

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

**APPLICATION OF TARGA MIDSTREAM  
SERVICES, LLC FOR AUTHORIZATION  
TO INJECT, LEA COUNTY, NEW MEXICO.**

**CASE NO.** \_\_\_\_\_

**TARGA MIDSTREAM SERVICES, LLC'S  
APPLICATION FOR AUTHORIZATION TO INJECT**

In accordance with 19.15.26 NMAC, Targa Midstream Services, LLC (“Targa”) (OGRID No. 24650) seeks authorization to inject treated acid gas (“TAG”) from its Copperhead Gas Processing (“Plant”) into the proposed Copperhead AGI No. 1 Well (“Well”), to be located in Section 13, Township 24 South, Range 32 East, Lea County, New Mexico. In support of this Application, Targa states the following.

1. The Well is an Underground Injection Control (“UIC”) Class II well subject to the requirements of 19.15.26 NMAC.
2. The Well will be drilled as a vertical well with a surface location approximately 793 feet from the south line (FSL) and 429 feet from the east line (FEL) of Section 13.
3. The Well will inject TAG into the Devonian Thirtyone, Upper Silurian Wristen, and Lower Silurian Fusselman Formations at a depth of approximately 17,299 feet to 18,689 feet.
4. The Well’s maximum daily injection rate will be 26 million standard cubic feet per day (“MMSCFD”).
5. The Well’s maximum surface injection pressure will be approximately 3,460 pounds per square inch gauge (“psig”).
6. The surface location of the Well is within the Plant’s boundary.

7. The complete C-108 for the Well is attached to this application as Exhibit A.
8. The Well will allow Targa to serve operators in the area and avoid cessation of production.
9. Targa's request for authorization to inject TAG into the Well will prevent waste, protect correlative rights, and protect human health and the environment.

WHEREFORE, Targa requests that this application be set for hearing before the Commission on the next available docket, and, after notice and hearing as required by law, the Commission enter an order approving Targa's C-108 application for authorization to inject.

Respectfully submitted,

HINKLE SHANOR LLP

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STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL  
RESOURCES DEPARTMENT

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

FORM C-108  
Revised June 10, 2003

**APPLICATION FOR AUTHORIZATION TO INJECT**

I. PURPOSE: \_\_\_\_\_ Secondary Recovery \_\_\_\_\_ Pressure Maintenance  Disposal \_\_\_\_\_ Storage  
Application qualifies for administrative approval? \_\_\_\_\_ Yes  No

II. OPERATOR: Targa Midstream Services, LLC  
ADDRESS: 811 Louisiana Street, Houston, TX 77002  
CONTACT PARTY: Jimmy Oxford, VP Operations PHONE: 940-220-2493

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection.  
Additional sheets may be attached if necessary. See Attached Narrative

IV. Is this an expansion of an existing project? \_\_\_\_\_ Yes  No  
If yes, give the Division order number authorizing the project: \_\_\_\_\_

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review. See Narrative, Section V

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail. No wells penetrate proposed injection zone, see also Section V, VI. and Attachment 3 for additional well tabulations.

VII. Attach data on the proposed operation, including:  
1. Proposed average and maximum daily rate and volume of fluids to be injected;  
2. Whether the system is open or closed;  
3. Proposed average and maximum injection pressure;  
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,  
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.). See Narrative, Section VII

\*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval. See Narrative, Section VIII

IX. Describe the proposed stimulation program, if any. See Narrative, Section IX

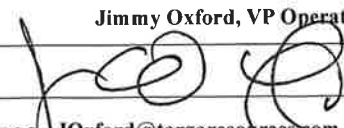
\*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

\*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken. See Narrative, Section XI

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water. See Narrative Section XII

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Jimmy Oxford, VP Operations TITLE: VP Operations  
SIGNATURE:  DATE: 5/28/2024  
E-MAIL ADDRESS: JOxford@targaresources.com

\* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: \_\_\_\_\_

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

Side 2

## III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

- (1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.  
**See Narrative, Section III A 1**
  - (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined. **See Narrative, Section III A 2**
  - (3) A description of the tubing to be used including its size, lining material, and setting depth.  
**See Narrative, Section III A 3**
  - (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.  
**Halliburton 7" Nickel Alloy Permanent Packer set at 17,250', Section III A 4**
- Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

**Also in Narrative, Section III B, 1-5**

- (1) The name of the injection formation and, if applicable, the field or pool name.  
**Devonian Formation, Devonian AGI**
- (2) The injection interval and whether it is perforated or open-hole.  
**Open hole completion 17299 to 18699 for a total of 1400'**
- (3) State if the well was drilled for injection or, if not, the original purpose of the well.  
**Well to be drilled for injection of TAG**
- (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.  
**NA**
- (5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.  
**Atoka/Morrow gas zones above (~14420—16,500'), no deeper producing horizons.**

## XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

- (1) The name, address, phone number, and contact party for the applicant;
- (2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;
- (3) The formation name and depth with expected maximum injection rates and pressures; and,
- (4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

**NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.**

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**NOTICE:** Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Side 1

INJECTION WELL DATA SHEET

OPERATOR: Targa Midstream Services, LLC

WELL NAME & NUMBER: Copperhead AGI #1

WELL LOCATION: 429 FEL + 793 FSL P 13 24S 32E
FOOTAGE LOCATION UNIT LETTER SECTION TOWNSHIP RANGE

WELLBORE SCHEMATIC
Targa Midstream Services, LLC
Copperhead AGI #1
429 FEL & 793 FSL
Sec. 13-24E-R32E
GL 3573'

WELL CONSTRUCTION DATA
Surface Casing

Surface - (Conventional)

Hole Size: 26"
Casing: 20" - 106.5# J-55 BTC Casing
Depth Top: Surface
Depth Bot: 1028'



Hole Size: 26" Casing Size: 20"

Cemented with: 1,880 sx. or ft^3

Top of Cement: Surface Method Determined: Visual

Intermediate Casing

Intermediate #1 - (Conventional)

Hole Size: 17.5"
Casing: 13.375" - 72L-80 BTC Casing
Depth Top: Surface
Depth Bot: 5094'

Hole Size: 17-1/2" Casing Size: 13-3/8"

Cemented with: 1,650 sx. or ft^3

Top of Cement: Surface Method Determined: Visual

Production Casing

Intermediate #2 - (Conventional)

Hole Size: 12.25"
Casing: 9.625" - 47# HCL-80 BTC Casing
Bond Coat 5094'-7100'
Depth Top: Surface
Depth Bot: 12250'

Hole Size: 8-1/2" Casing Size: 7"

Cemented with: 563 sx. or ft^3

Top of Cement: Surface Method Determined: Visual

Total Depth: 17,299'

Injection Interval

17,299 feet to 18,699 feet

(Perforated or Open Hole; indicate which) Open Hole

Production

Hole Size: 8.5"
Casing #1: 7" - 32# P-110 TCPC Casing (or equivalent)
Depth: Surface - 18699'
Casing #2: 3" - 32# G3-110 TCPC Casing (or equivalent)
Depth: 16999' - 17299'

Intermediate #3 - (Open Hole)

Hole Size: 5.875"
Depth: 18699'
Inj. Interval: 17299' - 18699'

Tubing - (Conventional)

Tubing Depth: 0 - 16950' L85, 16950 - 17250 G3
Tubing: 3.5" - 9.2# G3-110 VANITOP (or equivalent)
Packer Depth: 17250'
Packer: 3.5" - "Perma-Pak" or Equivalent (Hucoset)
Packer Fluid: Diesel + Additives

Side 2

**INJECTION WELL DATA SHEET**

Tubing Size: 3-1/2" Lining Material: Internally Fiberglass or Plastic

Type of Packer: Halliburton 7" Permanent Packer

Packer Setting Depth: 17,250'

Other Type of Tubing/Casing Seal (if applicable): \_\_\_\_\_

Additional Data

1. Is this a new well drilled for injection?  Yes  No

If no, for what purpose was the well originally drilled? \_\_\_\_\_

\_\_\_\_\_

2. Name of the Injection Formation: Devonian

3. Name of Field or Pool (if applicable): AGI - Devonian

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used.  No

\_\_\_\_\_

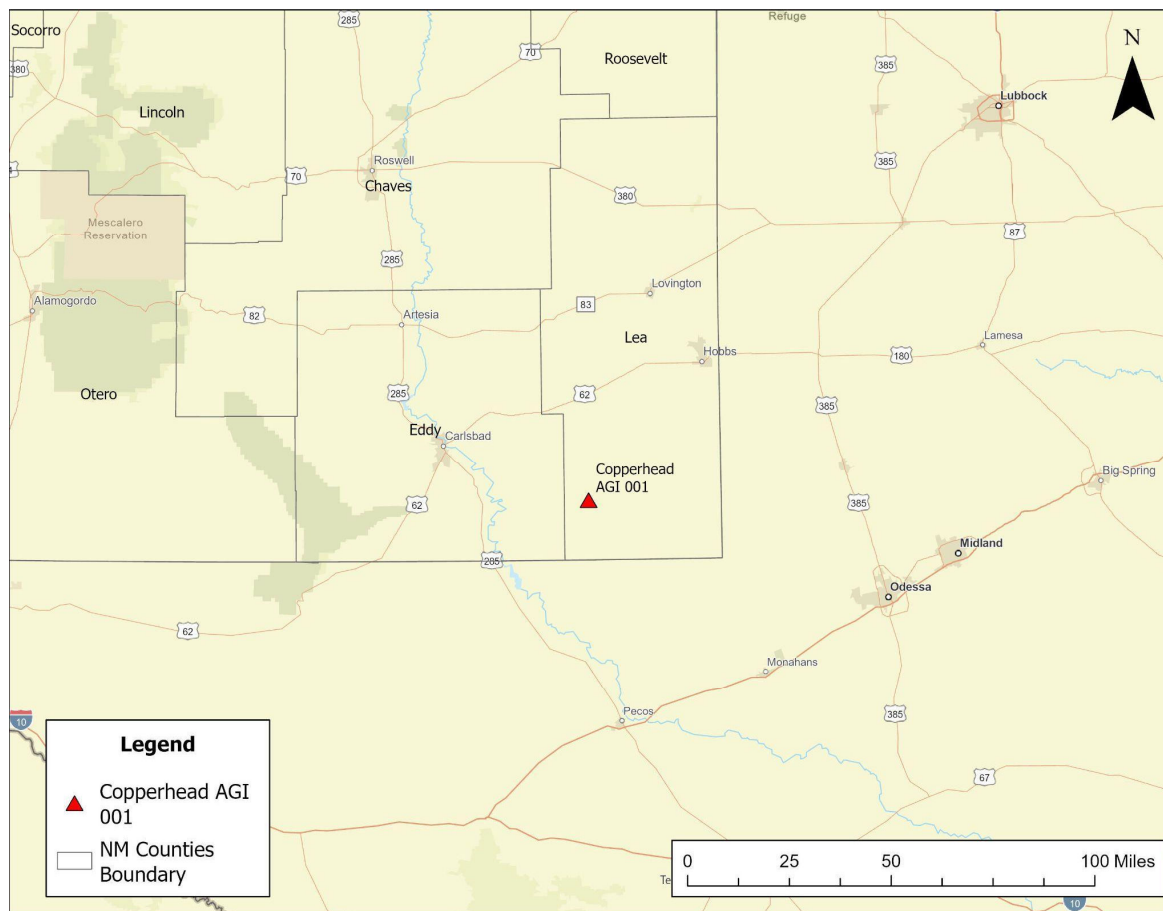
5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: \_\_\_\_\_

Atoka / Morrow 14,419' - 15,784'

\_\_\_\_\_

\_\_\_\_\_

**APPLICATION FOR COPPERHEAD ACID GAS INJECTION WELL  
TARGA MIDSTREAM SERVICES LLC  
COPPERHEAD AGI #001  
SECTION 13 T24S, R33E  
LEA COUNTY, NEW MEXICO**



Prepared for: Targa Midstream Services LLC, 811 Louisiana St, Houston TX 77002

Prepared by: New Mexico Tech Petroleum Recovery Research Center, 801 Leroy Place, Socorro NM

May 24, 2024

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## INTRODUCTION

The following document and attachments support the attached C-108 form for the proposed well Copperhead AGI #001. The narrative sections below align with the structure of the C-108 form.

### I. WELL PURPOSE

The well will be utilized to dispose of treated acid gas (TAG) from the adjacent Copperhead Gas Processing Plant. The Copperhead AGI #001 will be drilled at a location 793 FSL feet from the north line (FNL) and 429 feet from the east line (FEL) of Section 13 T24S, R32E (**Attachment 1**). The Copperhead AGI #001 well will be drilled vertically to an approximate depth of 18,699' as a Class II acid gas injection well. The well will be completed open hole and will inject into the Devonian Thirtyone Formation, Upper Silurian Wristen Group and the Lower Silurian Fusselman Formation, at a depth of ~17,299 – 18,689 feet. The well is designed to safely sequester acid gas injectate at a rate of 26.0 million standard cubic feet per day (MMSCFD) at an approximate surface pressure not to exceed 3,460 psig.

### II. OPERATOR INFORMATION

The operator of the well will be Targa Midstream Services, LLC, a subsidiary of Targa Resources Corp.

### III. WELL DATA

#### *C-108 SECTION A*

#### **1. General Well Information (See Attachment 1 for C-102)**

Lease name and Well Number: Copperhead AGI #001

Legal location and footage: P-13-T24S-R32E, 793' FSL, 429' FEL

Acreage: 40.03

Lat/Long: 32°12'45.39" N/ 103°37'16.30" W

Geodetic Coords: X = 761583.3, Y = 441810.7, NAD 83 NME

Elevation: 3,579'

Proposed Injection Unit and Depth: Siluro-Devonian, ~17,299 – 18,689

Operator (OGRID): Targa Midstream Services LLC (24650) - a subsidiary of Targa Resources

County: Lea County, NM

#### **2. Casing/Cement Information (See Attachment 2 for Wellbore Diagram)**

The preliminary casing design is presented in **Table 1**, and casing specifications are provided in **Table 2**. The well will have four strings of the telescoping casing. All four of the casing strings will be cemented to the surface. The injection tubing will include a subsurface safety valve on the production tubing to assure that fluid cannot flow back out of the well in the event of a failure of the injection equipment. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. The annular space between the production tubing and the well bore will be filled with an inert fluid (corrosion-inhibited diesel fuel) as a further safety measure, which is consistent with injection well

designs that have been previously approved by the New Mexico Oil Conservation Commission (NMOCC) for acid gas injection.

**Table 1. Casing Design**

Casing/ Tubing String	Casing /Tubing Depth, TVD1, ft	Borehole Diameter, in.	Casing / Tubing Outside Diameter, in	Coupling/ Connection	Casing/Tubing Material (Weight /Grade)	String Weight in Air, lb
Conductor	0-100	30	24	Welded	118 lb/ft, J-55	11,800
Surface	0-1,208	26	20	BTC	106.5 lb/ft, J-55	128,652
Intermediate #1	0-5,034	17 1/2	13 3/8	BTC	72 lb/ft, L-80	362,448
Intermediate #2	0-12,250	12 1/4	9 5/8	BTC Bond coat 5,084'- 7,100'	47 lb/ft, L-80	575,750
Long String	0-17,299	8 5/8	7	Prem FJ	32 lb/ft, Cr1 & - P110	553,568
Open hole	17,299- 18,700'	5 7/8	N/A	N/A	N/A	N/A
Tubing	0-17,295'	N/A	3 1/2	VAM	9.2 lb/ft, L-80 & 300' G3 on bottom	158,700

**Table 2. Casing Specifications**

Casing / Tubing String	Casing / Tubing Material (Weight / Grade / Connection)	Casing/ Tubing Diameters (OD/ID/ Drift), in.	Yield, (ksi)	Tensile (ksi)	Internal (Burst) Yield, psi	Collapse (psi)	Body Yield, (1,000 lbs)	Joint Strength, 1,000 lbs
Surface	106.5 lb/ft, J-55, BTC	20/19/ 18.812	55	75	2,410	770	1,685	1,595

Inter-mediate #1	72 lb/ft, L-80, BTC	13.375/12.347/12.191	80	95	5,380	2,670	1,661	1,650
Inter-mediate #2	47 lb/ft, L-80, BTC	9.625/ 8.681/ 8.525	80	95	6,870	4,760	1,086	1,122
Long String	32 lb/ft, Cr13-P110, Prem FJ	7.000/ 6.094/ 5.969	110	125	11,640	10,780	1,025	1,053
Tubing	9.2 lb/ft, VAM TOP/G3	3.500/ 2.992/ 2.867	80	95	10,160	10,540	207	168

**Table 3** summarizes cement design specifications. Top plugs shall be used to reduce contamination of cement by displacement fluid. A bottom plug or other acceptable technique, such as a pre-flush fluid, inner string cement method, etc. shall be utilized to help isolate the cement from contamination by the mud fluid being displaced ahead of the cement slurry.

Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. The slurries listed above or equivalent slurries will be used depending on the service provider selected. Cement yields may change depending on the type of slurries selected.

Cement shall be allowed adequate curing time to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

Nickel Alloy casing will be the bottom 300' of the 7" casing for corrosion resistance and will be cemented with corrosion resistant cement.

**Table 3. Cement Design**

Casing	Depth (ft)	Cement Volume (sacks)	Cement Type & Yield	Designed TOC	Centralizers
Conductor	100	82	Type I Neat 14.8 ppg	Surface cement circulated	None

Surface	1,208'	100% open hole excess 1,680 sks lead, 200 sks tail. Volume verified with fluid caliper	Lead Class C + 2% CaCl <sub>2</sub> + 0.25lb/sk Cello Flake + 0.2% FL, 12.9 ppg, 1.97 cuft/sk. Tail 200 sk Class C 14.8 ppg, 1.34 cuft/sk Circulate	Surface Cement Circulated	1 per joint on bottom 3 joints
Inter-mediate #1	5,034'	75% open hole excess Lead: 1,400 sks, Tail: 200 sks CorrosaCem Volume verified with fluid caliper	Lead: Class C Cmt + 3% CaCl + 0.25lb/sk CelloFlake + 5lb/sk LCM, 11.8 ppg 2.453 cuft/sk Tail: CorrosaCem Cmt, 14.5ppg 1.38 cuft/sk	Surface Cement Circulated	1 per joint for bottom 3 joints, 1 on every 3 joints for remaining joints
Inter-mediate #2	12,250'	75% open hole excess <b>STAGE 1</b> Lead: 892 sks Tail: 100 sks <b>STAGE 2</b> Lead:362 sks CorrosaCem <b>STAGE 3</b> Lead: 850 sks Tail: 200 sks	<b>STG 1</b> Lead: Class C Cmt,12.5 ppg, 1.63 cuft/sk Tail:Class C Cmt 14.82 ppg, 1.32 cuft/sk <b>STG 2:</b> CorrosaCem, 12.0 ppg, 1.75 cuft/sk <b>STG 3:</b> Lead Class C, 12.5 ppg, 1.63 cuft/sk Tail: Class C, 14.8 ppg, 1.32 cuft/sk	Surface Cement Circulated	1 per joint for bottom 3 joints, 1 on every 3 joints for remaining joints
Production	17299'	75% open hole excess <b>STAGE 1</b> 7 BBLs WELLLOCK CMT <b>STAGE 2</b> Lead 263 sks Tail 200 sks Volume verified with caliper	<b>STG 1 WELL LOCK RESIN STG 2</b> Lead Class H cement, 12.5 ppg, 1.63 cuft/sk Tail: 200 sks cement, 15.6 ppg, 1. cuft/sk	Surface	1 every 3 joints for remaining joints
* Cement program may change based on cement engineer recommendation and caliper log result.					

### 3. Tubing Information

The tubing is 3 ½" L80 9.2 lb/ft tubing with a Premium Gas Tight Thread from the surface to 16,950' and then 300' of G3 Nickel Alloy 9.2 lb/ft tubing with Vam Top Gas Tight Threads (16,950' -17,250') connected to the Inconel Permanent Production Packer. G3 Nickel alloy tubing is a highly corrosion resistant material. An Inconel SubSurface Safety Valve will be installed in the tubing at 100' to 150'. Bottom hole pressure and temperature gauges will be attached to the permanent packer via fiber optic line attached to the outside of the tubing.

### 4. Packer Information

Halliburton 7" Nickel Alloy Permanent Packer set at 17,295'. The casing annulus will be filled with a corrosion resistant packer fluid consisting of diesel and corrosion inhibitors.

### Drilling Fluids Design

The anticipated bottom hole pressure is ~8,000 psi. No abnormal pressure or temperatures are anticipated; however, there will be sufficient mud on location to control a blowout should one occur. Managed Pressure Drilling Systems will be installed on the rig and operated to control abnormal pressure events. Mud flow and volume will be monitored both visually and with electronic pit volume totalizers. Mud tests shall be performed every 24 hours after mudding up to determine, as applicable: density, viscosity, gel strength, filtration, and pH. The mud program may be revised at the recommendation of the field engineer.

A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals, including fresh water and oil-based operations. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of by the service from the company.

### C 108 SECTION III B

1. Name of injection formation: AGI Devonian
2. Injection interval: Open hole 17,299' - 18,699'
3. Original well purpose: Drilled for Acid Gas Injection
4. Depths of any other perforated intervals: No other perforated intervals
5. Depths and names of next higher and lower oil/gas zones in well area: Atoka/Morrow gas zones above (~14,420—16,500'), no deeper producing horizons.

The proposed Copperhead AGI #001 well will be drilled for the purpose of injecting TAG into the Silurian/Devonian formations at a depth of 17,299' - 18,699'. No production or injection wells in the area penetrate these formations, nor is there production from any deeper zones. The nearest wells in the vicinity produce primarily from the Bone Spring and Wolfcamp formations. There are also three active gas wells in the Atoka (**Figure 1**). **Table 4** provides a summary of wells.

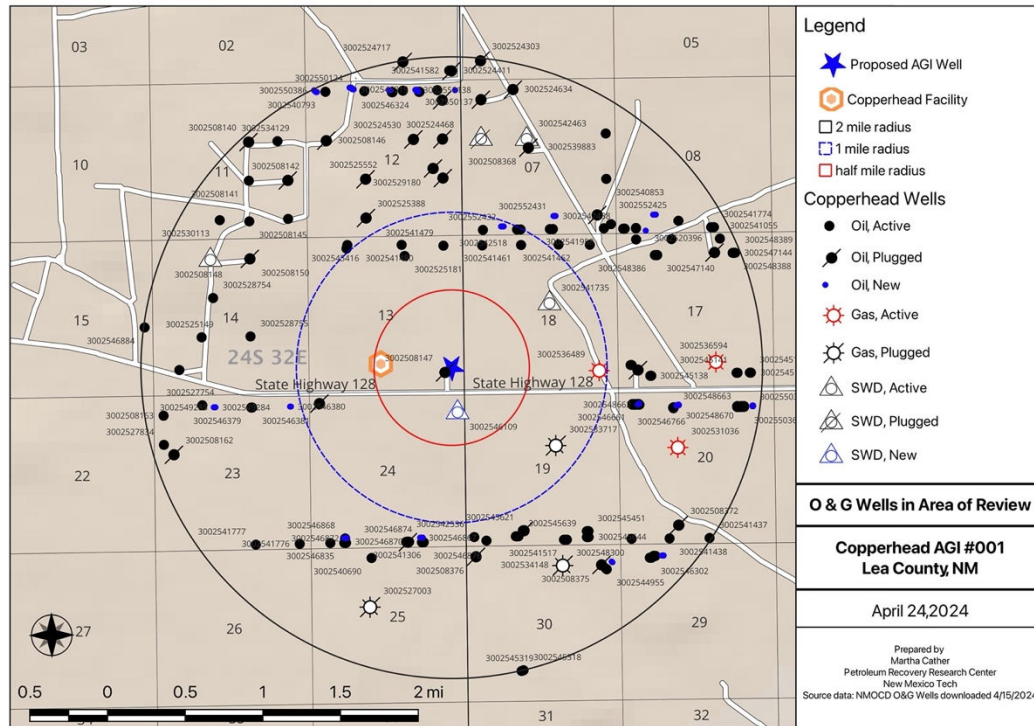
### IV. EXPANSION OF EXISTING PROJECT

This is NOT an expansion of an existing project.

**V. LEASE AND WELL MAPS (SEE ATTACHMENT 3 ALSO)**

The following maps are provided in accordance with NMOCD requirements. See **Table 3-1 in Attachment 3** for tabular listings of wells, operators, and owners, as well as more details on land and leases.

- 2-mile, 1-mile and ½-mile radius Oil & Gas Well Map (Figure 1, Figure 3-1)
- 2-mile radius Surface Ownership Map (Figure 2, Figure 2-2)



**Figure 1. Wells within 1/2-, 1- and 2-mile radius of proposed Copperhead AGI #001**

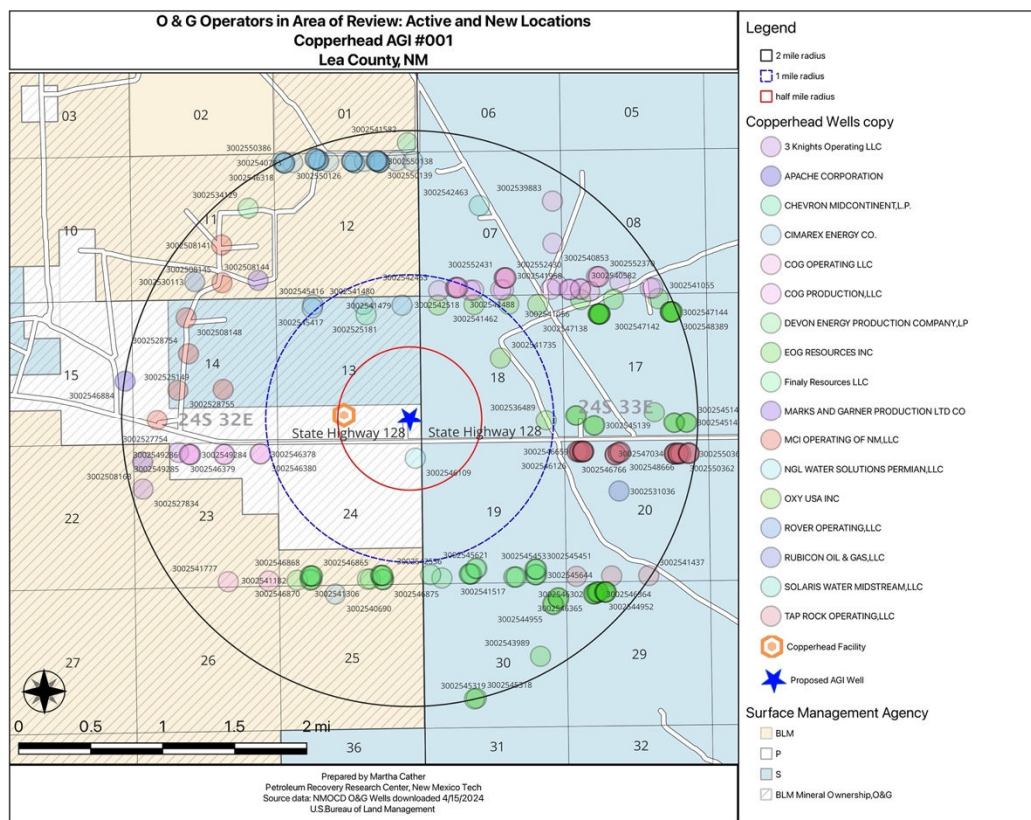


Figure 2. Operators and surface ownership for wells within 1/2-, 1- and 2-mile radius of proposed Copperhead AGI #001

### VI. TABULATION OF WELLS (SEE ATTACHMENT 3 FOR COMPLETE WELL LIST)

Table 4 provides a list and details regarding wells within a 1-mile radius of the proposed location. There are no other injection or production wells penetrating the proposed injection within a 2-mile radius of the proposed location.

Table 4. Well locations within 1/2 mile of Copperhead AGI #001

Well API	Well Name	Well Type	Formation	Well Status	Operator	Spud	Plug	Notes
3002508147	WOOLLEY #001	Oil	Brushy Canyon	Plugged (site released)	Westates Petroleum Corp of Texas	1957	1957	DH 1957, TD Delaware 5063'
3002546109	MCCLOY CENTRAL SWD #001	SWD	Devonian-Silurian	New	NGL Water Solutions Permian, LLC	NA	NA	APD filed 6/13/2019, <b>expired</b> 6/13/2021

There are 237 well locations (active, plugged, or new) within 2 miles of the proposed well, with 2 wells located (Table 4) within a 1/2 mile radius. The Woolley #001 (API# 30-025-08147) was drilled in 1957 to a depth of 5,063 feet into Delaware Mountain Group sands and plugged that same year. Forms C-101 and

102 were filed for a SWD well in 2017 (30-025-46109), but the permits expired in 2019 and no further action has been taken. Over 90% of the wells within the 2-mile radius are oil wells drilled to either Bone Spring (83) or Wolfcamp (46) reservoirs. The remainder are drilled to the Delaware or Atoka/Morrow. No wells produce from the proposed injection zone anywhere within the 2-mile radius. **Table 5** provides a general summary of wells in the area.

**Table 5. Summary of wells within 2 miles of Copperhead AGI #001**

Radius distance from location (mi)	Active	New/Never Drilled	Plugged, site released	Total
½-mile	0	1	1	2
1-mile	10	4	2	16
Two	134	56	29	219
Total	144	61	32	237

## VII. DATA ON PROPOSED OPERATION

(Items 1-3) A closed system will be used. Average and maximum rates and pressures are shown in **Table 6**. Equations, calculations, and modeling results are provided in **Attachment IV**.

**Table 6. Average and maximum injection rates and pressures**

Injection rate, MMSCFD	Average BHP, psi	Max BHP, psi	Average WHP, psi	Max WHP, psi
12	6,880	7,469	1,551	1,663
26	7,353	9,094	2,476	3,101

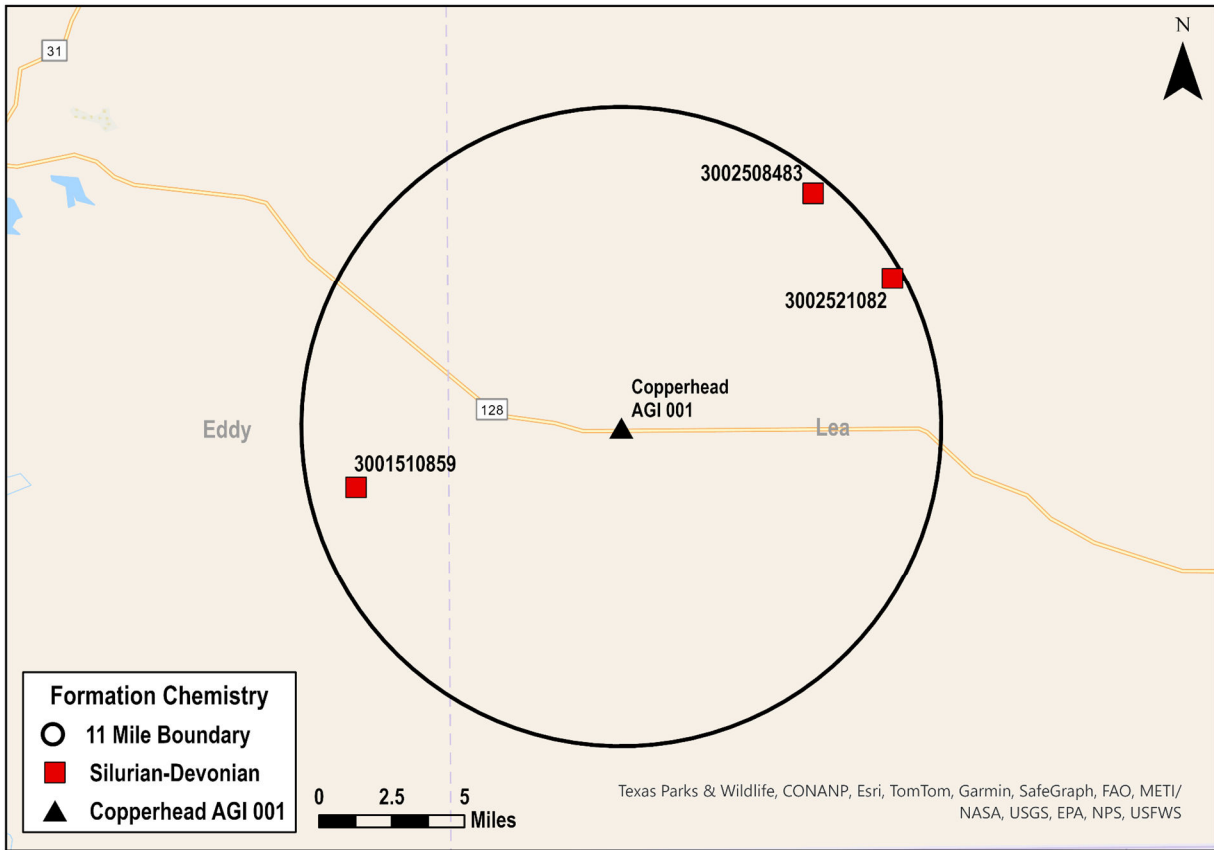
(4) Source of injection fluid is TAG from Copperhead facility with a composition of 30% H<sub>2</sub>S, 70% CO<sub>2</sub>

(5) **Injection formation water analysis:** The proposed well will inject TAG into the Siluro-Devonian interval. Water data was retrieved from the U.S. Geological Survey National Produced Waters Geochemical Database v2.3 (05/22/2019) to determine formation chemistry in the Siluro-Devonian injection interval for the Copperhead AGI #1 well. Water samples from the Devonian have been collected from 3 wells located within 11 miles of the proposed injection well. Those analyses show that the water contains NaCl and concentrations of total dissolved solids (TDS) range from 71,078 to 120,326 mg/L with an average of 90,530 mg/L (**Table 7, Figure 3**). High salinity indicates this interval is compatible with injection.



**Table 7. Wells with water chemistry (mg/L) in the Devonian near the Copperhead AGI #2 well**

API	Form	HCO <sub>3</sub>	Ca	Mg	Na	K	Cl	SO <sub>4</sub>	TDS
3001510859	Devonian	427	6280	586	38393	1070	73100	470	120326
3002508483	Devonian	500	2400	329	24039	610	42200	1000	71078
3002521082	Devonian	476	2820	378	27076	637	47900	900	80187



**Figure 3. Wells with water chemistry (mg/L) in the Devonian within 11 miles of the Copperhead AGI #1 well from the USGS National Produced Waters Geochemical Database. Data show these formations are NaCl waters with average TDS of 90,530 mg/L.**

## VIII. GEOLOGIC DESCRIPTION AND DATA

**Table 8** lists formations, depths and thicknesses. The subsurface geology is composed of a very thick sequence of sedimentary rocks including evaporites, carbonates, sandstones and shales representing a variety of depositional environments, underlain by Precambrian bedrock. Details of injection and confining zones are given below.

**Table 8. Formation tops, depths, and thicknesses**

	Measured Depth	Thickness	Porosity (%)	Permeability (md)	Behavior
Rustler	1155	346			Seal*
Salado	1501	1288			Seal*
Castile	2789	2185			Seal*
Lamar	4974	50			
Bell Canyon	5024	1028			Injection zone*
Cherry Canyon	6052	1627			Injection zone*
Brushy Canyon	7679	1265			
Bone Spring	8944	3255			
Wolfcamp	12199	1880			
Strawn	14079	340			
Atoka	14419	1365			
Morrow	15784	745			
Barnett Shale	16529	253	1.00%	0.1	Seal
Mississippian Ls	16782	392	1.50%	0.1	Seal
Woodford Sh	17174	125	1.00%	0.04	Seal
Thirtyone Fm	17299	890	2.20%	1.5	Injection zone
Wristen Gp			3.50%	6	Injection zone
Fusselman	18189	500	4.00%	2	Injection
Montoya	18689	80	2.00%	1	Seal
Simpson shales	18769	1615	1.00%	0.6	Seal
Ellenburger Dolomite	20384	550	1.50%	0.01	Seal
Ground elevation	3579				
*not proposed for injection at this location					

### INJECTION ZONE

The injection zone encompasses the rocks of the Ordovician, Silurian, and Devonian age including the Fusselman, Thirtyone and Wristen strata; at depths of ~17,299-18,689 feet. The total thickness of the injection interval is estimated to be ~ 1,390 feet (**Table 8**).

## Ordovician – Silurian

**Fusselman Formation** – The Fusselman Formation is a shallow-water carbonate system. In the Copperhead area, it is around 500' thick. Although these shallow water carbonates initially had fairly high primary porosity, diagenesis usually has decreased both the porosity and permeability unless impacted by exposure and dissolution. Based on area well logs, the porosity averages around 1-2%, but some zones may have higher porosity based on regional well logs and injection well data. Reported permeability for shallower sections range from 0.001 to 10 mD (Ruppel, 2019).

## Lower Devonian – Silurian

**Thirtyone and Wristen Formations** – Underlying the Woodford Shale are the interbedded dolomites and dolomitic limestones of the Devonian Thirtyone Formation and the Silurian Wristen Group, collectively referred to as the Siluro-Devonian section (~890 ft thick). Unlike the Fusselman, Montoya and Ellenburger carbonates, these deposits represent deposition in deeper waters in the Copperhead area. Porosity and permeability in the Wristen are limited in the main body of the unit (3-5%), but exposure events and carbonate dissolution can improve the porosity (~5%). Within Thirtyone deposits, the chert-rich deposits have the best porosity (up to 40%, up to 80 mD), while the limestones have less than 7% porosity and less than 1 mD of permeability (**Table 8**; Ruppel et al., 2020a).

### *UPPER CONFINING ZONE PROPERTIES: WOODFORD SHALE/MISSISSIPPIAN LIMESTONE*

**Mississippian** – Mississippian age deposits are commonly divided (from youngest to oldest) into the Barnett Shale and the Mississippian limestone (an un-named unit) of Lower Mississippian age. The Mississippian section is approximately 392 ft thick in the Copperhead area and is regionally extensive. Known production from this limestone consists of one to two well plays that normally have poor porosity (4-9%) and permeability (Broadhead, 2017) in New Mexico and a few isolated fields in the shallow water, high-energy limestones in Texas. The Barnett Shale is a widespread, dark, organic shale with very low porosity and permeability and is ~250 ft thick.

**Upper Devonian** – Within the Permian Basin, the Upper Devonian Woodford Shale serves as a seal to hydrocarbon migration out of Devonian and older units (Wright, 1979). In combination with the Mississippian section, it makes an excellent seal for potential injection. The Woodford Shale is ~125 ft thick in the Copperhead area and is laterally continuous, organic- and shale-rich, siliceous (radiolarians) mudstone. Although porosity can be as high as 10% (Jarvie et al., 2001), it averages around 1% with very low permeabilities.

### *LOWER CONFINING ZONE PROPERTIES: ORDOVICIAN TO PRECAMBRIAN*

**Simpson Group** – The Simpson Group is a thick sequence of carbonates, sandstones, and shales (~1,600 ft) which has a depocenter roughly equivalent to the Delaware Basin/Tobosa Basin. There are several transgressive/regressive cycles within the section, but only the transgressive sandstone sections have significant porosity. The rest of the section typically consists of mud-rich carbonates and shales. In the Copperhead area, the Simpson is shaly, with low porosity and permeability.

**Montoya Group** – The Montoya deposits (~80 feet) are dominated by shallow-water, ramp limestones. Porosity within the Montoya Group is dependent on depositional environment and diagenesis. The

higher energy environments tend to have better initial porosity than the low-energy environments. Compaction destroys the porosity, and dolomitization produces secondary porosity. Based on the well logs, the average porosity is approximately 3%, with scattered zones over 5% (**Table 8**). The probable average permeability is probably less than 1 mD, but fracturing may enhance it.

While in some areas **Ellenburger Group** sediments are prospective injection zones, in this area Ellenburger rocks have low porosity and permeability (1 – 2% and <1 mD) due their original depositional environment and the depth of burial (Loucks and Kerans, 2019). This makes it a potential underlying seal, ~550' in thickness.

**Cambrian to Precambrian** – The oldest sediment in the area is Cambrian Bliss Sandstone (Broadhead, 2017) which overlies Precambrian granites. The Bliss Sandstone and crystalline Precambrian rocks are potential lower seals. Porosity and permeability data indicates that in shallower wells, the Bliss is an aquifer. Within the Copperhead area, no porosity and permeability data could be found. Considering their depth, compactional history, and potential diagenetic alteration, the Bliss sandstones and associated granitic debris (from weathering of the basement rock) are probably relatively tight.

#### *SEISMIC REVIEW*

A search was conducted for seismic events recorded within a 10- and 20-mile radius (300 and 1,250 mi<sup>2</sup> respectively) surrounding the Copperhead AGI #1 well location. All seismic events of magnitude 2.0 or greater recorded by the New Mexico Tech Seismological Observatory and USGS databases from 1/12/17 to current day, were collected to determine if active seismicity exists near the proposed well location.

The search results from the New Mexico Tech Seismological Observatory database indicate 38 seismic events occurred from the period of January 2017 to present (**Figure 4**). The closest offset seismic event occurred approximately 8.3 miles from the proposed location and was a magnitude 2 event. The largest recorded seismic event within the 10 miles radius was a 4.03 magnitude event, at approximately 9.7 miles from the Copperhead AGI #001 location. Except for this 4.03 event, there are currently no seismic events of greater than 3.0 magnitude recorded within a 10 miles radius. In addition, all seismic activity reported from the period is concentrated to the southwestern edges of the 10 and 20 miles radius buffer zone. This more active area is a locus of oil production and concomitant SWD activity in the region.

There are 3 active monitoring stations located within 10 miles of the Copperhead AGI #001 well location. Among these 3 stations, one is in direct proximity to the well (**Figure 5**). There are 10 other seismic monitoring station within 10 to 20 miles of the well.

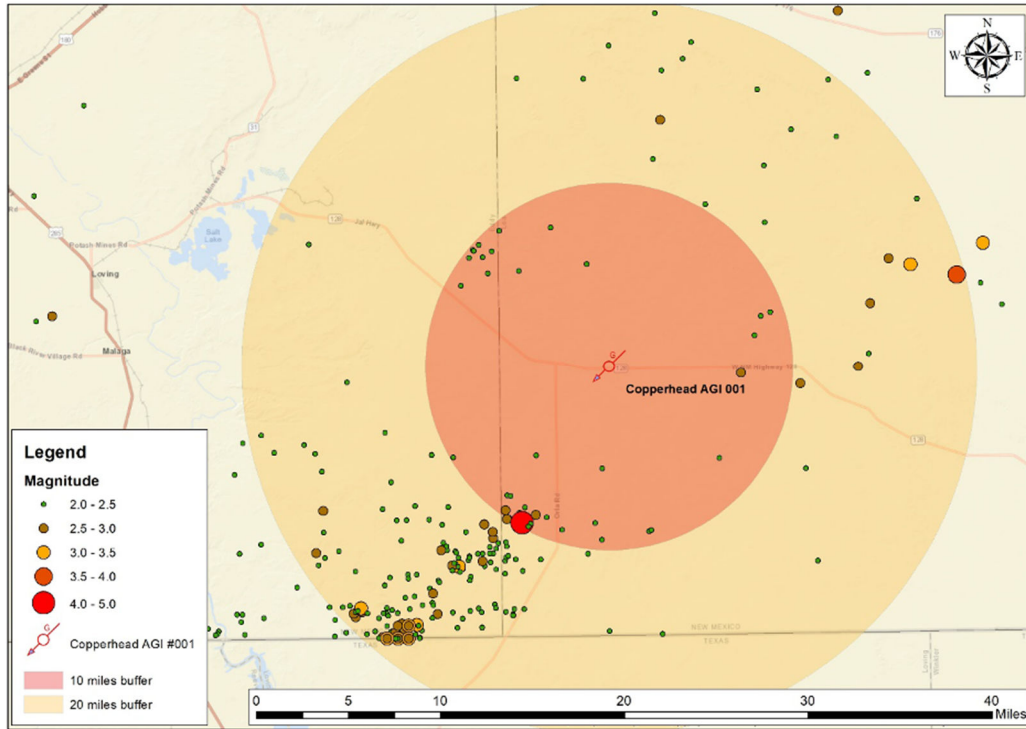


Figure 4. Seismic events, 2017 – 2024.

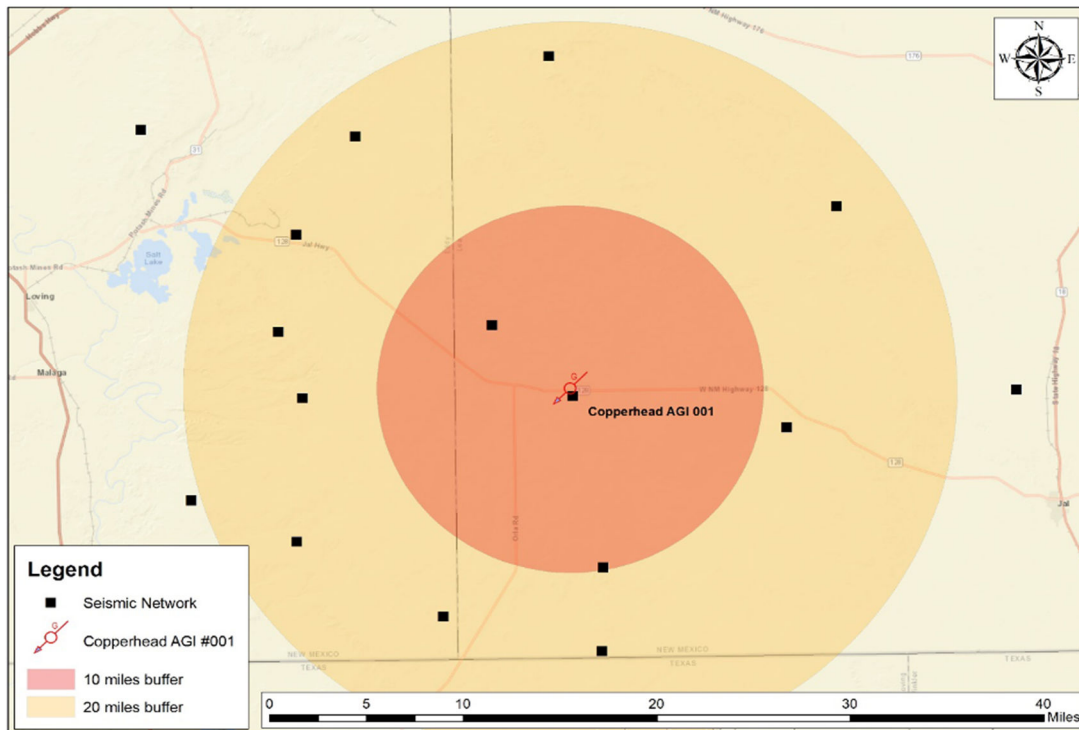
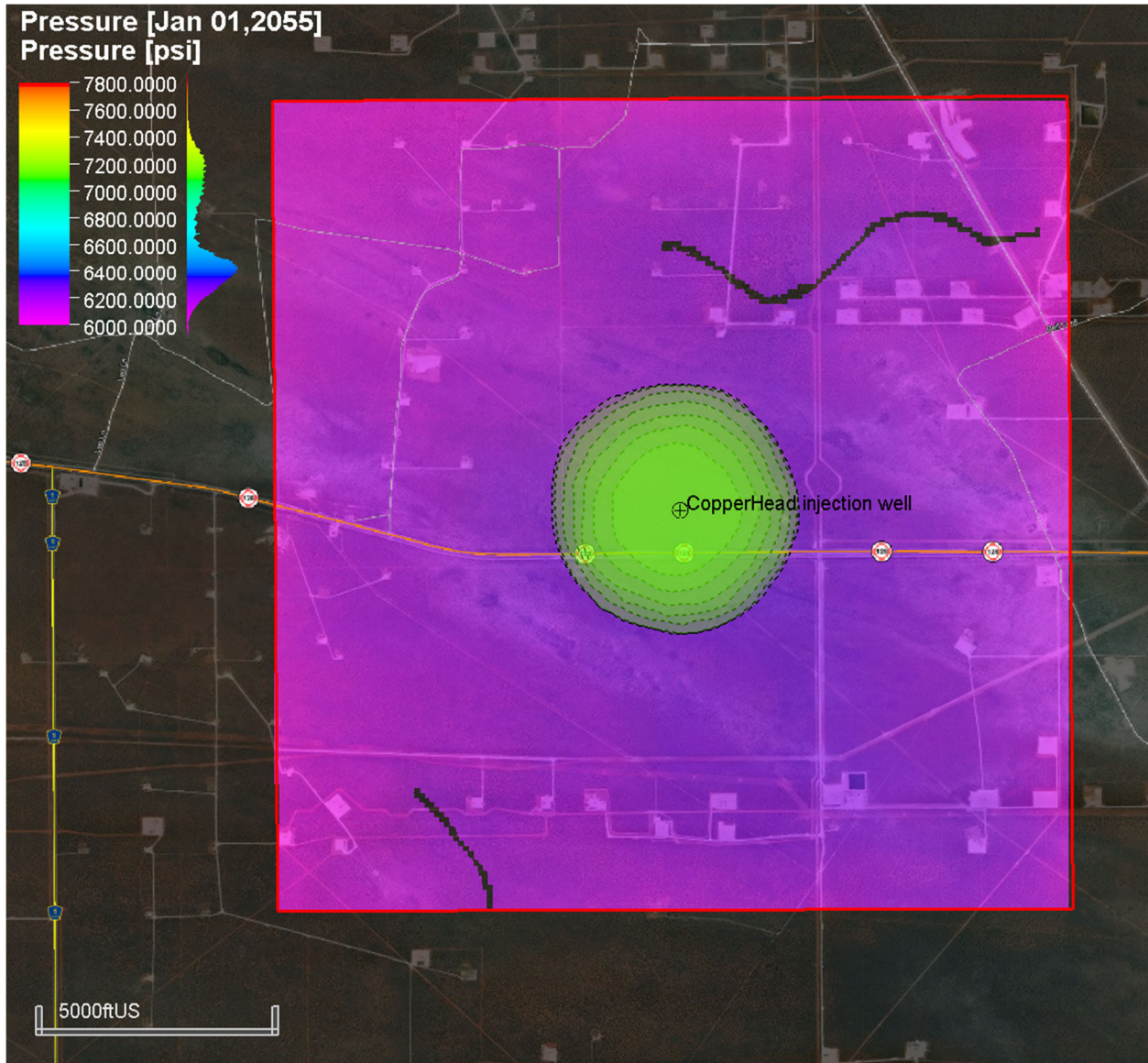


Figure 5. Existing seismic monitoring network surrounding Copperhead AGI #001.

### Fault Slip Potential

As shown in **Figure 6**, at its maximum extent, the pressure front of the TAG injection plume remains well away from any faults in the area. Based on the map, there is no potential for fault slip due to the TAG injection process.



**Figure 6. Map view showing maximum extent of TAG plume and fault traces projected to the surface within the area of the proposed well. No faults penetrate the injection zone near the proposed location.**

#### IX. PROPOSED STIMULATION PROGRAM

A cleanup acid job may be used to remove mud and drill cuttings from the formation. No other formation stimulation is currently planned.

#### X. LOGGING AND TEST DATA

Logs will be submitted to the Division upon completion of the well.

## XI. GROUND WATER

There are four main sources of underground drinking water in the northern Delaware Basin of New Mexico (Ritchie et al., 1985; Lowry et al., 2018; USBLM, 2020). They include: Cenozoic alluvium, lithologically complex fluvial accumulations of the Pecos River and other streams, windblown sands, playa deposits, gypsite, and others, with TDS ranging from <200 to 15,000 mg/L with an average of 2,319 mg/L; the Santa Rosa member of the Dockum Group, a reddish-brown and gray cross-stratified sandstone with TDS ranging from 205 to 2,990 mg/L which serves as the principal source of groundwater in the eastern part of Eddy County and the western third of Lea County; the Rustler Formation, a brackish to saline (~10,000 to 300,000 mg/L TDS) anhydrite or gypsum formation with two dolomite marker beds and a basal zone of sandstone to shale which is typically utilized for livestock, irrigation, and enhanced oil recovery; and the Capitan Reef, a karst limestone with TDS of <300 to 10,000 mg/L (Ritchie et al., 1985; Lowry et al., 2018; USBLM, 2020).

Based on the New Mexico Water Rights Database from the New Mexico Office of the State Engineer, there are no freshwater wells located within one mile of the Copperhead AGI #1 well. The closest groundwater well is approximately 1.70 miles away, completed to a depth of 492 ft and collecting water in the Triassic Dockum Group (Santa Rosa), with primary use of livestock watering (Ritchie et al., 1985; NMOSE, 2021; **Table 9; Figure 7**). The shallow freshwater aquifer is protected by the surface and intermediate casings and cements in the Copperhead AGI #1.

Water chemistry is not available for well C-01932. However, image files in the NMOSE water rights database for the expired application of pod C-01896 which is approximately 1.1 miles away include a chemical analysis of groundwater quality in the Santa Rosa of the Dockum Group (**Table 10**). Targa also implements frequent sampling in two additional shallow Triassic groundwater wells, C-03666 POD1 and C-03917 POD1 located adjacent to the Red Hills Gas Plant at distances of 5.2 and 5.7 miles away from the Copperhead AGI #1 well respectively. Samples collected on 07/31/2023 indicate the water is basic with pH of 8-9 and calculated TDS of 453 to 1380 mg/L (**Attachment V**). Results of these analyses are consistent with groundwater quality in the Triassic formations throughout the region.

**Table 9. Groundwater wells within 2 miles of Copperhead AGI #001**

pod_file	use	status	Well depth	tws	rng	sec	county	easting_13N	northing_13N	own_name
C-01932	STK	ACT	492	24S	32E	12	ED	628633	3567188	MCCLOY

**Table 10. Geochemistry of Santa Rosa from well C-01896 application.**

Ca	Mg	Na, K	HCO <sub>3</sub>	SO <sub>4</sub>	Cl	TDS	Spec. Cond
32	26	163	287	219	52	635	1030

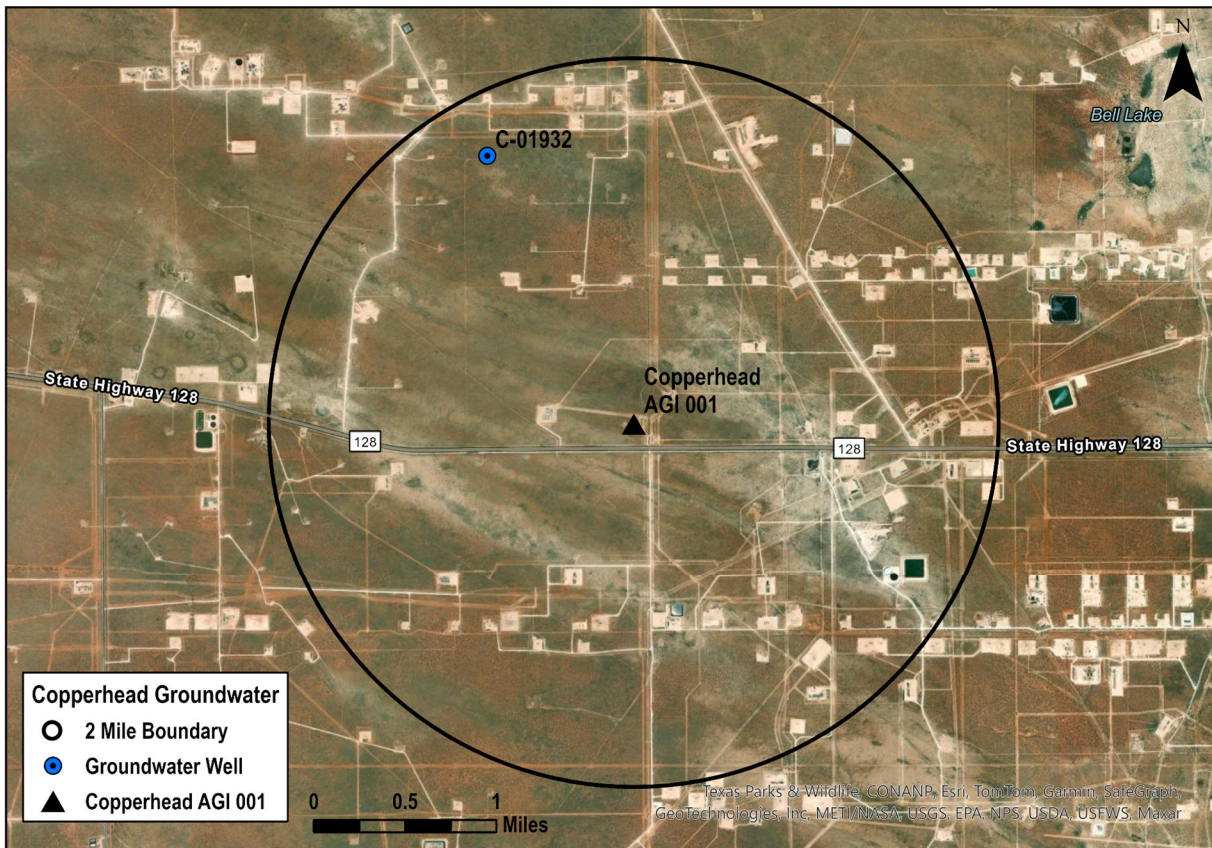


Figure 7. Groundwater wells near Copperhead AGI #001 from the NMOSE database.

#### References

Lowry, Thomas S., Michael D. Schuhen, Owen W. Lofton, La Tonya N. Walker, Patricia B. Johnson, Dennis W. Powers, and Dale O. Bowman. 2018. Water Resource Assessment in the New Mexico Permian Basin. Prepared by Sandia National Laboratories. SAND2018-12018. October 2018.

New Mexico Office of the State Engineer, Water Rights Division 2023. New Mexico Water Rights Reporting System, [https://gis.osne.state.nm.us/gisapps/ose\\_pod\\_locations/](https://gis.osne.state.nm.us/gisapps/ose_pod_locations/) (accessed August 2023 to November 2023)

Richey, S.F., Wells, J.G., and Stephens, K.T., 1985, Geohydrology of the Delaware Basin and vicinity, Texas and New Mexico: Water-Resources Investigations Report, doi:[10.3133/wri844077](https://doi.org/10.3133/wri844077)

U.S. Department of the Interior Bureau of Land Management, 2020. BLM Water Support Document for Oil and Gas Development in New Mexico (BLM WSD 2020), 68 p.



## XII. NO HYDROLOGIC CONNECTION STATEMENT

Based on the available geological data we find no evidence of open faults and/or other hydrologic connection between the target injection zone for the Copperhead AGI #1 well and underground sources of drinking water.

Dana Ulmer Scholle, Research Scientist

Date: May 24, 2024



George El-Kaseeh, Section Head – Industry Service Outreach

Date: May 24, 2024



## XIII. PROOF OF NOTICE

Targa researched land records to obtain a listing of all operators, oil, gas and mineral lessees, and surface owners within a one-mile radius of the proposed AGI well. **Attachment III** includes the results of that search.

**Attachment VI** contains a draft notice letter which will accompany the application when the individual letters are sent. These notices will be sent out as soon as the NMOCC assigns a case number and sets a date for the hearing. A draft public notice for the Commission secretary is also included in **Attachment VI**.

ATTACHMENT I: C-102 WELL LOCATION AND ACREAGE DEDICATION PLAT

District I  
1625 N. French Dr., Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720  
District II  
811 S. First St., Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

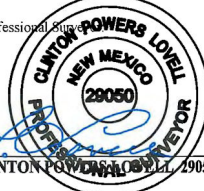
State of New Mexico  
Energy, Minerals & Natural Resources Department  
OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-102  
Revised August 1, 2011  
Submit one copy to appropriate  
District Office  
 AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

<sup>1</sup> API Number	<sup>2</sup> Pool Code 97885	<sup>3</sup> Pool Name AGI; DEVONIAN							
<sup>4</sup> Property Code	<sup>5</sup> Property Name COPPERHEAD AGI			<sup>6</sup> Well Number 1					
<sup>7</sup> OGRID No. 24650	<sup>8</sup> Operator Name TARGA MIDSTREAM SERVICES LLC			<sup>9</sup> Elevation 3579'					
<sup>10</sup> Surface Location									
UL or lot no. P	Section 13	Township 24-S	Range 32-E	Lot Idn	Feet from the 793	North/South line SOUTH	Feet from the 429'	East/West line EAST	County LEA
<sup>11</sup> Bottom Hole Location If Different From Surface									
UL or lot no.			Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
<sup>12</sup> Dedicated Acres 40.03	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code			<sup>15</sup> Order No.				

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

<p><sup>16</sup></p> <p>D C B A</p> <p>E F G H</p> <p>L K J I</p> <p>M N O P</p>	<p><sup>17</sup> OPERATOR CERTIFICATION</p> <p><i>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</i></p> <p><i>Matt Eales</i>      May 4, 2024 Signature                  Date</p> <p><b>Matt Eales</b> Printed Name</p> <p>meales@targaresources.com E-mail Address</p>			
	<p><sup>18</sup> SURVEYOR CERTIFICATION</p> <p><i>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</i></p> <p><b>FEBRUARY 9, 2024</b> Date of Survey</p> <p>Signature and Seal of Professional Surveyor</p> <div style="text-align: center;">  </div> <p>Clinton Powers Lorel Certificate Number      CLINTON POWERS LOREL 29050</p>			
	<p>GEODETIC COORDINATES</p> <p>NAD 83 NME X=761583.3 Y=441810.7 LAT. 32°12'45.39"N LONG. 103°37'16.30"W</p> <p>429' 793'</p>			
	<p>Diagram showing a well location on a grid. The well is located at the intersection of range 32-E and section 13. The well is 793 feet from the west line of section 13 and 429 feet from the south line of range 32-E. A north arrow and scale are provided.</p>			

# ATTACHMENT II: WELLBORE DIAGRAM

## WELLBORE SCHEMATIC

Targa **Midstream Services LLC**  
**Copperhead** AGI #1  
 429' FEL & 793' FSL  
 Sec. 13-**T24S-R32E**  
 GL 3579'

### Surface - (Conventional)

Hole Size: 26"  
 Casing: 20" - 106.5# J-55 BTC Casing  
 Depth Top: Surface  
 Depth Btm: 1028'  
 Cement: Lead Class C 1680 sks, 12.9 ppg, 1.97 cuft/sk  
 Tail Class C 200 sks, 14.8 ppg, 1.34 cuft/sk  
 Cement Top: Surface - (Circulate)

### Intermediate #1 - (Conventional)

Hole Size: 17.5"  
 Casing: 13.375" - 72L-80 BTC Casing  
 Depth Top: Surface  
 Depth Btm: 5034'  
 Cement: Lead Class C, 1450 sks, 11.8 ppg, 2.45 cuft/sk  
 Tail CorrosaCem, 200 sks, 14.5 ppg, 1.30 cuft/sk  
 Cement Top: Surface - (Circulate)

### Intermediate #2 - (Conventional)

Hole Size: 12.25"  
 Casing: 9.625" - 47# HCL-80 BTC Casing  
 Bond Coat 5034'-7100'  
 Depth Top: Surface  
 Depth Btm: 12250'  
 Cement 1: Lead Class C, 892 sks, 12.5 ppg, 1.63 cuft/sk  
 Tail Class C, 100 sks, 14.8 ppg, 1.33 cuft/sk  
 Cement Top: 7100' - (Circulate)  
 ECP/DV Tool: 7100'  
 Cement 2: 362 sks-CorrosaCem, 12.0 ppg, 1.75 cuft/sk  
 Cement 2 Top: 5070' - (Circulate)  
 DV Tool: 5070'  
 Cement 3: Lead Class C, 850 sks, 12.5 ppg, 1.63 cuft/sk  
 Tail Class C, 200 sks, 14.8 ppg, 1.33 cuft/sk  
 Cement 3 Top: Surface - (Circulate)

### Production

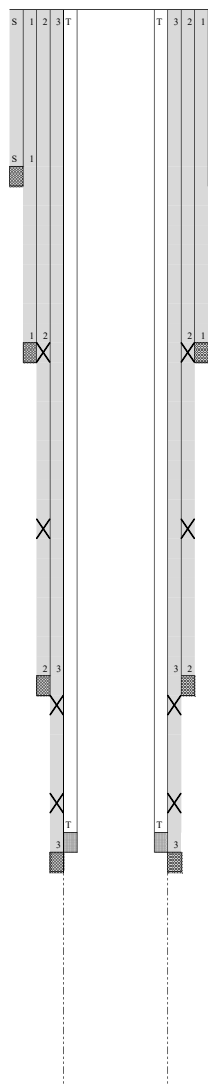
Hole Size: 8.5"  
 Casing #1: 7" - 32# P-110 TCPC Casing (or equivalent)  
 Depths: Surface - 16999'  
 Casing #2: 7" - 32# G3-110 TCPC Casing (or equivalent)  
 Depths: 16999' - 17299'  
 Cement: 7 bbl WellLock Resin  
 Cement Top: 17568' - (Circulate)  
 ECP/DV Tool: 17568'  
 Cement 2: Lead Class H, 263 sks, 12.5 ppg, 1.63 cuft/sk  
 Tail Class H, 200 sks, 14.8 ppg, 1.33 cuft/sk  
 Cement 2 Top: 12200' - (Circulate)  
 ECP/DV Tool: 12200'  
 Cement 3: Lead Class C 1013 sks, 12.5 ppg, 1.63 cuft/sk  
 Tail Class C 200 sks, 14.8 ppg, 1.33 cuft/sk  
 Cement 3 Top: Surface - (Circulate)

### Intermediate #4 - (Open Hole)

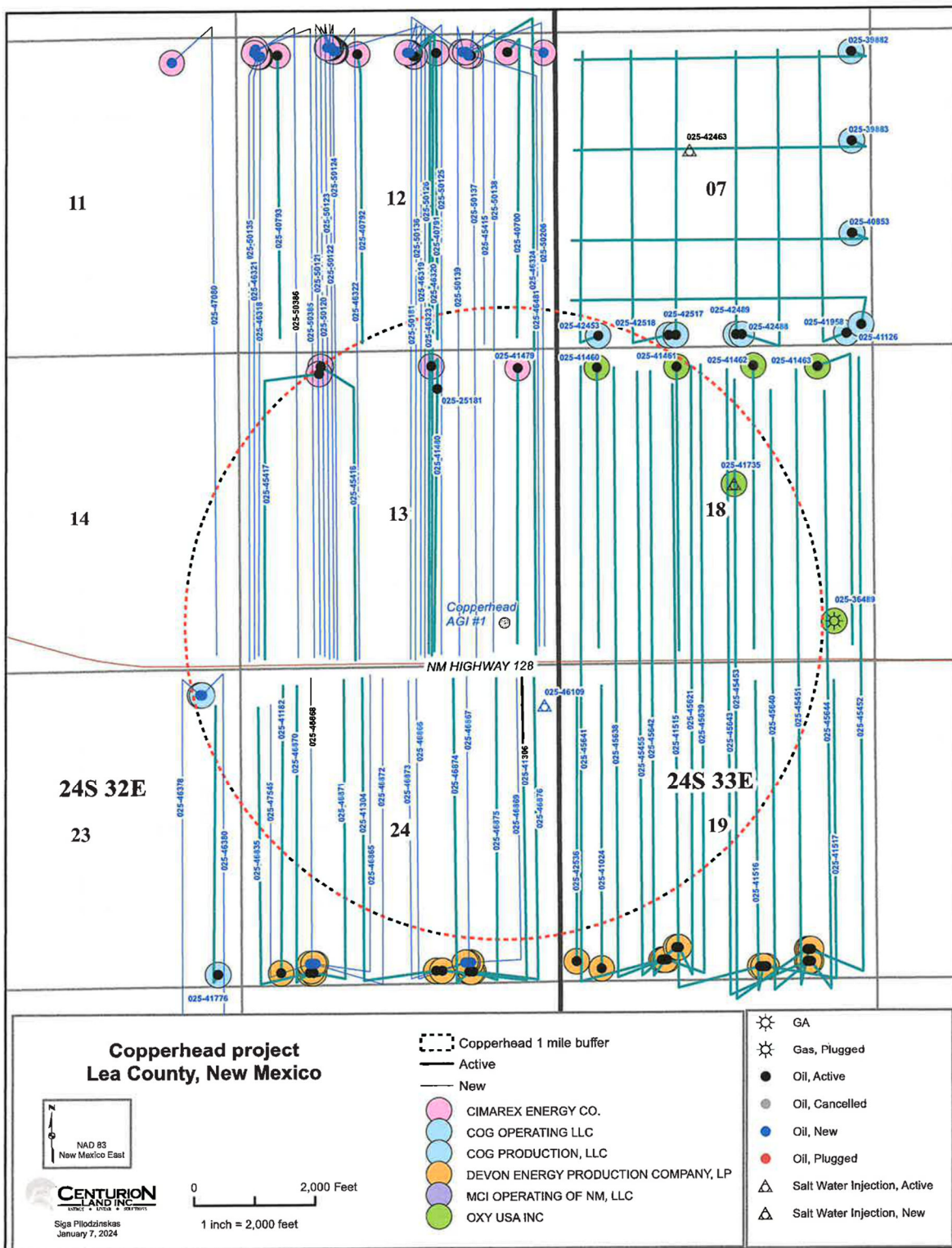
Hole Size: 5.875"  
 Depth: 18699'  
 Inj. Interval: 17299' - 18699'

### Tubing - (Conventional)

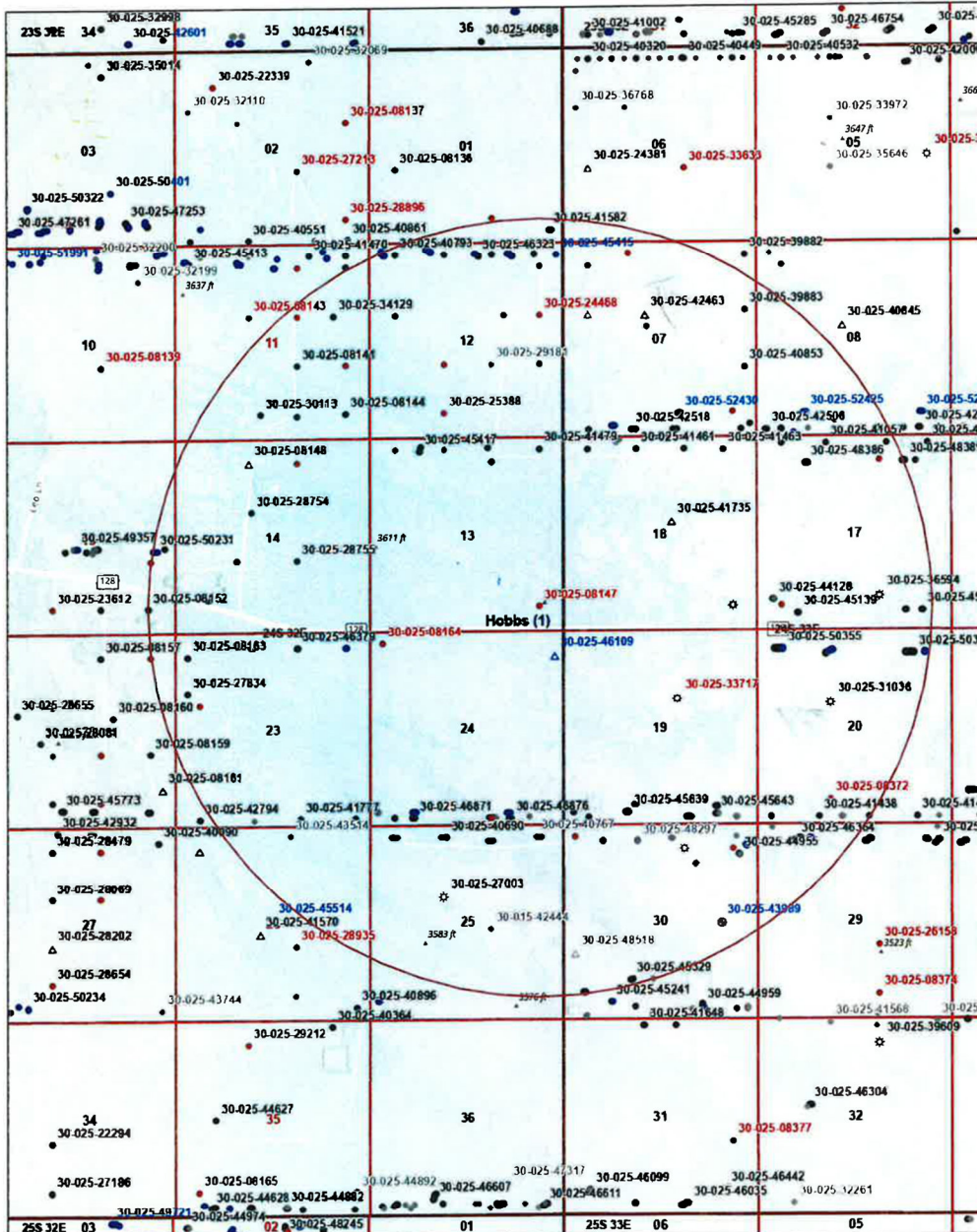
Tubing Depth: 0 - 16950' L80, 16950 - 17250 G3  
 Tubing: 3.5" - 9.2# G3-110 VAMTOP (or equivalent)  
 Packer Depth: 17250'  
 Packer: 3.5" - "Perma-Pak" or Equivalent (Inconel)  
 Packer Fluid: Diesel+ Additives



# ATTACHMENT III: WELL AND LEASE MAPS

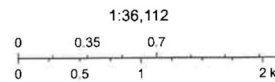


### OCD Well Locations



3/17/2024, 10:01:31 AM

- Override 1
- Wells - Large Scale
- Miscellaneous
- Gas, Active
- Gas, Cancelled
- Gas, Plugged
- Oil, Active
- Oil, Cancelled
- Oil, New
- Oil, Plugged
- ▲ Salt Water Injection, Active
- ▲ Salt Water Injection, Cancelled
- ▲ Salt Water Injection, New
- ▲ Salt Water Injection, Plugged
- OCD Districts
- PLSS First Division
- PLSS Townships



Esri, NASA, NGA, USGS, FEMA, Oil Conservation of the New Mexico Energy, Minerals and Natural Resources Department, Texas Parks & Wildlife, CONAH, TomTom, Garmin, SafeGraph, GeoTechnologies, IR, NASA, USGS, EPA, NPS, US Census Bureau

New Mexico Oil Conservator  
 NM OCD Oil and Gas Map: <http://nm-emrtd.maps.arcgis.com/apps/webappviewer/index.html?id=401712306164de29fd2b9f835ca75> New Mexico Oil Conservator

Table III-1. List of all active, plugged, or new well locations in a 2-mile radius

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002508147	WOOLLEY #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5063	0.05	1957	1957	32.212265	-103.62197
3002546109	MCCLOY CENTRAL SWD #001	New	NGL WATER SOLUTIONS PERMIAN, LLC	SWD, DEV-SIL	0	0.28	9999	9999	32.208562	-103.62060
3002541735	COPPERHEAD 18 STATE SWD #001	Active	OXY USA INC	SWD, DEL	6800	0.76	2014	9999	32.218628	-103.61036
3002525181	WIMBERLY A #001	Active	Finaly Resources LLC	DEL	5050	0.78	1975	9999	32.223160	-103.62621
3002541479	DOS EQUIS 13 FEDERAL COM #001H	Active	CIMAREX ENERGY CO.	BSPG	10988	0.79	2014	9999	32.224075	-103.62194
3002541460	COPPERHEAD 18 STATE #002H	Active	OXY USA INC	BSPG	11060	0.81	2014	9999	32.224049	-103.61768
3002533717	STATE 19 #001	Plugged	DEVON ENERGY PRODUCTION COMPANY, LP	ATOKA	15966	0.83	1997	9999	32.205322	-103.60990
3002541480	DOS EQUIS 13 FEDERAL COM #002H	Active	CIMAREX ENERGY CO.	BSPG	10937	0.86	2014	9999	32.224201	-103.62653
3002508164	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5080	0.88	1900	9999	32.209507	-103.63581
3002541461	COPPERHEAD 18 STATE #003H	Active	OXY USA INC	BSPG	11076	0.91	2014	9999	32.224045	-103.61340
3002542453	MACHO NACHO STATE COM #010H	Active	COG PRODUCTION, LLC	BSPG	9480	0.91	2015	9999	32.225496	-103.61758
3002536489	COPPERHEAD 18 STATE #001	Active	OXY USA INC	WOLF	14627	0.95	2004	9999	32.212261	-103.60503
3002552433	MACHO NACHO STATE COM #608H	New	COG OPERATING LLC	WOLF	0	0.96	9999	9999	32.225770	-103.61558

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002552429	MACHO NACHO STATE COM #607H	New	COG OPERATING LLC	BSPG	0	0.97	9999	9999	32.225770	-103.61548
3002552432	MACHO NACHO STATE COM #606H	New	COG OPERATING LLC	WOLF	0	0.97	9999	9999	32.225770	-103.61538
3002552428	MACHO NACHO STATE COM #605H	New	COG OPERATING LLC	BSPG	0	0.97	9999	9999	32.225770	-103.61529
3002542518	MACHO NACHO STATE COM #009H	Active	COG PRODUCTION, LLC	BSPG	9533	0.99	2015	9999	32.225493	-103.61383
3002542517	MACHO NACHO STATE COM #008H	Active	COG PRODUCTION, LLC	BSPG	9496	1.00	2015	9999	32.225493	-103.61344
3002545417	DOS EQUIS 13 FEDERAL COM #010H	Active	CIMAREX ENERGY CO.	BSPG	11045	1.03	2019	9999	32.223920	-103.63259
3002545416	DOS EQUIS 13 FEDERAL COM #009H	Active	CIMAREX ENERGY CO.	BSPG/WOLF	11051	1.04	2019	9999	32.224250	-103.63250
3002541462	COPPERHEAD 18 STATE #004H	Active	OXY USA INC	BSPG	10980	1.05	2014	9999	32.224041	-103.60929
3002546380	EIDER 23 FEDERAL #701H	New	COG PRODUCTION, LLC	WOLF	0	1.06	9999	9999	32.209203	-103.63892
3002546378	EIDER 23 FEDERAL #601H	New	COG PRODUCTION, LLC	WOLF	0	1.07	9999	9999	32.209202	-103.63901
3002542536	BELL LAKE 19 STATE #006H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9716	1.10	2015	9999	32.196823	-103.61896
3002542489	MACHO NACHO STATE COM #007H	Active	COG PRODUCTION, LLC	BSPG	9477	1.10	2015	9999	32.225490	-103.61021
3002546869	BELL LAKE 24 FEDERAL #013H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	0	1.11	2021	9999	32.196809	-103.62462
3002542488	MACHO NACHO STATE COM #006H	Active	COG PRODUCTION, LLC	BSPG	9527	1.11	2015	9999	32.225490	-103.60989
3002546867	BELL LAKE 24 FEDERAL #011H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9266	1.11	2021	9999	32.196808	-103.62471

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002546866	BELL LAKE 24 FEDERAL #010H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9295	1.11	2021	9999	32.196808	-103.62481
3002546873	BELL LAKE 24 FEDERAL #021H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG/WOLF	10041	1.11	2021	9999	32.196808	-103.62491
3002525388	PRE-ONGARD WELL #007	Plugged	PRE-ONGARD WELL OPERATOR	NA	5100	1.12	1900	9999	32.226780	-103.63043
3002541024	BELL LAKE 19 STATE #001H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11054	1.13	2013	9999	32.196472	-103.61762
3002546876	BELL LAKE 24 FEDERAL #025H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.13	2020	9999	32.196396	-103.62452
3002546875	BELL LAKE 24 FEDERAL #024H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.13	2020	9999	32.196396	-103.62462
3002546874	BELL LAKE 24 FEDERAL #022H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.14	2020	9999	32.196396	-103.62471
3002545455	BELL LAKE 19 18 STATE COM #017H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9350	1.14	2019	9999	32.197392	-103.61361
3002545454	BELL LAKE 19 18 STATE COM #013	Plugged	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	120	1.14	2019	9999	32.197392	-103.61352
3002545621	BELL LAKE 19 18 STATE COM #013Y	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9491	1.14	2019	9999	32.197392	-103.61347
3002541306	BELL LAKE 24 FEDERAL #002H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11082	1.15	2014	9999	32.196457	-103.62612
3002544127	HEARTTHROB 17 STATE #701H	Active	EOG RESOURCES INC	WOLF	12447	1.15	2018	9999	32.212704	-103.60154
3002541307	BELL LAKE 24 FEDERAL #003H	Plugged	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11064	1.15	2014	2015	32.196457	-103.62628
3002541304	BELL LAKE 24 FEDERAL #004H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11056	1.15	2014	9999	32.196457	-103.62645
3002545641	BELL LAKE 19 18 STATE COM #034H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12229	1.16	2019	9999	32.196842	-103.61439



API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002544128	HEARTTHROB 17 STATE #702H	Active	EOG RESOURCES INC	WOLF	12422	1.16	2018	9999	32.212704	-103.60143
3002545638	BELL LAKE 19 18 STATE COM #030H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12469	1.16	2019	9999	32.196842	-103.61429
3002545642	BELL LAKE 19 18 STATE COM #035H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12325	1.16	2019	9999	32.196842	-103.61420
3002545639	BELL LAKE 19 18 STATE COM #031H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12515	1.16	2019	9999	32.196842	-103.61410
3002552431	MACHO NACHO STATE COM #604H	New	COG OPERATING LLC	WOLF	0	1.18	9999	9999	32.226688	-103.60981
3002552427	MACHO NACHO STATE COM #603H	New	COG OPERATING LLC	BSPG	0	1.18	9999	9999	32.226688	-103.60971
3002552430	MACHO NACHO STATE COM #602H	New	COG OPERATING LLC	WOLF	0	1.18	9999	9999	32.226688	-103.60961
3002552426	MACHO NACHO STATE COM #601H	New	COG OPERATING LLC	BSPG	0	1.19	9999	9999	32.226688	-103.60957
3002546126	HYPERION STATE #141H	Active	TAP ROCK OPERATING, LLC	BSPG	10493	1.19	2019	9999	32.209055	-103.60139
3002545842	HYPERION STATE #221H	Active	TAP ROCK OPERATING, LLC	WOLF	12915	1.19	2019	9999	32.208986	-103.60139
3002541463	COPPERHEAD 18 STATE #005H	Active	OXY USA INC	BSPG	11109	1.19	2014	9999	32.223984	-103.60585
3002520400	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5230	1.20	1963	1963	32.212257	-103.60076
3002546659	HYPERION STATE #131H	Active	TAP ROCK OPERATING, LLC	WOLF	12248	1.20	2020	9999	32.209053	-103.60113
3002546658	HYPERION STATE #201H	Active	TAP ROCK OPERATING, LLC	WOLF	12486	1.20	2020	9999	32.208985	-103.60113
3002546661	HYPERION STATE #215H	Active	TAP ROCK OPERATING, LLC	WOLF	12572	1.20	2020	9999	32.209054	-103.60105
3002546660	HYPERION STATE #205H	Active	TAP ROCK OPERATING, LLC	WOLF	12945	1.21	2020	9999	32.208985	-103.60105
3002548665	HYPERION STATE #151H	Active	TAP ROCK OPERATING, LLC	BSPG	11480	1.22	2022	9999	32.209053	-103.60079

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002508376	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5108	1.22	1961	1961	32.195015	-103.61882
3002548662	HYPERION STATE #101H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.22	2022	9999	32.208985	-103.60079
3002548667	HYPERION STATE #171H	Active	TAP ROCK OPERATING, LLC	BSPG	9549	1.22	2022	9999	32.209053	-103.60071
3002548669	HYPERION STATE #181H	Active	TAP ROCK OPERATING, LLC	BSPG	9967	1.23	2022	9999	32.208985	-103.60071
3002526643	PRE-ONGARD WELL #002	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5100	1.23	1980	1980	32.230423	-103.62193
3002548668	HYPERION STATE #172H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.23	2022	9999	32.209053	-103.60063
3002550355	HYPERION STATE #125H	Active	TAP ROCK OPERATING, LLC	BSPG	10872	1.23	2022	9999	32.208985	-103.60063
3002545138	HEARTTHROB 17 STATE #703H	Active	EOG RESOURCES INC	WOLF	12473	1.28	2019	9999	32.211675	-103.59939
3002545139	HEARTTHROB 17 STATE #704H	Active	EOG RESOURCES INC	WOLF	12510	1.29	2019	9999	32.211674	-103.59928
3002546865	BELL LAKE 24 FEDERAL #008H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	0	1.29	2021	9999	32.196849	-103.63296
3002546872	BELL LAKE 24 FEDERAL #019H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG/WOLF	0	1.29	2021	9999	32.196849	-103.63305
3002546868	BELL LAKE 24 FEDERAL #012H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9311	1.29	2021	9999	32.196849	-103.63315
3002529180	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5020	1.29	1985	1985	32.231331	-103.62299
3002547545	BELL LAKE 24 FEDERAL #014H	New	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9383	1.30	2021	9999	32.196848	-103.63325
3002546381	EIDER 23 FEDERAL #702H	Active	COG PRODUCTION, LLC	WOLF	12390	1.31	2019	9999	32.209186	-103.64318
3002546870	BELL LAKE 24 FEDERAL #016H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.31	2020	9999	32.196536	-103.63315
3002528755	JENNINGS FEDERAL #006	Active	MCI OPERATING OF NM, LLC	DEL	4933	1.31	1984	9999	32.215824	-103.64326

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3002546871	BELL LAKE 24 FEDERAL #018H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.31	2020	9999	32.196436	-103.63306
3002546379	EIDER 23 FEDERAL #602H	Active	COG PRODUCTION, LLC	WOLF	12364	1.31	2019	9999	32.209185	-103.64328
3002541515	BELL LAKE 19 STATE #002H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11105	1.32	2014	9999	32.196472	-103.60911
3002546835	BELL LAKE 24 FEDERAL #015H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	0	1.32	2020	9999	32.196436	-103.63325
3002541516	BELL LAKE 19 STATE #003H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11114	1.32	2014	9999	32.196472	-103.60895
3002540690	DOUBLE X 25 FEDERAL #004	Active	CIMAREX ENERGY CO.	BSPG	10832	1.33	2012	9999	32.194988	-103.63027
3002541517	BELL LAKE 19 STATE #004H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	11088	1.33	2014	9999	32.196472	-103.60879
3002541958	MACHO NACHO STATE COM #005H	Active	COG PRODUCTION, LLC	BSPG	9512	1.33	2014	9999	32.225494	-103.60428
3002525552	PRE-ONGARD WELL #008	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5070	1.34	1977	1979	32.230408	-103.63042
3002508369	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5165	1.36	1958	1958	32.226788	-103.60502
3002545453	BELL LAKE 19 18 STATE COM #010H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9339	1.36	2019	9999	32.197239	-103.60658
3002545451	BELL LAKE 19 18 STATE COM #007H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9509	1.36	2019	9999	32.197239	-103.60649
3002545452	BELL LAKE 19 18 STATE COM #009H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	9336	1.37	2019	9999	32.197239	-103.60639
3002541182	BELL LAKE 24 FEDERAL #001H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	BSPG	10991	1.37	2013	9999	32.196434	-103.63478
3002541126	MACHO NACHO STATE #004H	Active	COG PRODUCTION, LLC	BSPG	10826	1.38	2013	9999	32.225880	-103.60350
3002545643	BELL LAKE 19 18 STATE COM #036H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12289	1.39	2019	9999	32.196689	-103.60658

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002545640	BELL LAKE 19 18 STATE COM #032H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12467	1.39	2019	9999	32.196689	-103.60649
3002545644	BELL LAKE 19 18 STATE COM #037H	Active	DEVON ENERGY PRODUCTION COMPANY, LP	WOLF	12332	1.40	2019	9999	32.196689	-103.60639
3002542505	EATA FAJITA STATE #011H	Active	COG PRODUCTION, LLC	BSPG	9606	1.42	2015	9999	32.225438	-103.60216
3002508144	GULF HANAGAN FEDERAL #001	Active	MARKS AND GARNER PRODUCTION LTD CO	DEL	5065	1.43	1962	9999	32.226757	-103.63897
3002542506	EATA FAJITA STATE #012H	Active	COG PRODUCTION, LLC	BSPG	9520	1.43	2015	9999	32.225438	-103.60199
3002546765	HYPERION STATE COM #137H	Active	TAP ROCK OPERATING, LLC	WOLF	12713	1.45	2020	9999	32.208677	-103.59693
3002541056	HEARTTHROB BSX STATE #001H	Active	EOG RESOURCES INC	BSPG	11116	1.45	2014	9999	32.224419	-103.60075
3002546766	HYPERION STATE #202H	Active	TAP ROCK OPERATING, LLC	WOLF	12504	1.45	2020	9999	32.208615	-103.59689
3002546767	HYPERION STATE #217H	Active	TAP ROCK OPERATING, LLC	WOLF	12570	1.45	2020	9999	32.208707	-103.59686
3002534148	STATE 30 #001	Plugged	COBRA OIL & GAS CORPORATION	WC	15585	1.45	1997	1999	32.194107	-103.60931
3002548663	HYPERION STATE #102H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.47	2022	9999	32.208832	-103.59655
3002548666	HYPERION STATE #152H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.47	2022	9999	32.208877	-103.59652
3002550356	HYPERION STATE #127H	New	TAP ROCK OPERATING, LLC	BSPG	10831	1.48	2022	9999	32.208928	-103.59632
3002524468	WIMBERLY #003	Plugged	PRIMAL ENERGY CORPORATION	DEL	5070	1.48	1973	2002	32.234070	-103.62192
3002508150	PRE-ONGARD WELL #003	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5030	1.48	1962	1982	32.223106	-103.64325
3002548670	HYPERION STATE #182H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.48	2022	9999	32.208866	-103.59628
3002542487	EATA FAJITA STATE #013H	Active	COG PRODUCTION, LLC	BSPG	9570	1.49	2015	9999	32.225458	-103.60076

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002540582	EATA FAJITA STATE #001H	Active	COG PRODUCTION, LLC	BSPG	11002	1.49	2013	9999	32.225491	-103.60075
3002524432	INGRAM O STATE #002	Plugged	ROVER OPERATING, LLC	SWD, DEL	5204	1.49	1973	2022	32.234070	-103.61765
3002541776	TREASURE ISLAND FEDERAL #001H	Active	COG PRODUCTION, LLC	BSPG	10722	1.49	2014	9999	32.196396	-103.63815
3002524530	WIMBERLY #004	Plugged	PRIMAL ENERGY CORPORATION	DEL	5030	1.50	1973	1997	32.234066	-103.62511
3002547137	HEARTTHROB 17 STATE #201H	Active	EOG RESOURCES INC	BSPG	9536	1.50	2021	9999	32.222940	-103.59871
3002547138	HEARTTHROB 17 STATE #202H	Active	EOG RESOURCES INC	BSPG	9788	1.50	2021	9999	32.222940	-103.59866
3002548386	HEARTTHROB 17 STATE #101H	Active	EOG RESOURCES INC	BSPG	9449	1.50	2021	9999	32.222940	-103.59861
3002547139	HEARTTHROB 17 STATE #203H	Active	EOG RESOURCES INC	BSPG	9595	1.50	2021	9999	32.222940	-103.59856
3002508368	PRE-ONGARD WELL #002	Plugged	PRE-ONGARD WELL OPERATOR	NA	5076	1.50	1962	1962	32.233158	-103.61249
3002547140	HEARTTHROB 17 STATE #204H	Active	EOG RESOURCES INC	BSPG	9934	1.51	2021	9999	32.222940	-103.59851
3002548387	HEARTTHROB 17 STATE #102H	Active	EOG RESOURCES INC	BSPG	9493	1.51	2021	9999	32.222940	-103.59846
3002552371	EATA FAJITA STATE COM #607H	New	COG OPERATING LLC	BSPG	0	1.53	9999	9999	32.225208	-103.59968
3002531036	STATE 20 #001	Active	RUBICON OIL & GAS, LLC	MORROW	16000	1.54	1990	9999	32.204994	-103.59650
3002549284	EIDER 23 FEDERAL COM #703H	New	COG PRODUCTION, LLC	WOLF	0	1.54	9999	9999	32.209225	-103.64721
3002549285	EIDER 23 FEDERAL COM #704H	New	COG PRODUCTION, LLC	WOLF	0	1.55	9999	9999	32.209224	-103.64731
3002549286	EIDER 23 FEDERAL COM #705H	New	COG PRODUCTION, LLC	WOLF	0	1.55	9999	9999	32.209224	-103.64740

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002542463	MACHO NACHO 7 STATE SWD #001	Active	SOLARIS WATER MIDSTREAM, LLC	SWD, DEL	7385	1.56	2015	9999	32.234001	-103.61263
3002540853	MACHO NACHO STATE #003H	Active	COG PRODUCTION, LLC	BSPG	10891	1.57	2013	9999	32.230110	-103.60395
3002508375	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	350	1.59	1961	1961	32.194107	-103.60504
3002541439	HYPERION STATE #005H	Active	TAP ROCK OPERATING, LLC	BSPG	11127	1.59	2014	9999	32.196468	-103.60168
3002528754	JENNINGS FEDERAL #005	Active	MCI OPERATING OF NM, LLC	DEL	4950	1.60	9999	9999	32.219456	-103.64732
3002508142	PRE-ONGARD WELL #003	Plugged	PRE-ONGARD WELL OPERATOR	DEL	4986	1.61	1900	9999	32.230385	-103.63897
3002508145	GULF HANAGAN FEDERAL #002	Active	MCI OPERATING OF NM, LLC	DEL	5046	1.61	1962	9999	32.226570	-103.64324
3002548301	MAMBA 30 STATE COM #210H	New	EOG RESOURCES INC	BSPG	0	1.62	9999	9999	32.194337	-103.60390
3002527003	FEDERAL BM #001	Plugged	DEVON ENERGY PRODUCTION COMPANY, LP	WC	15973	1.62	1980	2007	32.190453	-103.63053
3002548300	MAMBA 30 STATE COM #209H	New	EOG RESOURCES INC	BSPG	0	1.62	9999	9999	32.194277	-103.60382
3002525149	JENNINGS FEDERAL #004	Active	MCI OPERATING OF NM, LLC	DEL	5000	1.62	9999	9999	32.215801	-103.64864
3002527754	EXXON 23 FEDERAL #001	Active	3 Knights Operating LLC	DEL	4985	1.62	1982	9999	32.209450	-103.64865
3002544053	MAMBA 30 STATE COM #501H	Active	EOG RESOURCES INC	BSPG	11155	1.63	2018	9999	32.193714	-103.60453
3002552372	EATA FAJITA STATE COM #608H	New	COG OPERATING LLC	WOLF	0	1.63	9999	9999	32.226691	-103.59885
3002544955	MAMBA 30 STATE COM #502H	Active	EOG RESOURCES INC	BSPG	11157	1.63	2018	9999	32.193654	-103.60445
3002552425	EATA FAJITA STATE COM #606H	New	COG OPERATING LLC	WOLF	0	1.64	9999	9999	32.226691	-103.59865

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002541057	HEARTTHROB BSX STATE #002H	Active	EOG RESOURCES INC	BSPG	10862	1.64	2014	9999	32.224411	-103.59687
3002552370	EATA FAJITA STATE COM #605H	New	COG OPERATING LLC	BSPG	0	1.64	9999	9999	32.226691	-103.59856
3002508146	PRE-ONGARD WELL #003	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5049	1.68	1962	1963	32.234051	-103.63469
3002541777	TREASURE ISLAND FEDERAL #002H	Active	COG PRODUCTION, LLC	BSPG	10961	1.70	2014	9999	32.196373	-103.64296
3002536594	ATOKA BANK BDJ STATE COM #001	Active	EOG RESOURCES INC	MORR OW	16033	1.70	2004	9999	32.212933	-103.59219
3002508148	JENNINGS FEDERAL #001	Active	MCI OPERATING OF NM, LLC	SWD, DEL	5019	1.70	1962	9999	32.223084	-103.64755
3002524433	WIMBERLY #002	Plugged	PRIMAL ENERGY CORPORATION	DEL	5038	1.73	1973	2000	32.237698	-103.62190
3002540570	EATA FAJITA STATE #002H	Active	COG PRODUCTION, LLC	BSPG	11125	1.74	2013	9999	32.226116	-103.59608
3002524347	STATE O #001	Plugged	TAHOE ENERGY INC	DEL	5204	1.74	1973	2002	32.237698	-103.61764
3002508149	JENNINGS FEDERAL #002	Active	MCI OPERATING OF NM, LLC	DEL	5000	1.75	1962	9999	32.212772	-103.65113
3002546365	BANDIT 29 STATE COM #707H	Active	EOG RESOURCES INC	WOLF	12461	1.76	2019	9999	32.194682	-103.59971
3002546302	BANDIT 29 STATE COM #604H	Active	EOG RESOURCES INC	BSPG	12267	1.77	2019	9999	32.194682	-103.59960
3002530113	WIMBERLY #006	Active	ROVER OPERATING, LLC	DEL	5075	1.77	9999	9999	32.226719	-103.64648
3002546364	BANDIT 29 STATE COM #705H	Active	EOG RESOURCES INC	WOLF	12485	1.77	2019	9999	32.194682	-103.59949
3002544953	BANDIT 29 STATE COM #507H	Active	EOG RESOURCES INC	BSPG	11118	1.77	2018	9999	32.194847	-103.59930
3002508372	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5219	1.77	1961	1961	32.197723	-103.59650

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002544952	BANDIT 29 STATE COM #506H	Active	EOG RESOURCES INC	BSPG	11143	1.78	2018	9999	32.194847	-103.59919
3002508141	HANAGAN D FEDERAL #002	Active	MCI OPERATING OF NM, LLC	DEL	4962	1.78	1962	9999	32.230366	-103.64323
3002541438	HYPERION STATE #004H	Active	TAP ROCK OPERATING, LLC	BSPG	11131	1.78	2014	9999	32.196461	-103.59750
3002544951	BANDIT 29 STATE COM #505H	Active	EOG RESOURCES INC	BSPG	11150	1.78	2018	9999	32.194846	-103.59909
3002545415	DOS EQUIS 12 FEDERAL COM #007H	New	CIMAREX ENERGY CO.	BSPG	0	1.79	9999	9999	32.238555	-103.62043
3002546481	DOS EQUIS 12 13 FEDERAL COM #006H	Active	CIMAREX ENERGY CO.	BSPG/WOLF	12951	1.79	2019	9999	32.238470	-103.62435
3002546324	DOS EQUIS 12 13 FEDERAL COM #086H	Active	CIMAREX ENERGY CO.	WOLF	12419	1.79	2019	9999	32.238470	-103.62441
3002550137	DOS EQUIS 12 13 FEDERAL COM #087H	New	CIMAREX ENERGY CO.	WOLF	0	1.79	9999	9999	32.238470	-103.62448
3002540700	DOS EQUIS 12 FEDERAL COM #001	Active	CIMAREX ENERGY CO.	BSPG	11085	1.79	2012	9999	32.238606	-103.62239
3002550206	DOS EQUIS 12 13 FEDERAL COM #088H	New	CIMAREX ENERGY CO.	BSPG	0	1.80	9999	9999	32.238635	-103.62461
3002550138	DOS EQUIS 12 13 FEDERAL COM #089H	New	CIMAREX ENERGY CO.	BSPG	0	1.80	9999	9999	32.238635	-103.62467
3002550139	DOS EQUIS 12 13 FEDERAL COM #090H	New	CIMAREX ENERGY CO.	BSPG	0	1.80	9999	9999	32.238635	-103.62474
3002550181	DOS EQUIS 11 14 FEDERAL COM #091H	New	CIMAREX ENERGY CO.	BSPG	0	1.81	9999	9999	32.238635	-103.62480
3002539883	MACHO NACHO STATE #002H	Active	COG OPERATING LLC	BSPG	10893	1.81	2013	9999	32.234356	-103.60394
3002549702	BANDIT 29 STATE COM #741H	New	EOG RESOURCES INC	WOLF	0	1.81	2022	9999	32.194845	-103.59837



API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002540791	DOS EQUIS 12 FEDERAL COM #002H	Active	CIMAREX ENERGY CO.	BSPG	11027	1.81	2013	9999	32.238598	-103.62617
3002549705	BANDIT 29 STATE COM #751H	New	EOG RESOURCES INC	WOLF	0	1.82	2022	9999	32.194845	-103.59831
3002546320	DOS EQUIS 12 13 FEDERAL COM #005H	Active	CIMAREX ENERGY CO.	BSPG/WOLF	12418	1.82	2020	9999	32.238468	-103.62732
3002546323	DOS EQUIS 12 13 FEDERAL COM #073H	Active	CIMAREX ENERGY CO.	WOLF	12396	1.82	2020	9999	32.238468	-103.62739
3002549703	BANDIT 29 STATE COM #742H	New	EOG RESOURCES INC	WOLF	0	1.82	2022	9999	32.194845	-103.59824
3002549704	BANDIT 29 STATE COM #743H	New	EOG RESOURCES INC	WOLF	0	1.82	2022	9999	32.194845	-103.59818
3002550125	DOS EQUIS 12 13 FEDERAL COM #075H	New	CIMAREX ENERGY CO.	BSPG	0	1.83	9999	9999	32.238633	-103.62758
3002550126	DOS EQUIS 12 13 FEDERAL COM #076H	New	CIMAREX ENERGY CO.	BSPG	0	1.83	9999	9999	32.238633	-103.62765
3002550136	DOS EQUIS 12 13 FEDERAL COM #077H	New	CIMAREX ENERGY CO.	WOLF	0	1.83	9999	9999	32.238633	-103.62771
3002545140	HEARTTHROB 17 STATE COM #705H	Active	EOG RESOURCES INC	WOLF	12553	1.83	2019	9999	32.211847	-103.58991
3002524634	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5121	1.84	1973	1974	32.238602	-103.61411
3002545141	HEARTTHROB 17 STATE COM #706H	Active	EOG RESOURCES INC	WOLF	12558	1.84	2019	9999	32.211847	-103.58980
3002534129	WIMBERLY #007	Active	Finally Resources LLC	DEL	5118	1.84	1997	9999	32.234032	-103.64003
3002520396	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	NA	5242	1.85	1964	1964	32.223141	-103.59219
3002547034	HYPERION STATE COM #206H	Active	TAP ROCK OPERATING, LLC	WOLF	12459	1.85	2021	9999	32.208724	-103.58990
3002547033	HYPERION STATE COM #203H	Active	TAP ROCK OPERATING, LLC	WOLF	0	1.85	2021	9999	32.208656	-103.58990

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002547032	HYPERION STATE COM #204H	Active	TAP ROCK OPERATING, LLC	WOLF	0	1.86	2021	9999	32.208725	-103.58981
3002547035	HYPERION STATE COM #208H	Active	TAP ROCK OPERATING, LLC	WOLF	12499	1.86	2021	9999	32.208656	-103.58981
3002548563	HYPERION STATE COM #223H	Active	TAP ROCK OPERATING, LLC	WOLF	13025	1.86	2021	9999	32.208651	-103.58973
3002540792	DOS EQUIS 12 FEDERAL COM #003H	Active	CIMAREX ENERGY CO.	BSPG	11003	1.87	2013	9999	32.238594	-103.63042
3002508162	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5020	1.87	1962	1962	32.204899	-103.65186
3002550364	HYPERION STATE COM #173H	Active	TAP ROCK OPERATING, LLC	BSPG	9569	1.88	2022	9999	32.208725	-103.58947
3002550360	HYPERION STATE COM #143H	Active	TAP ROCK OPERATING, LLC	BSPG	10537	1.88	2022	9999	32.208655	-103.58947
3002508163	ERNEST FEDERAL #001	Active	MARKS AND GARNER PRODUCTION LTD CO	DEL	4992	1.88	1962	9999	32.208523	-103.65292
3002550357	HYPERION STATE COM #103H	Active	TAP ROCK OPERATING, LLC	BSPG	9446	1.88	2022	9999	32.208725	-103.58939
3002550362	HYPERION STATE COM #153H	Active	TAP ROCK OPERATING, LLC	BSPG	11516	1.88	2022	9999	32.208655	-103.58939
3002543989	MAMBA 30 STATE #001	New	EOG RESOURCES INC	MONITOR	0	1.88	2017	9999	32.188468	-103.60606
3002550358	HYPERION STATE COM #126H	Active	TAP ROCK OPERATING, LLC	BSPG	10866	1.90	2022	9999	32.208725	-103.58913
3002550366	HYPERION STATE COM #183H	Active	TAP ROCK OPERATING, LLC	BSPG	9975	1.90	2022	9999	32.208656	-103.58913
3002540571	EATA FAJITA STATE #003H	Active	COG PRODUCTION, LLC	BSPG	11127	1.90	2013	9999	32.225475	-103.59249
3002546319	DOS EQUIS 12 13 FEDERAL COM #003H	New	CIMAREX ENERGY CO.	BSPG/WOLF	0	1.90	2023	9999	32.238754	-103.63158

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002546322	DOS EQUIS 12 13 FEDERAL COM #047H	New	CIMAREX ENERGY CO.	WOLF	0	1.90	2023	9999	32.238754	-103.63164
3002550120	DOS EQUIS 12 13 FEDERAL COM #048H	New	CIMAREX ENERGY CO.	WOLF	0	1.90	9999	9999	32.238754	-103.63171
3002541582	J KEATS 1 24 32 #040H	Active	CHEVRON MIDCONTINENT, L.P.	BSPG	11035	1.92	2014	9999	32.240421	-103.62106
3002524411	NEWMAN FEDERAL #001	Plugged	UNION OIL CO OF CALIFORNIA	DEL	5025	1.92	1973	1995	32.240421	-103.62083
3002541774	EATA FAJITA STATE COM #006H	Active	COG PRODUCTION, LLC	BSPG	9542	1.92	2015	9999	32.225475	-103.59219
3002527834	EXXON 23 FEDERAL #002	Active	3 Knights Operating LLC	DEL	5013	1.92	9999	9999	32.205803	-103.65292
3002550121	DOS EQUIS 12 13 FEDERAL COM #049H	New	CIMAREX ENERGY CO.	WOLF	0	1.92	9999	9999	32.238919	-103.63184
3002541055	ATOKA BANK BDJ STATE COM #002H	Active	EOG RESOURCES INC	BSPG	11159	1.92	2014	9999	32.224403	-103.59155
3002545142	HEARTTHROB 17 STATE COM #707H	Active	EOG RESOURCES INC	WOLF	12512	1.92	2018	9999	32.211844	-103.58844
3002550123	DOS EQUIS 12 13 FEDERAL COM #051H	New	CIMAREX ENERGY CO.	BSPG	0	1.92	9999	9999	32.238919	-103.63197
3002550124	DOS EQUIS 12 13 FEDERAL COM #052H	New	CIMAREX ENERGY CO.	BSPG	0	1.92	9999	9999	32.238918	-103.63203
3002545143	HEARTTHROB 17 STATE COM #708H	Active	EOG RESOURCES INC	WOLF	12534	1.93	2018	9999	32.211844	-103.58834
3002550361	HYPERION STATE COM #144H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.95	2022	9999	32.208748	-103.58822
3002550365	HYPERION STATE COM #174H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.95	2022	9999	32.208680	-103.58822
3002550363	HYPERION STATE COM #154H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.95	2022	9999	32.208748	-103.58814

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002547141	HEARTTHROB 17 STATE COM #205H	Active	EOG RESOURCES INC	BSPG	9632	1.95	2021	9999	32.223054	-103.59017
3002550359	HYPERION STATE COM #128H	New	TAP ROCK OPERATING, LLC	BSPG	0	1.96	2022	9999	32.208679	-103.58813
3002540793	DOS EQUIS 12 FEDERAL COM #004H	Active	CIMAREX ENERGY CO.	BSPG	10933	1.96	2013	9999	32.238586	-103.63469
3002547142	HEARTTHROB 17 STATE COM #206H	Active	EOG RESOURCES INC	BSPG	9968	1.96	2021	9999	32.223054	-103.59011
3002508140	WIMBERLY #001	Plugged	PRIMAL ENERGY CORPORATION	DEL	5091	1.96	1962	2000	32.234016	-103.64323
3002548388	HEARTTHROB 17 STATE COM #103H	Active	EOG RESOURCES INC	BSPG	9496	1.96	2021	9999	32.223054	-103.59006
3002547144	HEARTTHROB 17 STATE COM #208H	Active	EOG RESOURCES INC	BSPG	9925	1.97	2021	9999	32.223054	-103.58996
3002548389	HEARTTHROB 17 STATE COM #104H	Active	EOG RESOURCES INC	BSPG	9485	1.97	2021	9999	32.223054	-103.58991
3002546318	DOS EQUIS 12 13 FEDERAL COM #001H	New	CIMAREX ENERGY CO.	BSPG/WOLF	0	1.98	2023	9999	32.238545	-103.63562
3002546321	DOS EQUIS 12 13 FEDERAL COM #008H	New	CIMAREX ENERGY CO.	WOLF	0	1.98	2023	9999	32.238543	-103.63568
3002550135	DOS EQUIS 12 13 FEDERAL COM #009H	New	CIMAREX ENERGY CO.	WOLF	0	1.98	2023	9999	32.238545	-103.63575
3002541437	HYPERION STATE COM #003H	Active	TAP ROCK OPERATING, LLC	BSPG	11059	1.99	2014	9999	32.196453	-103.59311
3002524303	GULF NW STATE #001	Plugged	ADAMS OIL & GAS PRODUCERS	DEL	5160	1.99	1972	2002	32.241329	-103.61763
3002546884	GHOST RIDER 22 15 FEDERAL COM #101H	Active	APACHE CORPORATION	BSPG	9934	1.99	2020	9999	32.216788	-103.65489
3002550386	DOS EQUIS 12 13 FEDERAL COM #011H	New	CIMAREX ENERGY CO.	WOLF	0	1.99	9999	9999	32.238710	-103.63594

API	NAME	STATUS	OPERATOR	FM	TVD	DISTANCE (MI)	SPUD	PLUG	LATITUDE	LONGITUDE
3002545318	MAMBA 30 STATE COM #706H	Active	EOG RESOURCES INC	WOLF	12507	2.00	2018	9999	32.184326	-103.61374
3002545319	MAMBA 30 STATE COM #707H	Active	EOG RESOURCES INC	WOLF	12466	2.00	2018	9999	32.184259	-103.61395
3002524717	PRE-ONGARD WELL #001	Plugged	PRE-ONGARD WELL OPERATOR	DEL	5117	2.00	1974	1979	32.241322	-103.62617



**Surface Owners**

**Versado Gas Processors, L.L.C.**

KE Andrews & CO  
2424 RIDGE RD  
Rockwall, TX 75087

- Property Code. - 4000051757005
- 80.00 AC being S2S2 located in T24S, R32E, Sec13

**NGL North Ranch LLC**

6120 S Yale Ave  
Suite 805  
Tulsa, OK 74136

- Property Code - 4980808100234
- 65.35 AC being S2S2 located in T24S, R32E, Sec13
- Less 14.65 AC dedicated to NMDOT for NM 128
- Property Code - 4000051757004
- 258.15 AC being W2W2, S2SE4, SE4SW4 located in T24S, R32E, Sec14
- Less 21.85 AC dedicated to NMDOT for NM 128
- Property Code - 4 4000051757002
- 155.54 AC being E4NW4, N2NE4, SE4NE4 located in T24S, R32E, Sec23
- Less 4.44 AC dedicated to NMDOT for NM 128
- Property Code - 4 4000051757001
- 68.06 AC being N2, N2S2 located in T24S, R32E, Sec 24
- Less 11.94 AC dedicated to NMDOT for NM 128

**New Mexico Department of Transportation**

1120 Cerrillos Road  
P.O. Box 1149  
Santa Fe, NM 87504-1149  
Phone (505) 795-1401

- Lands in T24S, R32E with 14.65ac in sec 13, 21.85ac in sec 14, 4.44ac in sec 23, 11.94ac in sec 24

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**State of New Mexico**

State Land Office  
310 Old Santa Fe Trail, Santa Fe NM 87501  
Mailing Address:  
P.O. Box 1148, Santa Fe, NM 87504  
505-827-5760  
505-827-5766 (Fax)

- Lands in T24S, R32E Sections 12 and 24

**United States Bureau of Land Management**

New Mexico State Office  
301 Dinosaur Trail  
Santa Fe, NM 87508  
United States  
Phone: 505-954-2222

- Lands in T24S, R32E Sections 13 and 14 and T24S, R33E Sections 7, 18 and 19

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**Operators**

**Cimarex Energy Co.**

6001 Deauville Blvd  
300N  
Midland, TX 79706  
Main Phone: 432-571-7800

- Operations in T24S, R32E Sections 12,13, and 14

**Finaly Resources LLC**

16585 PCH  
Suite 324  
Sunset Beach, CA 90742  
Main Phone: 562-881-0975

- Operations in T24S, R32E Section 13

**COG Production, LLC**

One Concho Center  
600 W. Illinois Ave  
Midland, TX 79701  
Main Phone: 432-683-7443  
Main Fax: 432-687-8013

- Operations in T24S, R32E Section 23 and in T24S, R33E Section 7

**Devon Energy Production Co, LP**

333 W. Sheridan Ave  
Oklahoma City, OK 73102  
Phone Main: (405)235-3611  
Phone: (405) 228-4800

- Operations in T24S, R32E Sections 24 and 13, and in T24S, R33E Section 19

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**Oxy USA, Inc.**

Oil & Gas Royalty Interest Owners  
Attn: Land Administration  
P.O. Box 27570  
Houston, TX 77227-7757  
Phone: (713) 215-7231

- Operations in T24S, R33E Section 18

**NGL Water Solutions Permian, LLC**

865 North Albion Street  
Suite 400  
Denver, CO 80220  
Main Phone: 303-815-1010  
Main Fax: 303-815-1011

- Operations in T24S, R32E Section 24

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**Working Interest Owners**

**Cimarex Energy Co.**

6001 Deauville Blvd.  
Suite 300N  
Midland, Texas 79706  
Phone: (432) 571-7800

**Magnum Hunter Production Inc.**

840 Gessner Rd  
Suite 1400  
Houston, TX 77024

**Chevron USA Inc**

6001 Bollinger Canyon Road  
San Ramon, CA 94583, USA  
Phone: (925) 842-1000

**Chevron Midcontinent LP**

6301 Deauville Blvd  
Midland, Tx 79706  
Phone: (432) 687-7723

**Devon Energy Production Co. LP**

333 W. Sheridan Ave  
Oklahoma City, OK 73102  
Phone Main: (405)235-3611  
Phone: (405) 228-4800

**Conoco Phillips Company**

P.O. Box 2197  
Houston, Texas 77252-2197

**Conoco Phillips Company**

315 S Johnstone  
Bartlesville, OK 74005-7500

**Canaan Resources Drilling Company, LLC**

1101 N Broadway  
#300  
Oklahoma, City 73103

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**Oxy USA, Inc.**

Attn: Land Administration  
P.O. Box 27570  
Houston, TX 77227-7757  
Phone: (713) 215-7231

**Finaly Resources LLC**

16585 PCH  
Suite 324  
Sunset Beach, CA 90742  
Main Phone: 562-881-0975

**Cumberland Properties, Inc.**

3909 W Industrial  
Midland, TX 79703

**OVINTIV**

4 Waterway Square Pl  
Suite 100  
The Woodlands, TX 77380-2764

**Rover Operating LLC**

17304 Preston Rd  
Suite 740  
Dallas, TX 75252-4645

**Royalty Holding Co**

3535 NW 58th St #720  
Oklahoma City, OK 73112  
<https://www.royaltyholdingcompany.com/contact-us>

**XTO Holdings, LLC**

22777 Springwoods Village Pkwy  
Spring, Texas 77389  
Phone (817) 870-2800  
Fax: (817) 870-1671

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**COG Production, LLC**  
One Concho Center  
600 W. Illinois Ave  
Midland, TX 79701  
Main Phone: 432-683-7443  
Main Fax: 432-687-8013

**COG Operating LLC**  
600 W. Illinois Avenue  
Midland, Texas 79701

**Concho Oil & Gas LLC**  
600 W. Illinois Avenue  
Midland, Texas 79701

**Pitch Energy Corp**  
PO Box 304  
Artesia, NM 88211-0304

**SMC Oil & Gas, Inc.**  
6800 Gateway East  
Suite 1B  
El Paso, TX 79915  
Phone: (800) 762-7621

**Allar Company**  
735 Elm St.  
P.O. Box 1567  
Graham, Tx 76459  
Phone: (940) 549-0077  
jack@allarcompany.com

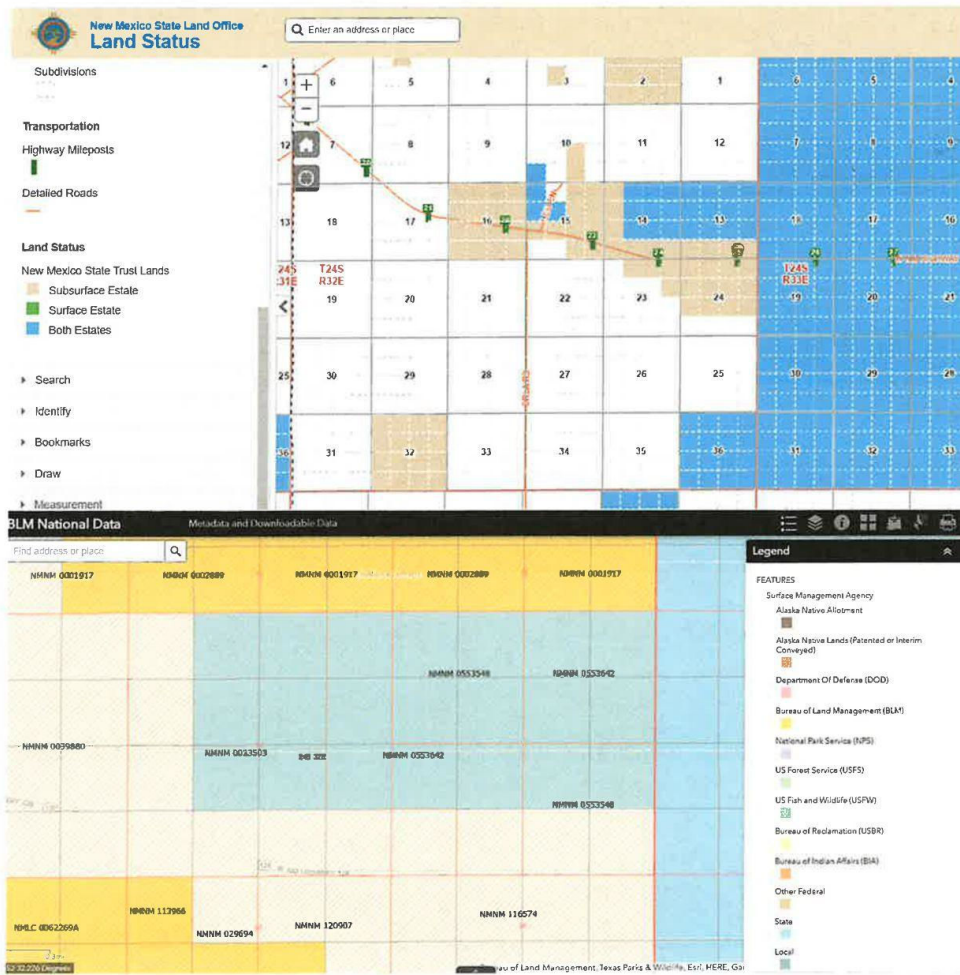
**Shepherd Royalty**  
5949 Sherry Lane  
Suite 1175  
Dallas, Tx 75225

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**Mineral Interest Owner(s) for unleased tracts**

Based on United States Bureau of Land Management maps, New Mexico Land Status Maps, Lea County Records, BLM Records and The State of New Mexico Land Office records, the State of New Mexico and the United States Bureau of Land Management appear to own all mineral interests in subject lands.



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## ATTACHMENT IV – RESERVOIR MODELING

### RESERVOIR MODELING

#### OVERVIEW

Numerical simulations of dynamic reservoirs are carried out on a detailed geological model to facilitate the disposal authorization for Copperhead AGI #001. These models project the injectivity of the well, its pressure dynamics, and the movement of the AGI plume. The chosen depth for acid gas injection is at approximately 17,299-18,689 ft MD. The target injection zone includes the Thirtyone, Wristen, and Fusselman formations.

#### INPUTS AND ASSUMPTIONS

In this study, we employed advanced software tools for the construction of geological and reservoir simulation models. Schlumberger's Petrel® software (Version 2023.3) was utilized for developing the geological models, while reservoir simulations were conducted using Computer Modeling Group (CMG)'s CMG-GEM® (Version 2024.10). CMG-WINPROP® (Version 2023.30) was used to perform PVT calculation through Equation of States and properties interactions among various compositions to feed the hydrodynamic modeling performed in CMG-GEM®. The treated acid gas (TAG) involved in the injections was modeled with the potential to exist in both dissolved and supercritical states within the aqueous and gaseous phases, respectively.

The construction of the static model was based on well logs and formation tops, aiming to accurately characterize and map the structural layers of the caprock. The geological model covers an area of approximately 3.1 by 3.2 miles, represented in a gridded format comprising 164 x 167 x 39 cells, totaling 1,068,132 cells. The grid size in the actively injected areas averages 100 by 100 square feet. **Figures IV-1** through **S3** provide detailed visualizations of the model, including a map view (**Figure IV-1**), a 3D representation of the simulation model (**Figure IV-2**), and estimates of porosity and permeability based on available data from well logs (**Figure IV-3**). In the model, the range of the porosity is between 0.1 to 8.99 %. The permeability is interpolated between 0.001 to 3.40 millidarcy (mD), and the vertical permeability anisotropy is 0.1 (**Figure IV-3**).

For initialization of the reservoir simulations, several parameters and assumptions were considered. The connate water saturation of the storage reservoir was conservatively set at 100 %, with a residual water saturation of 55 % as per established sources (Jenkins, 1961; Bennion and Bachu, 2005). The initial salinity was assumed at 83,198 ppm, an average derived from measurements in three nearby wells, and the well data is from U.S. Geological Survey National Produced Waters Geochemical Database (ver. 3.0, December 2023) (Blondes et al., 2023). Following industry standards and data from drill stem tests in the Delaware Basin, a pore pressure gradient of 0.45 psi/ft was estimated, establishing a reservoir pressure of 7,750 psi at the top of the Thirtyone-Wristen formation at the initiation phase.

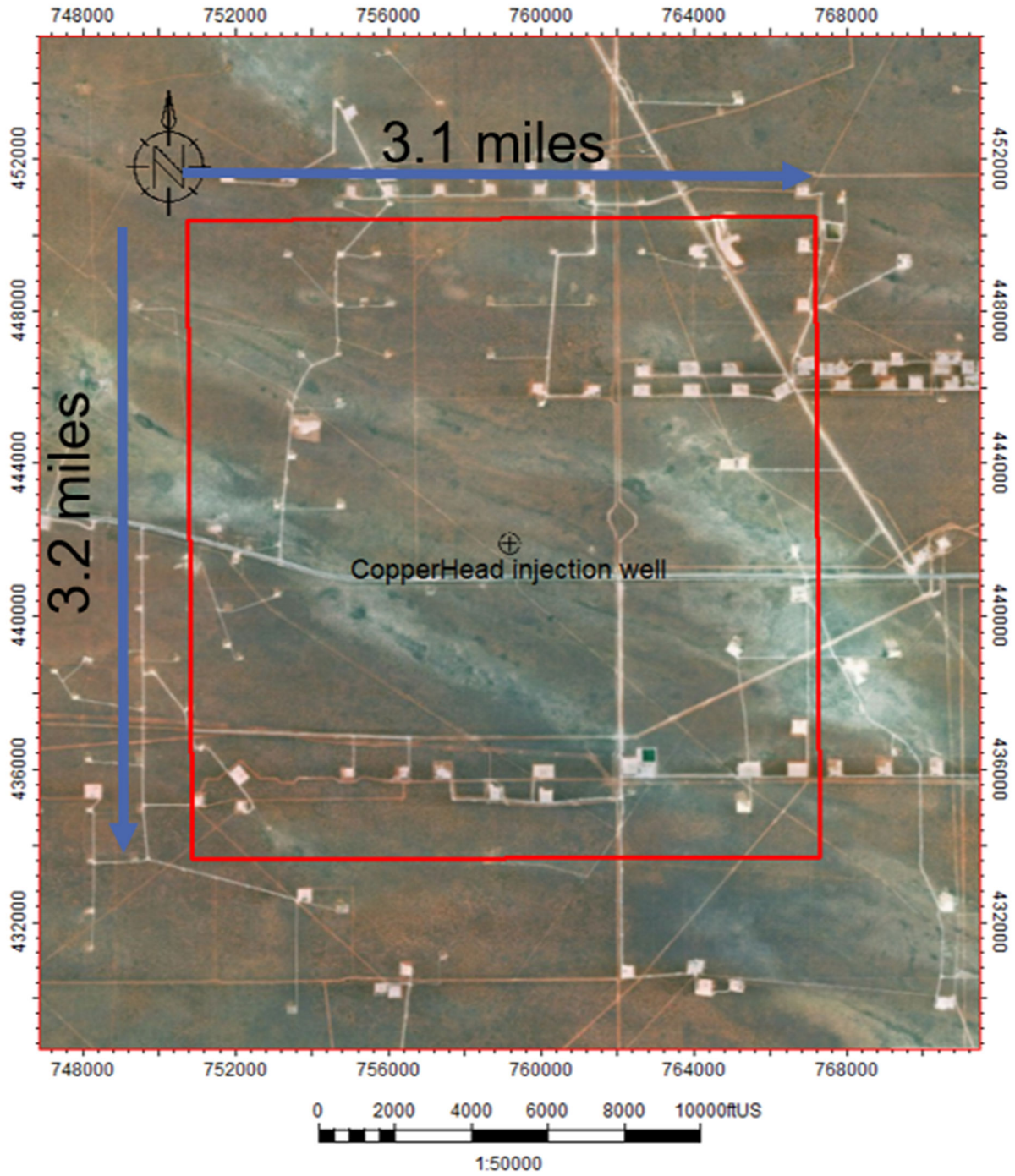


Figure IV-1. Map view of the simulation model of the Copperhead AGI #001

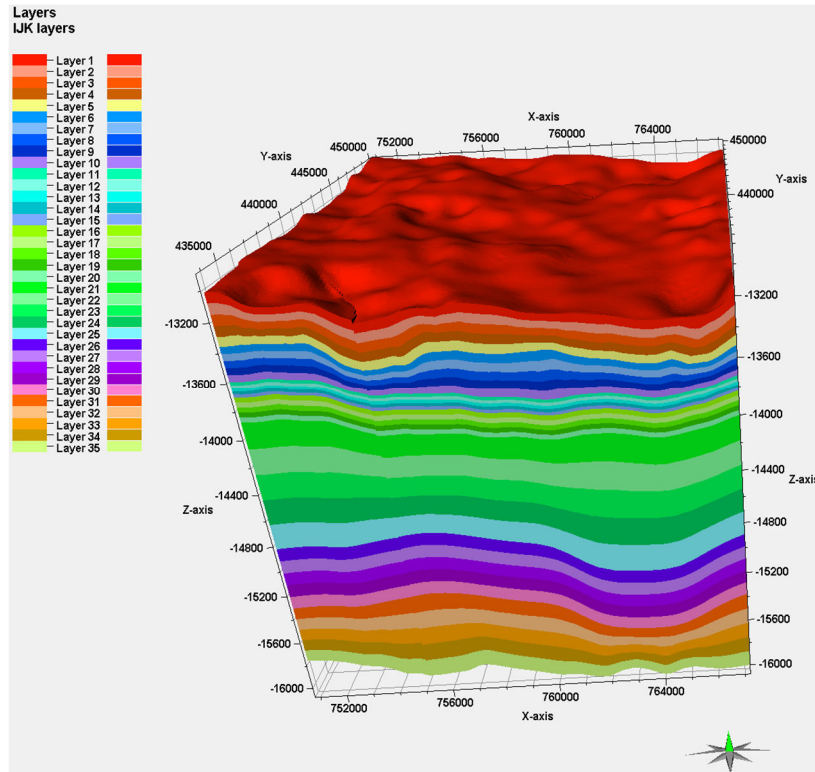


Figure IV-2. 3D view of the simulation model of the Copperhead AGI #1 containing Barnett, Mississippian, Woodford, Thirtyone, Wrysten, Fusselman, Montoya formations. Color legends represent the layers.

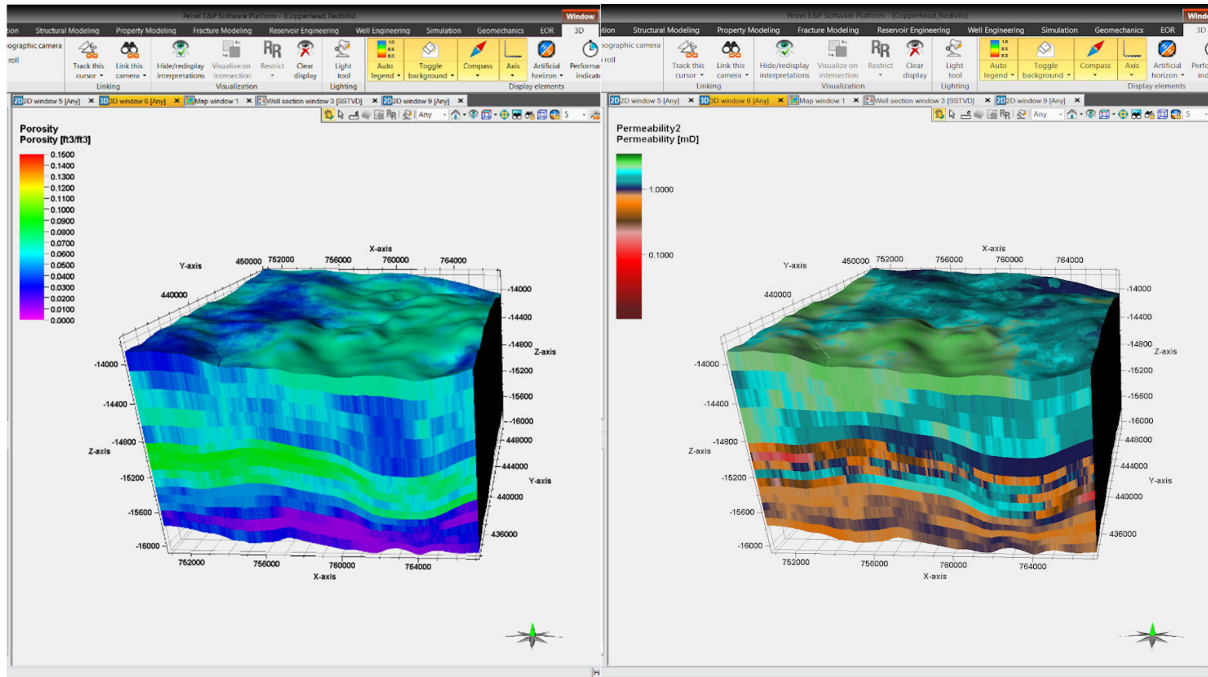


Figure IV-3. Porosity (left) and permeability (right) estimation of the storage zone (Thirtyone, Wrysten, and Fusselman formations).



The fracture gradient (FG) for the injection interval was calculated using Eaton’s formula, which characterized the formation lithology from Poisson’s ratio and stress ratio value:

$$FG=1-OBG-pp+pp$$

Where,

*is the Poisson’s ratio,*

OBG *is the overburden gradient,*

pp *is the pore pressure gradient*

An overburden gradient of 1.05 psi/ft is typically used in calculations when no site-specific data is available (Luo et al., 1994). Poisson’s ratio was assumed to be 0.3 for the injection layer, with a variation between 0.29 and 0.31 to account for uncertainties (Smye et al., 2021; Dvory and Zoback, 2021). The fracture gradient was estimated to be 0.65 to 0.68 psi/ft (Dvory and Zoback, 2021). This led to a calculated bottom hole formation fracture pressure of 10,370 psi. Furthermore, a safety margin of 10% was applied to this fracture gradient to prevent the bottom hole injection pressure (BHP) during active injection from surpassing the fracture gradient, setting the maximum BHP at 0.59 psi/ft in simulations. The geomechanical properties of the reservoir are detailed in **Table IV-1**. These parameters, derived from existing well logs and referenced literature, will be validated with actual measurements upon completion of the proposed, with subsequent updates to the modeling and simulation work as necessary.

**Table IV-1. Summary of parameters for the confining zones and injection interval**

Parameter	Upper Confining Zone	Injection Interval	Lower Confining Zone
Overburden Gradient (psi/ft)	1.05	1.05	1.05
Pore Pressure Gradient (psi/ft)	0.45	0.45	0.45
Poisson’s Ratio	0.29	0.30	0.31
Fracture Gradient (psi/ft)	0.68	0.65	0.68
Fracture Gradient with 10% Safety Factor (psi/ft)	0.61	0.59	0.61

The simulation at Copperhead AGI #001 is set to inject at the proposed average injection rate of 12 MMSCFD and the proposed maximum injection rate of 26 MMSCFD. A maximum allowable surface injection pressure (MAOP) calculated by the NMOCD approved method and bottom hole pressures of 5,160 psi and 10,370 psi, respectively, are set, with an injection composition of 30% H2S and 70% CO2.

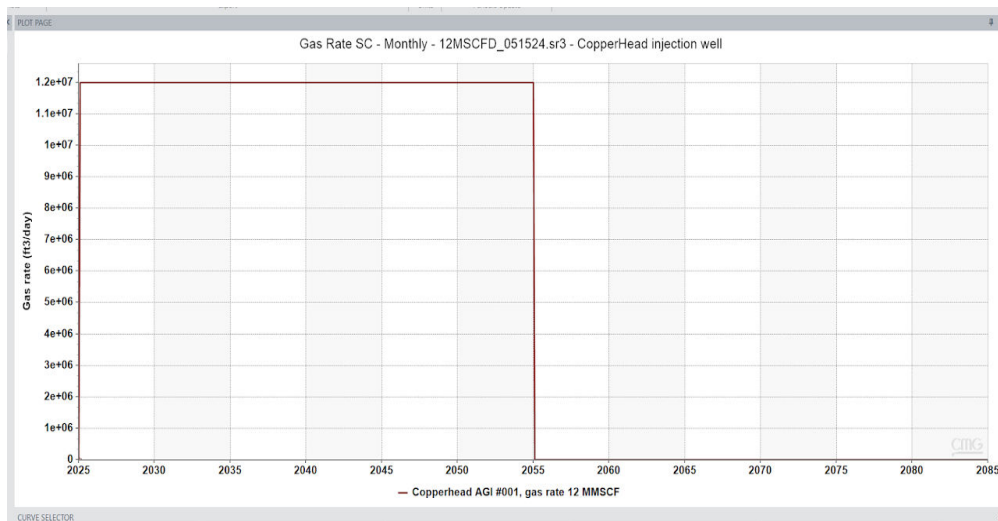
The simulation begins on January 1, 2025, and concludes on January 1, 2085, encompassing a 30-year active injection phase followed by a subsequent 30-year post-injection monitoring phase to estimate the maximum impacted area.

**Table IV-2. Well operations input of reservoir simulation**

Well Name	Injection Starting Date	Shut-In Date	Injection Rate
Copperhead AGI #001	2025	2055 (expected)	12 MMSCFD (Surface condition)
Copperhead AGI #001	2025	2055 (expected)	26 MMSCFD (Surface condition)

### MODEL OUTPUTS

The injection rate profiles for Copperhead AGI #001 suggests the consistent proposed rates, as depicted in **Figure IV-4**. The consistent rate of both 12 MMSCFD and 26 MMSCFD ensures that the target formations can safely receive the treated acid gas (TAG) from Copperhead #001 over a 30-year period while adhering to the pressure constraints and maintaining formation integrity.



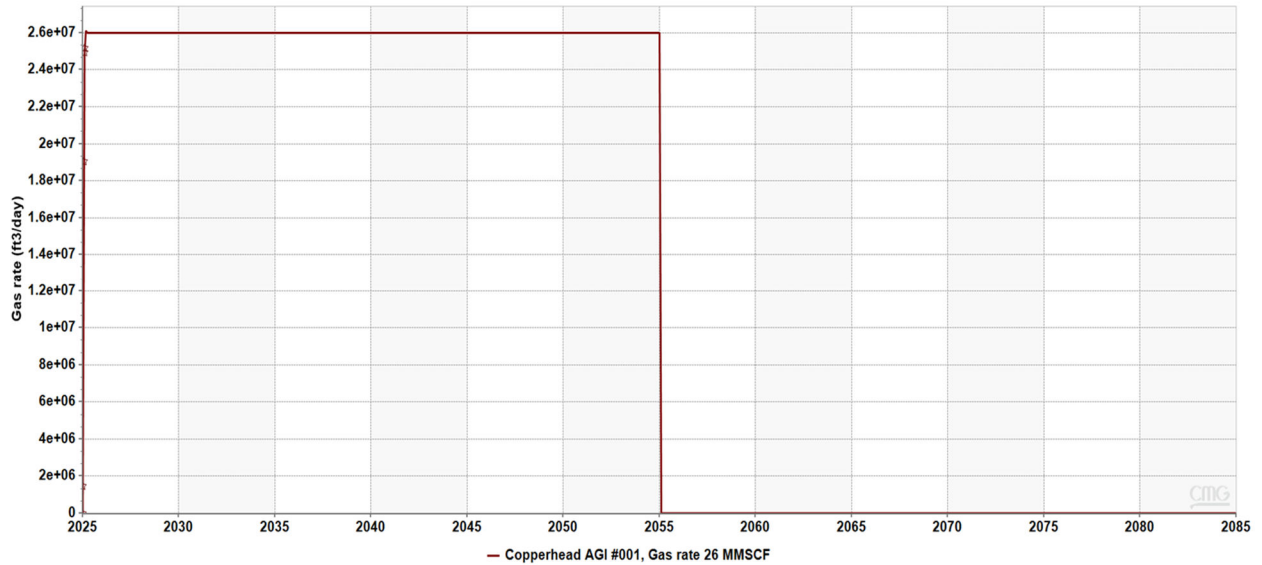


Figure IV-4. Forecast of TAG injection rate of Copperhead AGI #001 at 12MMSCFD (top) and 26 MMSCFD (bottom)

### TAG PLUME

Figure IV-5 captures the evolution of the TAG plume for Copperhead AGI #001 at various stages: 5, 10, 15, 20, 25, and 30 years' post-injection commencement in 2025, with the largest part of the plume estimated to span 3,832 ft (0.73 miles) with 12 MMSCFD and 5,362 ft (1.02 miles) with 26 MMSCFD. The dashed lines in the figure delineate the plume boundary at these specified intervals.

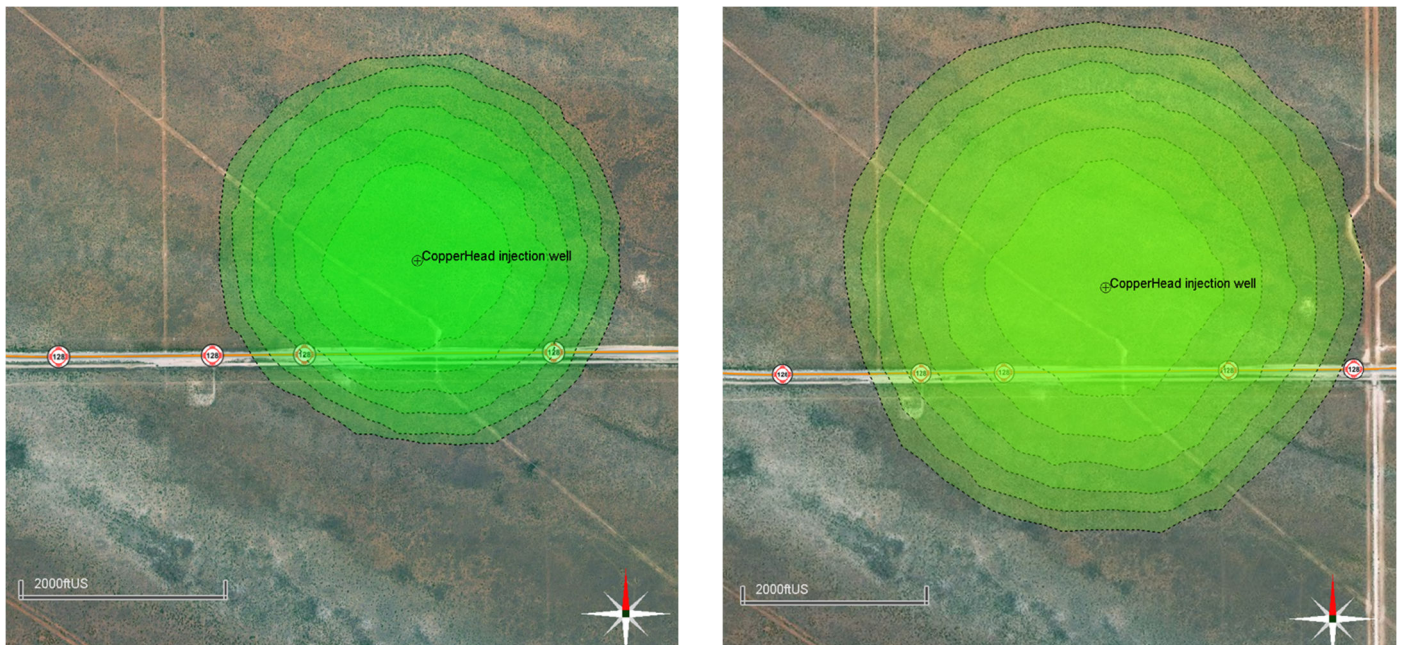


Figure IV-5. Extent of TAG plume (represented by gas saturation) at years 2030, 2035, 2040, 2045, 2050, and 2055 (end of injection) in map view at 12 MMSCFD (left) and 26 MMSCFD (right). Dashed lines represent plume boundary at these time intervals.

**PREDICTED BOTTOM HOLE PRESSURES**

The maximum and average wellhead pressures were determined from the simulation output by CMG-GEM (GEM). GEM uses Equation-of-State (EOS) to compute the effects from the tubing size and calculate friction losses of the phase behavior and fluid properties of the flowing fluid. The input parameters for the wellbore model are summarized in **Table IV-3**. The prediction of the bottom hole and wellhead pressures are summarized in **Table IV-4** and displayed in **Figure IV-6**.

**Table IV-3. Input parameters for Wellbore Model Pressure Calculations**

<b>Wellbore Model</b>	<b>Values</b>
Length, ft	17,299
Relative Roughness	0.001
Wellhead Temperature, °F	90
Bottomhole Temperature, °F	225
Tubing Size (OD), inch	3.5
Composition of injected gas	70% CO <sub>2</sub> /30% H <sub>2</sub> S
Density and Viscosity of injected gas	Dynamically Calculated by EOS

**Table IV-4. Summary of predicted injection pressures**

<b>Injection rate, MMSCFD</b>	<b>Average BHP, psi</b>	<b>Max BHP, psi</b>	<b>Average WHP, psi</b>	<b>Max WHP, psi</b>
12	6,880	7,469	1,551	1,663
26	7,353	9,094	2,476	3,101



Figure IV-6 Bottom hole pressure (red) and wellhead pressure (green) of Copperhead AGI #001 at 12 MMSCFD (top) and 26 MMSCFD (bottom)

*Critical Pressure Front*

The base of the deepest underground sources of drinking water (USDW) at approximately 1,500 ft below the surface at the Copperhead AGI #1 area. As given by Nicot et al. (2008) and Bandilla et al. (2012), assuming (1) hydrostatic conditions and (2) initially linearly varying densities in the borehole and constant density once the injection-zone fluid is lifted to the top of the borehole (i.e., uniform density approach), the threshold pressure increase ( $\Delta P_c$ ) may be calculated:

$$\Delta P_c = \frac{1}{2} g \cdot \epsilon \cdot (z_u - z_i)^2$$

where  $\xi$  is a linear coefficient defined by:

$$\xi = \frac{\rho_i - \rho_u}{(z_u - z_i)}$$

Where:  $\rho_u$  is the fluid density of the USDW,

$\rho_i$  is the injection interval fluid density,

$g$  is the acceleration due to gravity,

$z_u$  is the representative elevation of the USDW,

$z_i$  is the representative elevation of the injection interval

As shown in **Table IV-5**, the maximum allowable pressure elevation is 698 psi. **Figure VI-7** shows the pressure elevation at year 2055 (end of injection) on the top of Thirtyone formation. The center of pressure elevation created by Copperhead AGI #1 with 26 MMSCFD injection rate is the maximum pressure gain of 500 psi. This pressure increase is less than 698 psi, indicating the USDW will not be endangered from Copperhead AGI #1 injection.

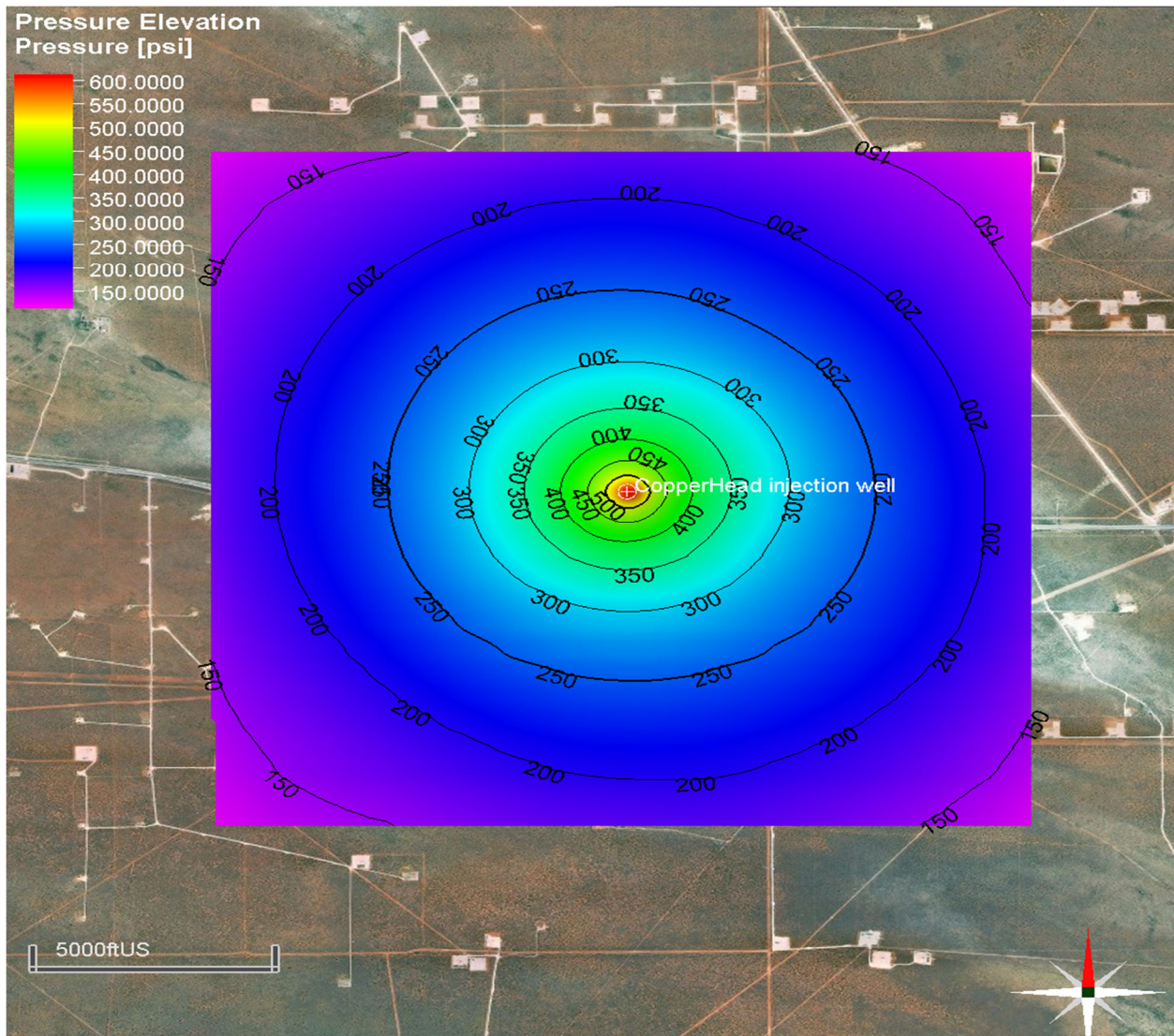


Figure IV-7 Pressure elevation in 2055 (end of injection) on the top of the Thirtyone formation

Table IV-5 – Summary of parameters for the USDW critical pressure calculations

USDW Base	Fresh water density	Brine Salinity	Brine Density	Top of Thirtyone	Admissible additional pressure
1,500 ft	62.4 lbm/ft <sup>3</sup>	83,198 ppm	63.70 lbm/ft <sup>3</sup>	17,299 ft	698 psi

In summary, the review of reservoir engineering and numerical simulations indicates that the target formation can receive the TAG at the proposed average and maximum injection rates. The models confirm that the injection pressures will remain below the formation's fracture pressure, ensuring the

safe containment of the injected TAG within the designated injection and post-injection periods. The planned injection process is designed to facilitate sequestration while mitigating potential environmental impacts. This analysis relies on the best available estimates from existing legacy wells and referenced literature. After the proposed well is completed, formation properties will be assessed, and the study will be updated with site-specific data and the most recent legacy injection records before any TAG injection commences.

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## References

1. Jenkins R.E. 1961. Characteristic of the Delaware Formation.
2. Bennion, B., Bachu, S. 2005. Relative permeability Characteristics for Supercritical CO<sub>2</sub> Displacing Water in a Variety of Potential Sequestration Zones in the Western Canada Sedimentary Basin. SPE 95547.
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5. Smye, K.M., Hennings, P.H., and Horne, E.A., 2021. Variations in vertical stress in the Permian Basin region. *AAPG Bulletin*, 105(10), pp. 1893-1907.
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7. Bandilla, K.W., Kraemer, S.R., Birkholzer, J.T. 2021. Using semi-analytic solutions to approximate the area of potential impact for carbon dioxide injection. *International Journal of Greenhouse Gas Control*. <https://doi.org/10.1016/j.ijggc.2012.02.009>
8. Blondes, M.S., Knierim, K.J., Croke, M.R., Freeman, P.A., Doolan, C., Herzberg, A.S., and Shelton, J.L., 2023, U.S. Geological Survey National Produced Waters Geochemical Database (ver. 3.0, December 2023): U.S. Geological Survey data release, <https://doi.org/10.5066/P9DSRCZJ>.



## ATTACHMENT V – GROUNDWATER ANALYSES

There are two Targa water wells located in this region. The water samples provided were taken on July 31<sup>st</sup>, 2023, from groundwater wells C-03666 POD1 and C-03917 POD1 which are both less than 6 miles from the Copperhead AGI #1 well. The sampling and analyses provided were all done in-house at New Mexico Tech.

For these water wells, 1-L washed Nalgene bottles were triple-rinsed with well water and filled. Samples were temperature regulated prior to the general chemistry analysis. The water is basic with pH of 8 to 9 and calculated TDS of 453 to 1,380 mg/L. The conductivity ranges from 757 to 2,066 us/cm.

GENERAL CHEMISTRY ANALYSES		
Customer name	Tianguang Fan	
Company	New Mexico Tech	
Address	801 Leroy Place	
City, State, Zip code	Socorro NM 87801	
Phone	(575) 835-5542	
Email	Tianguang.Fan@nmt.edu	
Date sampled	7/31/2023	
Date completed	8/30/2023	
Analyte	C-03666	C-03917
pH	8.5	8.2
Conductivity (uS/cm)	757.0	2,066.0
Alkalinity as CO <sub>3</sub> <sup>2-</sup> (mg/L)	4.0	
Alkalinity as HCO <sub>3</sub> <sup>-</sup> (mg/L)	287.9	97.6
Chloride (mg/L)	15.0	191.4
Fluoride (F) (mg/L)	ND	ND
Bromide (Br) (mg/L)	ND	1.5
Nitrate (NO <sub>3</sub> <sup>-</sup> ) (mg/L)	ND	ND
Phosphate (mg/L)	ND	ND
Sulfate (SO <sub>4</sub> <sup>2-</sup> ) (mg/L)	106.0	666.2
Lithium(Li) (mg/L)	0.1	0.2
Sodium (Na) (mg/L)	156.0	370.7
Potassium (K) (mg/L)	3.6	6.5
Magnesium (Mg) (mg/L)	15.0	33.9
Calcium (Ca) (mg/L)	12.9	62.7
TDS Calculation (mg/L)	452.6	1,379.6
Total cations (meq/L)	8.8	22.2
Total anions (meq/L)	-7.5	-20.9

Percent difference (%)	7.9	3.1
ORP (mV)	292.7	294.2
IC (ppm)	69.8	23.0
NPOC (ppm)	0.6	0.4
ND, non-detectable.		

## ATTACHMENT VI – SAMPLE NOTICE LETTER

### SAMPLE NOTICE LETTER

June XX, 2024

Sample Notice Letter

VIA CERTIFIED MAIL

RETURN RECEIPT REQUESTED

TO ALL PARTIES ENTITLED TO NOTICE

RE: TARGA MIDSTREAM SERVICES LLC PROPOSED COPPERHEAD AGI #1

This letter is to advise you that Targa Midstream Services LLC has filed the enclosed C-108 application (Application for Authorization to Inject) with the New Mexico Oil Conservation Division seeking authorization to drill and operate a Class II acid gas injection (AGI) well, the Copperhead AGI #1 well, at Targa Resources' gas processing facility in Lea County, New Mexico. In accordance with the requirements of the New Mexico Oil Conservation Division, you are being provided this notice and a copy of the complete application as you are an interested party within one (1) mile of the proposed AGI well location.

The proposed Copperhead AGI #1 will be a vertical well with a surface location of approximately 793 feet from the south line (FSL) and 429 feet from the east line (FEL) (Unit P) in Section 13, Township 24 South, Range 32 East, Lea County, New Mexico. As proposed, the Copperhead AGI #001 well will inject waste carbon dioxide and hydrogen sulfide into the Devonian formation from approximately 17,299 to 18,689 feet. The maximum surface pressure will not exceed 3,460 psi with a maximum daily injection volume of 26 million standard cubic feet (MMSCF).

This application (Case No. XXXXX) has been set for a hearing before the New Mexico Oil Conservation Commission at XX:XX am on XX, 2024. You are not required to attend this hearing, but as an owner of an interest that may be affected by this application, you may appear and present testimony. Failure to appear at that time and become a party of record will preclude you from challenging the application at a later date. Hearings are currently conducted in a hybrid fashion, both in-person at the Energy, Minerals, Natural Resources Department, Wendell Chino Building, Pecos Hall, 1220 South St. Francis Drive, 1st Floor, Santa Fe, NM 87505 and via the WebEx virtual meeting platform. To participate virtually, see the instructions posted on the OCD Hearings website: <https://www.emnrd.nm.gov/ocd/hearing-info/>.

Pursuant to Division Rule 19.15.4.13.B, a party who intends to present evidence at the hearing shall file a pre-hearing statement and serve copies on other parties, or the attorneys of parties who

are represented by counsel, at least four business days in advance of a scheduled hearing, but in no event later than 5:00 p.m. Mountain Time, on the Thursday preceding the scheduled hearing date. The statement must be submitted through the OCD E-Permitting system (<https://wwwapps.emnrd.nm.gov/ocd/ocdpermitting/>) or via e-mail to [ocd.hearings@emnrd.nm.gov](mailto:ocd.hearings@emnrd.nm.gov) and should include: the names of the parties and their attorneys, a concise statement of the case, the names of all witnesses the party will call to testify at the hearing, the approximate time the party will need to present its case, and identification of any procedural matters that are to be resolved prior to the hearing.

If you have any questions concerning this application, you may contact Jimmy Oxford at 940-220-2493.

Sincerely,

/s/ Dana S. Hardy

Counsel for Targa Midstream Services LLC