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

APPLICATION OF SELECT WATER SOLUTIONS, LLC FOR APPROVAL OF A SALTWATER DISPOSAL WELL, LEA COUNTY, NEW MEXICO. **CASE NO. _____**

APPLICATION

Pursuant to 19.15.26.8 NMAC, Select Water Solutions, LLC ("Select Water") requests that the New Mexico Oil Conservation Division ("Division") issue an order approving a saltwater disposal well in Lea County, New Mexico. In support of its application, Select Water states the following.

1. Select Water (OGRID No. 289068) seeks an order approving its proposed Antelope Fed 28 SWD #1, to be drilled at a location 629' from the south line and 2,543' from the west line (Unit N) of Section 28, Township 25 South, Range 35 East, Lea County, New Mexico, for the purpose of produced water disposal.

2. Select Water seeks authorization to inject produced water into the Bell Canyon and Cherry Canyon formations (SWD; Bell Canyon-Cherry Canyon; Code 96802) at a depth of approximately 5,270 feet to 7,545 feet.

3. Select Water proposes to inject an average of 15,000 barrels of water per day up to a maximum of 20,000 barrels of water per day.

4. Select Water requests that the Division approve a maximum surface injection pressure of 1,054 psi.

5. A Division Form C-108, which includes an area of review map, structural cross sections, seismic sections and analysis, no hydrologic connection statement, reservoir characterization, source water analysis, injection formation water analysis, water well map and

data, reservoir performance modeling, list of wells, and list of affected parties, is attached as Exhibit A.

6. The granting of this application will prevent waste and protect correlative rights.

WHEREFORE, Select Water requests that this application be set for hearing on September 11, 2025, and that, after notice and hearing, the Division enter an order approving this application and authorizing Select Water to inject produced water into the Antelope Fed 28 SWD #1.

Respectfully submitted,

HARDY MCLEAN LLC

/s/ Dana S. Hardy

Dana S. Hardy
Jaclyn M. McLean
Jaime R. Kennedy
125 Lincoln Ave, Ste. 223
Santa Fe, NM 87501
Phone: (505) 230-4410
dhardy@hardymclean.com
jmclean@hardymclean.com

Counsel for Select Water Solutions, LLC

RECEIVED:	REVIEWER:	TYPE:	APP NO:

ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION

- Geological & Engineering Bureau –
1220 South St. Francis Drive, Santa Fe, NM 87505

ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Applicant: Select Water Solutions, LLC **OGRID Number:** 289068
Well Name: Antelope Fed 28 SWD #1 **API:**
Pool: SWD; BELL CANYON-CHERRY CANYON **Pool Code:** 96802

SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW

1) **TYPE OF APPLICATION:** Check those which apply for [A]
   A. Location – Spacing Unit – Simultaneous Dedication
   ☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD

   B. Check one only for [I] or [II]
   [I] Commingling – Storage – Measurement
   ☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM
   [II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
   ☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

FOR OCD ONLY
☐ Notice Complete
☐ Application Content Complete

2) **NOTIFICATION REQUIRED TO:** Check those which apply.
   A. ☒ Offset operators or lease holders
   B. ☐ Royalty, overriding royalty owners, revenue owners
   C. ☐ Application requires published notice
   D. ☐ Notification and/or concurrent approval by SLO
   E. ☒ Notification and/or concurrent approval by BLM
   F. ☒ Surface owner
   G. ☐ For all of the above, proof of notification or publication is attached, and/or,
   H. ☒ No notice required

3) **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Reed Davis
Print or Type Name

07/28/25
Date

918-382-7581
Phone Number

Signature

rdavis@all-llc.com
e-mail Address

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 ____X___Disposal _____Storage
Application qualifies for administrative approval? _____Yes ____X____No

II. OPERATOR: Select Water Solutions, LLC

ADDRESS: 1820 N I-35, Gainesville, TX 76240

CONTACT PARTY: David Cheek PHONE: 405-482-7508

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.

IV. Is this an expansion of an existing project? _____Yes ____X____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.

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.

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.).

*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.

IX. Describe the proposed stimulation program, if any.

*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.

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.

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: Reed Davis TITLE: Geophysicist

SIGNATURE: _____ DATE: 07/28/25

E-MAIL ADDRESS: rdavis@all-llc.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: File Electronically Via OCD Permitting

Application for Authorization to Inject
Well Name: Antelope Fed 28 SWD #1

III – Well Data (*The wellbore diagram is included as **Attachment 1***)

A.

(1) General Well Information:

Operator: Select Water Solutions, LLC (OGRID No. 289068)
Lease Name & Well Number: Antelope Fed 28 SWD #1
Location Footage Calls: 629' FSL & 2,543' FWL
Legal Location: Lot N, S28 T25S R35E
Ground Elevation: 3,195'
Proposed Injection Interval: 5,270' – 7,545'
County: Lea

(2) Casing Information:

Type	Hole Size	Casing Size	Casing Weight	Setting Depth	Sacks of Cement	Estimated TOC	Method Determined
Conductor	20"	18-5/8"	94.5 lb/ft	120'	35	Surface	Circulation
Surface	17-1/2"	13-3/8"	54.5 lb/ft	985'	685	Surface	Circulation
Intermediate	12-1/4"	9-5/8"	40.0 lb/ft	5,190'	1,395	Surface	Circulation
Production	8-3/4"	7-5/8"	29.7 lb/ft	7,565'	2,345	Surface	CBL
Tubing		5-1/2"	17.0 lb/ft	5,250'			

(3) Tubing Information:

5-1/2" (17.0 lb/ft) fiberglass or equivalent lined tubing with setting depth of 5,250'.

(4) Packer Information: SC-2 or equivalent packer set at 5,250'.

B.

(1) Injection Formation Name: Bell Canyon and Cherry Canyon
Pool Name: SWD; BELL CANYON-CHERRY CANYON
Pool Code: 96802

(2) Injection Interval: Perforated injection between 5,270' – 7,545'

(3) Drilling Purpose: New drill for saltwater disposal

(4) Other Perforated Intervals: No other perforated intervals exist.

(5) Overlying Oil and Gas Zones: Below are the approximate formation tops for known oil and gas producing zones in the area.

- None

Underlying Oil and Gas Zones: Below are the approximate formation tops for known oil and gas producing zones in the area.

- Brushy Canyon (7,780')
- Bone Spring (9,100')
- Wolfcamp (12,375')

V – Well and Lease Details

The following maps and documents are included as ***Attachment 2***:

- 2-mile Production Review Map
- 1-mile Problem Well Map
- 1-mile AOR Well Table
- 2-Mile Lease Map
- 2-Mile Mineral Ownership Map
- 2-Mile Surface Ownership Map
- Potash Lease Map

VI – AOR Well List

As recommended by the Oil Conservation Division (OCD) in Cases 23686 and 23687 Exhibit 11a 1.d, the proposed Select Delaware Mountain Group SWDs have been planned with uniform spacing and a one-mile radius area of review.

A list of the well(s) within the 1-mile AOR is included in ***Attachment 2***.

Two wells have been drilled in the 1-mile AOR. Both of these wells have been properly cased and cemented through the proposed injection zone.

VII – Proposed Operation

(1) **Proposed Maximum Injection Rate:** 20,000 bpd
Proposed Average Injection Rate: 15,000 bpd
Step Rate Test: Select intends to conduct a Step Rate Test (SRT) at the proposed Antelope Fed 28 SWD #1 location, prior to commencement of injection, to determine the formation fracture gradient and maximum allowable surface injection pressure.

(2) A **closed-loop system** will be used.

(3) **Proposed Maximum Injection Pressure**: 1,054 psi (surface)
Proposed Average Injection Pressure: Approximately 790 psi (surface)

(4) **Source Water Analysis:** The expected injectate will consist of produced water from production wells completed in the Abo, Yeso Group, Avalon Shale, Bone Spring, and Wolfcamp formations. Publicly available water quality analysis from the Go-Tech database is included for these formations as ***Attachment 3***.

(5) **Injection Formation Water Analysis:** The proposed SWD will be injecting water into the Bell Canyon and Cherry Canyon formations of the Delaware Mountain Group, which are non-productive zones known to be compatible with formation water from the Abo, Yeso Group, Avalon Shale, Bone Spring, and Wolfcamp formations. Water analyses from the Delaware Mountain Group in the area are included as ***Attachment 4*.**

VIII – Geologic Description

The proposed injection interval includes the Bell Canyon and Cherry Canyon formations of the Delaware Mountain Group from 5,270' – 7,545'. The Guadalupian-age Bell Canyon and Cherry Canyon formations consist primarily of sandstones and siltstones with significant primary porosity and permeability, indicating these formations are viable injection targets. Select Water

Solutions, LLC will not perforate or inject into the Lamar Dolomite or Brushy Canyon Formation of the Delaware Mountain Group.

Further reservoir characterization, including discussion of the injection formation, overlying and underlying confinement zones, and historic use of the field is included as ***Attachment 5***.
In addition, structural and seismic cross sections depicting the area are included as ***Appendix A.*** Expert evaluation of the 3-D seismic section and structural cross sections are included within the *3-D Seismic Interpretation Statement* as ***Attachment 8****.*

Reservoir performance modeling, over 20 years, is included as ***Appendix B.***

The base of the USDW is the Rustler Formation at a depth of approximately 985 feet. Depth of the nearest water well in the area is approximately 105 feet below ground surface.

IX – Proposed Stimulation Program

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

X – Logging and Test Data

Logs to be run include gamma ray, resistivity, neutron density, and sonic and will be submitted to the Division upon completion of the well.

Every two years, a static bottomhole pressure reading will be obtained, and a report will be generated to summarize performance based on injection volume, injection pressure, and any additional information collected during the period. The evaluation will include a delineation of the injection pressure front and a Hall's plot for each year and every four years an injection survey will be conducted.

XI – Fresh Groundwater Samples

Based on a review of data from the New Mexico Office of the State Engineer, there are no groundwater wells located within 1-mile of the proposed SWD location.

A water well map is included as ***Attachment 6***.

XII – No Hydrologic Connection Statement

No publicly known faulting is present in the area that would provide a hydrologic connection between the injection interval and overlying USDWs. Additionally, the casing program has been designed to ensure there will be no hydrologic connection between the injection interval and overlying USDWs.

A signed *No Hydrologic Connection Statement* is included as ***Attachment 7.***

XIII – Notice

A list of notice recipients is included as ***Attachment 9****.*

Attachments

Attachment 1:

- C-102
- Wellbore Diagram
- Packer Diagram

Attachment 2: Area of Review Information:

- 2-mile Production Review Map
- 1-mile Problem Well Map
- 1-mile AOR Well Table
- 2-mile Lease Map
- 2-mile Mineral Ownership Map
- 2-mile Surface Ownership Map
- Potash Lease Map

Attachment 3: Source Water Analysis

Attachment 4: Injection Formation Water Analysis

Attachment 5: Reservoir Characterization

Attachment 6: Water Well Map and Well Data

Attachment 7: No Hydrologic Connection Statement

Attachment 8: 3-D Seismic Interpretation Statement

Attachment 9: List of Affected Persons

Appendix A: Seismic and Structural Cross Sections

Appendix B: Reservoir Performance Modeling

Attachment 1

- C-102
- Wellbore Diagram
- Packer Diagram

C-102 Submit Electronically Via OCD Permitting	State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION	Revised July 9, 2024 Submittal Type: ☒ Initial Submittal ☐ Amended Report ☐ As Drilled

WELL LOCATION INFORMATION

API Number	Pool Code	Pool Name	
Property Code	Property Name: ANTELOPE FED 28 SWD		Well Number: #1
OGRID No.	Operator Name: SELECT WATER SOLUTIONS, LLC		Ground Level Elevation: 3195'
Surface Owner: ☐ State ☐ Fee ☐ Tribal ☒ Federal		Mineral Owner: ☐ State ☐ Fee ☐ Tribal ☒ Federal	

Surface Location

UL	Section	Township	Range	Lot	Ft. from N/S	Ft. from E/W	Latitude	Longitude	County
N	28	25 S	35 E		629' FSL	2543' FWL	32.095817°	-103.372795°	LEA

Bottom Hole Location

UL	Section	Township	Range	Lot	Ft. from N/S	Ft. from E/W	Latitude	Longitude	County

Dedicated Acres	Infill or Defining Well	Defining Well API	Overlapping Spacing Unit (Y/N)	Consolidation Code

Order Numbers. | Well setbacks are under Common Ownership: ☐Yes ☐No

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Ft. from N/S	Ft. from E/W	Latitude	Longitude	County

First Take Point (FTP)

UL	Section	Township	Range	Lot	Ft. from N/S	Ft. from E/W	Latitude	Longitude	County

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Ft. from N/S	Ft. from E/W	Latitude	Longitude	County

Unitized Area or Area of Uniform Interest	Spacing Unit Type ☐ Horizontal ☐ Vertical	Ground Floor Elevation: 3195'

OPERATOR CERTIFICATIONS

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and, if the well is a vertical or directional well, 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 a working interest or unleased mineral interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

If this well is a horizontal well, I further certify that this organization has received the consent of at least one lessee or owner of a working interest or unleased mineral interest in each tract (in the target pool or formation) in which any part of the well's completed interval will be located or obtained a compulsory pooling order from the division.

JANUARY 27, 2025

Signature: Reed Davis | Date

Printed Name: rdavis@all-llc.com

Email Address

SURVEYOR CERTIFICATIONS

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.

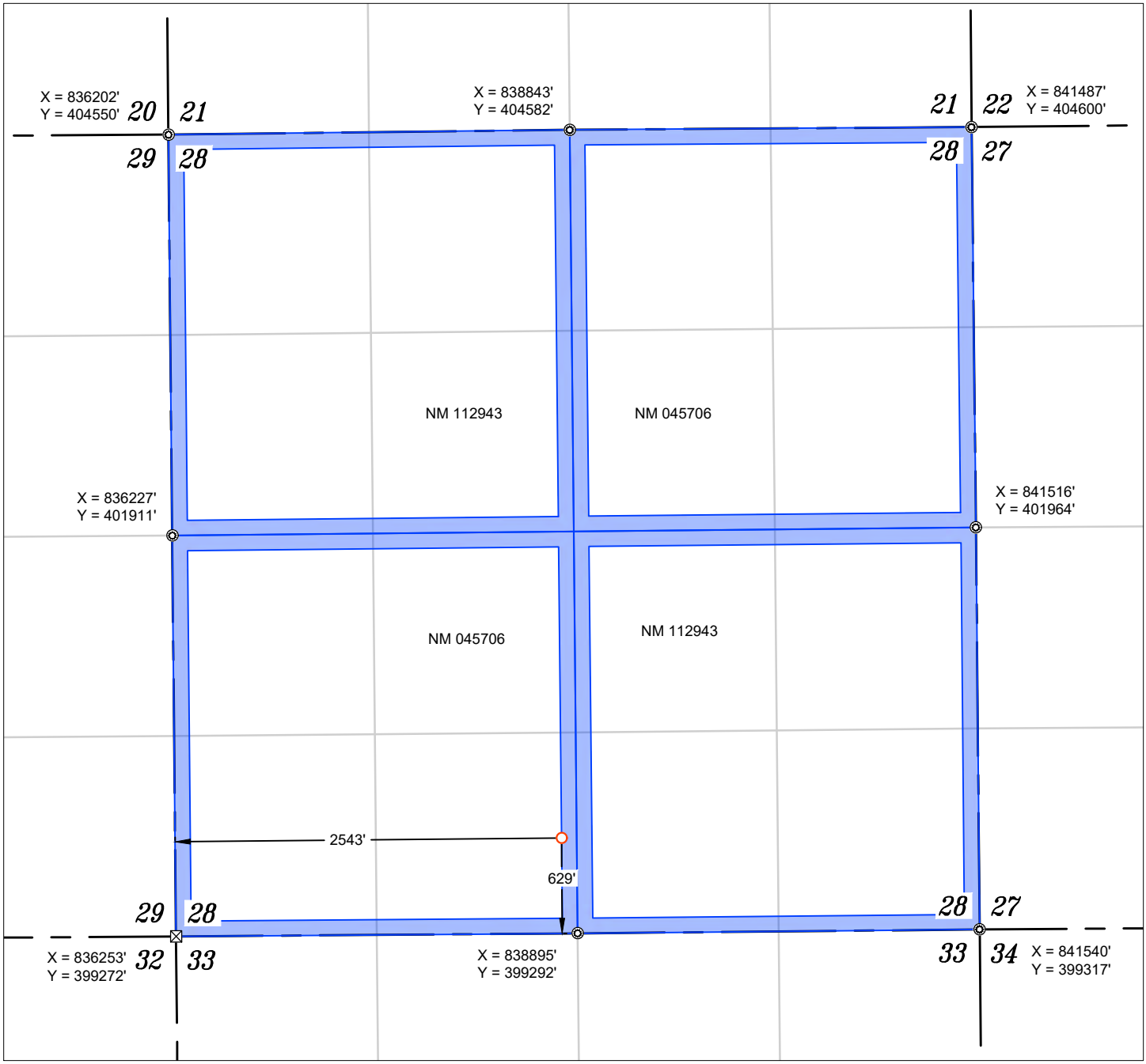
TIM C. PAPPAS NEW MEXICO 21209 PROFESSIONAL SURVEYOR

28 Jan 2025

Signature and Seal of Professional Surveyor

Certificate Number: 21209 | Date of Survey: JANUARY 27, 2025

Note: 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.



WELL NAME: ANTELOPE FED 28 SWD #1
ELEVATION: 3195'

NAD 83 (SHL) 629' FSL & 2543' FWL
LATITUDE = 32.095817° LONGITUDE = -103.372795°
NAD 27 (SURFACE HOLE LOCATION)
LATITUDE = 32.095691° LONGITUDE = -103.372332°
STATE PLANE NAD 83 (N.M. EAST)
N: 399919.83' E: 838788.97'
STATE PLANE NAD 27 (N.M. EAST)
N: 399861.92' E: 797601.71'

0' 1000' 2000'

SCALE: 1" = 1000'

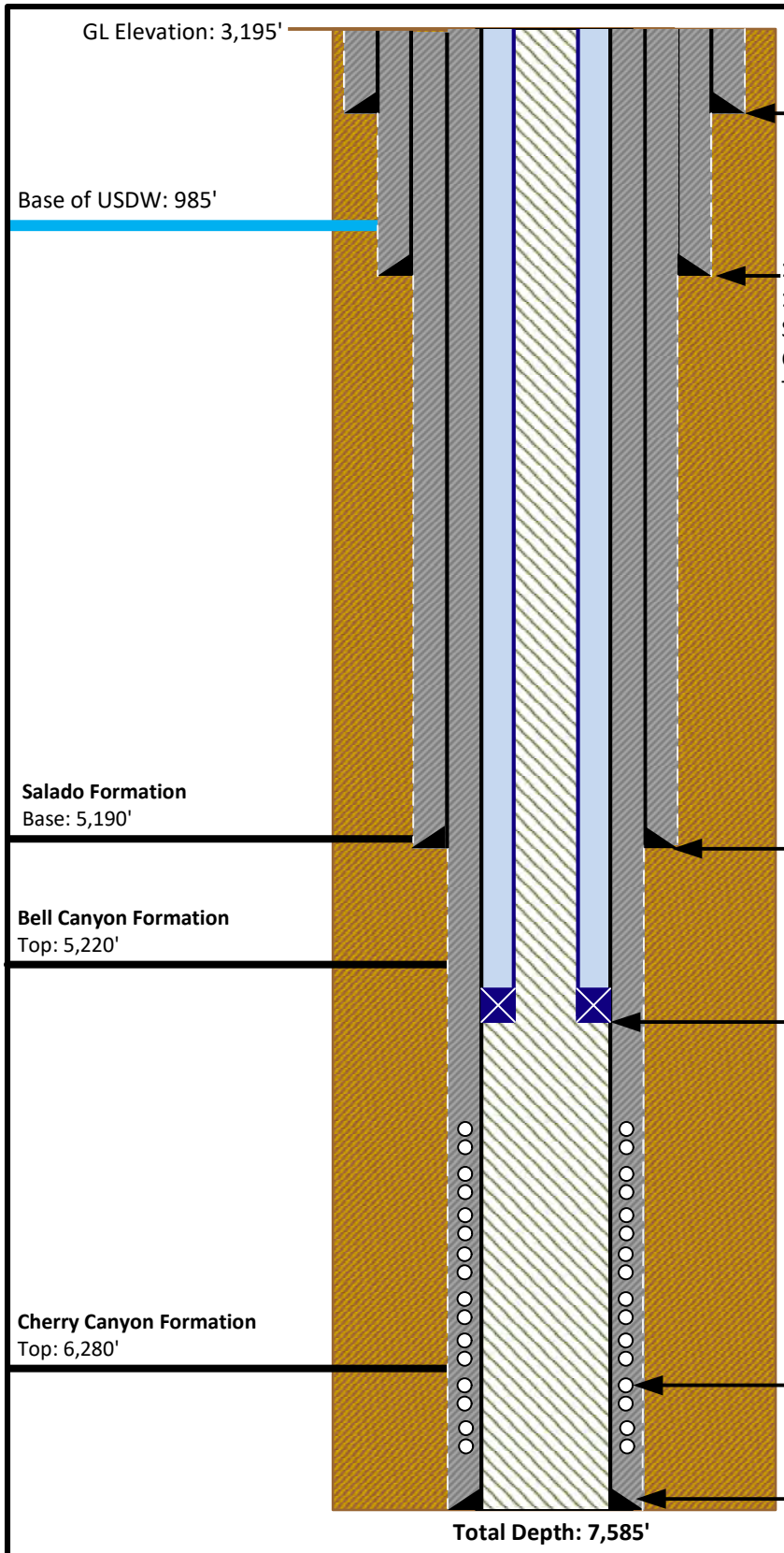
FOUND MONUMENT
CALC. CORNER
SHL
HORIZONTAL SPACING UNIT
STATE OIL & GAS LEASE
BLM OIL & GAS LEASE

NOTES

1. ALL COORDINATES, BEARINGS, AND DISTANCES CONTAINED HEREIN ARE GRID, BASED UPON THE NEW MEXICO STATE PLANE COORDINATES SYSTEM, NORTH AMERICAN DATUM 83, NEW MEXICO EAST (3001).

2. THIS DOCUMENT IS BASED UPON AN ON THE GROUND SURVEY PERFORMED DURING JANUARY, 2025. CERTIFICATION OF THIS DOCUMENT IS ONLY TO THE LOCATION OF THIS EASEMENT IN RELATION TO RECORDED MONUMENT OF DEEDS PROVIDED BY THE CLIENT.

3. ELEVATIONS MSL, DERIVED FROM G.N.S.S. OBSERVATION AND DERIVED FROM SAID ON-THE-GROUND SURVEY.



20" Borehole to 140'.
18.625" J-55 (94.5#) Conductor casing set at 120'.
Cement back to the surface using 35 sacks of Class C.
Top of cement to be verified by circulation.

17.5" Borehole to 1,005'.
13.375" J-55 54.5# Surface casing set at 985'.
Surface casing set 25' below the base of the USDW.
Cement surface casing to ground level with 685 sacks of Class C.
Top of cement to be verified by circulation.

12.25" Borehole to 5,210'.
9.625" L-80 40# Intermediate casing set at 5,190'.
Cement casing to ground level with 1,395 sacks of Class C.
Top of cement to be verified by circulation.

5.5" 17# N-80 or L-80 fiberglass lined tubing.
Tubing set in a SC-2 packer (or equivalent).
Packer set at 5,250'.
Note: Packer quality fluid (i.e. freshwater with corrosion inhibitor and biocide) will be circulated in to the casing-tubing annulus.

Perforate selected intervals within the Bell Canyon and Cherry Canyon formations from 5,270'-7,545'.

8.75" Borehole to 7,585'.
7.625" L-80HC (29.7#) Production casing set at 7,565'.
Cement casing back to ground level with 2,345 sacks of Class C.
Top of cement to be verified by bond log.

NOT TO SCALE

Note: Listed depths and cement volumes are approximates based on available information.

Prepared by: ALL CONSULTING *Prepared for:* SELECT	**Drawn by: Joshua Ticknor**	**Antelope Fed 28 SWD #1** **Proposed Wellbore Diagram** **Operated by Select Water Solutions. LLC** **S28, T25S, R35E** **Lea County, New Mexico**
	Project Manager: Reed Davis	
	Date: 06/10/2025	

SC-2 Retrievable Packer

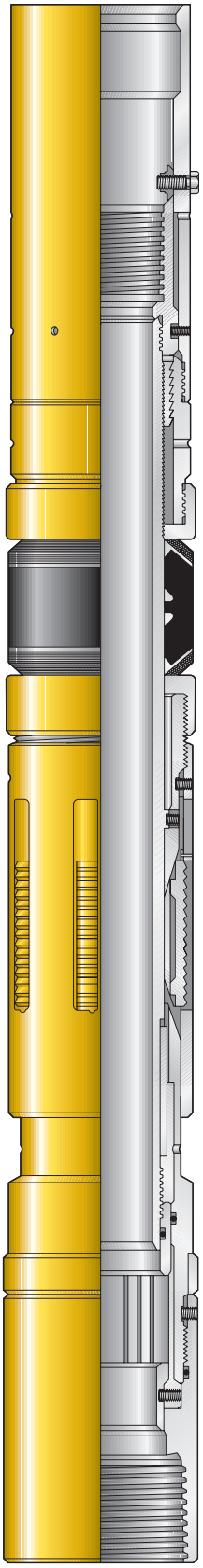
Product Family No. H48807

APPLICATION

The Baker Hughes SC-2™ retrievable packer is a high-performance, retrievable, sealbore packer. It can be run and set on electric wireline, slick line/tubing with the same setting tools used for the D packer.

Advantages

- Can be set with wireline or hydraulic setting tools
- Can be equipped with a variety of bottom guides (must be ordered separately)
- Packer easily accommodates tubing expansion or contraction
- Tubing and seals can be removed without accidentally unsetting packer
- Easy retrieval due to caged slips and releasing mechanism located in protected area below packing element
- Packer's releasing mechanism is not affected by differential pressure or tailpipe weight
- Case-hardened slips suitable for all grades of casing including V-150
- Compatible with standard Baker Hughes' seal accessories, tubing-conveyed perforating and gravel-packing systems



SC-2 Retrievable Packer
Product Family No. H48807

SPECIFICATION GUIDE

SC-2™ Retrievable Packer, Product Family No. H48807

Casing			Packer ✷					
OD		T & C Weight ▼	Size ●		Max Gage Ring OD		Max Packing Element	
in.	*mm*	lb/ft			in.	*mm*	in.	*mm*
5-1/2	*139.7*	20–23	55A2–26		4.485	*113.9*	4.406	*111.9*
		17–20	55A4–26		4.593	*116.6*	4.500	*114.3*
		13–15.5	55B–26		4.765	*121.0*	4.687	*119.0*
7	*177.8*	35–38	70A2–32		5.735	*145.6*	5.687	*144.4*
		29–32	70A4–32		5.820	*147.8*	5.750	*146.0*
		23–29	70B–32		6.000	*152.4*	5.937	*150.8*
		17–20	70C–32		6.250	*158.7*	6.187	*157.1*
7-5/8	*193.6*	33.7–39	76A2–32 ◆	76A2–40 ◆	6.440	*163.6*	6.375	*161.9*
		29.7–33.7	76A4–32 ◆	76A4–40 ◆	6.580	*167.1*	6.500	*165.1*
		24–29.7	76B2–32 ◆	76B2–40 ◆	6.690	*169.9*	6.625	*168.2*
		20–24	76B4–32 ◆	76B4–40 ◆	6.784	*172.3*	6.718	*170.6*
9-5/8	*244.4*	53.5–58.4	96A–47		8.191	*208.0*	8.125	*206.3*
		47–53.5	96A2–47		8.319	*211.3*	8.250	*209.5*
		40–47	96A4–47		8.465	*215.0*	8.375	*212.7*
		36–40	96B–47		8.619	*218.9*	8.500	*215.9*

Size	Sealbore Dia for Seal Nipples ■		Seal Accessory Size ▲	Min Bore Thru Seal Nipples	
	in.	*mm*		in.	*mm*
55A2–26	2.688	*68.2*	40–26	1.968	*50.0*
55A4–26					
55B–26					
70A2–32	3.250	*82.5*	80–32 or 81–32	2.406 or 1.995	*61.1 or 50.6*
70A4–32					
70B–32					
70C–32					
76A2–32					
76A2–40	4.000	*101.6*	80–40	3.000	*72.6*
76A4–32	3.250	*82.5*	80–32 or 81–32	2.406 or 1.995	*61.1 or 50.6*
76A4–40	4.000	*101.6*	80–40	3.000	*72.6*
76B2–32	3.250	*82.5*	80–32 or 81–32	2.406 or 1.995	*61.1 or 50.6*
76B2–40	4.000	*101.6*	80–40	3.000	*72.6*
76B4–32	3.250	*82.5*	80–32 or 81–32	2.406 or 1.995	*61.1 or 50.6*
76B4–40	4.000	*101.6*	80–40	3.000	*72.6*
96A–47	4.750	*120.6*	190–47 or 192–47	3.000 or 3.875	*72.6 or 98.4*
96A2–47					
96A4–47					
96B–47					

✷ *For information on packer or accessory sizes not found in this specification guide, refer to Baker Hughes' packer systems technical manual or your Baker Hughes representative.*

● *When proposed for use in other than the casing weight range shown, contact your Baker Hughes representative.*

■ *The maximum OD (including tolerance) of any part run through a production packer should be at least 1/16-in. (1.59mm) smaller than the minimum bore through the packer body. This may occasionally require that the coupling ODs be turned down.*

▲ *Tubing-seal assemblies, tubing seal and spacer nipples.*

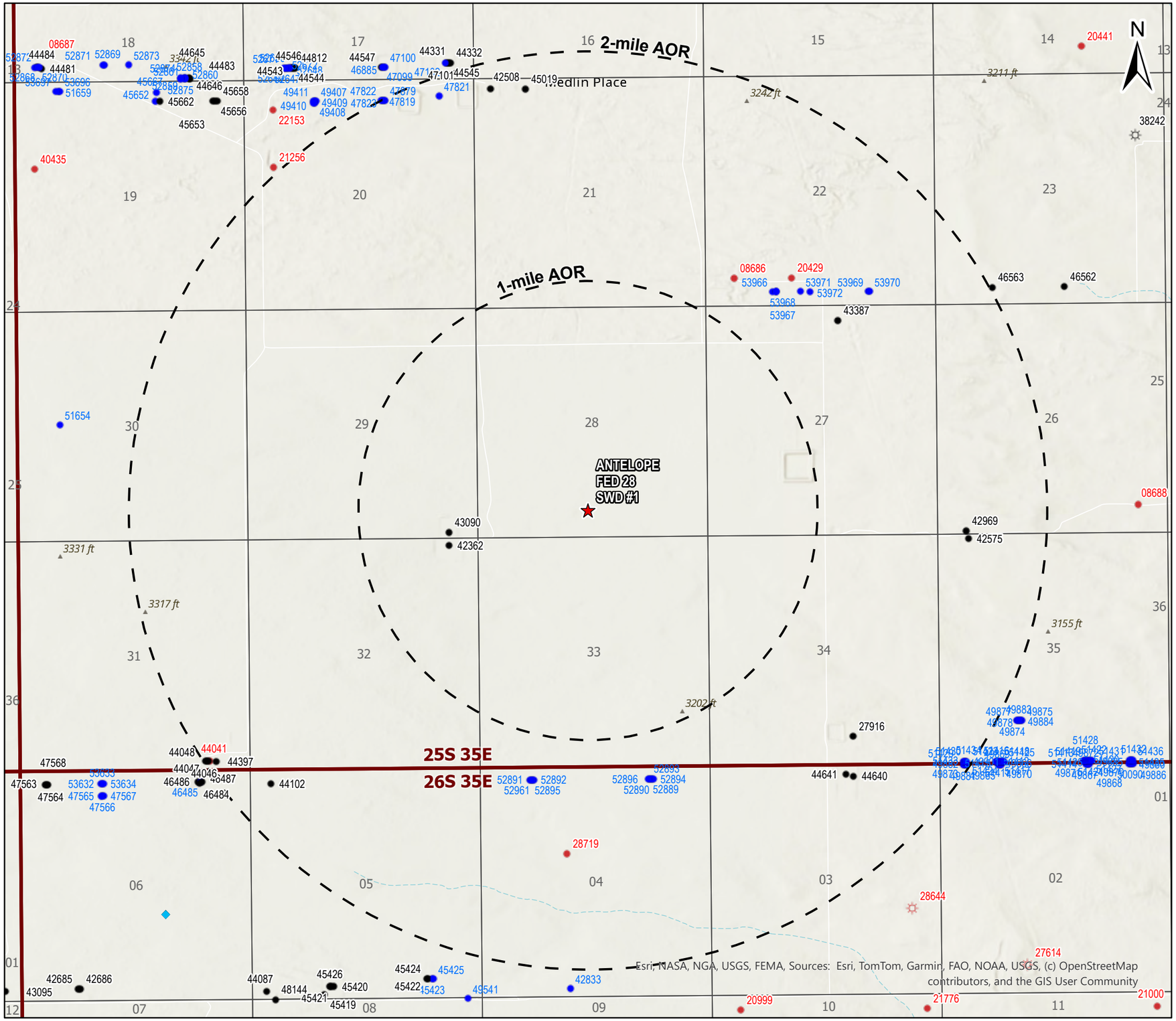
◆ *This tool available with 3.250 in. (82.5 mm) or 4.000 in. (101.6 mm) seal bore diameter and uses sizes 80-32/ 81–32 or 80–40 accessories respectively.*

▼ *When selecting a SC-2 packer for a casing weight common to two size packers choose the packer with the smallest OD to maximize running clearances. Example: In 5-1/2-in. (139.7-mm), 20.0-lb/ft casing, use size 55A2–26.*

Attachment 2

Area of Review Information:

- 2-mile Production Review Map
- 1-mile Problem Wells Map
- 1-mile AOR Well Table
- 2-mile Lease Map
- 2-mile Mineral Ownership Map
- 2-mile Surface Ownership Map
- Potash Lease Map



0 0.5 1 2 Miles

Source Info: https://gis.emnrd.nm.gov/arcgis/rest/services/OCDView/Wells/MapServer

Legend

- Proposed SWD (1)
- Gas, Active (1)
- Gas, Plugged (2)
- Oil, Active (52)
- Oil, New (114)
- Oil, Plugged (13)
- Reclamation Fund (1)
- Wells Producing from Target Injection Zone (0)

2-mile Production Review

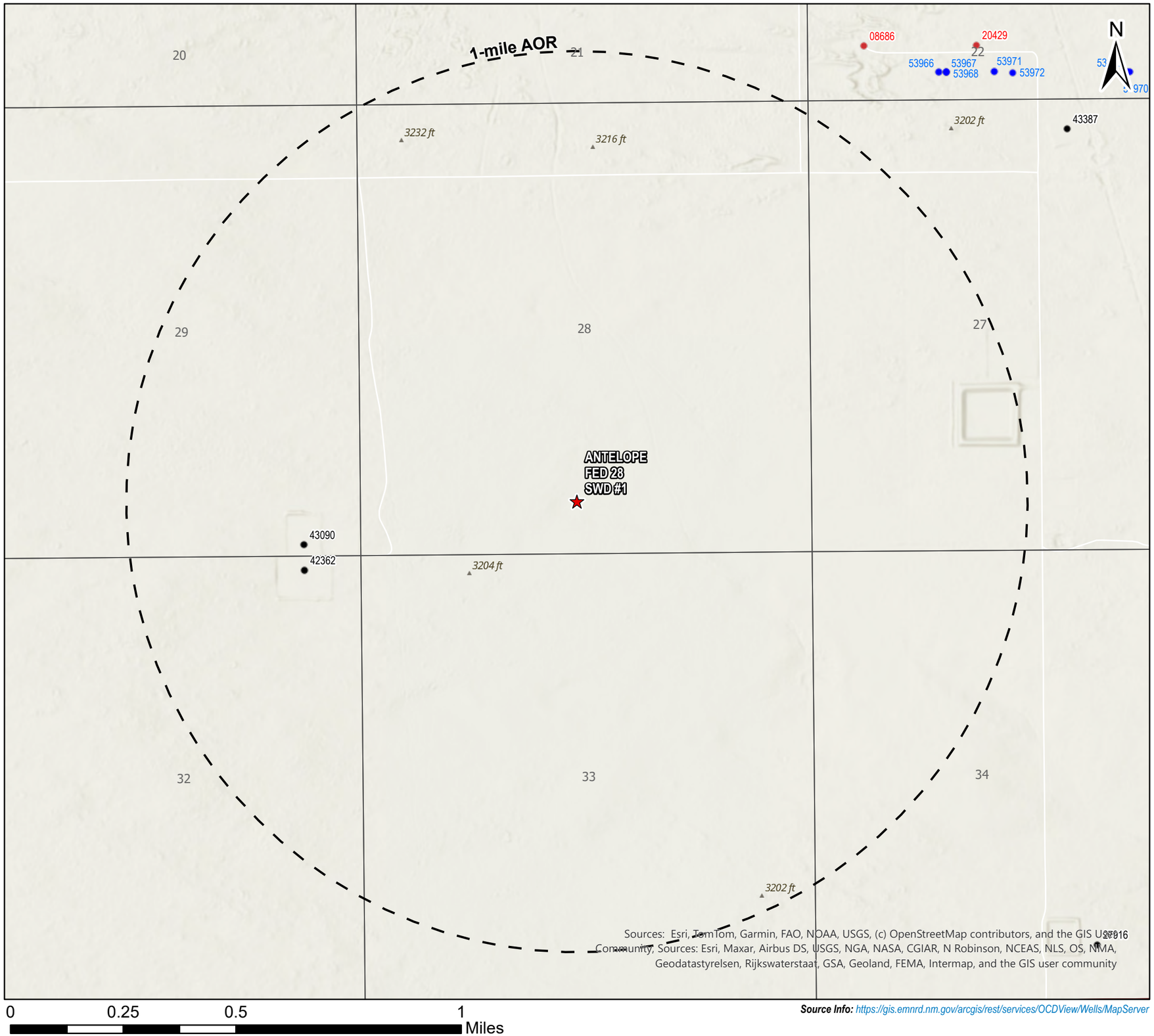
ANTELOPE FED 28 SWD #1

LEA COUNTY, NEW MEXICO

Proj Mgr: Reed Davis	May 12, 2025	Mapped by: Ben Bockelmann

Prepared for: SELECT

Prepared by: ALL CONSULTING



Source Info: https://gis.emnrd.nm.gov/arcgis/rest/services/OCDView/Wells/MapServer

Legend

- Proposed SWD (1)
- Oil, Active (4)
- Oil, New (7)
- Oil, Plugged (2)

1-mile O&G Wells AOR

ANTELOPE FED 28 SWD #1

LEA COUNTY, NEW MEXICO

Proj Mgr: Reed Davis	May 12, 2025	Mapped by: Ben Bockelmann

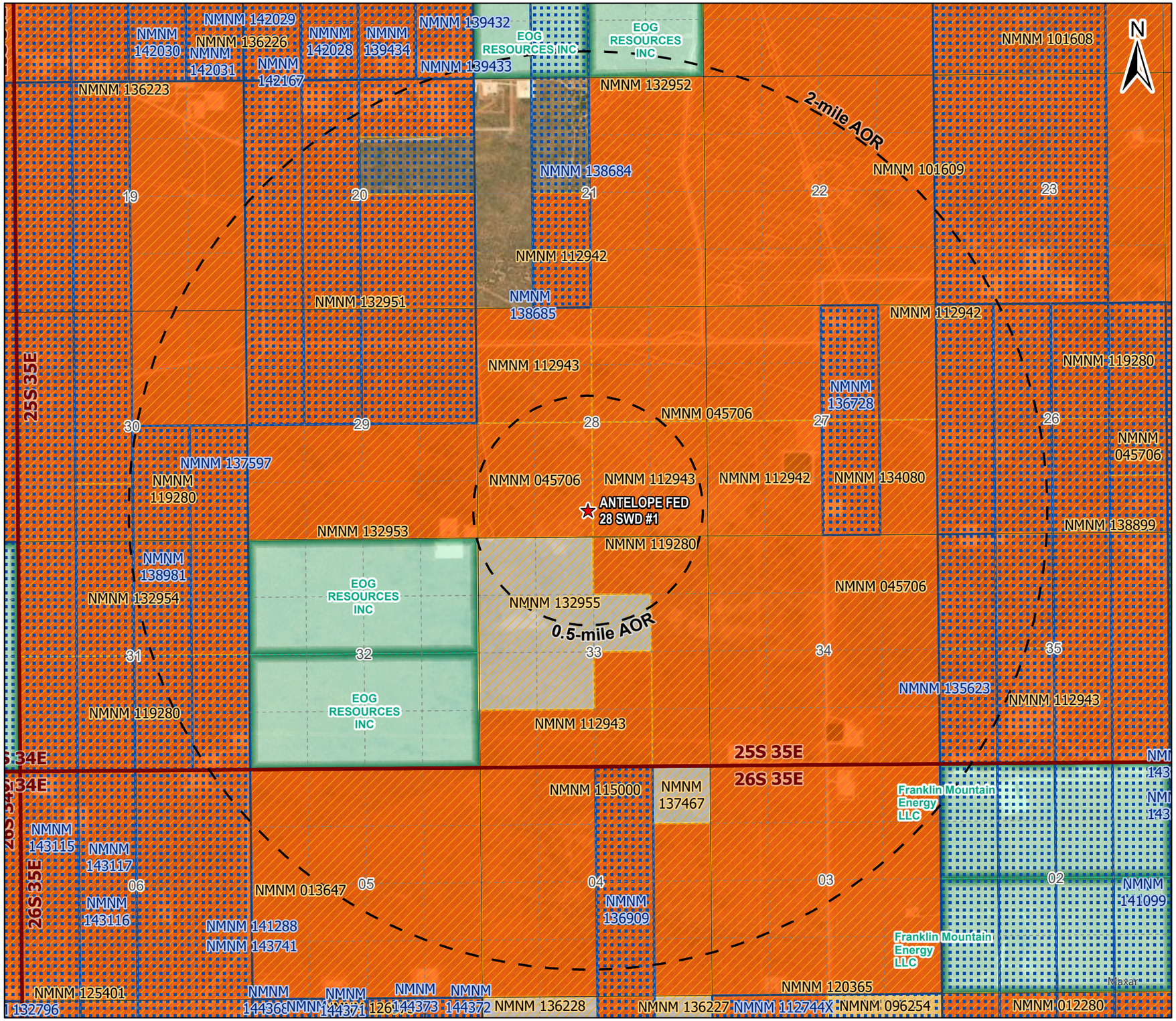
Prepared for: SELECT

Prepared by: ALL CONSULTING

AOR Tabulation for Antelope Fed 28 SWD #1 (Bell Canyon and Cherry Canyon - Injection Interval: 5,270' - 7,545'), Lea County							
Well Name	**API#**	**Well Type**	**Operator**	**Spud Date**	**Location (Sec., Tn., Rng.)**	**Total Vertical Depth (feet)**	**Penetrate Inj. Zone?**
Duo Sonic 29 Federal #004H	30-025-43090	Oil	COG Operating LLC	9/11/2016	29-25S-35E	10,963'	Yes
Tele Delux 32 State #004H	30-025-42362	Oil	COG Operating LLC	3/15/2015	32-25S-35E	12,405'	Yes
Tele Delux 32 State #706C	30-025-43084	Oil	COG Operating LLC	Cancelled	29-25S-35E	NA	NA
Tele Delux 32 State #504C	30-025-43123	Oil	COG Operating LLC	Cancelled	32-25S-35E	NA	NA
Duo Sonic 29 Federal #104H	30-025-43327	Oil	COG Operating LLC	Cancelled	29-25S-35E	NA	NA
Tele Delux 32 State #503C	30-025-43122	Oil	COG Operating LLC	Cancelled	32-25S-35E	NA	NA
Tele Delux 32 State #103C	30-025-43120	Oil	COG Operating LLC	Cancelled	32-25S-35E	NA	NA
Duo Sonic 29 Federal #003H	30-025-43455	Oil	COG Operating LLC	Cancelled	29-25S-35E	NA	NA
Duo Sonic 29 Federal #103H	30-025-43481	Oil	COG Operating LLC	Cancelled	29-25S-35E	NA	NA
Duo Sonic 29 Federal #503H	30-025-43446	Oil	COG Operating LLC	Cancelled	29-25S-35E	NA	NA

Casing / Plugging Information for Wells Penetrating the Antelope Fed 28 SWD #1 Injection Zone

Well Name	Type	Set Depth	Casing Size	TOC	TOC Method Determined	Sks of Cement	Hole Size
DUO SONIC 28 FEDERAL #004H	Surface	1,099'	13-3/8"	Surface	Circulation	950	17-1/2"
	Intermediate	5,239'	9-5/8"	Surface	Circulation	1380	12-1/4"
	Production	15,550'	5-1/2"	4,980'	Calculated	1405	8.75"
	No Issues.						
TELE DELUX 32 STATE #004H	Surface	1,047'	13-3/8"	Surface	Circulation	460	17-1/2"
	Intermediate	9,177'	9-5/8"	Surface	Circulation	2405	12-1/4"
	Production	16,933'	5-1/2"	Surface	Circulation	2046	8-3/4"
	No Issues.						



Source Info: BLM Surface Ownership (https://catalog.data.gov/dataset/blm-new-mexico-surface-ownership)

Legend

- Proposed SWD
- NMSLO Mineral Leases
- BLM Communitization Units

BLM O&G Leases

Case Disposition

- Authorized

BLM Oil and Gas Leases

Production Status

- Held by Actual Production
- Held by Allocated Production
- Non-Producing

1/2-mile Affected Parties AOR

BLM Lessees:
- DEVON ENERGY PROD CO LP
- CHEVRON USA INC
- COG OPERATING LLC
- OCCIDENTAL PERMIAN LP

SLO Lessees:
- EOG RESOURCES INC

Mineral Lease AOR

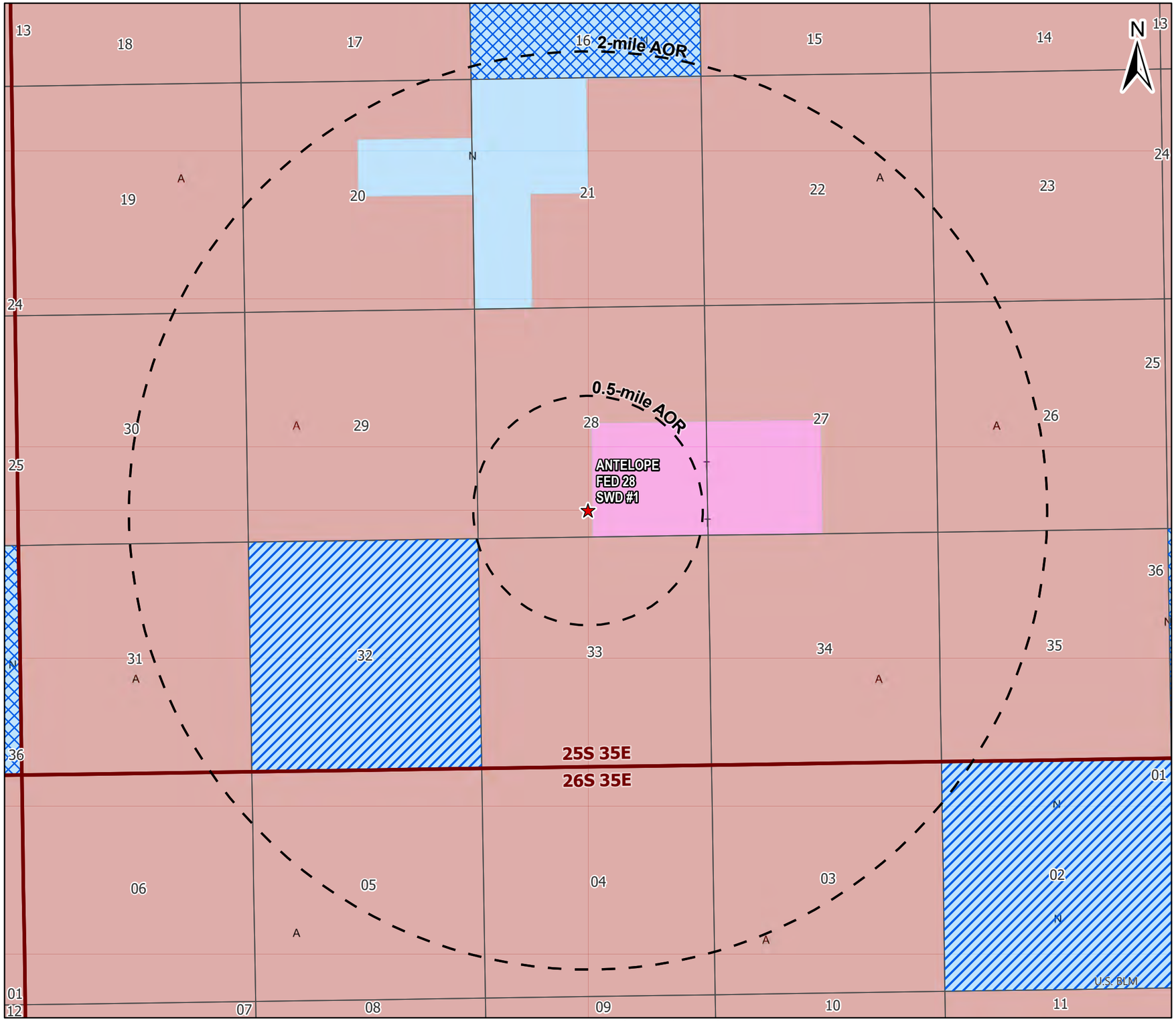
ANTELOPE FED 28 SWD #1

LEA COUNTY, NEW MEXICO

Proj Mgr: Reed Davis	June 06, 2025	Mapped by: Ben Bockelmann

Prepared for: SELECT

Prepared by: ALL CONSULTING



Source Info: BLM Surface Ownership (https://catalog.data.gov/dataset/blm-new-mexico-surface-ownership)

Legend

- Proposed SWD

NMSLO Ownership

- Subsurface
- Surface
- Surface and Subsurface

Mineral Ownership

- A-All minerals are owned by U.S.
- N-No minerals are owned by the U.S.
- T-Other minerals are owned by the U.S.

2-mile Mineral Ownership AOR

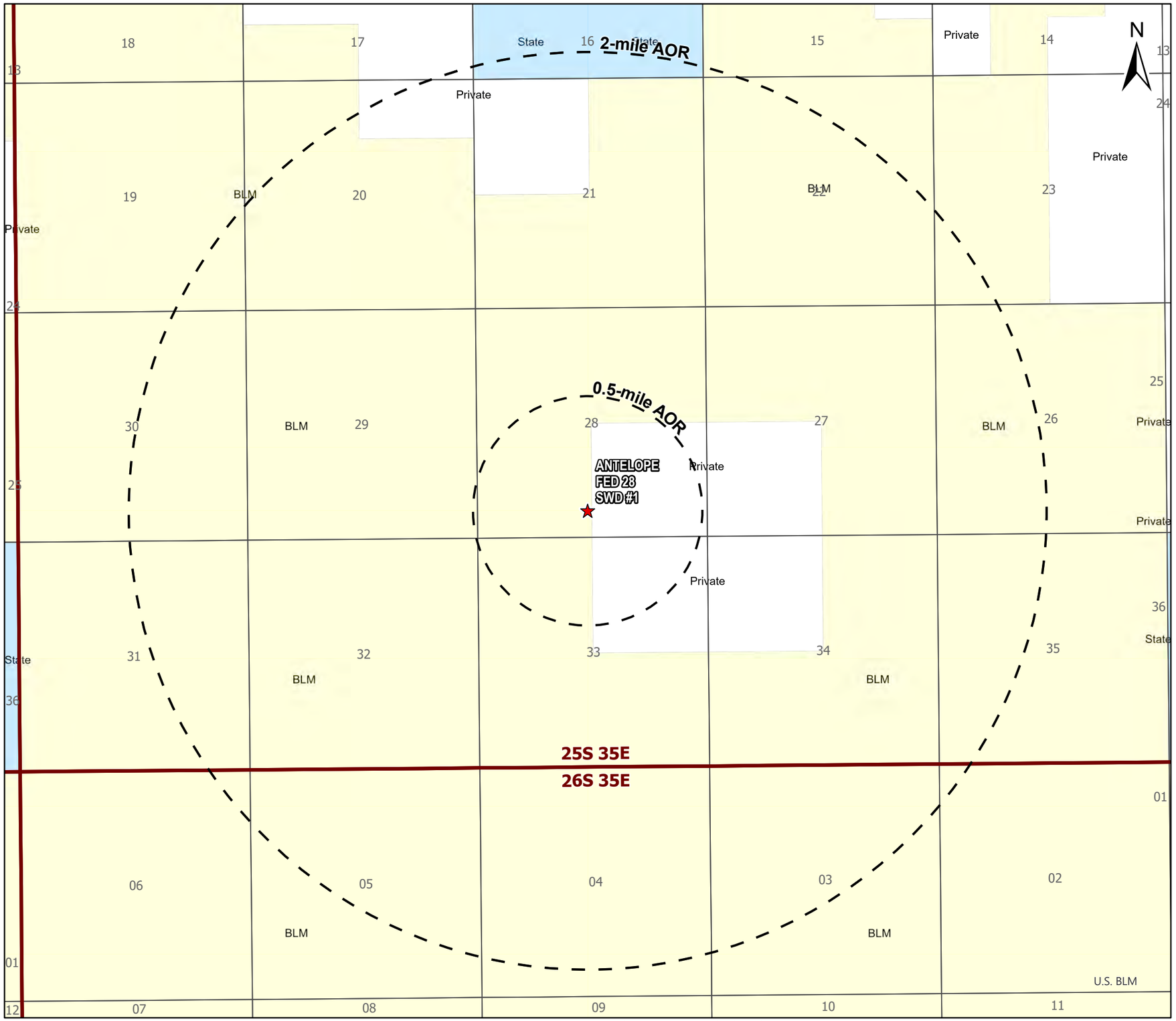
ANTELOPE FED 28 SWD #1

LEA COUNTY, NEW MEXICO

Proj Mgr: Reed Davis	April 17, 2025	Mapped by: Ben Bockelmann

Prepared for: SELECT

Prepared by: ALL CONSULTING



Source Info: BLM Surface Ownership (https://catalog.data.gov/dataset/blm-new-mexico-surface-ownership)

Legend

- Proposed SWD

Land Ownership

- BLM
- P
- S

2-mile Surface Ownership AOR

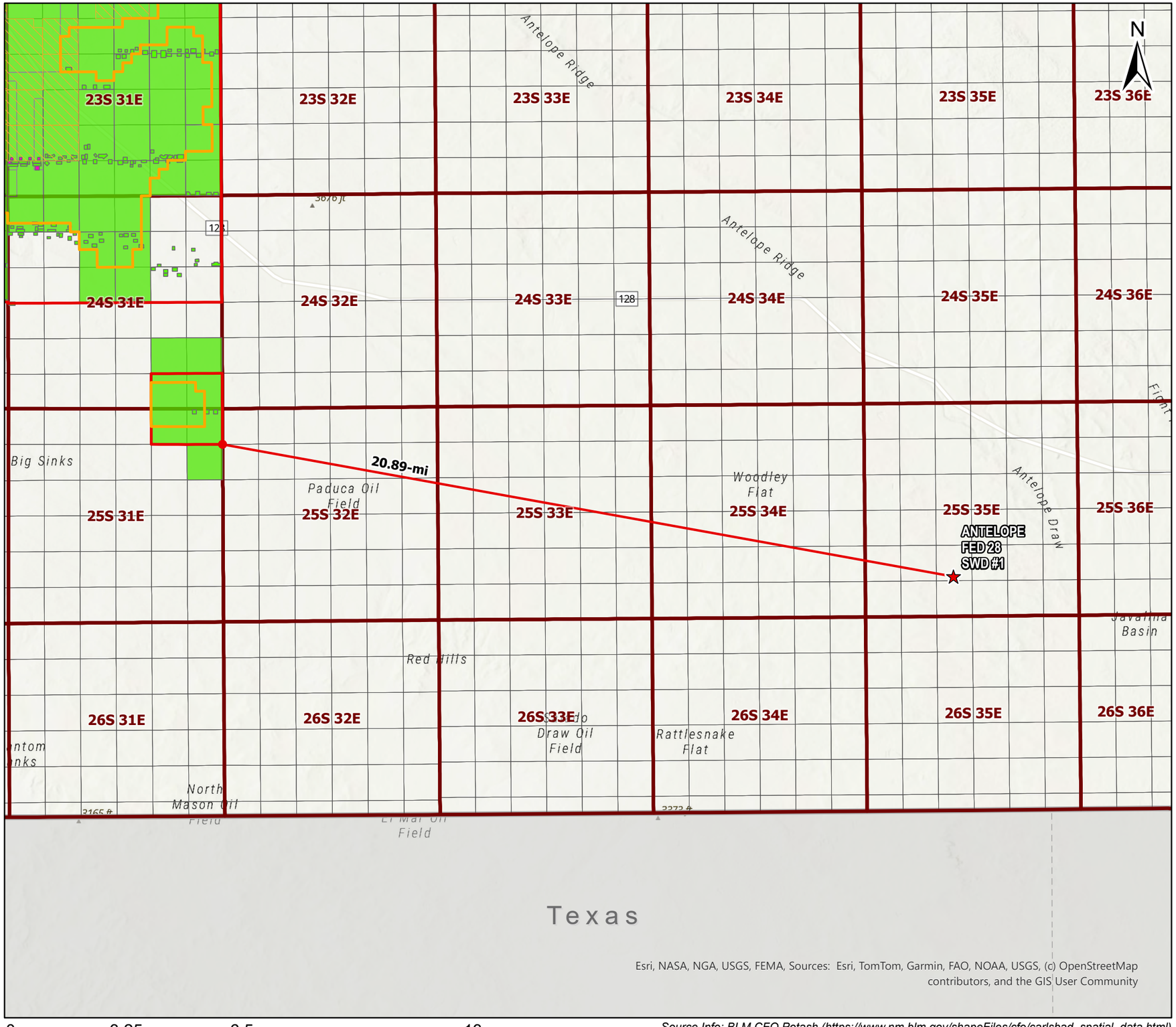
ANTELOPE FED 28 SWD #1

LEA COUNTY, NEW MEXICO

Proj Mgr: Reed Davis	April 17, 2025	Mapped by: Ben Bockelmann

Prepared for: SELECT

Prepared by: ALL CONSULTING



0 3.25 6.5 13 Miles

Source Info: BLM CFO Potash (https://www.nm.blm.gov/shapeFiles/cfo/carlsbad_spatial_data.html)

Legend

- Proposed SWD
- Known Potash Leasing Area
- Intrepid and Mosaic Potash Leases
- SOPA 1986

Drill Islands - 2025-04-04

Status, Depth Buffer

- Approved, Half Mile
- Approved, Quarter Mile
- Nominated,Half Mile
- Nominated,Quarter Mile

Development Areas- 2025-04-04

Status

- Approved
- Pending

Potash Lease AOR

ANTELOPE FED 28 SWD #1

LEA COUNTY, NEW MEXICO

Proj Mgr: Reed Davis	April 18, 2025	Mapped by: Ben Bockelmann

Prepared for: SELECT

Prepared by: ALL CONSULTING

Attachment 3

Source Water Analysis

Antelope Fed 28 SWD #1 - Source Water Analysis (Abo, Yeso Group, Avalon Shale, Bone Spring, Wolfcamp)

Well Name	API	Latitude	Longitude	Formation	Tds (mg/L)	Sodium (mg/L)	Calcium (mg/L)	Iron (mg/L)	Barium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Strontium (mg/L)	Manganese (mg/L)	Chloride (mg/L)	Carbonate (mg/L)	Bicarbonate (mg/L)	Sulfate (mg/L)	H2S (mg/L)
BELL LAKE UNIT #009	3002520261	32.3028488	-103.5110779	BONE SPRING	204652									130000		512	260	
SALADO DRAW 6 FEDERAL #001H	3002541293	32.0657196	-103.5146942	BONE SPRING 3RD SAND	99401.9	34493.3	3295	0.4		396.8			0.37	59986.5		109.8	710	
FIGHTING OKRA 18 FEDERAL COM #001H	3002540382	32.0435333	-103.5164566	AVALON UPPER	201456	66908.6	9313	10		1603			1.6	121072.7		1024.8	940	
SOUTH JUSTIS UNIT #031	3002511929	32.0777092	-103.1099548	BLINEBRY/TUBB/DRINKARD	141326									83740		549	2286	
SNAPPING 2 STATE #014H	3001542688	32.06555986	-103.7413815	WOLFCAMP	81366.4	26319.4	2687.4	26.1		326.7				50281.2			399.7	
C C CAGLE C #003	3002511933	32.0777206	-103.157135	ABO	187443									113000		483	2150	

Attachment 4

Injection Formation Water Analysis

Antelope Fed 28 SWD #1 - Injection Formation Water Analysis (Delaware - Bell Canyon and Cherry Canyon)

Well Name	API	Latitude	Longitude	Formation	Tds (mg/L)	Sodium (mg/L)	Calcium (mg/L)	Iron (mg/L)	Barium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Strontium (mg/L)	Manganese (mg/L)	Chloride (mg/L)	Carbonate (mg/L)	Bicarbonate (mg/L)	Sulfate (mg/L)	H2S (mg/L)
BELL LAKE UNIT #002	3002508489	32.2701836	-103.5112457	DELAWARE	52115									32200		451	529	
SWEETNESS 30 STATE FED COM #001H	3002541864	32.278347	-103.4042511	DELAWARE-BRUSHY CANYON	67516.1	23558.7	2923.2	0.1		401			0.03	39091.2		732	740	
ICHABOD 7 FEDERAL #004H	3002540574	32.0509529	-103.5018997	DELAWARE-BRUSHY CANYON	232755	71556.2	15222.7	113.1		2609.4			4.05	140558		244	0	

Note: Select agrees to collect one formation water sample for analysis prior to commencing commercial injection operations, given that no Bell Canyon or Cherry Canyon data addressing H2S, cations, and anions is available within 1/2-mile.
Glorieta sampling results will be electronically provided to NMOCD within 30-days of analysis.

Attachment 5

Reservoir Characterization

Reservoir Characterization at the Antelope Fed 28 SWD #1

1. Injection Formation and Confinement

a. Injection Formation

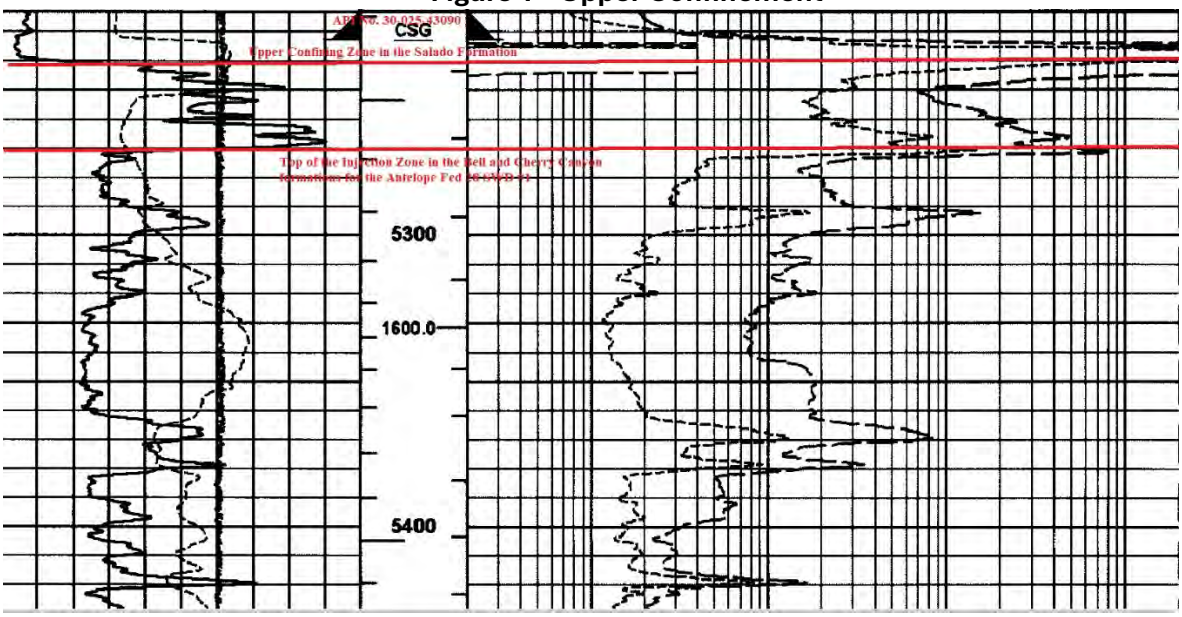
The proposed injection interval includes the Bell Canyon and Cherry Canyon formations of the Delaware Mountain Group from 5,270' – 7,545'. The Guadalupian-age Bell Canyon and Cherry Canyon members consist primarily of sandstones and siltstones with significant primary porosity and permeability, indicating these formations are viable injection targets. Select will not perforate or inject into the Lamar Dolomite or Brushy Canyon Formation of the Delaware Mountain Group. Reservoir performance modeling suggests injection pressure into the Bell Canyon-Cherry Canyon injection interval would be below the fracture pressures of the upper and lower confining layers.

b. Upper Confinement

Nearby open hole geophysical well logs indicate the proposed Bell Canyon-Cherry Canyon injection interval is overlain by thousands of feet of tight evaporites within the Salado Formation, which will prevent the upward migration of fluids and act as the upper confining layer.

Estimated fracture gradient for the upper confinement layer is 0.726 psi/ft, per reservoir performance modeling in ***Appendix B.***

Figure 1 – Upper Confinement

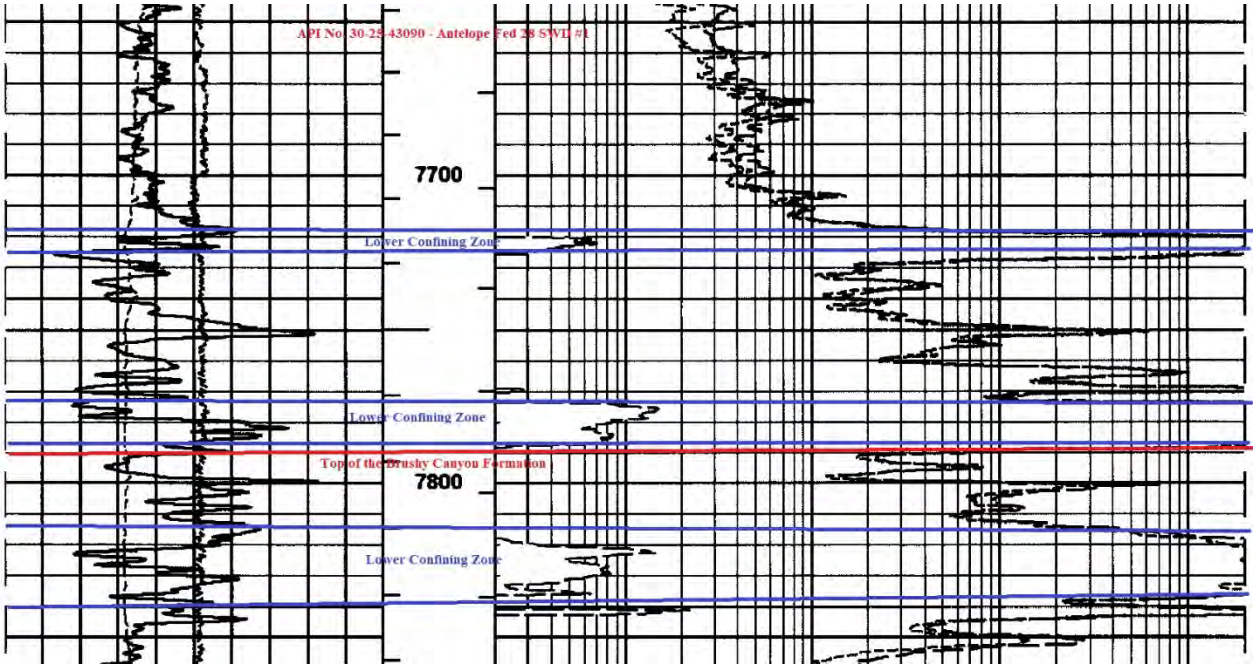


c. Lower Confinement

Nearby open hole geophysical well logs indicate the proposed Bell Canyon-Cherry Canyon injection interval is underlain by approximately 55 feet of low porosity and low permeability rocks within the lower Brushy Canyon Formation of the Delaware Mountain Group, which will prevent the downward migration of fluid and act as the lower confining layer.

Estimated fracture gradient for the lower confinement layer is 0.771 psi/ft, per reservoir performance modeling in ***Appendix B.***

Figure 2 – Lower Confinement



2. Historic Field Usage

a. Offset Production

A review of all wells in the NMOCD database within a 2-mile radius of the Antelope Fed 28 SWD #1 does not show any historic or current hydrocarbon production from the Bell Canyon or Cherry Canyon formations of the Delaware Mountain Group.

b. Commercial Water Sources

A review of all wells in the NMOCD and OSE databases within a 2-mile radius of the Antelope Fed 28 SWD #1 does not show any historic or current commercial water supply sources from the Delaware Mountain Group.

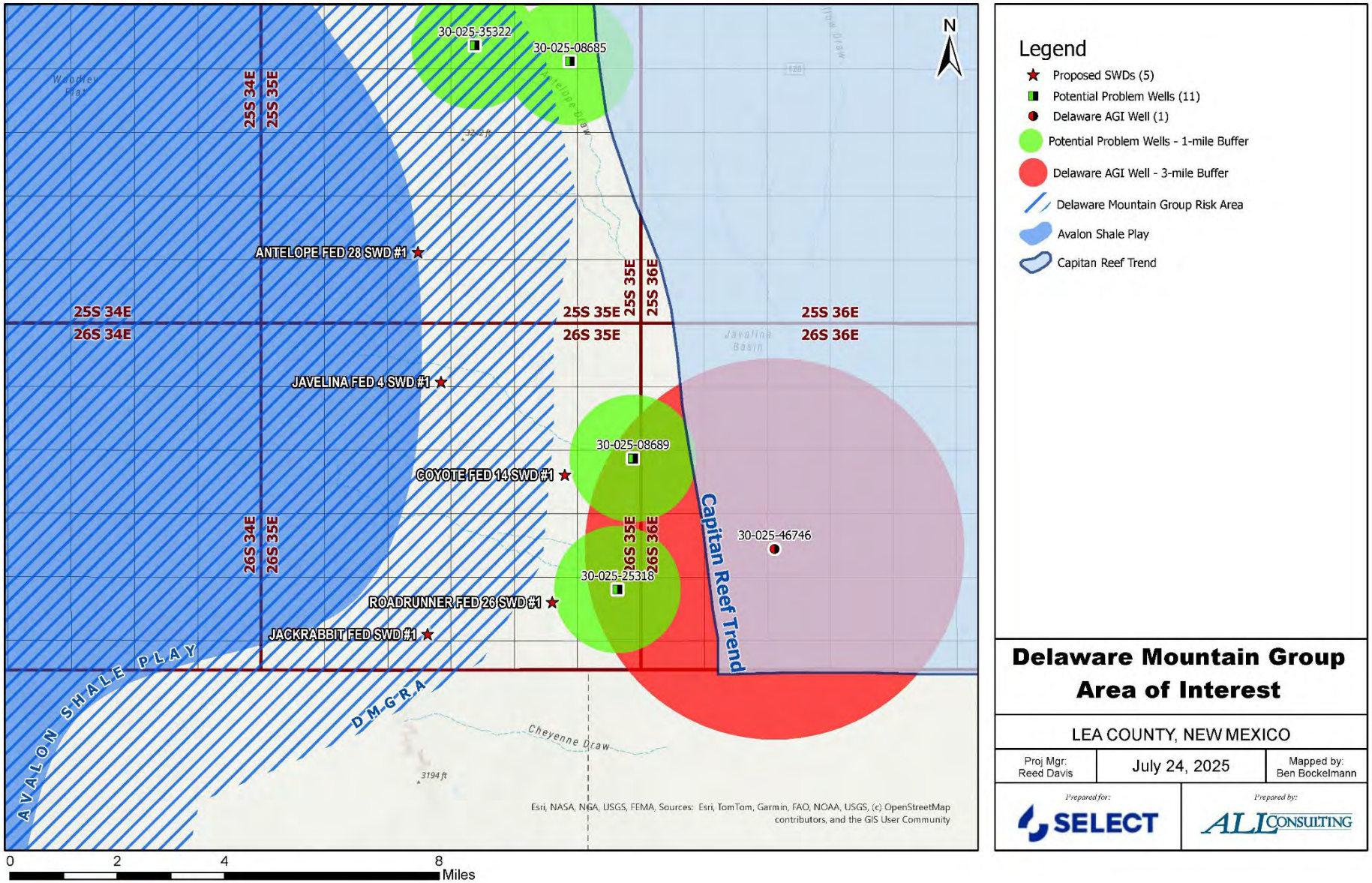
c. Enhanced Oil Recovery

A review of all wells in the NMOCD database within a 2-mile radius of the Antelope Fed 28 SWD #1 does not show any historic or current enhanced oil recovery operations utilizing the overlying Lamar Dolomite, or the underlying Brushy Canyon.

d. Additional OCD Exhibit 11a Requirements

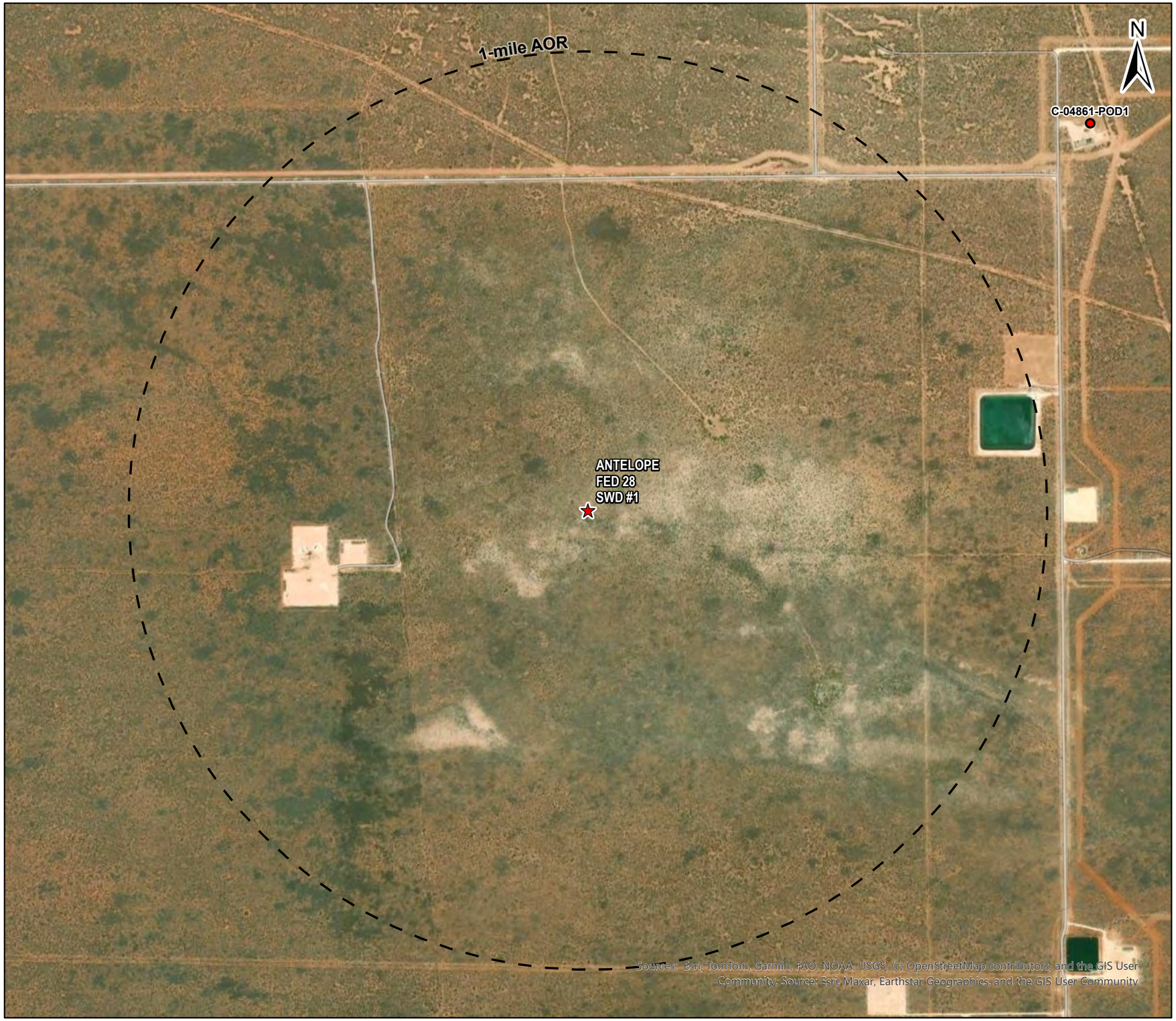
No Delaware Acid Gas Injection wells are located within 3-miles of the proposed Antelope Fed 28 SWD #1. In addition, the proposed SWD is located outside of the Avalon Shale play, the Capitan Reef Trend, and has been positioned more than 1-mile from any identified wells with potential wellbore concerns or lack of data for evaluation (see **Figure 3**).

Figure 3 – Delaware Mountain Group Area of Interest



Attachment 6

Water Well Map and Well Data



0 0.25 0.5 1 Miles

SourceInfo: ttps://gis.ose.state.nm.us/arcgis/rest/services/WatersPod/OSE_PODs/MapServer/0

Legend

- Proposed SWD

OSE Water PODs

POD Status

- Active (0)
- Pending (0)
- Changed Location of Well (0)
- Inactive (0)
- Capped (0)
- Plugged (1)
- Unknown (0)

1-mile Water Well AOR

ANTELOPE FED 28 SWD #1

LEA COUNTY, NEW MEXICO

Proj Mgr: Reed Davis	April 17, 2025	Mapped by: Ben Bockelmann

Prepared for: SELECT

Prepared by: ALL CONSULTING

Antelope Fed 28 SWD #1 - Water Well Sampling Rationale					
Water Wells	**Owner**	**Available Contact Information**	**Use**	**Sampling Required**	**Notes**
Note: There are no water wells within 1-mile of the proposed Antelope Fed 28 SWD #1.					

Attachment 7

No Hydrologic Connection Statement

RE: Select Water Solutions LLC – Antelope Fed 28 SWD #1 application, Lea County, New Mexico

ALL Consulting LLC (ALL) has performed a thorough hydrologic investigation related to the one saltwater disposal well (SWD) listed above. The investigation was conducted to determine if there were any existing or potential connections between the proposed injection zones in the Bell Canyon and Cherry Canyon formations and the deepest underground source of drinking water (USDW).

ALL performed an assessment and analysis of the subsurface geophysical log data along with published documents on the groundwater in this vicinity of Lea County, New Mexico. The area is within the South Plain and the surficial geology is Quaternary alluvial deposits consisting predominantly of sand and silt deposits. In this area the depths to potable water for stock and domestic supplies are less than 175 feet below the surface. The USDW is the Rustler Formation and the base of the USDW plus 25 feet into the anhydrite unit is approximately 985 feet below the surface.

Based on ALL's assessment and analysis there is containment through multiple confining zones above the proposed Bell Canyon and Cherry Canyon injection zones and the USDW and over 4,285 feet of vertical separation between the base of the USDW and the top of the injection interval. Additionally, there is no evidence of faults that would allow for communication between the USDW and Bell Canyon and Cherry Canyon injection zones.

Tom Tomastik

_____ June 11, 2025

Tom Tomastik Date

Chief Geologist and Regulatory Specialist

ALL Consulting LLC

Attachment 8

3-D Seismic Interpretation Statement

HENORRAH RESOURCES, LLC

503 STOUT STREET

BRIDGEPORT, WV 26330

As a consulting geophysicist/geologist and third-party contractor for ALL Consulting, I, Joseph Smith, have performed a complete seismic interpretation of the 3-D seismic reflection survey that covered the area of the proposed of the Antelope Fed 28 SWD #1, including the Bell Canyon and Cherry Canyon formations that will be utilized as injection zone. Additionally, I have created seismic sections and geologic cross sections that clearly demonstrate there are no obvious faults cutting across the proposed Bell Canyon and Cherry Canyon injection zones and no obvious faults that would breach the upper confining zones with the Salado Formation or the lower confining zones within the top of the Brushy Canyon Formation.

6-24-25

Joseph Smith, Consulting Geophysicist/Geologist

Date

Joseph P. Smith II

Owner - Geologist

Hennora Resources, LLC

937.621.0558 (c)

SOCIETY OF INDEPENDENT PROFESSIONAL EARTH SCIENTISTS

JOSEPH SMITH

Certified Earth Scientist

3596

Attachment 9

List of Affected Persons

Antelope Fed 28 SWD #1 - Notice of Application Recipients

Affected Party Classification	Entity - Proof of Notice	Entity - As Mapped/Exhibited	Address	City	State	Zip Code
Surface and Mineral Owner	New Mexico Bureau of Land Management	BLM	620 E Greene St.	Carlsbad	NM	88220
NMOCD District Office	New Mexico Oil Conservation District 1	N/A	1625 N. French Drive	Hobbs	NM	88240
BLM - Lessee	Devon Energy Production Company, LP	DEVON ENERGY PROD CO LP	333 West Sheridan Ave.	Oklahoma City	OK	73102
BLM - Lessee	CHEVRON U S A INC	CHEVRON USA INC	6301 Deauville	Midland	TX	79706-2964
BLM - Lessee and Unit Operator	COG OPERATING LLC	COG OPERATING LLC	600 W Illinois Ave	Midland	TX	79701
BLM - Lessee	OCCIDENTAL PERMIAN LIMITED PARTNERSHIP	OCCIDENTAL PERMIAN LP	5 Greenway Plz Ste. 110	Houston	TX	77046-0521
SLO - Lessee	EOG RESOURCES INC	EOG RESOURCES INC	5509 Champions Drive	Midland	TX	79706

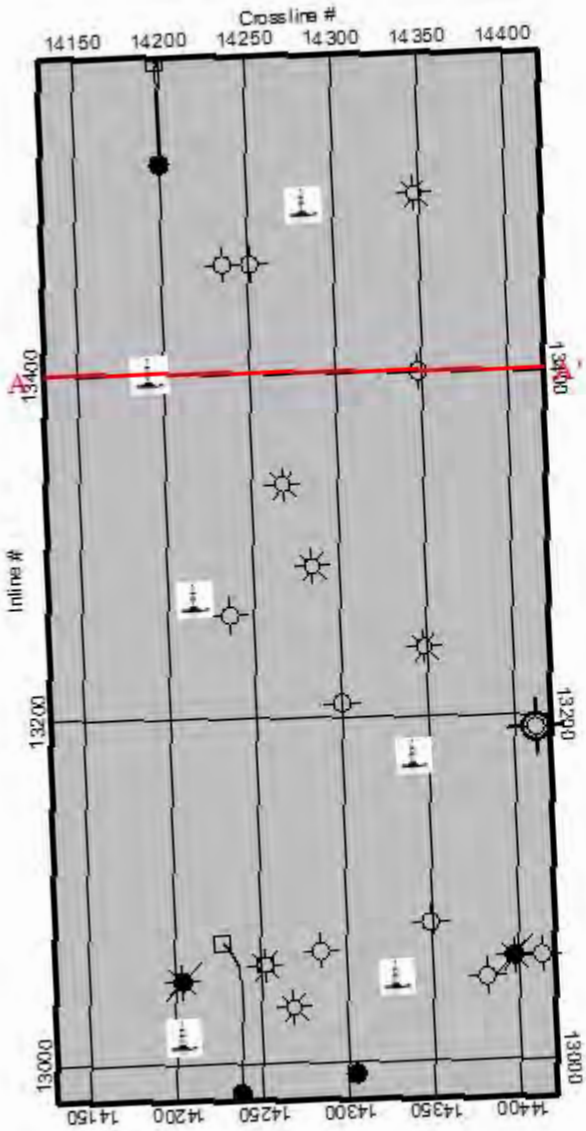
Note: The affected parties above received notification of this C-108 application.
BLM Unit Operators and Lessee information was retrieved from BLM MLRS (https://mlrs.blm.gov/s/).
NMSLO Lessee information retreived from NMOCD Operator Search (https://wwwapps.emnrd.nm.gov/OCD/OCDPermitting/Operators/Search/OperatorSearch.aspx).

Appendix A

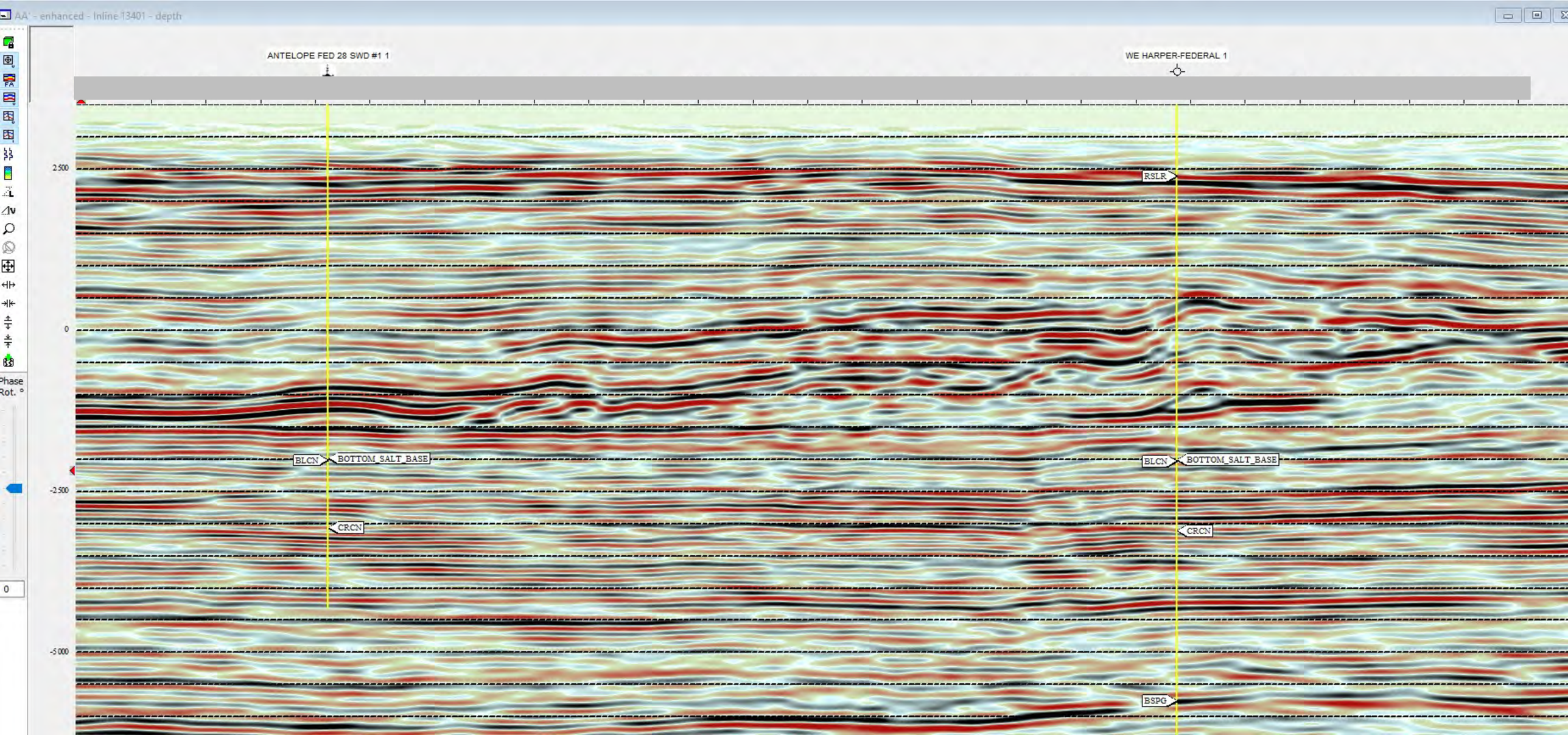
Seismic and Structural Cross Sections

Appendix A-1

Seismic A-A'

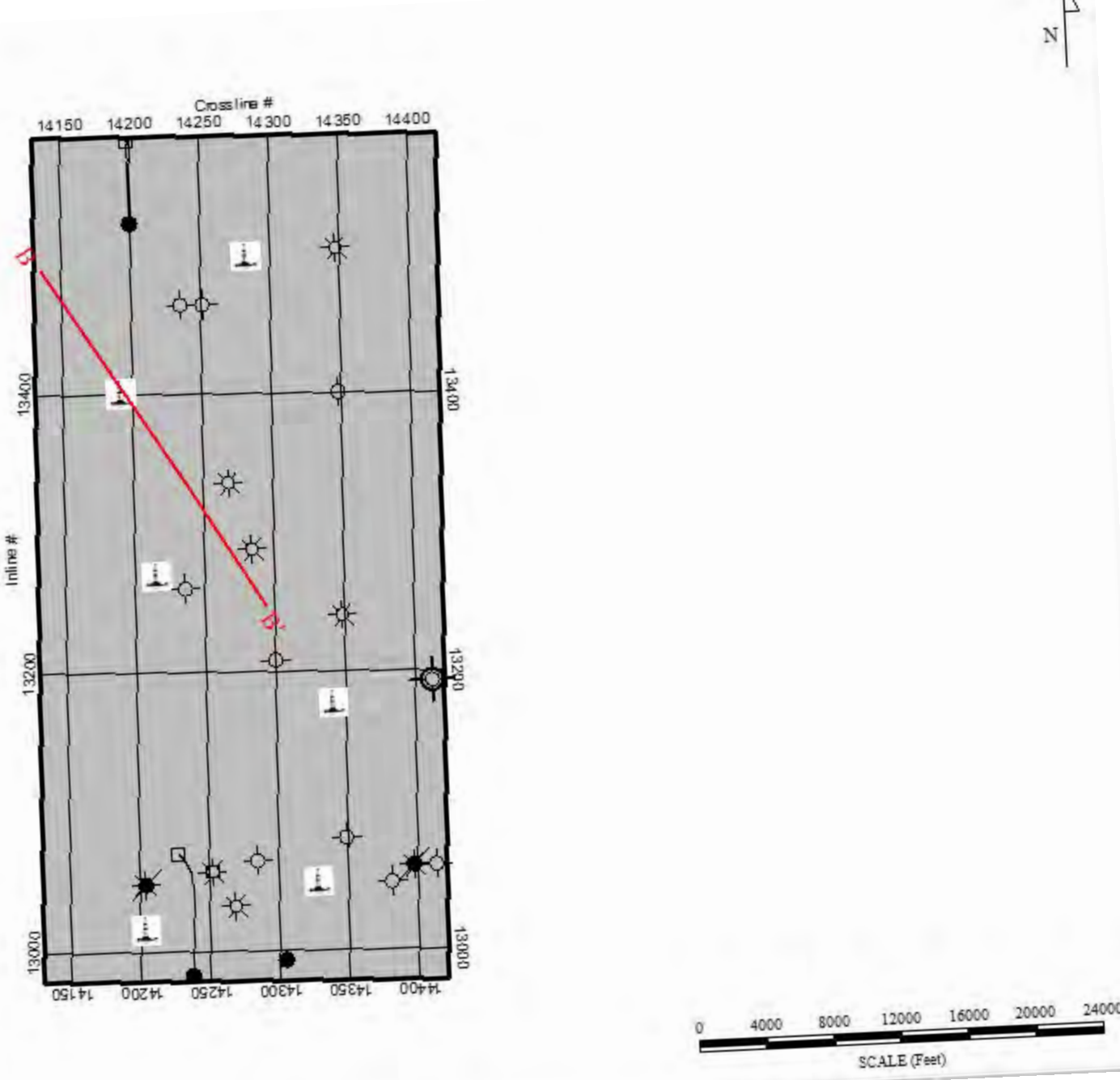

Crossline #
14150
14200
14250
14300
14350
14400
Inline #
13000
13200
13400
A
A'
13000
13200
13400

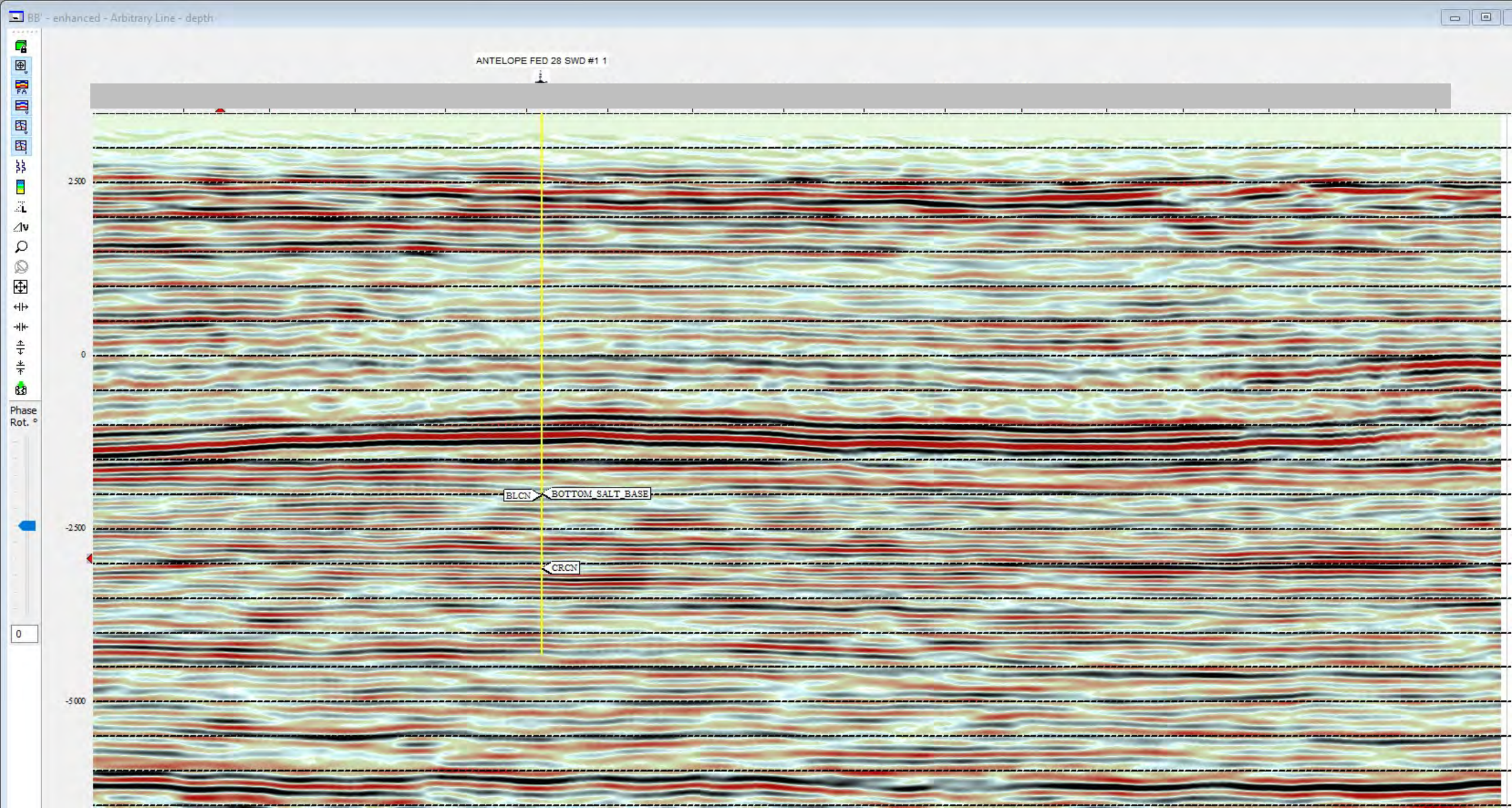
N
0
4000
8000
12000
16000
20000
24000
SCALE (Feet)


AA' - enhanced - Inline 13401 - depth
ANTELOPE FED 28 SWD #1 1
WE HARPER-FEDERAL 1
2 500
0
-2 500
-5 000
RSLR
BLCN
BOTTOM_SALT_BASE
BLCN
BOTTOM_SALT_BASE
CRCN
CRCN
BSPG
Phase Rot. °
0

Appendix A-2

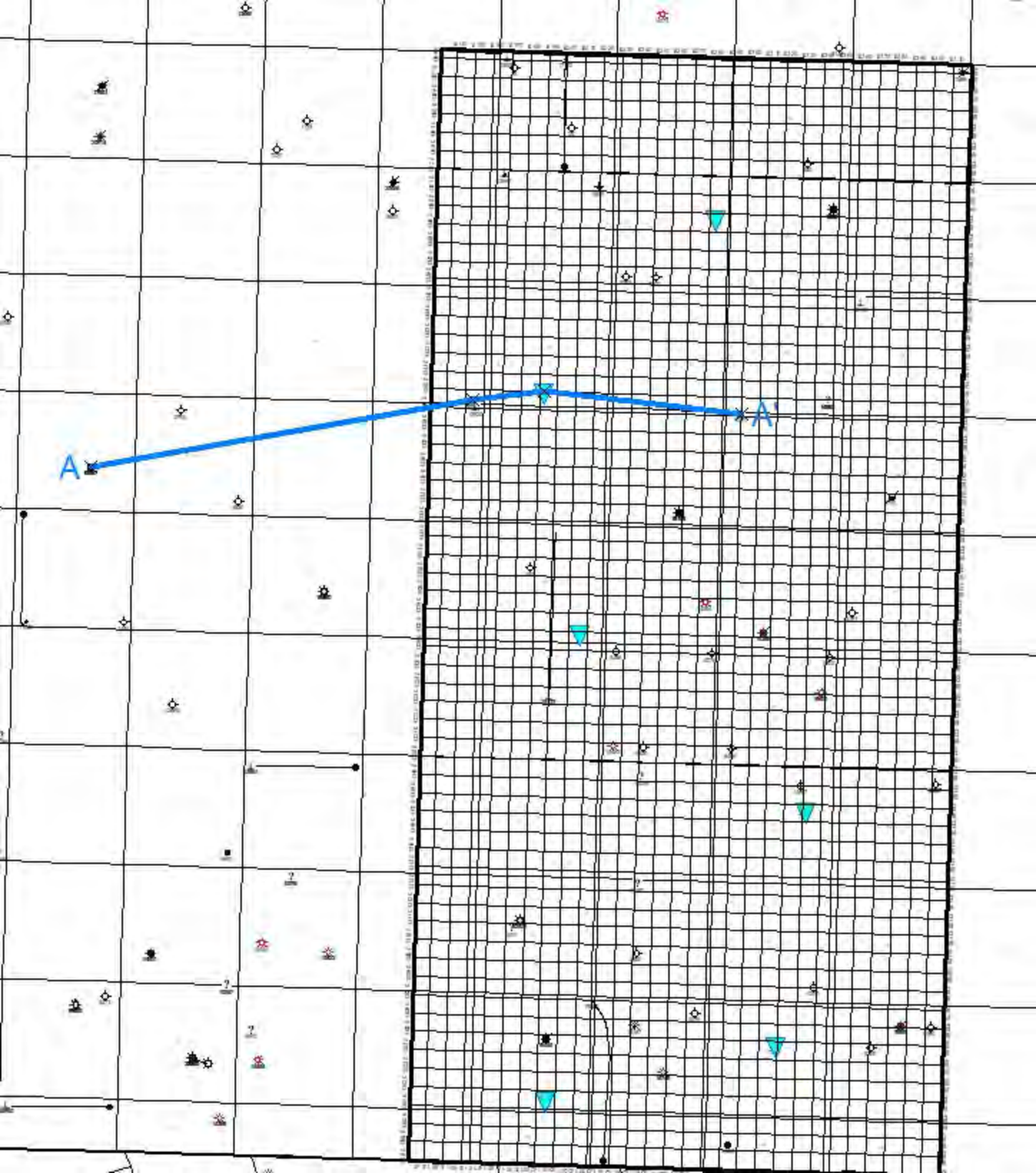
Seismic B-B'

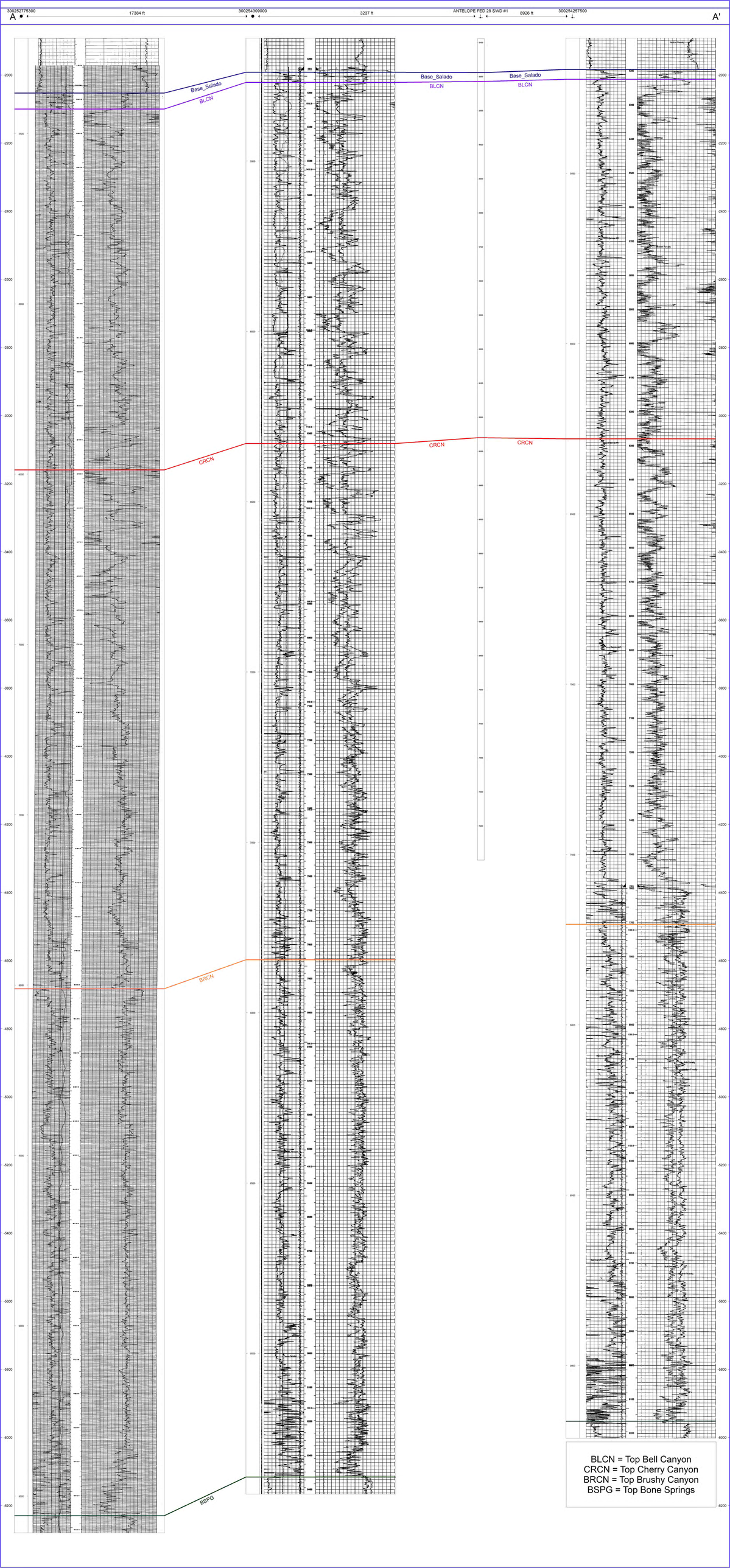

N
Crossline #
14150
14200
14250
14300
14350
14400
Inline #
13400
13200
13000
D
D'
0
4000
8000
12000
16000
20000
24000
SCALE (Feet)


BB' - enhanced - Arbitrary Line - depth
ANTELOPE FED 28 SWD #1 1
2500
0
-2500
-5000
BLCN
BOTTOM_SALT_BASE
CRCN
Phase Rot. °
0

Appendix A-3

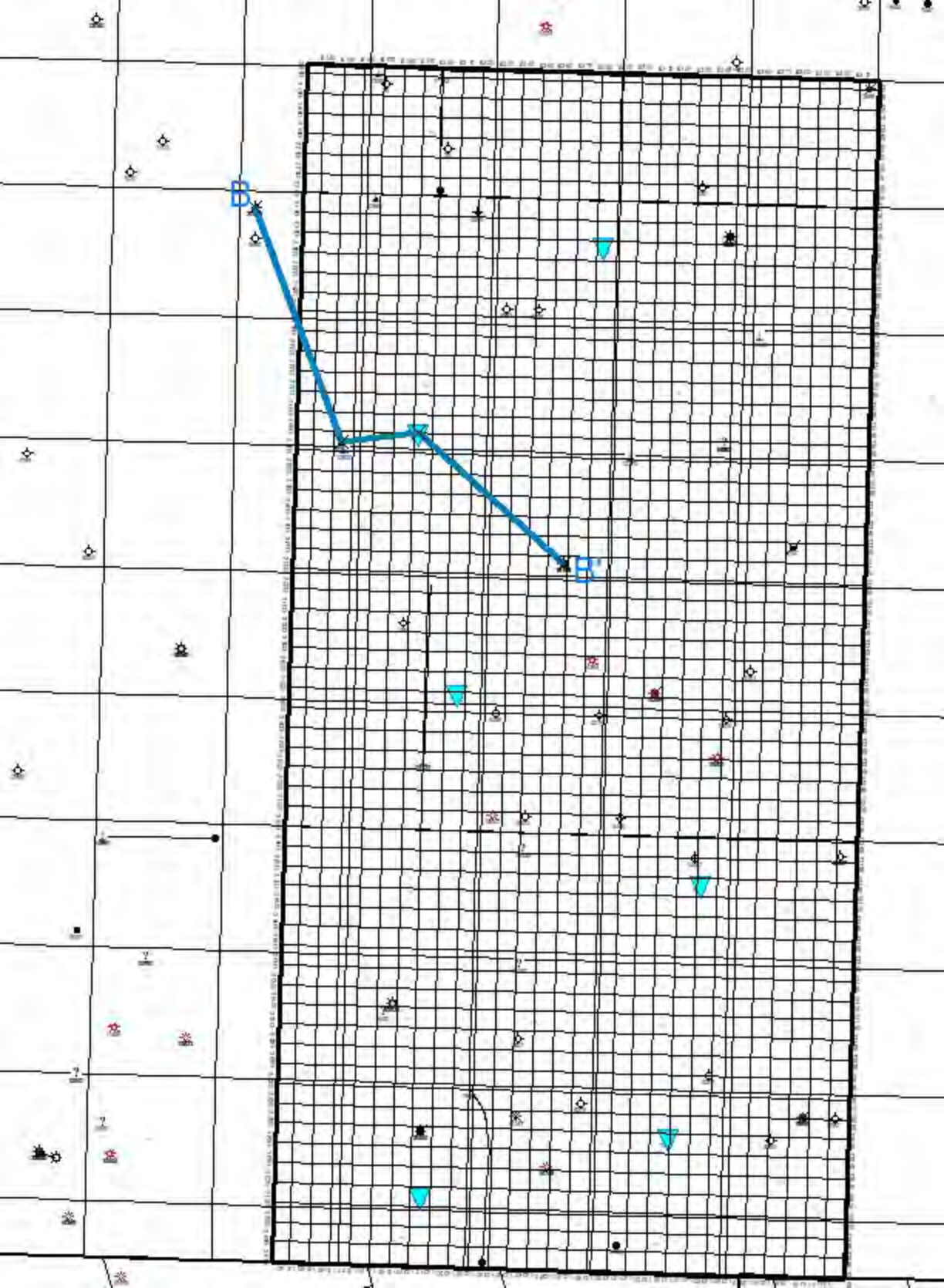
Structural A-A'

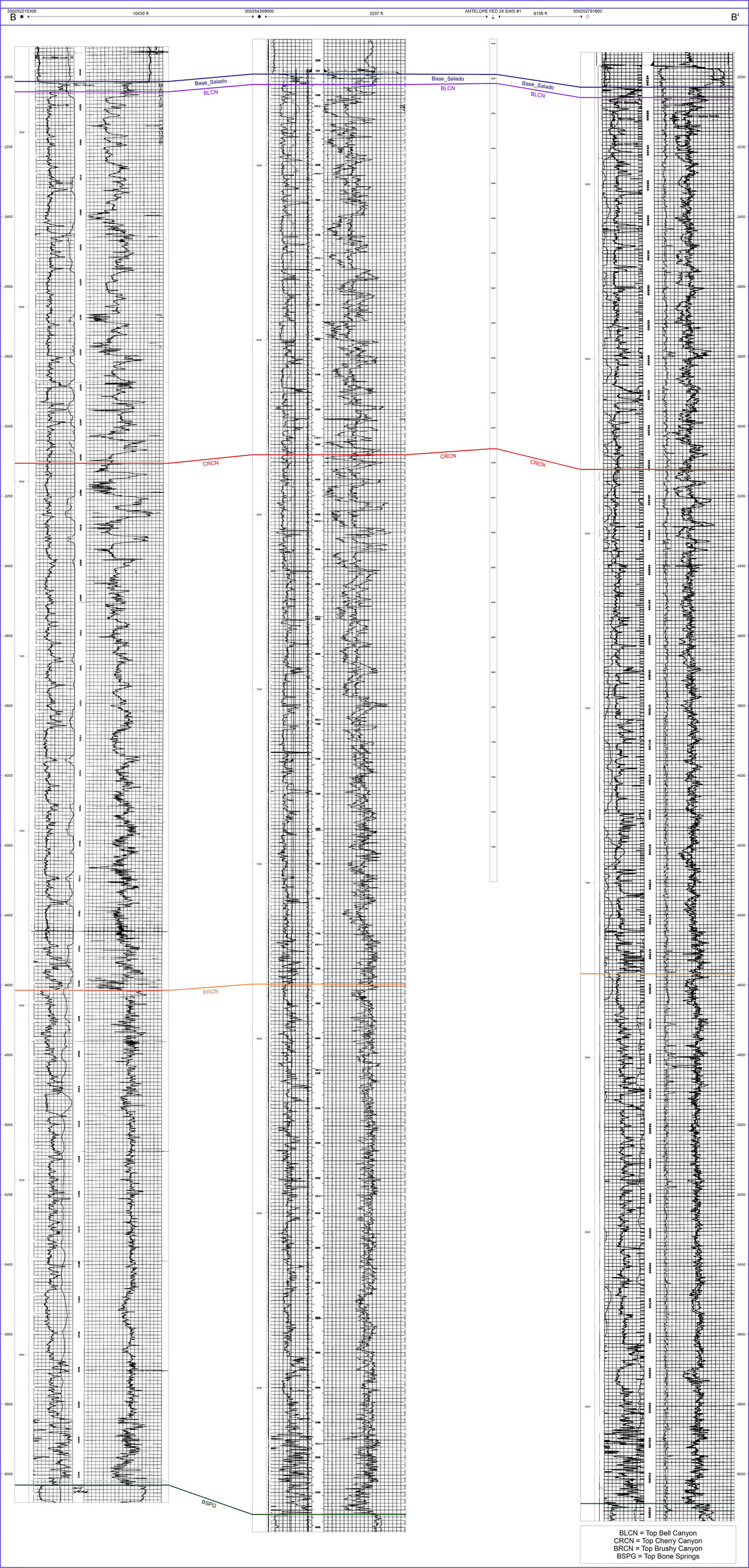

A
A'


300252775300
A
17384 ft
300254309000
3237 ft
ANTELOPE FED 28 SWD #1
8926 ft
300254257500
A'
Base_Salado
BLCN
CRCN
BRCN
BSPG
BLCN = Top Bell Canyon
CRCN = Top Cherry Canyon
BRCN = Top Brushy Canyon
BSPG = Top Bone Springs

Appendix A-4

Structural B-B'


B
B'


B
300252215300
10430 ft
300254309000
3237 ft
ANTELOPE FED 28 SWD #1
8156 ft
300252791600
B'
Base_Salado
BLCN
CRCN
BRCN
BSPG
BLCN = Top Bell Canyon
CRCN = Top Cherry Canyon
BRCN = Top Brushy Canyon
BSPG = Top Bone Springs

Appendix B

Reservoir Performance Modeling

Southeast Lea County
5 DMG SWDs east of Jal New Mexico

TASP Group, June 9, 2025

Dave Childers, Sr. Reservoir Engineer

5 YEARS

WTTR LISTED NYSE

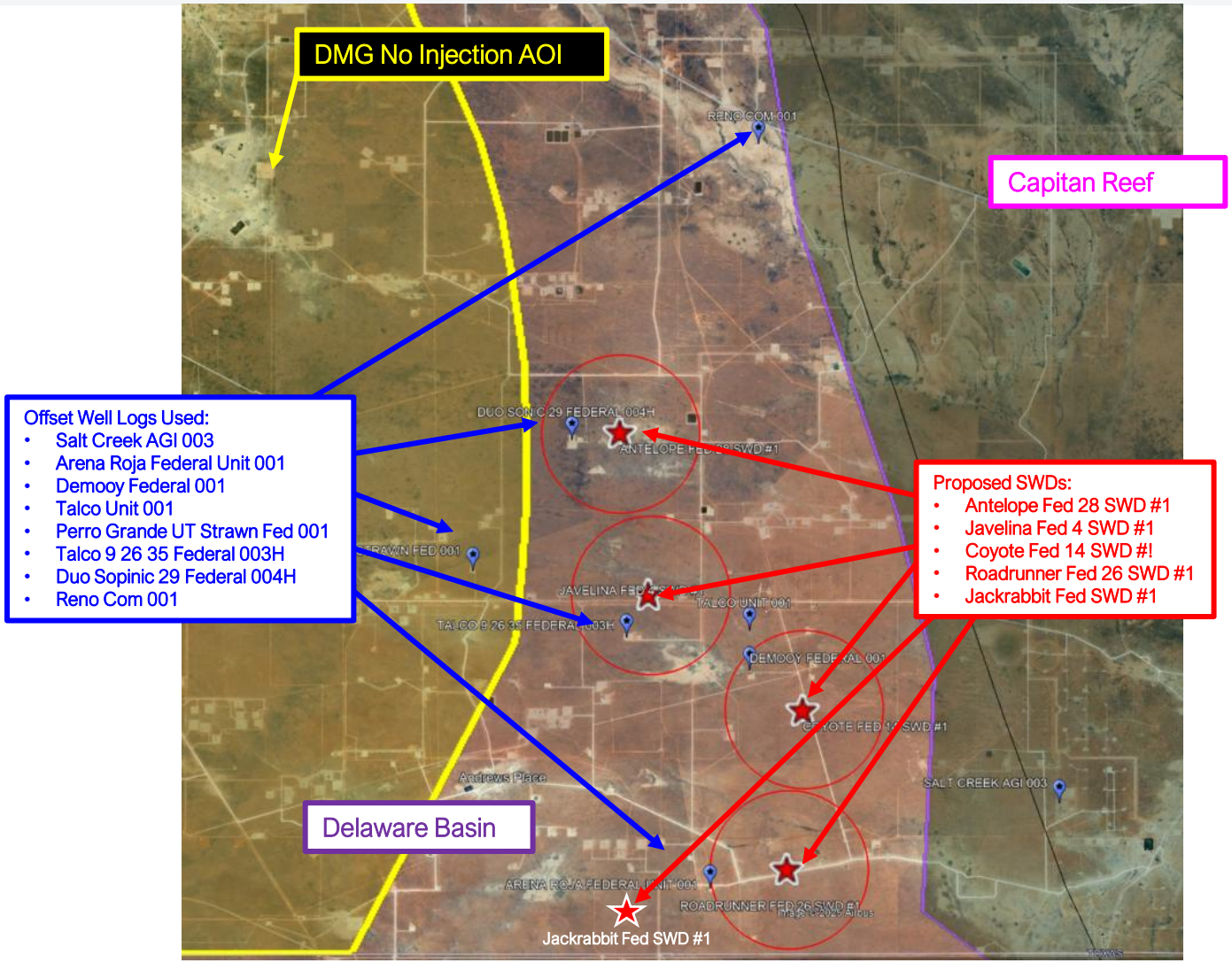
Scope of Work

- Determine:
  - Reservoir and geomechanical properties to approximate reservoir and wellbore hydraulics.
  - Analyze confining layers and estimate fracture gradients.
  - Estimate operational pressure gradients based on maximum injection rates and SWD life.
- Proposed SWDs:
  - Antelope Fed 28 SWD #1
  - Javelina Fed 4 SWD #1
  - Coyote 14 SWD #1
  - Roadrunner Fed 26 SWD #1
  - Jackrabbit Fed SWD #1

SELECT

Locations & Offset Logs

- Review viability of SWD operations based on disposal injection rates.
- DMG Formation Injection Targets
  - Bell Canyon
  - Cherry Canyon
- Confining Layers
  - Lamar (upper interval)
  - Brushy Canyon (lower interval)



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Injection Interval

Well Name	Target Interval	Top of Interval Approximated (ft)	Gross Injection Zone Thickness (ft)
Antelope Fed 28 SWD #1	Bell Canyon	5,250’	2,500’
	Cherry Canyon	6,200’	
	Brushy Canyon	7,750’	
Javelina Fed 4 SWD #1	Bell Canyon	5,350’	2,430’
	Cherry Canyon	6,450’	
	Brushy Canyon	7,780’	
Coyote Fed 14 SWD #1	Bell Canyon	5,200’	2,350’
	Cherry Canyon	6,250’	
	Brushy Canyon	7,550’	
Roadrunner Fed 26 SWD #1	Bell Canyon	5,275’	2,475’
	Cherry Canyon	6,300’	
	Brushy Canyon	7,750’	
Jackrabbit Fed SWD #1	Bell Canyon	5,250'	2,450’
	Cherry Canyon	6,350'	
	Brushy Canyon	7,700'	

SELECT

Offset Wells used to Estimate Reservoir/Geomechanical Properties

							Logs Used to Ascertain Reservoir and Geomechanical Properties					
							Porosity	Rock Density	Water or Hydrocarbon bearing Layers	Lithology	Lithology	Geomechanical Properties
API	Well Name	Lat.	Long.	Interval of Interest	Top of Interval (feet	Thickness	Neutron	Density	Resistivity	Photoelectric	Gamma Ray	Sonic DT
300255186500	Salt Creek AGI 003	32° 1'40.67"N	103°16'39.73"W	Saldo	1900		Yes	Yes	Yes	Yes	Yes	Yes
				Bell Canyon	5300	1900						
				Cherry Canyon	6200							
				Brushy Canyon (Approximation)	7200							
300253725700	Arena Roja Federal Unit 001	32° 0'44.66"N	103°21'11.39"W	Salt	4876		No	Yes	No	Yes	No	No
				Bell Canyon	5156	2494						
				Cherry Canyon (Approximation	6350							
				Brushy Canyon (Approximation)	7650							
300252253100	Demooy Federal 001	32° 3'8.46"N	103°20'40.96"W	Salado	1900		No	No	No	No	Yes	Yes
				Bell Canyon	5250	2375						
				Cherry Canyon (Approximation	6250							
				Brushy Canyon (Approximation)	7625							
300252674700	Talco Unit 001	32° 3'34.62"N	103°20'41.02"W	Saldo	1900		No	No	Yes	No	Yes	Yes
				Bell Canyon	5250	2400						
				Cherry Canyon	6250							
				Brushy Canyon (Approximation)	7650							
300252735900	Perro Grande UT Strawn Fed 001	32° 4'13.84"N	103°24'15.85"W	Saldo	1900		No	No	Yes	No	Yes	No
				Bell Canyon	5350	2525						
				Cherry Canyon	6550							
				Brushy Canyon (Approximation)	7875							
300254345800	Talco 9 26 35 Federal 003H	32° 3'30.11"N	103°22'16.54"W	Lamar	5332		Yes	Yes	Yes	Yes	Yes	No
				Bell Canyon	5360	2410						
				Cherry Canyon	6300							
				Brushy Canyon (Approximation)	7770							
300254309000	Duo Sopnic 29 Federal 004H	32° 5'40.23"N	103°22'59.30"W	Lamar	5239		No	No	No	No	No	No
				Bell Canyon	5269	2558						
				Cherry Canyon	6329							
				Brushy Canyon (Approximation)	7827							
300252686700	Reno Com 001	32° 8'55.60"N	103°20'34.62"W	Saldo	1900		Yes	Yes	Yes	Yes	No	Yes
				Bell Canyon	5300	2025						
				Cherry Canyon	6180							
				Brushy Canyon (Approximation)	7325							

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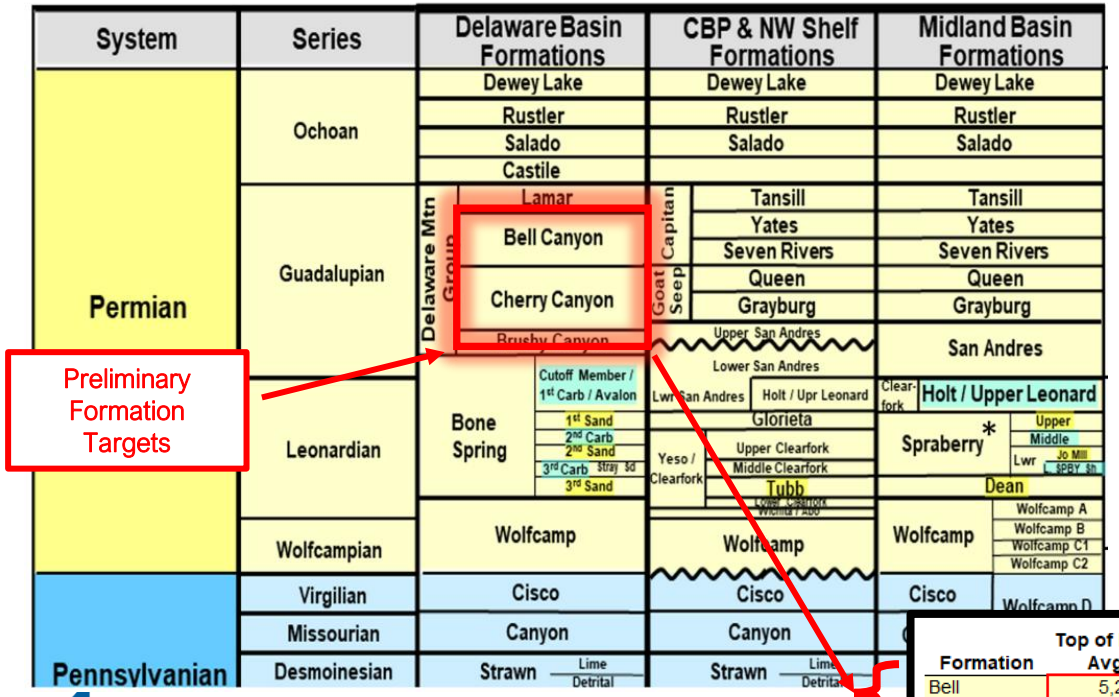
Isopach Thickness: Top of Bell Canyon - Bottom of Cherry Canyon

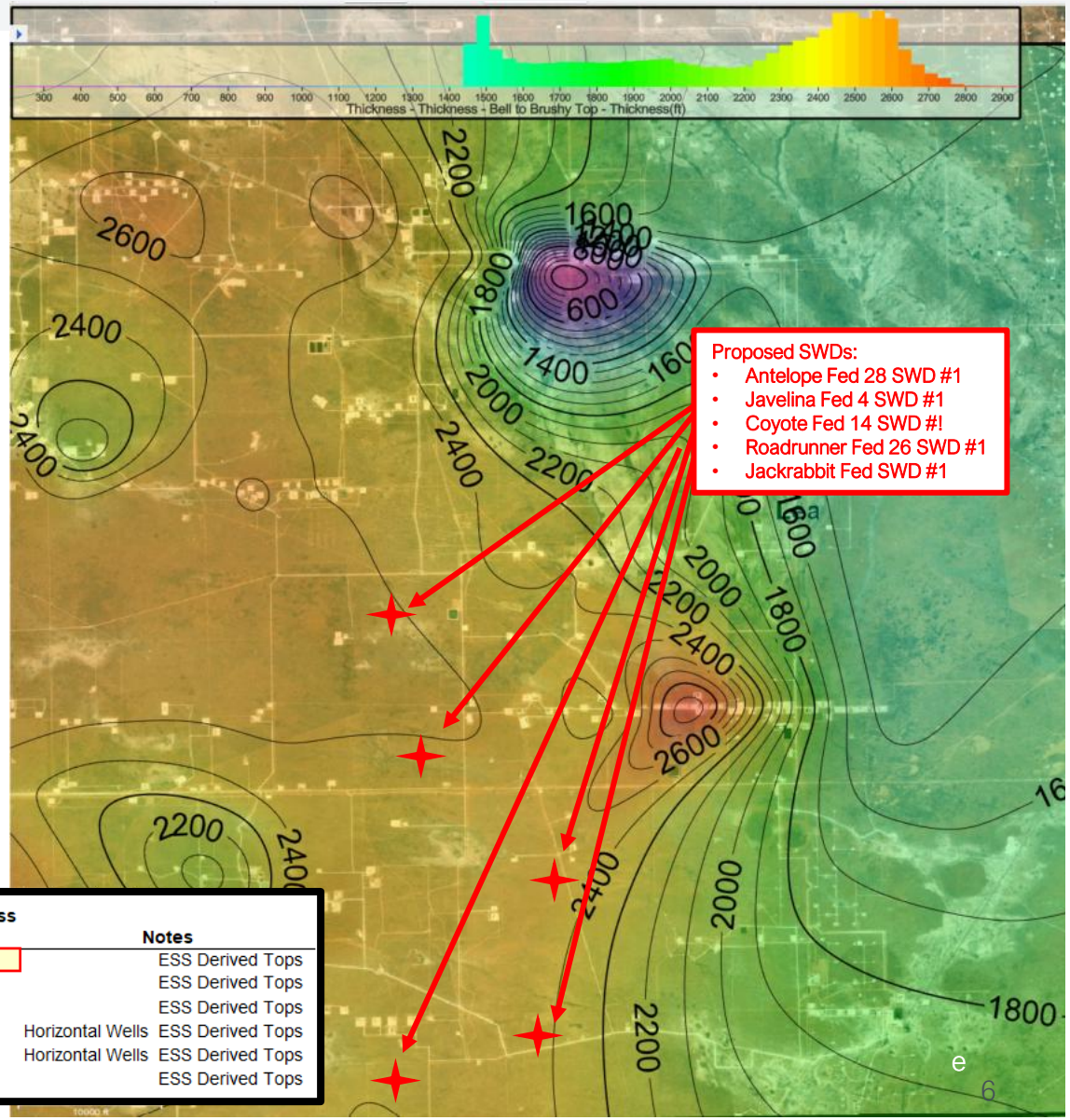
- Zones of interest (ZOI) are Bell Canyon and Cherry Canyon formations.
  - Average depth, thickness, and injection interval is provided in the table below.

Summary of lower Permian stratigraphic nomenclature, Permian Basin region



Preliminary Formation Targets

Formation	Top of Interval Avg (ft)	Target Thickness Avg (ft)	Notes	
Bell	5,250	2,500		ESS Derived Tops
Cherry	6,250			ESS Derived Tops
Brushy	7,750			ESS Derived Tops
Bone Springs	9,250		Horizontal Wells	ESS Derived Tops
Wolfcamp	12,375		Horizontal Wells	ESS Derived Tops
Strawn	13,500			ESS Derived Tops



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Findings

- Fracture Gradients:
  - Fracture Models used to estimate fracture limits *(Bourgoyne, 1986)*.
  - Triangular distribution with cumulative distribution function was used to estimate the most probable fracture gradient.
    - Deviation from the most likely facture gradient will result in lower probable fracture gradient outcomes.
  - Pressure gradients from injection operations are less than upper and lower confining layer fracture gradients indicating injectate confinement.

Near Wellbore Hydraulic Model:
- Coupling of reservoir and wellbore hydraulic models to estimate the pressure response as a function of injection rate *(Spivey et.al, 2013, and Lee et.al, 2003).*

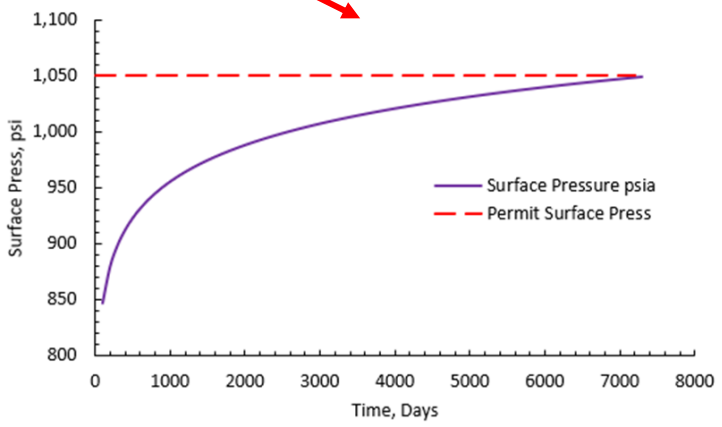
Fracture Mechanic Models	Upper Layer psi/ft	Lower Layer psi/ft
Hubbert and Willis Correlation	0.639	0.646
Mathews and Kelly Correlation	0.823	0.866
Pennebaker Correlation	0.814	0.871
Eaton Correlation	0.637	0.675

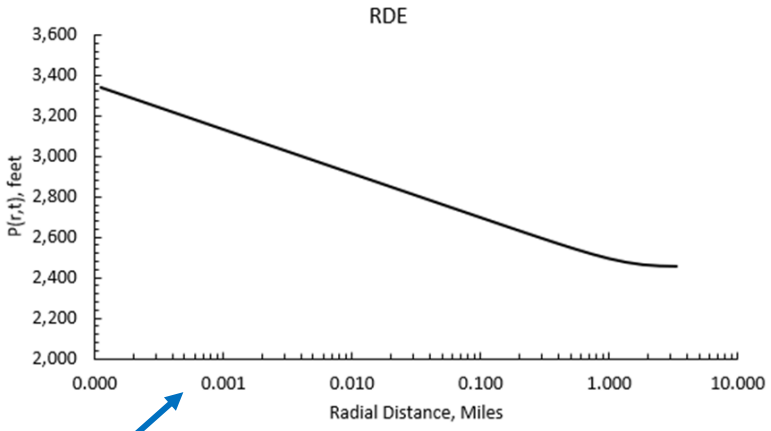
Offset Well Logs with Triangular Distribution	Fracture Gradient psi/ft min	mean	max
Upper Confining Layer	0.637	0.726	0.814
Lower Confining Layer	0.646	0.771	0.871

Most likely fracture gradients

Near Wellbore Model		
NMOCD Surface Pressure Gradient Constraint =	0.2	psi/ft

Model		
Rate =	20,000	BPD
Pore Pressure = Initial Pressure ~	2,455	psi/ft
Well Life =	10	yrs.
Injection Interval =	1,250	feet
Likely Porosity =	21.8%	dim
Minimum effective permeability k_{eff} >=	19.2	md
Pressure Gradient due to Injection Ops. =	0.64	psi/ft
Flow Capacity (kh) =	24,000	md-ft
Rate =	20,000	BPD
Pore Pressure = Initial Pressure ~	2,455	psi/ft
Well Life =	20	yrs.
Injection Interval =	1,250	feet
Likely Porosity =	21.8%	dim
Minimum effective permeability k_{eff} >=	19.93	md
Pressure Gradient due to Injection Ops. =	0.64	psi/ft
Flow Capacity (kh) =	24,913	md-ft





Radial Diffusion Model:
- Estimate of pressure diffusion with respect to SWD well life *(Spivey et.al, 2013, and Lee et.al, 2003).*

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Conclusions

- Injection pressure into the Bell/Cherry Canyon is below the fracture pressures of the upper and lower confining zones (Injectate Confinement).
- Radial Diffusion Model shows that initial pressure of 2,455 psi will be approached at approximately two-miles away from the wellbore with an injection rate of 20k bwpd for 20-years.
- Pressure Gradient (PG) near wellbore is approximately 0.64 psi/ft or 12.3 ppg EMW
  - Near Wellbore PG levels are around 0.64 psi/ft for 10 or 20-year time period.
- Simulations presented are for the least amount of flow capacity (kh) needed for disposal. We expect that the kh could be significantly higher due to additional height available and having higher reservoir porosity and permeability contrasts.
  - Step rate test will quantify the actual fracture gradient of the injection zone followed by a pressure fall off test to determine the actual reservoir properties.

SELECT

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  - Lee, W. J., Rollins, J. B., & Spivey, J. P. (2003). Pressure transient testing (Vol. 9). Society of Petroleum Engineers.

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