STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION COMMISSION

APPLICATION OF SALT CREEK MIDSTREAM, LLC FOR AUTHORIZATION TO INJECT, LEA COUNTY, NEW MEXICO

CASE NO. 20780
ORDER NO. R-20913-C

ORDER OF THE COMMISSION

THIS MATTER comes before the New Mexico Oil Conservation Commission ("Commission") on Salt Creek Midstream, LLC's ("Salt Creek) *Application for Authorization to Inject, Lea County, New Mexico* ("Application"). The Commission, having conducted a hearing on December 11, 2019, and having considered the testimony and the record in this case, enters the following findings of fact, conclusions of law, and order.

THE COMMISSION FINDS THAT:

1. On August 5, 2019, Salt Creek filed the Application seeking authority to inject treated acid gas ("TAG") consisting of approximately 78 percent carbon dioxide ("CO2") and 22 percent hydrogen sulfide ("H2S") from the Ameredev South Gas Processing Plant ("Plant") into the proposed Salt Creek Midstream AGI No. 1 Well ("Well").

2. The Well is an Underground Injection Control ("UIC") Class II well subject to the requirements of 19.15.26 NMAC.

3. The Well is vertical with an approximate surface and bottom hole location at 594 feet from the West line and 2,370 feet from the South line of Section 21, Township 26 South, Range 36 East.

4. The target injection zone is located in the Bell Canyon and Cherry Canyon formations of the Delaware Mountain Group ("DMG") at depths of approximately 5,410 feet to 7,000 feet.

5. The Well's maximum daily injection rate is eight million standard cubic feet per day ("MMSCFD").

6. The Well's maximum surface injection pressure is approximately 2,149 pounds per square inch gauge ("psig").

7. The surface location of the Well is located within the Plant's boundary.

8. Salt Creek leases the surface location of the Well from a private third party surface owner.

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Salt Creek Midstream
Exhibit 1

9. Salt Creek gave personal notice of the Application and the Commission's hearing via certified mail, return receipt requested to all operators, surface owners, and lessees within a one-mile radius of the location for the Well.

10. The Oil Conservation Division ("OCD") gave public notice of the Application and the Commission's hearing by publication in a newspaper of general circulation in Lea County.

11. The New Mexico State Land Office ("SLO") filed an Entry of Appearance and Pre-Hearing Statement on September 26, 2019. SLO's Pre-Hearing Statement expressed concern about the Well's proximity to State Trust Lands and Minerals, and that TAG migrating from the Well could impact production and horizontal wells, enter into the Capitan Reef, and cause waste and a threat to health and safety.

12. The OCD filed an Entry of Appearance and Notice of Intervention on September 30, 2019.

13. Subsequent to these filings, Salt Creek, OCD, and SLO ("Parties") negotiated a set of permit conditions ("Permit Conditions"). The Permit Conditions, among other things, require Salt Creek to construct a second well in the Devonian formation that would be become the primary disposal well by a specified deadline.

14. Salt Creek filed a Pre-Hearing Statement on October 31, 2019, and an amended Pre-Hearing Statement on December 4, 2019. Salt Creek's amended Pre-Hearing Statement requested authorization to inject TAG into the Bell Canyon and Cherry Canyon formations of the DMG subject to the Permit Conditions set forth in Salt Creek Exhibit 2.

15. SLO filed an amended Pre-Hearing Statement on December 4, 2019. SLO's amended Pre-Hearing Statement stated that Salt Creek had resolved SLO's concerns by agreeing to the Permit Conditions and committing to compensate SLO for the incursion of TAG into SLO pore space.

16. OCD filed a Pre-Hearing Statement on December 4, 2019. OCD's Pre-Hearing Statement explained that OCD initially opposed the Application because the proposed injection intervals in the DMG demonstrate low formation fracture pressures and geologic variation that have could allow the horizontal migration of fluids beyond the Area of Review, potentially affecting correlative rights in the production of horizontal wells completed in the DMG; could increase the risk that operators would incur additional drilling and production costs to drill and produce through the projected injection intervals to the stratigraphically deeper hydrocarbon targets in the Permian Bone Spring and Wolfcamp formations, potentially causing the waste of resources; and may be located below or adjacent to the Capitan Reef aquifer, which is classified as an Underground Source of Drinking Water ("USDW"), potentially causing contamination if the Well were to lose vertical containment. OCD further stated that prior to the hearing, the Parties had conferred and reached agreement on the Permit Conditions, which adequately addressed OCD's concerns by, inter alia, requiring Salt Creek to perforate the Well at a specific depth beneath the Capitan Reef aquifer, and to construct a second well in the Devonian formation that would become the primary disposal well by a specified deadline.

17. No other person filed an objection to the Well or an entry of appearance.

18. The Commission held a hearing on the Application on December 11, 2019.

19. In support of the Application, Salt Creek presented testimony from three technical witnesses: Mr. Brian Perilloux, Senior Vice President of Operations and Engineering, Salt Creek Midstream LLC; Mr. Alberto Gutierrez, President of Geolex, Inc.; and Mr. David White, Geologist, Geolex, Inc.

20. Mr. Perilloux provided background regarding Salt Creek, including its organizational structure, current and future H2S treating investment, natural gas infrastructure, and practices relating to health, safety, and the environment. Mr. Perilloux also testified regarding sour gas treatment options and the benefits of disposing of TAG through an AGI well. Specifically, Mr. Perilloux testified that an AGI well is the only disposal method that allows for the sequestration of CO2 and that an AGI well is the most efficient, safe, and economic method to dispose of TAG. Mr. Perilloux testified that in his opinion Salt Creek's proposal to dispose of TAG through the Well will protect public health and the environment and result in more efficient operation of the Plant. Mr. Perilloux also testified that Salt Creek agreed to the Permit Conditions set forth in Salt Creek Exhibit 2.

21. Mr. Perilloux testified that Salt Creek wants to minimize flaring "by all means possible", and for this reason, it plans for, knows in advance about, and actively manages wells with high H2S in response to restricted flow scenarios, but acknowledged that the plan was not written. Mr. Perilloux also testified that Salt Creek "would certainly commit" to submitting a written plan for mapping out these scenarios that may interrupt flow to the Well, including control system failure, compressor shut down, and upstream equipment failure, and the specific responses to protect human health and the environment.

22. Mr. Gutierrez testified regarding the information contained in the Application, including modeling of the injection plume. Specifically, Mr. Gutierrez testified that based on his model, after 30 years of operation at the maximum allowable rate, the TAG will occupy an area with a radius of approximately 0.15 miles laterally away from the well bore, and that the small size of this plume provided the "main protection" for correlative rights and the health and safety of producers in the area. However, Mr. Gutierrez acknowledged that his model may have underestimated the size of the plume because he used an average injection zone interval thickness of 900 feet with an average porosity of 17 percent, rather than the more representative thickness of approximately 500 feet of 12 percent porosity, and that the plume could extend farther than predicted by his model. Mr. Gutiérrez also described that anticipated reservoir characteristics were informed by data collected in the recent completion of a similar DMG well in Texas where porosity values were observed to be significantly higher than was estimated from offset geophysical logs. Mr. Gutierrez testified that reducing the thickness of the injection zone could result in an increase in the plume radius from 800 feet to 1200-1300 feet. He also testified that this concern was obviated by the agreed-upon permit conditions limiting the use of the Well.

23. Mr. Gutierrez testified that in his opinion the proposed injection zone provides a sufficient capacity and geologic seal to contain the injected TAG and prevent its migration into other zones; the injection zone is sufficiently isolated from any protectable groundwater sources; there is no evidence that injection will impair existing or potential hydrocarbon production in the

area; and there are no faults or other geologic or manmade conduits that will allow the treated injected acid gas to migrate out of the injection zone.

24. Mr. Gutierrez testified regarding the design and operation of the Well and confirmed that Salt Creek would perform testing and monitoring after the Well is drilled to ensure that the plume will not migrate out of the injection zone, and would modify and submit Salt Creek's H2S Contingency Plan for OCD approval prior to the commencement of injection.

25. Mr. Gutierrez testified that in his opinion DMG production will not be affected by the Well; there are no horizontal wells penetrating the injection zone; the Well will not impact the Capitan Reef; the Well will not pose health and safety risks to nearby residents and workers, and that the Well will not cause waste or damage correlative rights in any formations in the area.

26. Mr. Gutierrez testified that Salt Creek agreed with the Permit Conditions, including the conditions that require Salt Creek to file an application for authorization to drill an additional well in the Devonian formation and to use that well as Salt Creek's primary disposal well by a specified deadline.

27. Mr. White testified regarding Geolex's evaluation of the potential for induced seismicity, including its seismic review of the area and the preparation of the fault-slip modeling. Based on this evaluation, Mr. White testified that there is no potential for injection-related seismic events at the proposed location of the Well.

28. The Division presented the testimony of technical witness Phillip Goetze, along with three exhibits in support of his testimony.

29. Mr. Goetze testified that OCD generally disfavors the disposal of TAG in DMG formations for several reasons, including its low formation parting pressure and the known and potential impacts to production and correlative rights. Specifically, Mr. Goetze testified that OCD is aware of several cases in which operators have opposed disposal in the DMG formations because it increases the cost to develop and produce oil and gas, and in at least one instance, damaged production from horizontal wells in the Brushy Canyon formation of the DMG. Mr. Goetze produced a map labeled as OCD Exhibit 2 which depicted several disposal wells that were previously approved in the DMG formations. He observed that each of the red circles around the wells represented the erroneous testimony of an expert that the plume would not occur out of interval and would stay within the Area of Review. He also testified that he believed that Salt Creek's modeling assumptions regarding porosity and thickness of the injection interval were erroneous and may have caused an underestimation of the radius of the plume from the Well.

30. Mr. Goetze also testified that OCD was concerned about the proximity of the Well to the Capitan Reef, which is recognized as a protected USDW under the State's primacy agreement with the U.S. Environmental Protection Agency.

31. Mr. Goetze concluded by testifying that OCD did not oppose the Application because Salt Creek had agreed to the Permit Conditions, and specifically the condition requiring Salt Creek to construct the Devonian well as the primary method of TAG disposal. He further testified that in his opinion, the Permit Conditions provide adequate assurance that the Well will

not cause waste or harm correlative rights and protect public health and environment, including underground sources of drinking water, as set forth in Division Exhibit 3.

32. In response to a question from Commissioner Khalsa, Mr. Goetze testified that the Permit Conditions do not require Salt Creek to notify OCD when it shifts disposal between the DMG and Devonian wells in response to certain events such as the Devonian well going down. He subsequently clarified that OCD would support a condition requiring Salt Creek to provide such notice when it shifts disposal between the wells.

33. Counsel for SLO appeared at the hearing and stated that SLO supports the Application, subject to incorporating the Permit Conditions.

CONCLUSIONS OF LAW

1. The Commission has jurisdiction over the Parties and the subject matter of this case.

2. Proper public notices of the Application and the Commission's hearing, including personal notices to all operators, surface owners, and lessees within a one-mile radius of the Well, were given.

3. The Application is complete.

4. The Well, if constructed and operated in accordance with the Permit Conditions will comply with the requirements of 19.15.26 NMAC.

5. Salt Creek's injection of TAG, if conducted in accordance with the Permit Conditions and the additional conditions adopted by the Commission at the hearing, will not cause waste, impair correlative rights, or harm the public health and environment.

IT IS THERFORE ORDERED THAT:

1. The Application is approved, and Salt Creek is authorized to drill and operate the Well with an approximate surface and bottom hole location at 594 feet from the West line and 2,370 feet from the South line in Section 21, Township 26 South, Range 36 East, to dispose of TAG at a maximum daily injection rate of eight MMSCFD into the Bell Canyon and Cherry Canyon formations of the DMG at depths of approximately 5,410 feet to 7,000 feet and a maximum surface injection pressure of approximately 2,149 psig.

2. The Well shall be constructed substantially in accordance with the description in the Application.

3. No later than six (6) months after issuance of the DMG well permit, Salt Creek shall file a C-108 with OCD for approval to construct a redundant AGI well in the Devonian-Silurian formations ("Devonian well"), and will complete the Devonian well no later than fifteen (15) months after the Commission issues an order approving the Devonian well.

4. No later than six (6) months after placing the Devonian well in service, Salt Creek shall inject into the Devonian well as the primary source for disposal.

5. Upon commencing injection into the Devonian well, Salt Creek shall maintain the DMG well as a redundant well.

6. Prior to switching injection to the Devonian well as its primary source of disposal and maintaining the DMG well as a redundant well, Salt Creek may operate the DMG well as the primary source of disposal, subject to the following conditions:

a. Salt Creek shall not inject more than 8 MMSCFD (3,268 barrels per day at reservoir conditions) of TAG.

b. Salt Creek shall construct the DMG well to prevent migration of TAG into the Capitan Reef.

c. The upper perforation within the approved injection interval shall be at least 500 feet below the base of the Capitan Reef aquifer or the stratigraphic equivalent. Salt Creek shall propose to OCD and SLO the depth for the upper perforation based on its evaluation of the geophysical logs obtained during the drilling of the well. The Parties shall meet and confer regarding the depth for the upper perforation, and Salt Creek shall not initiate the upper perforation until OCD approves in writing.

d. Once the Devonian well is ready for injection, Salt Creek will notify OCD in writing when primary injection shall be transferred between the DMG and Devonian wells.

7. Salt Creek shall comply with the requirements of 19.15.26.10 NMAC in effect at the time of permit issuance regarding the migration of injectate outside the approved injection zone.

8. If Salt Creek fails to timely submit or to diligently prosecute the application for the Devonian well or, after receiving OCD's approval, fails to construct the Devonian well by the specified deadline, this permit shall terminate automatically and Salt Creek shall plug and abandon the DMG well pursuant to an OCD-approved plan.

9. Salt Creek shall conduct an annual mechanical integrity test ("MIT") on the DMG well.

10. Salt Creek shall conduct continuous monitoring of surface TAG injection pressure, temperature, rate, surface annular pressure, and bottom-hole (or "end of tubing") temperatures and pressures in the tubing.

11. Salt Creek shall conduct step-rate and fall-off tests on the completed DMG well before commencing injection. Salt Creek may adjust the maximum surface injection pressure for the well after these tests with OCD's written approval.

12. Salt Creek shall maintain a maintenance log, including the volume of annular fluid (diesel) replaced in the annulus of the well.

13. Salt Creek shall establish temperature parameters for the injected fluid, install and maintain temperature-activated controls to govern the temperature of the injected fluid, and install and maintain an alarm system for the controls to indicate exceedance of the parameters.

14. Salt Creek shall report to OCD on a quarterly basis the summary data for injection parameters monitored under the permit, and upon request by and subject to OCD approval, shall submit annual reports after each year of operation.

15. Salt Creek shall equip the well with a pressure-limiting device and a one-way safety valve (with the appropriate interior drift diameter) on the tubing approximately 250 feet below the surface.

16. Salt Creek shall use a biocide and corrosion inhibiting diesel in the annular fluid of the well.

17. Salt Creek shall circulate cement for all casing to the surface.

18. Well construction shall be designed for exposure to a corrosive environment, including the casing, casing cement, tubing and packer in proximity of the injection interval.

19. Prior to commencing injection, Salt Creek shall obtain OCD approval of a hydrogen-sulfide contingency plan that complies with 19.15.11.9 NMAC, and that includes a contingency plan for impacted gathering lines with a GIS mapping layer showing the gathering lines associated with the Plant.

20. Salt Creek shall obtain OCD approval of a response plan for any period when the DMG well is temporarily inactive prior to commencing injection into the Devonian well.

21. No later than thirty (30) days prior to commencing injection, Salt Creek shall obtain OCD's approval of immediate notification parameters for annulus pressure and tubing and casing differential pressure at a set injection temperature.

22. No later than forty-five (45) days after Salt Creek completes the drilling of the well, Salt Creek shall submit to OCD the well drilling logs, including mudlogs, electric logs, daily reports and static bottom-hole pressure, and core data if applicable.

23. No later than forty-five (45) days after Salt Creek completes the well, Salt Creek shall submit to OCD the final reservoir evaluation, and confirm that the perforated portion of the well does not intersect the fault plane of any identified fault that occurs within the approved injection interval.

24. No later than ninety (90) days after Salt Creek commences injection, and no less frequently than annually thereafter, Salt Creek shall consult with OCD regarding the immediate notification parameters. If OCD determines that the immediate notification parameters should be modified, Salt Creek shall provide modified parameters within thirty (30) days of notification for review by OCD.

25. No later than thirty (30) days after the fifth year of injection, Salt Creek shall submit to OCD a report summarizing the well's performance, including injected volumes by fluid type, changes in reservoir pressures, the models used in the Application calibrated using that information, and seismic modeling. Salt Creek shall provide an in-person presentation of the report to the Commission at its request.

26. Salt Creek shall obtain OCD approval before transferring ownership of the well as required by 19.15.9.9 NMAC.

27. After thirty (30) years from the date of this Order, the authority granted by the Order shall terminate unless Salt Creek, or its successor-in-interest, applies to the Commission for an extension of its authority to inject.

28. For the purposes of these conditions, "OCD" means OCD's Engineering Bureau.

DONE at Santa Fe, New Mexico on the 10 day of January, 2020.

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Adrienne Sandoval, Chair

Dr. Thomas Engler, Member

Naranjan Khalsa, Member