverted on a short-term basis to holding/discharge basins constructed on the site. Fluids discharged to such ponds may contain previously approved additives.

a. All discharge basins must have Division approved Discharge Basin form and be constructed as approved by the Division. Fluid volumes discharged to these basins shall be reported pursuant to Attachment I - TABLE 4 of this permit.
b. All discharge basins shall be fenced off and always maintained in proper manner as to not allow wildlife or livestock to be endangered by these constructed devices or the water within them. If any wildlife is trapped or found dead in basins, the Nevada Department of Wildlife shall be contacted immediately.

I.C MONITORING

I.C.1 Water Levels - The Permittee is required to notify the Division within five (5) days of becoming aware of any elevated water levels or constituents in any wells or surface waters being monitored under the terms of this permit that are outside the normal range of values for that site.

a. Depending on the magnitude of the change, the Division may require the Permittee to conduct a hydrogeologic investigation, increase monitoring, cease injection and/or any other actions deemed necessary by the Division so as to determine the cause and/or any necessary mitigation.

I.C.2 Access to Monitoring Locations - The Permittee shall immediately notify the Division verbally and also submit a follow-up written notice of any situation that prevents access to any of the monitoring wells/points. The reason for inaccessibility and corrective action measures necessary to resolve the situation shall also be noted in the semi-annual report.

I.C.3 Semi-Annual Monitoring and Reporting Requirements - The Permittee shall submit semi-annual Injection Monitoring Reports by January 28th and July 28th of each year whether injection occurred during period or not. The reports must contain the following information:

a. Checklist form attached to this permit as **Attachment I**.
b. All items identified under **Attachment I**.
c. Water samples, monitoring and documentation shall be taken in accordance with **Attachment I - TABLE 2**.
d. The items in **Attachment I - TABLE 4** shall be monitored by the Permittee.

I.C.4 Submitting Reports - Monitoring results and other requirements obtained during the previous reporting period shall be summarized for each month and reported no later than the 28th day of the month following the completed reporting period. Signed copies of these, and all other reports required herein, shall be submitted to the UIC Program at the following address:

Division of Environmental Protection
Bureau of Water Pollution Control
ATTN: Injection Monitoring Report
901 S. Stewart Street, Suite 4001
Carson City, NV 89701

PART II PERMIT COMPLIENCE, REQUIREMENTS, AND STANDARDS

II.A MECHANICAL INTEGRITY

II.A.1 Well Construction and Workover - The Permittee shall construct all production, test and other wells in compliance with all State and federal regulations such that unauthorized releases do not occur. When standard or routine maintenance procedures for **injection well cleanouts** are developed, such procedures will be submitted to the Division for approval and included in the UIC O&M Manual. Following any stimulation, acidizing or other treatment of the injection well(s), the Permittee shall submit details of the activity/treatment in the next UIC report or by separate cover.

a. Following construction or reworking of production, test or other wells, the Permittee shall submit plans and drawings of the completed well as constructed and chemical analysis (UIC Sample List 2) of the production waters. The Division may remove chemical species from reporting requirements if the Permittee satisfactorily demonstrates said species are not significant to the analysis of injection operations and potential impacts.

II.A.2 Tests for Mechanical Integrity - The Permittee shall conduct MITs per NAC 445A.917-918 on the Injection wells. These tests must demonstrate there are no significant leaks in the injection well casing (Part 1 Internal) and demonstrate there is no significant fluid movement behind the casing (Part 2 External) including checks for leaks and behind-casing flow at all key locations such as casing shoes, liner tops, liner laps, and above the top of liner or casing perforations. The Division may, by written notice, require the Permittee to demonstrate mechanical integrity if loss of mechanical integrity is evidenced by well failure or by other information.

II.A.3 MIT Frequency – The Permittee shall conduct MITs on the injection wells

a. Prior to initial use of the injection well
b. At least once every five (5) years on all required injection wells
c. Per Division MIT policy
d. The Division may, by written notice, require the Permittee to demonstrate mechanical integrity if loss of mechanical integrity is evidenced by well failure or by other

II.A.4 MIT Proposals - Submit MIT Proposals for each injection well to demonstrate the integrity of the well to the Division forty five (45) days prior to the test(s) being conducted to receive approval of said methodology and plan. MIT Proposals shall include:

a. Permit number and facility name.
b. Identify which internal and external MIT tests are the best for each injection well covered by this permit based on the static and maximum flowrate conditions and well construction.
c. Include proposed testing flowrates and pressures.
d. Submit an MIT Procedure. Reference the requirements of the MIT Summary Report below to ensure the plan contains how field notes will be taken, information is recorded, and discussion on testing interpretation and conclusions.
e. Include a copy of any approved U240 form relevant to the chemicals being used for the test(s), if any.
f. Provide the most recent, up to date, annotated well(s) diagrams and schematics.
g. Include signature block and certify the MIT Proposal contents to be accurate and correct.

II.A.5 Forty Eight (48) hour Notice - Give 48- hour notice to the Division as to the date and time of the test(s) for the Division staff or their representatives to witness the test.

II.A.6 MIT Summary Report - Compile and submit the MIT Summary Report, including relevant logs and interpretative reports, to the Division within ninety (90) days after the completion of the test. The MIT

Summary Report shall contain the following information:

a. Permit number and facility name.
b. Conditions of the injection well(s) prior to the test (e.g. static, injecting at ### gpm, etc.)
c. Conditions of the well(s) during the test(s), such as, but not limited to, operating conditions of the well, water level, changes in status/conditions of the well during the test, anomalies witnessed prior to or during the test, gauge calibration and condition for any gauges used, etc,; and
d. Interpretation and conclusions of the test results stating whether each well meets the internal and external regulatory requirements in the UIC regulations. This part should be done in conjunction with the service company.
e. include the most up to date, annotated, well completion diagram for each well.
f. Chemical safety data sheet for any chemicals injected during the test.
g. Use UIC MIT Form U111 to document the test for each individual well.

II.A.7 **Loss or Failure to Demonstrate Mechanical Integrity -** If the holder of the permit or the Division finds that the injection well fails to demonstrate mechanical integrity during a test or a loss of mechanical integrity becomes evident during operation, the operation of the injection well must be stopped immediately and may not be resumed until approved by the Division. Should a well lose or fail to demonstrate Mechanical integrity, the following shall proceed:

a. Injection shall cease immediately upon discovery of the failure. The Permittee shall notify the division of any mechanical integrity failure and any technical details surrounding it within twenty-four (24) hours and as outlined in Part III.A.2-3.
b. If the well is found to be in significant non-compliance, the well must remain shut-in until it is repaired or permanently plugged or abandoned. Repairs or plugging and abandonment shall be initiated within ninety (90) days of the failure date. The Division may lengthen or shorten this time frame for good reason or cause.
c. If the Division determines that there is a potential for adverse impact to an underground source of drinking water as a result of the well failure, the operator shall:
    i. Update the inventory of drinking water wells within a one (1) mile radius of the well and sample these wells for indicating parameters (such as UIC Sample List 2) selected by the Division. The sample taken must be representative given the distance, timeframe, and site specific characteristics. Any information showing the presence of contaminants in any drinking water well shall be reported to the Division immediately. Sample results shall be provided to the well owner(s).
    ii. Prepare a workplan for a formal study to determine the extent of contamination. The plan shall include a timetable for conducting a groundwater quality investigation. The work plan shall be submitted to the Division within ninety (90) days of the Division's request.
    iii. Upon receiving approval, immediately initiate the study and report the results of the initial groundwater sample analyses to the Division.
d. Wells that lose or fail to demonstrate mechanical integrity must pass an MIT before injection can resume.

II.A.8 **Plugging and Abandonment** - The holder of a permit shall notify the Division of the intent of the Permittee to abandon or close the injection well at least thirty (30) days, or in the case of a newly drilled injection well at least five (5) working days, before the abandonment or closure of the well.

a. The Permittee shall notify the Division by submitting a UIC *Well Pre-Closure Form*.
b. Before abandonment, an injection well must be plugged with cement in a manner which will not allow the movement of fluids into or between underground sources of drinking water.
c. All cavities in the well bore not plugged with cement must be filled with heavy drilling fluids in a state of static equilibrium with the weight of the fluid equalized from top to bottom.
d. Upon completion of the procedure for the plugging and abandonment of an injection well, the holder of a permit shall certify to the Director that the condition of the permit relating to plugging

and abandonment has been satisfied.

II.B GENERAL MONITORING, RECORDKEEPING, AND REPORTING OF RESULTS

II.B.1 Minimum Requirements for Sampling and Monitoring

a. A laboratory certified by the State of Nevada shall perform analyses. Testing methods for constituents shall be EPA or Division approved and meet drinking water analysis requirements.
b. The detection limits for the constituents listed above shall be at least as low as primary or secondary drinking water standards when applicable.
c. When sampling for radioactive constituents, ensure the laboratory reports only the adjusted gross alpha, as the drinking water standard of 15 pCi/L is an adjusted standard that subtracts radon and uranium from the total activity. Uranium is added in List 2 to verify value and additional activity.
d. **The UIC Program requires inorganic analyses of metals for "Total Metals"** in which samples are not filtered and are preserved with a weak acid in the field. Any exceptions to this policy shall be requested and pre-approved by the UIC program prior to the sampling event. It shall be clearly stated on all reports which analyses were performed.
e. All gauges used for compliance with this permit shall be calibrated pursuant to O&M manual and documented in the monitoring reports.
f. Water samples shall be 1) collected by grab method, and 2) unfiltered for metals analysis; unless otherwise approved by the Division in writing.
g. Annual samples shall be collected during the same month each year.
h. All UIC water samples shall be collected using UIC Form U230, and the completed U230 forms submitted for each water sample with the UIC report.
i. Test procedures for the analyses of required constituents shall comply with applicable analytical methods cited in 40 CFR 141 and under state of Nevada Drinking Water Program approved analytical methods, under which such procedures may be required, unless other procedures are approved by the Administrator.
j. Samples and measurements taken as required herein shall be representative of the volume and/or nature of the subject of interest.
k. Monitoring points or constituents may be increased or decreased by the Division for good cause. Requests by the Permittee to change any sampling or monitoring requirements must be made in writing.

II.B.2 Recording of Results - For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information pursuant to NAC 445A.922:

a. The exact place, date, and time of sampling;
b. The dates the analyses were performed;
c. The person(s) who performed the analyses;
d. The analytical techniques or methods used;
e. The results of all required analyses; and
f. The precision and accuracy of the analytical data (accessible through laboratory).

II.B.3 Additional Monitoring by Permittee - If the permittee monitors any constituent at the locations(s) designated herein more frequently than required by this permit, or monitors additional constituents than required by this permit, using approved analytical methods as specified above, the results of such monitoring results shall be made available to the Division upon request in accordance with NAC 445A.886.

II.B.4 Records Retention - All records and information resulting from the monitoring activities required by this permit, including all records and analyses performed and calibration and maintenance of instrumentation and recordings from continuous monitoring instrumentation, shall be retained for a

minimum of three (3) years, or longer if required by the Division pursuant to NAC 445A.922.

II.B.5 **Modification of Monitoring Frequency, Location and Sample Type -** After considering monitoring data, stream flow, discharge flow and receiving water conditions, the Division may, for just cause, modify the monitoring frequency, location and/or sample type by issuing a minor modification to the permittee pursuant to NAC 445A.902.

II.B.6 **Certification of Documents Submitted to the Division -** All applications, reports and information submitted to the Division shall be signed and certified to be correct and true by the owner or the operator pursuant to NAC 445A.859.

II.B.7 **Availability of Reports -** Except for data determined to be confidential under NRS 445A.665, all reports prepared in accordance with the terms of this permit shall be available for public inspection. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NRS 445A.710.

II.B.8 **Submission of Contents** – The permittee shall submit all reports and contents using Division provided forms wherever it is required by this permit. All UIC forms can be found at the NDEP-BWPC-UIC Forms web page provided at the following link: https://ndep.nv.gov/water/water-pollution-control/permitting/underground-injection-control-uic/forms.

PART III PERMIT MANAGEMENT AND RESPONSIBILITIES

III.A MANAGEMENT REQUIREMENTS

III.A.1 **Change in Injection or Discharge -** All injections or discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any constituent identified in this permit more frequently than or at a level more than that authorized shall constitute a violation of the permit. Any anticipated facility expansions, or treatment modifications which will result in new, different, or increased injections or discharges must be reported by submission of a new application or, if such changes will not violate the limitations specified in this permit, by notice to the permit issuing authority of such changes. Following such notice, the permit may be modified to specify and limit any constituents not previously limited.

III.A.2 **Noncompliance Notification -** If for any reason, the permittee does not comply with or will be unable to comply with the conditions, requirements and limitations specified in this permit, the permittee shall provide the Division pursuant to NAC 45A.889:

a. Written notification shall be provided as soon as possible but no later than twenty-four (24) hours after the event of noncompliance.
b. **5-Day Report**: A written Report shall be submitted to the Underground Injection Control Program of the Division within five (5) days if, for any reason, the permittee is unable to or does not comply with the conditions, requirements and limitations specified in this permit. The permittee shall provide the Division with the following information:
    i. The exact dates, times, and duration of noncompliance
    ii. The specific cause of noncompliance and exact location
    iii. An estimated volume unauthorized discharge if applicable
    iv. Identification of which injection well(s) are affected
    v. The corrective actions taken and anticipated time of continuance. Steps taken or planned to reduce, eliminate, and prevent recurrence of noncompliance

III.A.3 **Spills -** The permittee is responsible for carrying out notification in the event of a spill. If the permittee has acknowledged that a spill greater than 25 gallons or 3 cubic yards has occurred, notify the Division by calling the **NDEP Spill Hotline, 1-888-331-6337 or an online submission on the NDEP web page** as soon as possible and no later than one working day from the time of discovery. The permittee shall promptly notify the Division in writing of each spill, in accordance with the procedure specified in Part III.A.2 above.

III.A.4 **Facilities Operation –** Pursuant to NAC 445A.906, the Permittee shall always be maintained in good working order and operate as efficiently as possible, all treatment or control facilities, devices or systems installed or used by the Permittee to achieve compliance with the terms and conditions of this permit and shall be in conformance with the plans and specifications filed with the Division. All solid, toxic or hazardous waste shall be disposed of in accordance with the rules and regulations of this Division. All spills and releases shall be reported as required by Nevada Revised Statutes.

III.A.5 **Operations & Maintenance (O&M) Manual** - The permittee shall always keep a copy of the current permit and O&M manual on site.

III.A.6 **Adverse Impact –** Pursuant to NAC 445A.906, the permittee shall take all reasonable steps, including such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying Injection or discharge, to minimize any adverse impact to waters of the State resulting from noncompliance with any limitations specified in this permit.

III.A.7 **Bypassing -** Any diversion from or bypass of facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited except where unavoidable to prevent loss of life or severe property damage. The Division will have the final authority in the determination of whether a discharge is deemed unavoidable. The permittee shall promptly notify the Division in writing of each such diversion or bypass, in accordance with the procedure specified in Part II.B.2 above.

III.A.8 **Annual and Renewal Fees -** The Permittee shall submit the annual review and services fee in accordance with NAC 445A.872 no later than July 1st every year following permit issuance until the permit is terminated.

III.B PERMITTEE RESPONSIBILITIES

III.B.1 **Right of Entry and Inspection of Premises** – To enforce the provisions of any regulation, order or permit issued thereunder, the Division may, upon presenting proper credentials, pursuant to NRS 445A.655.

a. Enter any premises in which any act violating NRS 445A.300 to 445A.730, inclusive, originates or takes place or in which any required records are required to be maintained;
b. At reasonable times, have access to and copy any records required to be maintained
c. Inspect any equipment or method for continuing observation
d. Have access to and sample any discharges or injection of fluids into waters of the State which result directly or indirectly from activities of the owner or operator of the premises where the discharge originates or takes place or the injection of fluids through a well takes place.

III.B.2 **Transfer of Ownership or Control** – In the event of any change in ownership or control, the Permittee shall notify the succeeding owner of the existence of this permit and enter into a written agreement containing a specific date for the transfer, a copy of which shall be submitted to the Division. Until notice is given by the Division that the permit is transferred, the most recent owner or operator is responsible for complying with permit conditions, pursuant to NAC445A.881. The following shall proceed:

a. The new Permittee shall complete and file a UIC Change of Ownership Form and submit proof of financial responsibility at least thirty (30) days before the transfer is made.
b. The Division may require modification, or revocation with subsequent reissuance of the permit, to change the name of the permittee and incorporate such other requirements as may be deemed necessary.

III.B.3 **Permit Modification, Suspension or Revocation** – Pursuant to NRS 445A.600, after notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;
b. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
c. A change in any condition that requires either a temporary or permanent reduction or elimination of the injection or discharge.

III.B.4 **Civil and Criminal Liability –** Pursuant to NRS 445A.700-705 the following pertains:

a. Nothing in this permit shall be construed to relieve the Permittee from civil or criminal penalties for noncompliance.
b. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation.

c. The issuance of this permit does not convey any property rights, in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

III.B.5 Compliance with Regulations - The Permittee shall comply with all provisions of the UIC regulations, Nevada Administrative Code (NAC) 445A.810 through 445A.925, and all pertinent laws and regulations. Nothing in this permit relieves the Permittee from responsibilities, liabilities or penalties established by any other State, federal or local jurisdiction.

III.B.6 Definitions

a. CFR: Code of Federal Regulations
b. Division: Nevada Division of Environmental Protection
c. EPA: Environmental Protection Agency
d. GPM: Gallons Per Minute
e. NAC: Nevada Administrative Code
f. NDEP: Nevada Division of Environmental Protection
g. NRS: Nevada Revised Statutes
h. MIT: Mechanical Integrity Test
i. O&M: Operations and maintenance
j. PSIG: Pounds per Square Inch Gauge
k. UIC: Underground Injection Control

Attachment I - Checklist

UNEV2017201: Monitoring Report Requirements

The Permittee shall submit **Semi-annual (Quarterly for the first year) Reports with Attachment I** on a continuous basis, **whether actively injecting or not**, which contain the following data (please check all information included in the attached report):

1.____ Attachment I form
2.____ The UIC permit number on the cover of the UIC report.
3.____ The results of the chemical analyses performed in that reporting period, including copies of UIC form U230, field notes, original lab reports and tables for each well listing constituents sampled. **Per O&M manual, the following must be clearly documented in each report: 1) who collected sample, 2) Lab used, 3) date sample taken, 4) date delivered to Lab, and 5) where samples were collected from – point of compliance**.
4.____ Each month in the reporting period, the total volume of fluid produced (gal/month) and the mean-average, lowest (non-zero) and highest production rate (gpm or lb/hr)
5.____ Each month in the reporting period, the total volume of fluid injected (in gal/month) and the mean-average, lowest (non-zero), and highest injection rate for each injection well reported in gpm
6.____ Each month in the reporting period, the mean-average, lowest, and highest injection pressure, in psig, for the plant output.
7.____ Each month in the reporting period, the lowest and highest injection temperature reported (indicate deg. F or deg. C)
8.____ A plot of the injection rate vs. time and a plot of the injection pressure vs. time for each injection well. The data for these plots must be collected at the same time and the plots should show one set of values for every seven day period. Document on chart any events that did or could influence the parameters measured.
9.____ Estimated volume of fluid diverted to surface discharge, if any occurs at approved and documented basins.
10.___ Summary narrative analysis of monitoring activities for that six month period. Narrative shall include, but not be limited to, any problems encountered that had or have the potential to have affected the well integrity or the water quality, and the type of action taken, any spills or releases at the site, and all tests performed on the wells within the project area.
11.___ A list of all chemical additives used in the produced-geothermal and cooling tower fluids, including but not limited to, scale and corrosion inhibitors, biocide, etc, which were used at the project during the reporting period. **Include product name and amount/volume and/or rate used, and amount of chemical stored on site as of the report date.**
12.___ A list of all production, injection, observation and test wells located within the project area and utilized by the Permittee or their affiliates. List shall be chronological, listing the newest wells first, and shall include date of installation, depth, type of well, status (abandoned, plugged, not-in-use, etc.), well identification and location. All wells reported after the effective date of this permit will require submittal of a map indicating their location.
13.___ Five-year historical charts showing quarterly constituent values for total dissolved solids, arsenic, chloride, boron, fluoride, and lithium for all injectate and monitoring wells.
14.___ January report shall contain the evaluation and interpretation of data from monitoring program.
15.___ With the January UIC report, submit an Excel (or other NDEP approved electronic copy) file with all water monitoring and quality data.

* The purpose of this check-list is to assist the Permittee and the UIC program staff in ensuring all permit conditions for monitoring are submitted.

Attachment I - TABLE 2

	Sampling/Monitoring Points	**Frequency (Following Start-up)**	**Parameters**
a.	New production wells, sample port near wellhead	Monthly for 3 consecutive months, last week of each month	Months 1 & 2 - Table 3 Month 3 – Attachment II
b.	Each production well, sample port near wellhead (after a. is satisfied)	Semi-annual	Table 3
		Annual	Attachment II, excluding radioactive parameters
c.	Injection system pipeline, sample port near outlet of plant	Semi-annual	Table 3
		Annual	Attachment II, including radioactive parameters
d.	Monitoring points: 56-22 site MP (well) Springs #6, #7 and #13	First sample 30-60 days after Plant startup, then Semi-annually, samples/photos taken April and October	Water level/photo of spring, TDS, EC, temperature, fluoride, chloride, silica, sodium, sulfate (For springs, if no water to sample, photograph and record conditions; submit photo/conditions with UIC report)
e.	Monitoring Points: WW-1, Core holes 45-22, 67-22 (deep)	Daily measurements on downhole data-logger [1]	Water level & temperature (provide reference depth)
f.	Spring identified in Stone Canyon	Monthly for 2 months, then semi-annually (April/October)	Photo document & temperature

1. Readings (WL & T) taken manually on weekly basis until data loggers installed, data loggers to be installed by October 20, 2017.

Attachment I - TABLE 3

Total Dissolved Solids (TDS), mg/l	Antimony	Chloride	Silica
EC, umhos/cm, 25°C – FM	Arsenic	Fluoride	Sodium
Total Suspended Solids (TSS), mg/l	Bicarbonate	Lithium	Sulfate
pH, standard units - FM	Boron	Magnesium	
Temperature – FM when sampled	Calcium	Manganese	
Alkalinity	Carbonate	Potassium	

(EC – electrical conductivity, FM – field measurement)

Attachment I - TABLE 4

Parameter	**Monitoring Frequency & Location**
a) Production rate, gpm	Continuous recording gauge(s)/meter(s) at each production wellhead.
b) Injection rate, gpm	Continuous recorder at the power plant outlet and at flow meters, recorded daily, at each injection well.
c) Injection pressure, psig	Continuous recorder at power plant outlet and daily at each injection well.
d) Injection temperature, °F	Recording equipment at the injection wellhead.
e) Produced water discharges to	Monitoring flow rate and duration of discharge, calculate discharge

discharge basins, gpm	based on these parameters.
f) Binary Fluid Volume	Report any addition of binary working fluid to the system during the reporting period under Item 11 above, and explain where the used fluid was lost.

gpm- gallons per minute, psig- pounds per square inch gauge, F- Fahrenheit

Attachment II

Nevada Division of Environmental Protection

Underground Injection Control Program - Sampling and Monitoring Report Form

Facility Name :	**Depth of sampled water's origin :**
Facility Owner:	**County:**
NDEP UIC Permit # :	**Location sample taken :**
Well ID # :	**Sampler :**
Type of Well : Monitor Production Injection	**Date Sampled :**
UIC Sample List 2- Inorganic Extended	**Name of Laboratory :**

Parameter	Units	DW Standards	Initial Measured Values	Measured Values	Method
total dissolved solids	mg/L	500 - 1000			Approved analytical methods can be found at the Bureau of Safe Drinking Water webpage: https://ndep.nv.gov/uploads/water-drinking-pws-monitoring-docs/approved-analytica_methods.pdf
pH	standard units	6.5 - 8.5			
chloride	mg/L	250 - 400			
fluoride	mg/L	4			
sulfate	mg/L	250 - 500			
nitrate (as nitrogen)	mg/L	10			
aluminum	mg/L	0.05-0.2			
antimony	mg/L	0.006			
arsenic	mg/L	0.01*			
barium	mg/L	2			
beryllium	mg/L	0.004			
cadmium	mg/L	0.005			
chromium	mg/L	0.1			
copper	mg/L	1.0-1.3			
lead	mg/L	0.015			
iron	mg/L	0.3 - 0.6			
magnesium	mg/L	125 - 150			
manganese	mg/L	0.1			
mercury	mg/L	0.002			
nickel	mg/L	0.1			
selenium	mg/L	0.05			
silver	mg/L	0.05			
thallium	mg/L	0.002			
zinc	mg/L	5			
total uranium	ug/L	30			
adjusted gross alpha**	pci/L	15			
gross beta	mrem	4			
alkalinity (CaCO3)	mg/L	-			
bicarbonate	mg/L	-			
boron	mg/L	-			
calcium	mg/L	-			
carbonate	mg/L	-			
EC	umhos/cm	at 25 degC			
lithium	mg/L	-			
molybdenum	mg/L	-			
potassium	mg/L	-			
silica	mg/L	-			
sodium	mg/L	-			
total suspended solids	mg/L	-			
turbidity	NTU	-			

Comments: excluding nitrite and phosphorus

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Note: Detection limits must be at least as low as primary or secondary drinking water standards where applicable.

Please indicate detection limit instead of stating "Non-Detect". Initial Measured Values are the first values collected under the application.

Metals shall be sampled and analyzed as total metals. **Adjusted gross alpha particle activity doesn't include radon and uranium activity.