Initial Application Part I

Received 8/5/21

This application is placed in file for record. It MAY or MAY NOT have been reviewed to be determined Administratively Complete

QP14H-210805-C-1080

Revised March 23, 2017

RECEIVED:	REVIEWER:	TYPE:	APP NO:
8/5/21		SWD	pBL2121756625

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: Anthem Water Solutions, LLC **OGRID Number:** 330069
Well Name: Sparrow 222233 Federal SWD 1 **API:** 30-025-XXXXX
Pool: SWD; Devonian-Silurian **Pool Code:** 97869

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

SWD-2448

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.

Marshall Tippen
Print or Type Name

Signature

8/4/2021
Date

(972) 795-4201
Phone Number

mtippen@anthemwsllc.com
e-mail Address

ANTHEM
WATER SOLUTIONS

8/4/2021

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

Re: Application of Anthem Water Solutions, LLC to drill and permit the saltwater disposal well Sparrow 222233 Federal SWD 1 located in Unit I, Section 22, Township 22 South, Range 33 East, NMPM, Lea County, New Mexico.

To Whom it May Concern:

Please find the enclosed C-108 Application for Authority to Inject, supporting the above-referenced request for saltwater disposal. The well will be operated as a commercial endeavor offering operations in the area additional options for produced water disposal. Please find the enclosed C-108 Application for Authority to Inject along with supporting documents.

I would like to point out that this application for a proposed Devonian-Silurian SWD interval includes the following: Published legal notice ran 7/8/2021 in The Lovington Leader and all offset operators and other interested parties have been notified individually. The legal notice affidavit is included herein. This application also all information required for a completed Form C-108, as well as a wellbore schematic, area of review maps, affected party plat and other required and pertinent information. This well is located on Federal land and Federal minerals; a copy of the application has been sent to the appropriate regulatory bodies.

I respectfully request that the approval of this saltwater disposal well proceed swiftly and if your staff requires additional information or has any questions, please do not hesitate to call or email me.

Sincerely,

Marshall Tippen
Anthem Water Solutions
mtippen@anthemwsllc.com | (972) 795-4201

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? ____X____Yes _____No

II. OPERATOR: **Anthem Water Solutions, LLC**

ADDRESS: **5914 W. Courtyard Drive, Suite 320, Austin TX 78730**

CONTACT PARTY: **Marshall Tippen** PHONE: **(979) 795-4201**

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: **Marshall Tippen** TITLE: **Director of Engineering**

SIGNATURE:  DATE: 8/4/2021

E-MAIL ADDRESS: **mtippen@anthemwsllc.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.

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.

(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.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

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.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(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.

(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.

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.

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.

Item III – Subject Well Data (Attachment 1)

A. Well Data

1) General Well Data

Operator: Anthem Water Solutions, LLC
Lease Name and Well Number: Sparrow 222233 Federal SWD 1
Location Footage Calls: 2471' from FSL, 135' from FEL
Legal Location: Unit I, Section 22, Township 22 South, Range 33 East, NMPM
Ground Elevation: 3526 feet
Proposed Injection Interval: 15445 - 16192 (open hole)
County: Lea

2) - 3) Casing , Tubing & Cement Information

Casing Information						
Type	**Conductor (1)**	**Surface (2)**	**Intermediate (3)**	**Production (4)**	**Liner (5)**	**Open Hole (6)**
OD	30"	16"	13 3/8"	9 5/8"	7 5/8"	N/A
Weight	N/A	84 lb / ft	68 lb / ft	53.5 lb / ft	39 lb / ft	N/A
Grade	N/A	J-55 BTC	L-80 EZ-GO FJ3	HCP-110 BTC	HCP-110 EZ-GO FJ3	N/A
Hole Size	N/A	18 1/8"	14 3/4"	12 1/4"	8 1/2"	6 1/2"
Depth Set Top	-	-	-	-	12,882	15,445
Depth Set Bottom	120	1,195	5,000	13,082	15,445	16,192
TOC	Surf	Surf	Surf	Surface	-	-
TOC Method	Circ	Circ	Circ	Circ	CBL	-
Volume (Sacks)	250	600	891	3,855	425	N/A
DV Tool 1	N/A	N/A	N/A	5,050	N/A	N/A
DV Tool 2	N/A	N/A	N/A	10,679	N/A	N/A

Tubing Information		
Type	**Upper String (7)**	**Lower String (8)**
OD	5 1/2"	4 1/2"
Weight	20 lb / ft	18 lb / ft
Grade	HCL-80 BTC	HCL-80 LTC
Hole Size	N/A	N/A
Depth Set Top	-	12,782
Depth Set Bottom	12,782	15,395

**Wellbore Diagram Attached*

4) **Packer Information:**
   Arrowset AS1-X or equivalent packer set at approximately 15395 feet
   **Packer Schematic Attached*

B. Completion Information

1) **Injection Formation Name:** Devonian-Silurian
   Pool Name: SWD; Devonian-Silurian
   Pool Code: 97869
2) **Injection Interval:** 15445 - 16192 (open hole)
3) **Drilling Purpose:** Drilled for injection
4) **Overlying Oil and Gas Zones:** Below are approximate tops for known oil and gas producing zones in the area.
   - Delaware: 4950’
   - Bone Spring: 9917’
   - Wolfcamp: 12037’
   - Strawn: 13588’
   - Atoka: 13794’
   - Morrow: 14435’
5) **Underlying Oil and Gas Zones:** No underlying oil and gas zones exist.

Item V – Well and Lease Maps (Attachment 2)

1) **2-mile oil & Gas Well Map**
2) **1-mile Well Detail List**
3) **2-Mile Lease Map**
4) **2-Mile Mineral Ownership Map**
5) **2-Mile Surface Ownership map**
6) **1.5-Mile Deep SWD Map (Devonian-Silurian)**
7) **Potash Lease Map**

Item VI – AOR Well List (Attachment 2)

There have been 2 wells drilled within the 1-mile AOR. None of these wells nor any new or permitted wells penetrate the injection zone.

Item VII – Proposed Operation (Attachment 3)

1) **Proposed Maximum Injection Rate:** 30,000 bwpd
   Proposed Average Injection Rate: 15,000 bwpd
2) A **closed system** will be used.
3) **Proposed Maximum Injection Pressure:** 3089 psi (surface)
4) **Proposed Average Injection Pressure:** 1853 psi (surface)
5) **Source Water Analysis:** It is expected that the injected fluid will consist of water produced from the Wolfcamp and Bone Springs formations. Water samples from these formations are included in Attachment 3.
6) **Injection Formation Water Analysis:** The proposed SWD will be injecting water into the Devonian-Silurian formation which is a non-productive zone known to be compatible with formation water from the Wolfcamp and Bone Springs formations. Water analyses from the Devonian-Silurian formation in the area are included in attachment 3.

Item VIII – Geologic Description

The proposed injection interval includes the Devonian–Silurian formation from 15445 feet to 16192 feet. This formation consists of interbedded carbonate rocks consisting of dolomites and limestones with some interbedded siltstones and shales. Several thick sections of porous and permeable intervals capable of taking water are present within the subject formations in the area.

The base of the lowermost Underground Source of Drinking Water (USDW) is at a depth of approximately 1145 feet. The USDW is covered by 16-inch casing set at 1195 feet and cemented to surface, additionally the USDW is covered by intermediate casing set at 5000 feet and cemented to surface. Geophysical log assessment was conducted to accurately determine the top of the Rustler formation, as well as the top and base of the Salado formation in the area.

Item IX – Proposed Stimulation

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

Item X – Logging and Test Data

Log data will be submitted to the OCD upon completion of this well.

Item XI – Fresh Groundwater Samples (Attachment 4)

Based on a review of the data from the New Mexico Office of State Engineer there are no fresh water wells within a 1-mile radius of the proposed location. As a result, no groundwater samples were obtained.

XII – No Hydrologic Connection Statement (Attachment 5)

Anthem has examined available geologic and engineering data, and has found no evidence of faulting present in the area that would provide a hydrologic connection between the injection interval and overlying USDWs. Additionally, the casing and cementing progam has been designed to further insure there will be no hydrologic connection between the injection interval and overlying USDWs. A letter from a knowledgeable and qualified expert stating that there is a low risk of seismic activity from the proposed injection activities is included in Attachment 5.

XIII – Proof of Notice (Attachment 6)

A Public Notice was filed with The Lovington Leader and an affidavit is included in Attachment 6.

A copy of the application was mailed to the OCD District Office, landowners, appropriate regulatory bodies, and leasehold operators within a 1-mile radius of the proposed SWD location. A list of recipients, as well as delivery confirmations, is included in Attachment 6.

Attachments Table of Content:

Attachment 1: Form C-102

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

[1] API Number	[2] Pool Code	[3] Pool Name
30-025-XXXXX	97869	SWD; Devonian-Silurian

[4] Property Code	[5] Property Name	[6] Well Number
	Sparrow 222233 Federal SWD	1

[7] OGRID No.	[8] Operator Name	[9] Elevation
330069	Anthem Water Solutions, LLC	3526

[10] Surface Location

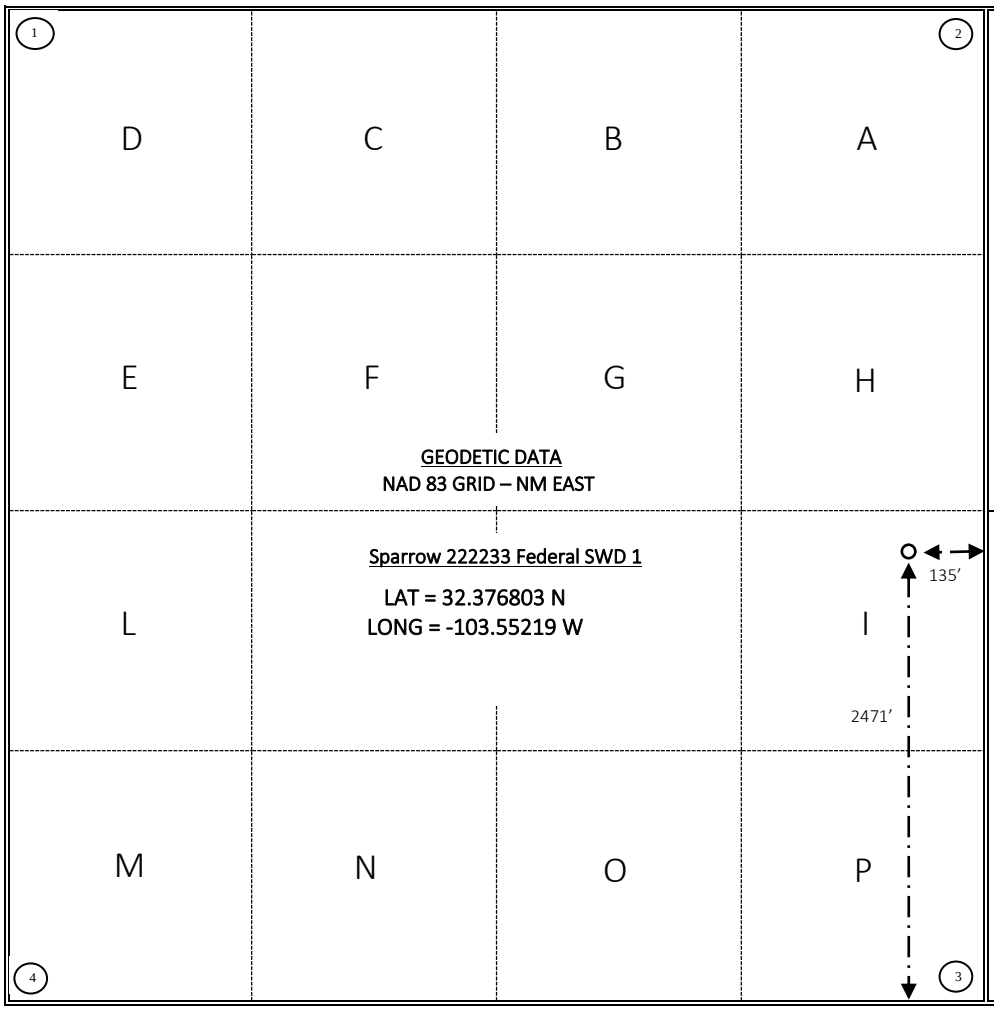
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	22	22S	33E		2471	South	135	East	Lea

[11] Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] 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.



[17] OPERATOR CERTIFICATION

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.

Signature Date

Printed Name

E-mail Address

[18] SURVEYOR CERTIFICATION

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.

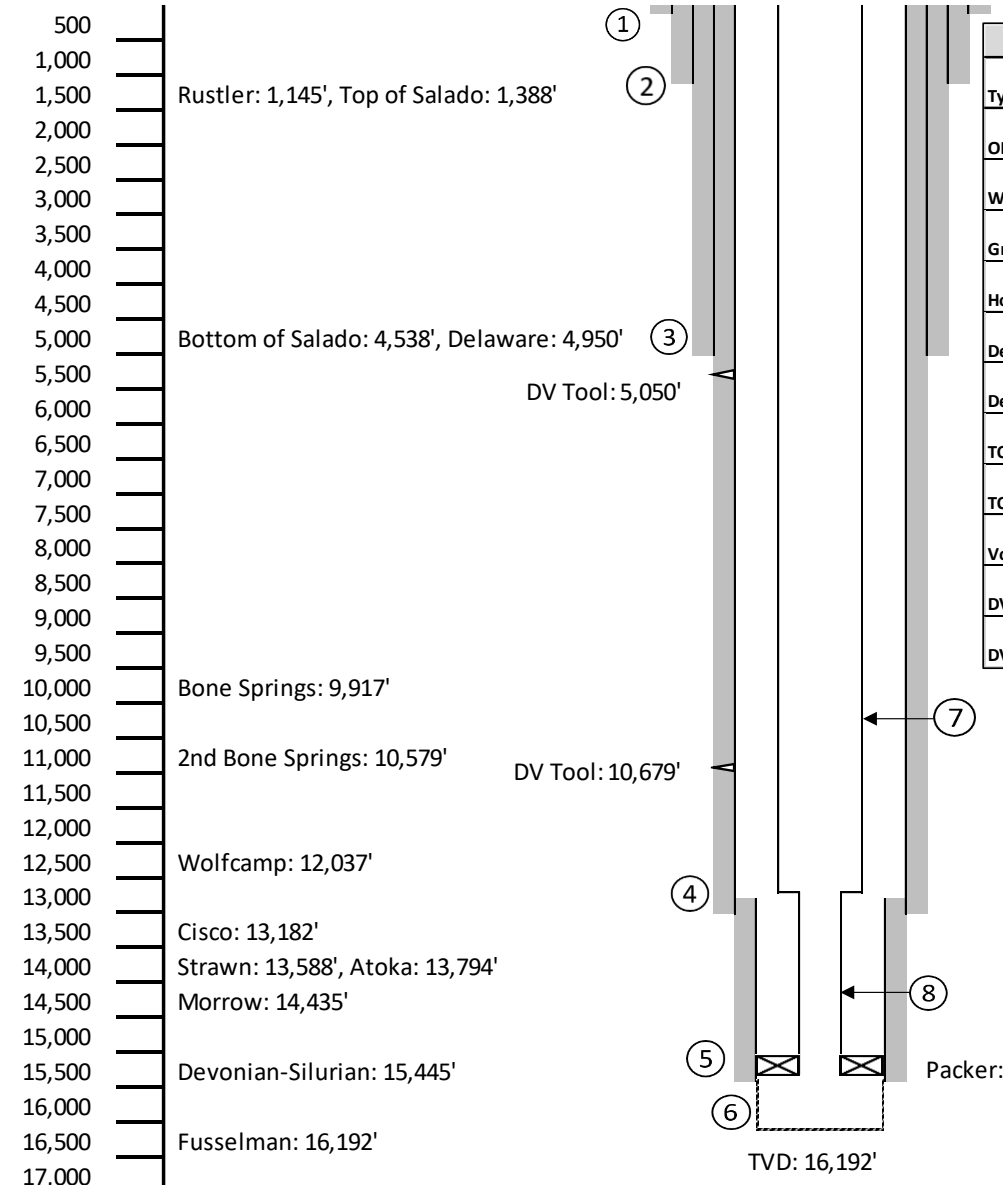
Date of Survey

Signature and Seal of Professional Surveyor:

PRELIMINARY
Certified survey to be conducted and submitted upon C-108 approval

Certificate Number

Attachment 1: Proposed Wellbore Diagram



Casing Information						
Type	Conductor (1)	Surface (2)	Intermediate (3)	Production (4)	Liner (5)	Open Hole (6)
OD	30"	16"	13 3/8"	9 5/8"	7 5/8"	N/A
Weight	N/A	84 lb / ft	68 lb / ft	53.5 lb / ft	39 lb / ft	N/A
Grade	N/A	J-55 BTC	L-80 EZ-GO FJ3	HCP-110 BTC	HCP-110 EZ-GO FJ3	N/A
Hole Size	N/A	18 1/8"	14 3/4"	12 1/4"	8 1/2"	6 1/2"
Depth Set Top	-	-	-	-	12,882	15,445
Depth Set Bottom	120	1,195	5,000	13,082	15,445	16,192
TOC	Surf	Surf	Surf	Surface	-	-
TOC Method	Circ	Circ	Circ	Circ	CBL	-
Volume (Sacks)	250	600	891	3,855	425	N/A
DV Tool 1	N/A	N/A	N/A	5,050	N/A	N/A
DV Tool 2	N/A	N/A	N/A	10,679	N/A	N/A

Tubing Information		
Type	Upper String (7)	Lower String (8)
OD	5 1/2"	4 1/2"
Weight	20 lb / ft	18 lb / ft
Grade	HCL-80 BTC	HCL-80 LTC
Hole Size	N/A	N/A
Depth Set Top	-	12,782
Depth Set Bottom	12,782	15,395

ANTHEM WATER SOLUTIONS

5914 W. Courtyard Dr. Suite 320, Austin, Texas, 78730

Wellbore Schematic: Sparrow 222233 Federal SWD 1

API: 30-025-XXXXX	Section: 22
NMOCD District: 1	Township: 22S
Prepaired By: PMT	Range: 33E
	County: Lea
Notes:	

Attachment 1: Packer Schematic

AS1-X MECHANICAL PACKER

The ACT AS1-X Packer is the most versatile of the mechanically set retrievable packers and may be used in any production application. Treating, testing, injecting, pumping wells, flowing wells, deep or shallow, the AS1-X is suited for all. The packer can be left in tension or compression, depending on well conditions and the required application. A large internal by-pass reduces swabbing when running and retrieving. The by-pass closes when the packer is set and opens prior to releasing the upper slips when retrieving to allow pressure equalization.

The J-slot design allows easy setting and releasing; 1/4 turn right-hand set, right-hand release. A patented upper-slip releasing system reduces the force required to release the packer. A non directional slip is released first, making it easier to release the other slips. The AS1-X packer can withstand 7,000 psi (48 MPa) of differential pressure above or below.

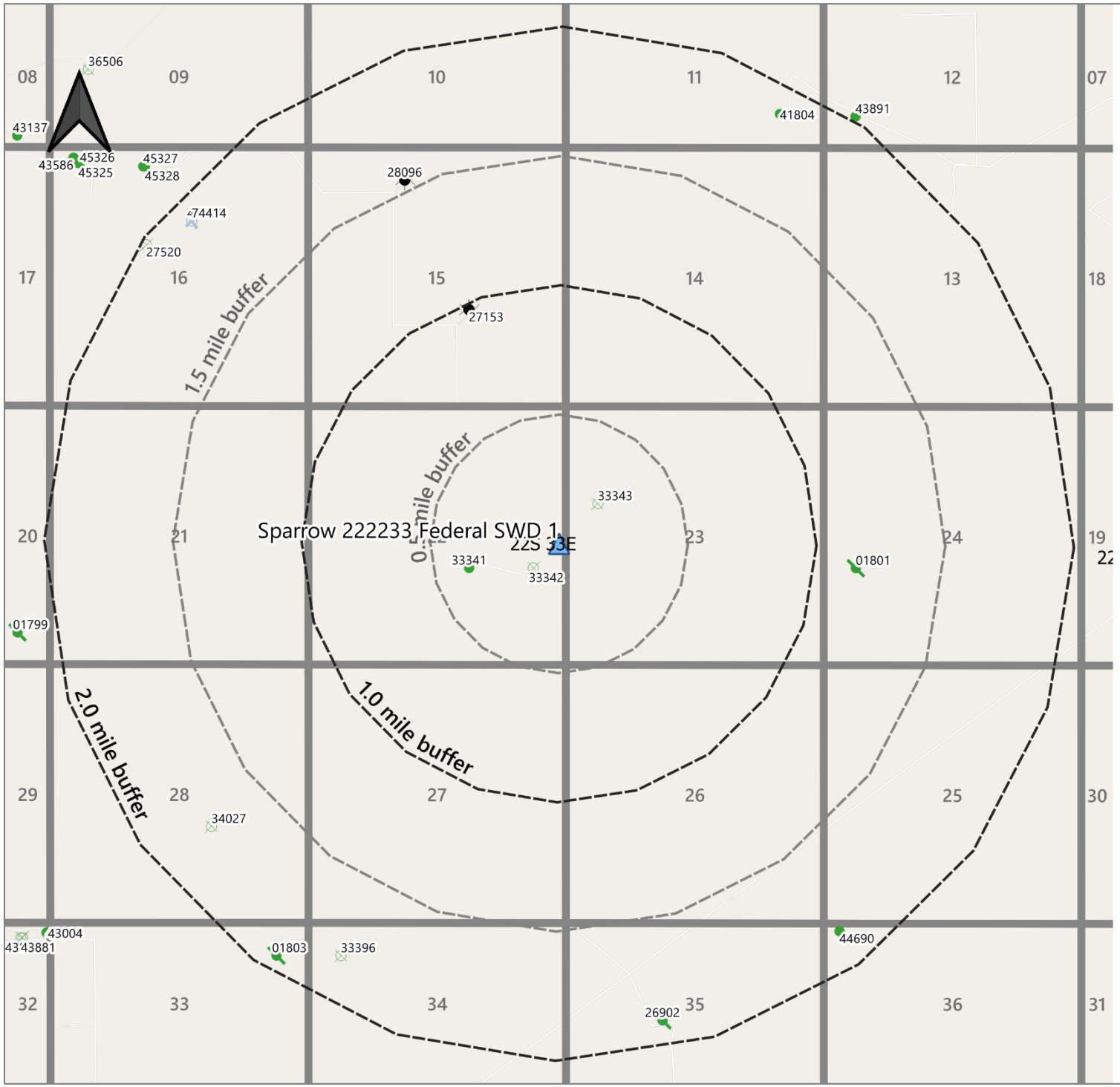
FEATURES, ADVANTAGES AND BENEFITS:

- The design holds high differential pressure from above or below, enabling the packer to meet most production, stimulation, and injection needs
- The packer can be set with compression, tension, or wire line, enabling deployment in shallow and deep applications
- The packer can be set and released with only a one-quarter turn of the tubing
- The bypass valve is below the upper slips so that debris are washed from the slips when the valve is opened, reducing the times for circulation and total retrieval
- The full opening enables unrestricted flow and the passage of wire line tools and other packer systems
- The packer can be run with the T-2 on-off tool, which enables the tubing to be disconnected and retrieved without retrieving the packer

OPTIONS:

- Elastomer options are available for hostile environments
- Optional safety releases are available

Attachment 2: 2-Mile Oil & Gas Map



Legend

- Gas, Active
- Oil, Active
- Oil, Cancelled
- Oil, Plugged (site released)
- Salt Water Disposal, Cancelled
- Salt Water Disposal, New

Sec 22 22S 33E

Lea County

New Mexico

Offset Well Review Area of Review

Sparrow 222233 Federal SWD 1

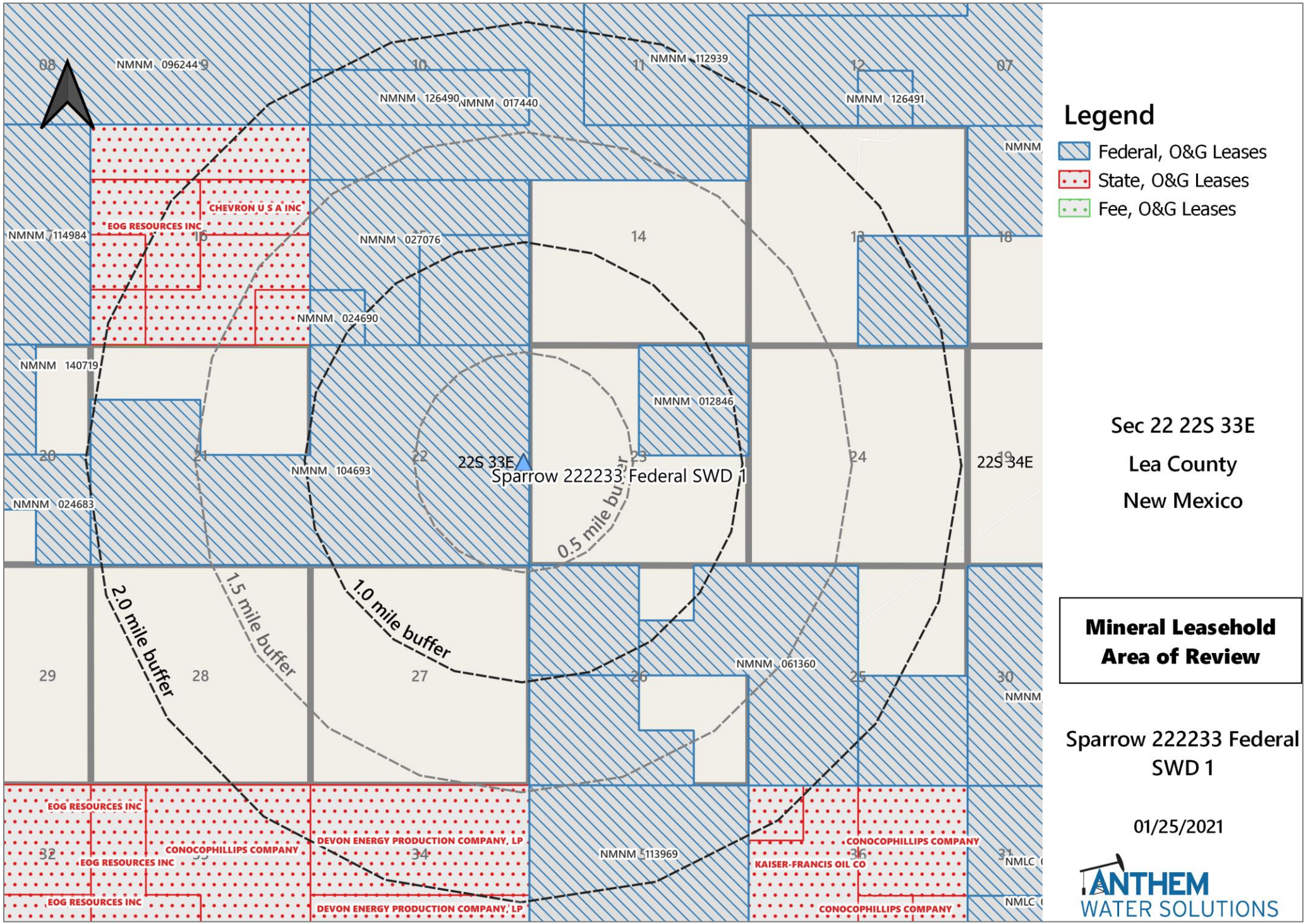
01/25/2021

ANTHEM WATER SOLUTIONS

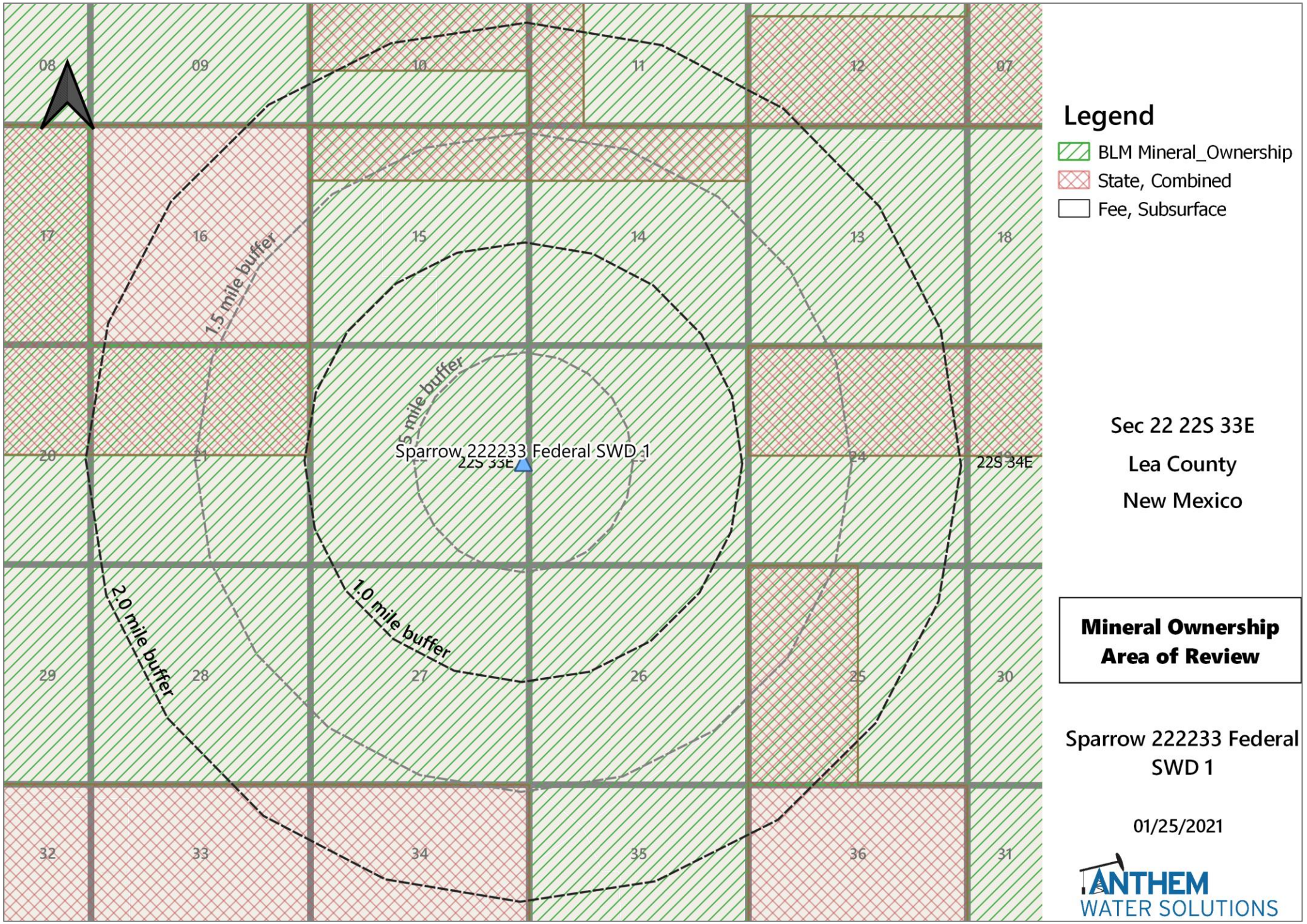
Attachment 2: 1-mile Well Detail List

AOR Tabulation for Sparrow 222233 Federal SWD 1 (Top of Injection Interval: 15,445')								
Well Name	**API #**	**Well Type**	**Well Status**	**Operator**	**Spud Date**	**Location (Sec, Tn, Rg)**	**TVD**	**Penetrate Inj Zone**
BARGAIN BQA FEDERAL #001H	30-025-33341	Oil	Active	CHEVRON U S A INC	4/7/1996	J-22-22S-33E	9,518	no
FEDERAL 15 A COM #001	30-025-27153	Gas	Active	MARATHON OIL PERMIAN LLC	12/12/1980	J-15-22S-33E	15,200	no
Notes:								
No Wells within a 1-mile radius penetrated the injection interval.								

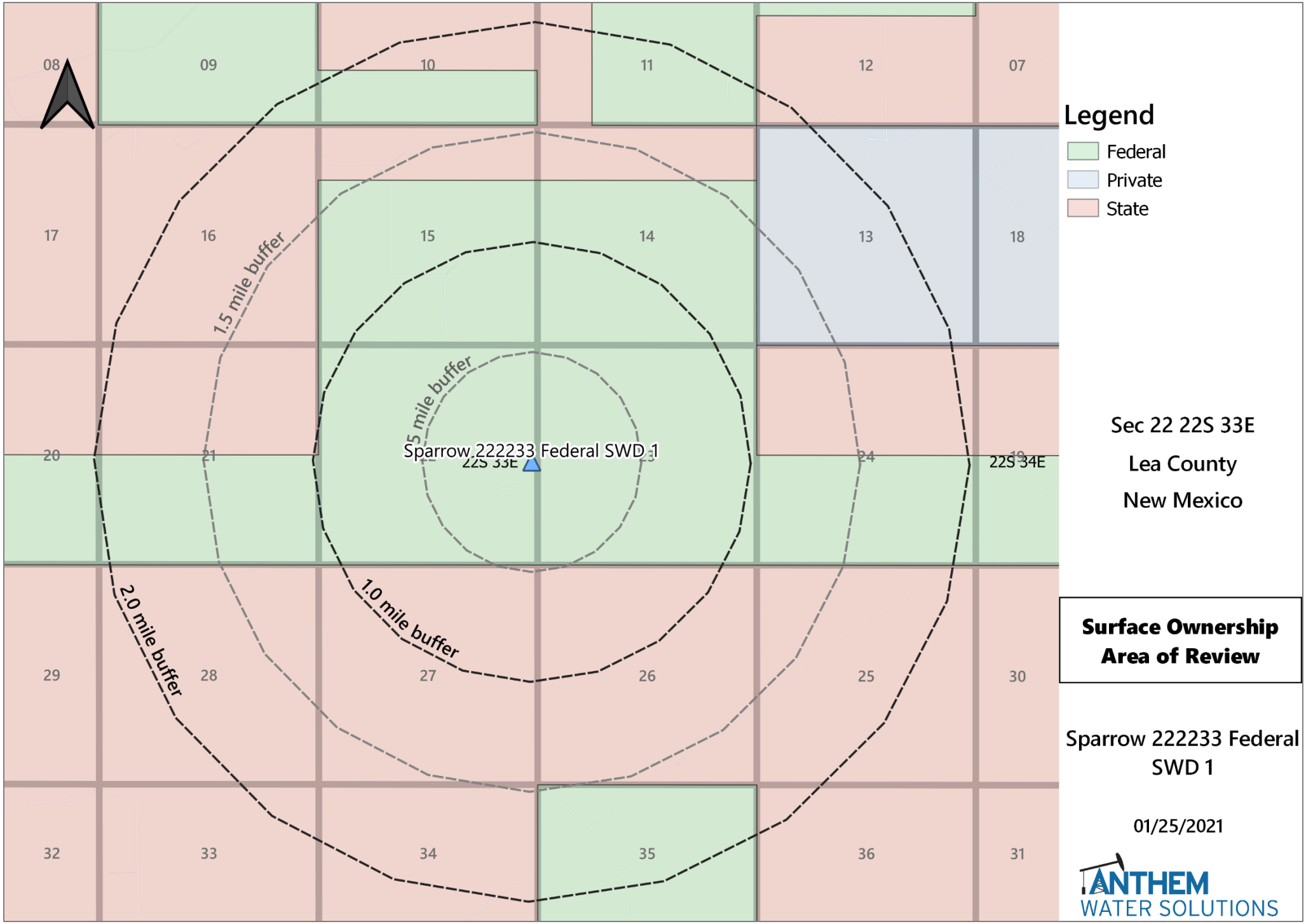
Attachment 2: 2-Mile Oil & Gas Lease Map



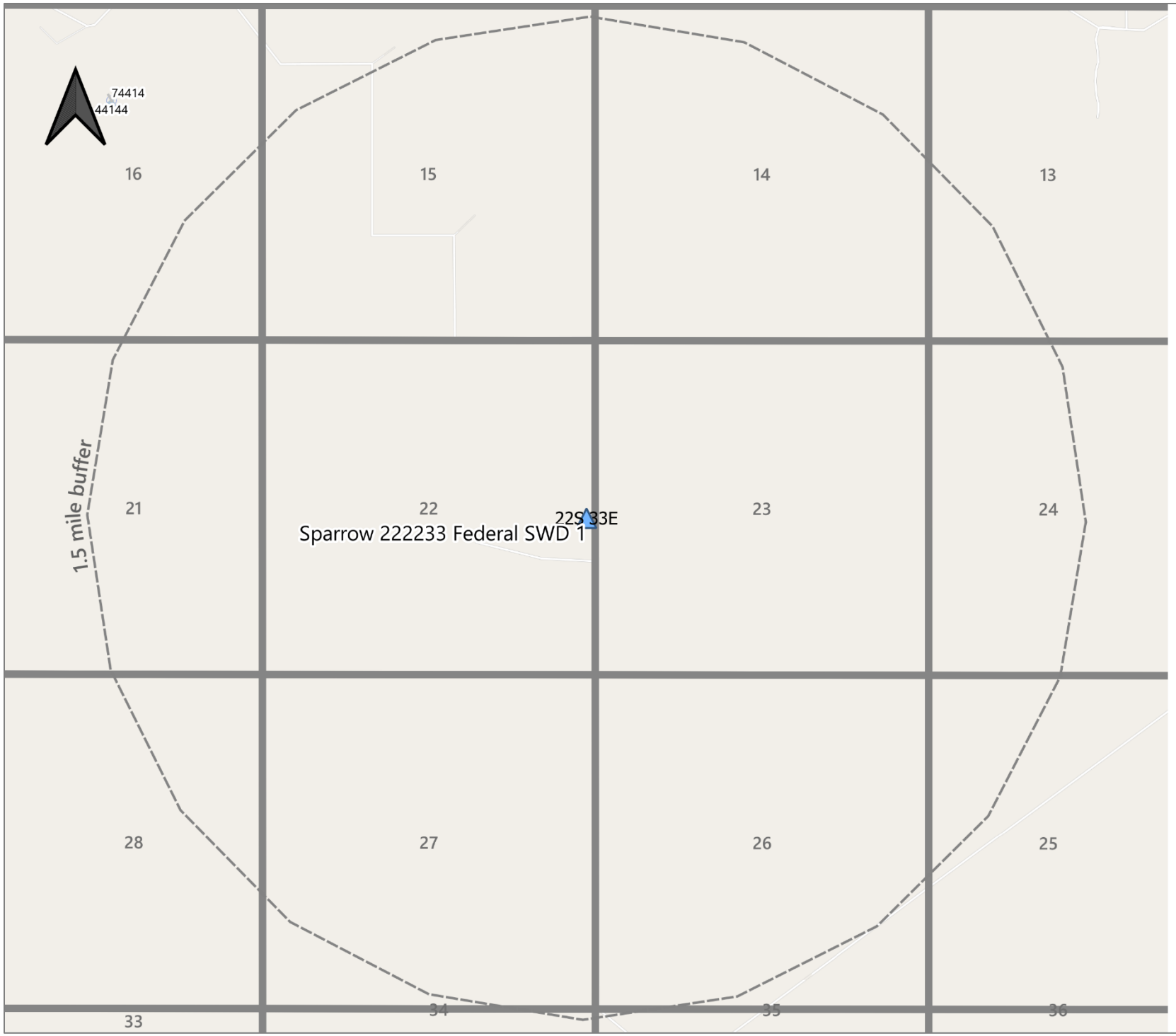
Attachment 2: Mineral Ownership Map



Attachment 2: Surface Ownership Map



Attachment 2: 1.5 Mile Deep SWD Map



Legend

- SWD, Cancelled
- SWD, New

Sec 22 22S 33E

Lea County

New Mexico

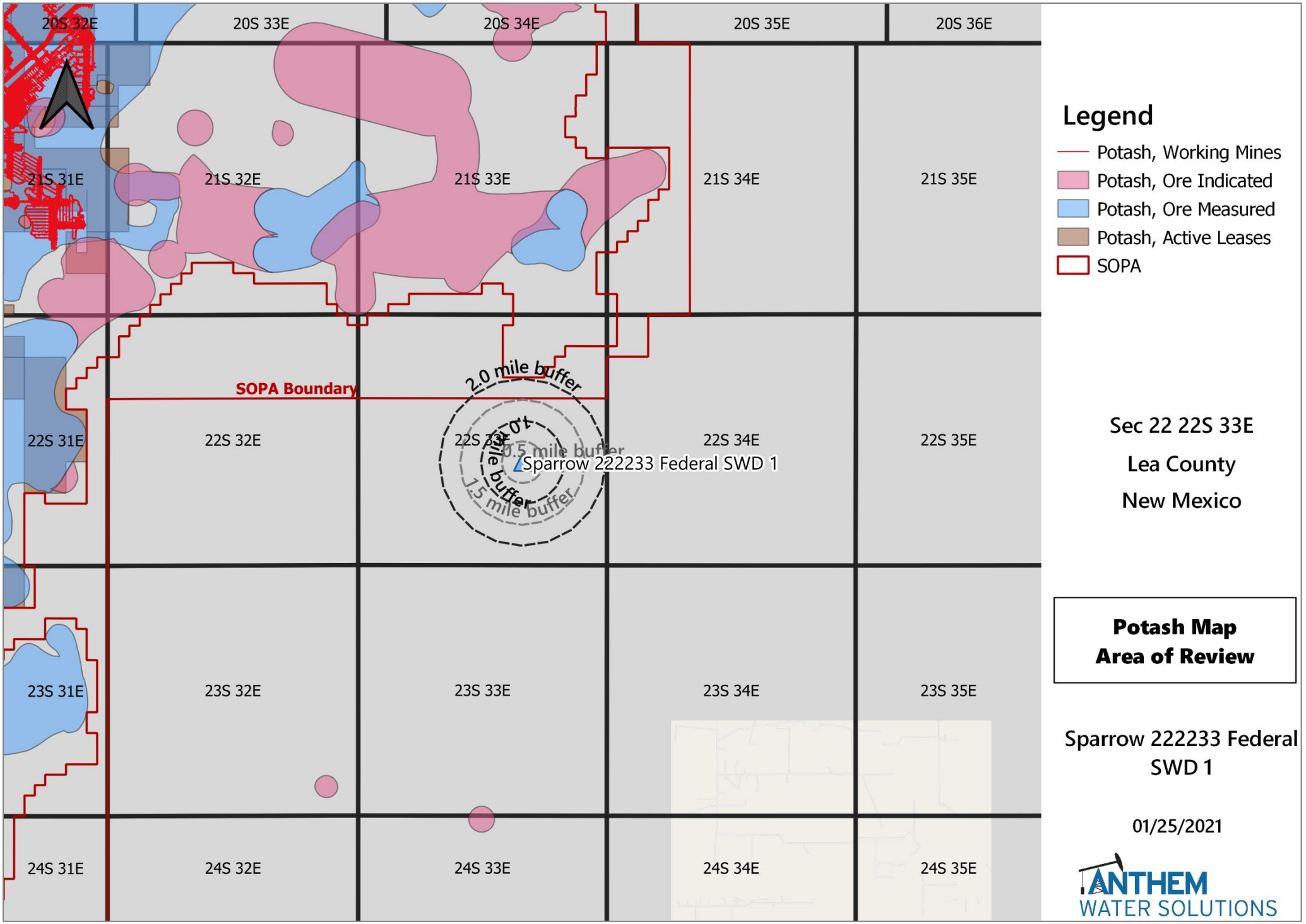
Deep SWD Review Area of Review

Sparrow 222233 Federal SWD 1

01/25/2021

ANTHEM WATER SOLUTIONS

Attachment 2: Potash Lease Map

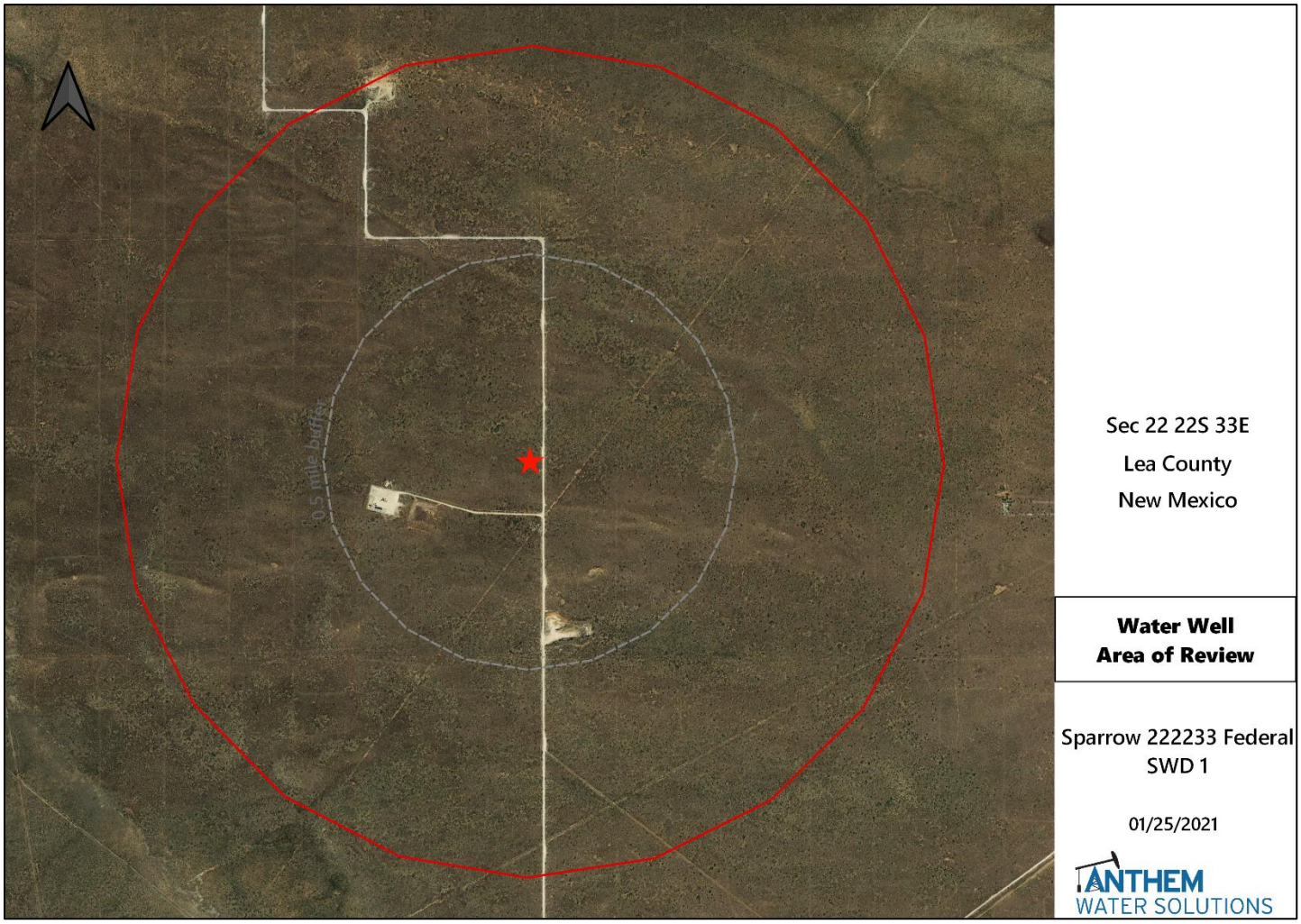


Attachment 3: Formation & Source Water Analysis

Injection Formation Water Analysis													
Anthem Water Solutions, LLC													
Well Name	**API**	**Latitude**	**Longitude**	**Section**	**Township**	**Range**	**County**	**State**	**Field**	**Formation**	**TDS (Mg/L)**	**Bicarbonate (MG/L)**	**Sulfate (Mg/L)**
RIO BLANCO 33 FEDERAL #002	30-025-36360	32.3499985	-103.4771576	33	22S	34E	Lea	NM	BELL LAKE	DEVONIAN	69,797	456	1,074
RIO BLANCO 9 STATE #001	30-025-36302	32.3246078	-103.4733582	9	23S	34E	Lea	NM	BELL LAKE	DEVONIAN	192,154	122	943
RIO BLANCO 33 FEDERAL #001	30-025-36359	32.3436928	-103.4783325	33	22S	34E	Lea	NM	BELL LAKE	DEVONIAN	77,881	366	1,941
MAD DOG 15 FEDERAL COM #001	30-025-36778	32.2992020	-103.4514999	15	23S	34E	Lea	NM	ANTELOPE RIDGE	DEVONIAN	72,188	332	1,198
ANTELOPE RIDGE UNIT #003	30-025-21082	32.2593155	-103.4610748	34	23S	34E	Lea	NM	APACHE RIDGE	DEVONIAN	80,187	476	900
LEA UNIT #009	30-025-02432	32.5785980	-103.5121155	13	20S	34E	Lea	NM	LEA	DEVONIAN	45,778	1,145	729
LEA UNIT #008	30-025-02431	32.5927162	-103.5116730	12	20S	34E	Lea	NM	SWD	DEVONIAN	35,094	1,272	1,096
KING SWD #001	30-015-20257	32.5933838	-104.4920578	9	20S	25E	Lea	NM	SWD	DEVONIAN	7,989	808	1,748
BELL LAKE UNIT #006	30-025-08483	32.3282585	-103.5071030	6	23S	34E	Lea	NM	BELL LAKE	DEVONIAN	71,078	500	1,000
STATE B COM #001	30-025-09716	32.1794052	-103.2212524	36	24S	36E	Lea	NM	CUSTER	DEVONIAN	176,234	128	1,004
WEST DOLLARHIDE DEVONIAN UN	30-025-12297	32.1720123	-103.0761032	32	24S	38E	Lea	NM	DOLLARHIDE	DEVONIAN	50,858	183	980
E C HILL B FEDERAL #001	30-025-10945	32.2658463	-103.1443634	34	23S	37E	Lea	NM	TEAGUE	DEVONIAN	112,959	288	2,765
E C HILL D FEDERAL #004	30-025-10950	32.2653503	-103.1443634	34	23S	37E	Lea	NM	TEAGUE	DEVONIAN	236,252	129	781
STATE NJ A #001	30-025-11398	32.1647491	-103.1273346	2	25S	37E	Lea	NM	JUSTIS	DEVONIAN	105,350	660	4,950
PRE-ONGARD WELL #001	30-025-10717	32.3025551	-103.1358261	14	23S	37E	Lea	NM	CLINE	DEVONIAN	118,979	462	2,593
PRE-ONGARD WELL #001	30-025-11818	32.0994835	-103.1656723	28	25S	37E	Lea	NM	CROSBY	DEVONIAN	27,506	1,089	1,079
PRE-ONGARD WELL #006	30-025-11950	32.0777245	-103.1624680	4	26S	37E	Lea	NM	CROSBY	DEVONIAN	31,931	302	591

Source Water Analysis													
Anthem Water Solutions, LLC													
Well Name	**API**	**Latitude**	**Longitude**	**Section**	**Township**	**Range**	**County**	**State**	**Field**	**Formation**	**TDS (Mg/L)**	**Bicarbonate (MG/L)**	**Sulfate (Mg/L)**
THISTLE UNIT #004	30-025-34456	32.2557449	-103.562294	34	23S	33E	Lea	NM	JOHNSON RANCH	WOLFCAMP	21,758	163	150
THISTLE UNIT #005	30-025-34580	32.2630043	-103.562302	34	23S	33E	Lea	NM	JOHNSON RANCH	WOLFCAMP	74,186	386	269
FLAGLER FEDERAL #001	30-025-30599	32.1505394	-103.596481	8	25S	33E	Lea	NM	JOHNSON RANCH	WOLFCAMP	40,770	122	6
THYME APY FEDERAL #002	30-025-33529	32.3364449	-103.625145	1	23S	32E	Lea	NM	RED TANK	BONE SPRING	172,896	781	1,150
DIAMONDTAIL 24 FEDERAL #001	30-025-33344	32.288414	-103.634743	24	23S	32E	Lea	NM	DIAMONDTAIL	BONE SPRING	172,490	199	2
MESA VERDE 6 FEDERAL #014	30-025-32753	32.252753	-103.717583	6	24S	32E	Lea	NM	MESA VERDE	BONE SPRING	254,344	83	1,128
TRESNOR MITCHELL 30 FEDERAL #0	30-025-32754	32.2763062	-103.715485	30	23S	32E	Lea	NM	SAND DUNES SOU	BONE SPRING	274,347	83	1,202
MESA VERDE 6 FEDERAL #006	30-025-32397	32.244917	-103.71629	6	24S	32E	Lea	NM	MESA VERDE	BONE SPRING	147,698	933	3,804
MESA VERDE 6 FEDERAL #005	30-025-32504	32.2482376	-103.711617	6	24S	32E	Lea	NM	MESA VERDE	BONE SPRING	263,977	104	567
RED BULL 31 STATE #001	30-025-36798	32.2574569	-103.405709	31	23S	35E	Lea	NM	ANTELOPE RIDGE	BONE SPRING	280,094	87	385
THISTLE UNIT #056H	30-025-41340	32.2693145	-103.558234	22	23S	33E	Lea	NM	TRIPLE X	BONE SPRING	135,196	500	765
APPLESEED FEDERAL COM #001	30-025-20377	32.5750008	-103.473038	17	20S	35E	Lea	NM	LYNCH	BONE SPRING	173,141	5,174	7,916
BERRY APN STATE #001	30-025-27250	32.5060349	-103.498344	5	21S	34E	Lea	NM	BERRY	BONE SPRING	128,117	567	1,723
HUNT APO STATE #001	30-025-27135	32.5070038	-103.481232	4	21S	34E	Lea	NM	GRAMA RIDGE	BONE SPRING	294,627	74	403
LEA UNIT #005	30-025-02429	32.5858536	-103.51165	12	20S	34E	Lea	NM	LEA	BONE SPRING	202,606	5,196	992
MAHAFFEY ARC FEDERAL #001	30-025-01735	32.5785904	-103.636131	14	20S	33E	Lea	NM	TEAS	BONE SPRING	28,079	791	1,885
LEA UNIT #004H	30-025-02424	32.5772604	-103.524571	11	20S	34E	Lea	NM	LEA	BONE SPRING	29,436	634	1,142
LEA UNIT #008	30-025-02431	32.5927162	-103.511673	12	20S	34E	Lea	NM	SWD	BONE SPRING	35,094	1,272	1,096
PRE-ONGARD WELL #009	30-025-20261	32.3028488	-103.511078	18	23S	34E	Lea	NM	BELL LAKE	BONE SPRING	204,652	512	260
LEA UNIT #001	30-025-02427	32.5858536	-103.520256	12	20S	34E	Lea	NM	LEA	BONE SPRING	15,429	1,016	670

Attachment 4: 1-mile Fresh Water Map and Tabular List



Water Well Sampling Rational					
Sparrow 222233 Federal SWD 1					
Water Wells	**Owner**	**Available Contact Information**	**Use**	**Sampling Required**	**Notes**
There are no fresh water wells within a 1-mile radius					

PERMITS WEST
PROVIDING PERMITS for LAND USERS
37 Verano Loop, Santa Fe, New Mexico 87508 505-466-8120

NM Oil Conservation Division
1220 S. St. Francis Dr.
Santa Fe, NM 87505

Re: Geology Statement
Anthem Water Solutions, LLC
Sparrow 222233 Federal SWD No. 1
Section 22, T. 22S, R. 33E
Lea County, New Mexico

To whom it may concern:

Publicly available geologic and engineering data related to the proposed well have been thoroughly reviewed, and no evidence for open faults or any other hydrologic connection between the proposed Devonian-Silurian injection zone and any underground sources of drinking water has been found. Please see the attached seismic risk assessment for additional information.

Sincerely,

Cory Walk

Cory Walk
Geologist

Seismic Risk Assessment

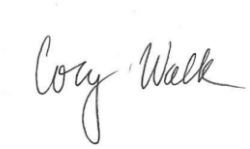
Anthem Water Solutions, LLC

Sparrow 222233 Federal SWD No. 1

Section 22, Township 22 South, Range 33 East

Lea County, New Mexico

Cory Walk, M.S.



Geologist

Permits West Inc.

July 20, 2021

GENERAL INFORMATION

Sparrow 222233 Federal SWD No. 1 is located in the SE 1/4, section 22, T22S, R33E, about 23 miles west of Eunice, NM in the Permian Basin. Anthem Water Solutions proposes the injection zone to be within the Devonian-Silurian formation through an open hole from 15,445'-16,192' below ground surface. This report assesses any potential concerns relating to induced seismicity along deep penetrating Precambrian faults or the connection between the injection zone and known underground potable water sources.

SEISMIC RISK ASSESSMENT

Historical Seismicity

Searching the USGS earthquake catalog resulted in no (0) earthquakes above a magnitude 2.5 within 6 miles (9.7 km) of the proposed deep disposal site since 1970 (Fig. 1). The nearest earthquake occurred on December 4, 1984 about 7.6 miles (~12.3 km) south of the proposed SWD site and had a magnitude of 2.9.

Basement Faults and Subsurface Conditions

A structure contour map (Fig. 1) of the Precambrian basement shows the Sparrow 222233 Federal SWD #1 is approximately 1.7 miles from the nearest basement-penetrating fault inferred by Todd Reynolds on behalf of NGL Energy Solutions (NMOCD Case Numbers 20141 and 20142). **Information about nearby faults is listed in Table 1**.

Snee and Zoback (2018) state, "In the western part of Eddy County, New Mexico, S_{Hmax} is ~north-south (consistent with the state of stress in the Rio Grande Rift; Zoback and Zoback, 1980) but rotates to ~east-northeast-west-southwest in southern Lea County, New Mexico and the northernmost parts of Culberson and Reeves counties, Texas." **Around the Sparrow 222233 Federal SWD site, Snee and Zoback indicate a S_{Hmax} direction of N075°E and an A_{φ} of 0.60, indicating an extensional (normal) stress regime.**

Induced seismicity is a growing concern of deep SWD wells. Relatively new software developed by the Stanford Center for Induced and Triggered Seismicity allows for the probabilistic screening of deeply penetrating faults near the proposed injection zone (Walsh et al., 2016; Walsh et al., 2017). This software uses parameters such as stress orientations, fault strike/dip, injection rates, fault friction coefficients, etc. to estimate the potential for fault slip. Using the best available data as input parameters (Table 2) including the subject well injecting at 30,000 bbls/day and all other existing and proposed SWDs within a 10 mile radius injecting at 30,000 bbls/day (69 total SWD wells), the Fault Slip Potential (FSP) models suggest a six (0.06) percent chance of slip on the nearest fault (fault 20), inferred by Todd Reynolds (NMOCD Case No 21090), through the year 2050 (Fig. 2; Table 1). **This model also suggests a pore pressure increase of 1420.8 psi on the nearest fault (Fault 20; Fig. 3; Table 1) by the year 2045.** Geomechanical modeling shows that the primary fault of concern (fault 4) would need a pressure increase of 3512.4 psi to reach a 100% probability of slip on the fault which is approximately 2x greater than the modeled increase of 1395.6 psi (Fig. 3).

GROUNDWATER SOURCES

Three principal aquifers are used for potable groundwater in southern Lea County; these geologic units include the Triassic Santa Rosa formation, Tertiary Ogallala formation, and Quaternary alluvium. Nicholson and Clebsch (1961) state, "Potable ground water is not available below the Permian and Triassic unconformity but, because this boundary is not easily defined, the top of the Rustler anhydrite formation is regarded as the effective lower limit of 'potable' ground water." Around the Sparrow 222233 Federal SWD #1, the top of the Rustler Formation lies at a depth of approximately 1145 feet bgs.

VERTICAL MIGRATION OF FLUIDS

Thick permeability barriers exist above (Woodford shale; 196 ft thick) and below (Simpson Group; 681 ft thick) the targeted Devonian-Silurian injection zone (Plate 2, Comer et al., 1991; Fig. 8, Frenzel et al., 1988). Precambrian structure contours (Ruppel, 2009) show the basement to be at a depth of approximately 18,668' in this area. Therefore, the injection zone lies approximately 2,475' above the Precambrian basement and approximately 14,300' below the previously stated lower limit of potable water at the top of the Rustler Anhydrite Formation. The stratigraphy suggests that the Woodford Shale and Simpson Group are adequate confining barriers that would prevent the vertical migration of injected fluids.

CONCLUDING STATEMENT

After examination of publicly available geologic and engineering data, there is no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

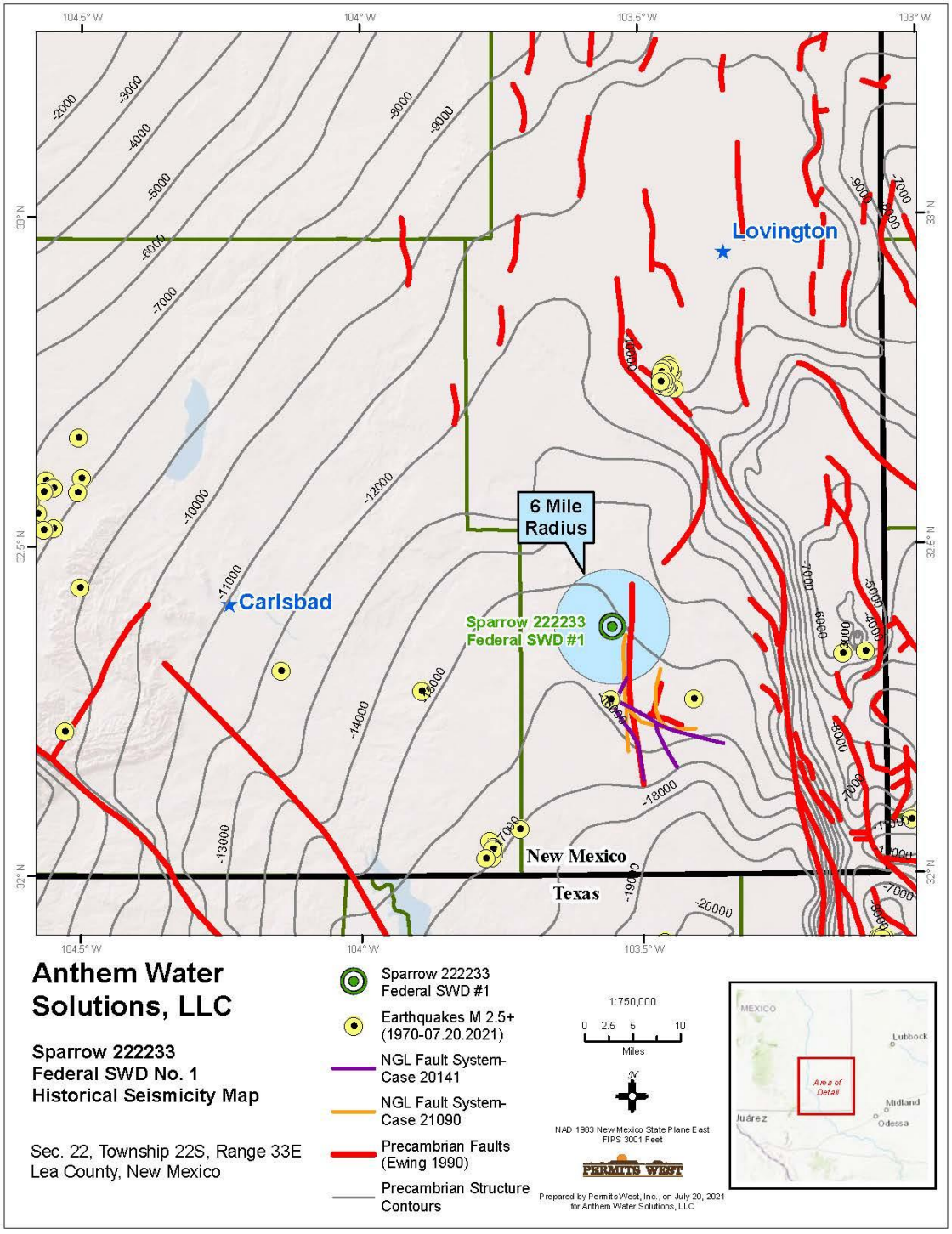


Figure 1. Structural contour map of the Precambrian basement in feet below sea level. Red lines represent the locations of Precambrian basement-penetrating faults (Ewing et al., 1990). Purple and orange lines represent the locations of basement-penetrating faults inferred by Todd Reynolds representing NGL in NMOCD Case Nos. 20141 and 21090. The Sparrow 222233 Federal SWD #1 well lies ~1.7 miles west of the closest deeply penetrating fault and ~7.6 miles south from the closest historic earthquake.

Table 1: Nearby Basement Fault Model Results

Fault Number (Fig. 2)	Distance to proposed SWD (mi)	Strike (°)	Dip (°)	FSP	Δ Pore Pressure after 30 years (psi)	Δ Pore Pressure needed for 100% FSP (psi)	Δ Pore Pressure needed for 50% FSP (psi)
20	1.7	190.6	50-90	0.06	1420.8	5189.9	2416.6
52	2.0	4.8	50-90	0.01	1395.5	6025.4	2823.4
35	2.2	359.2	50-90	0.00	1155.1	5881.3	3304.7
4	5.6	26.1	50-90	0.49	1395.6	3512.4	1413.7

Table 2: Fault Slip Potential model input parameters

Faults	Value	Notes
Friction Coefficient	0.58	Ikari et al. (2011)
Dip Angle (deg)	70	Snee and Zoback (2018)
Stress		
Vertical stress gradient (psi/ft)	1.1	Hurd and Zoback (2012)
Max Horizontal Stress Direction (deg)	75	Snee and Zoback (2018)
Depth for calculations (ft)	16000	Proposed injection zone
Initial Reservoir Pressure Gradient (psi/ft)	0.7	calculated from mud wt (ppg) used in drilling at these depths
A Phi Parameter	0.60	Snee and Zoback (2018)
Reference Friction Coefficient	0.58	Ikari et al. (2011)
Hydrology		
Aquifer thickness (ft)	750	Proposed injection zone
Porosity (%)	6	
Permeability (mD)	150	
Injection Rate (bbl/day)	30000	Maximum proposed injection rate

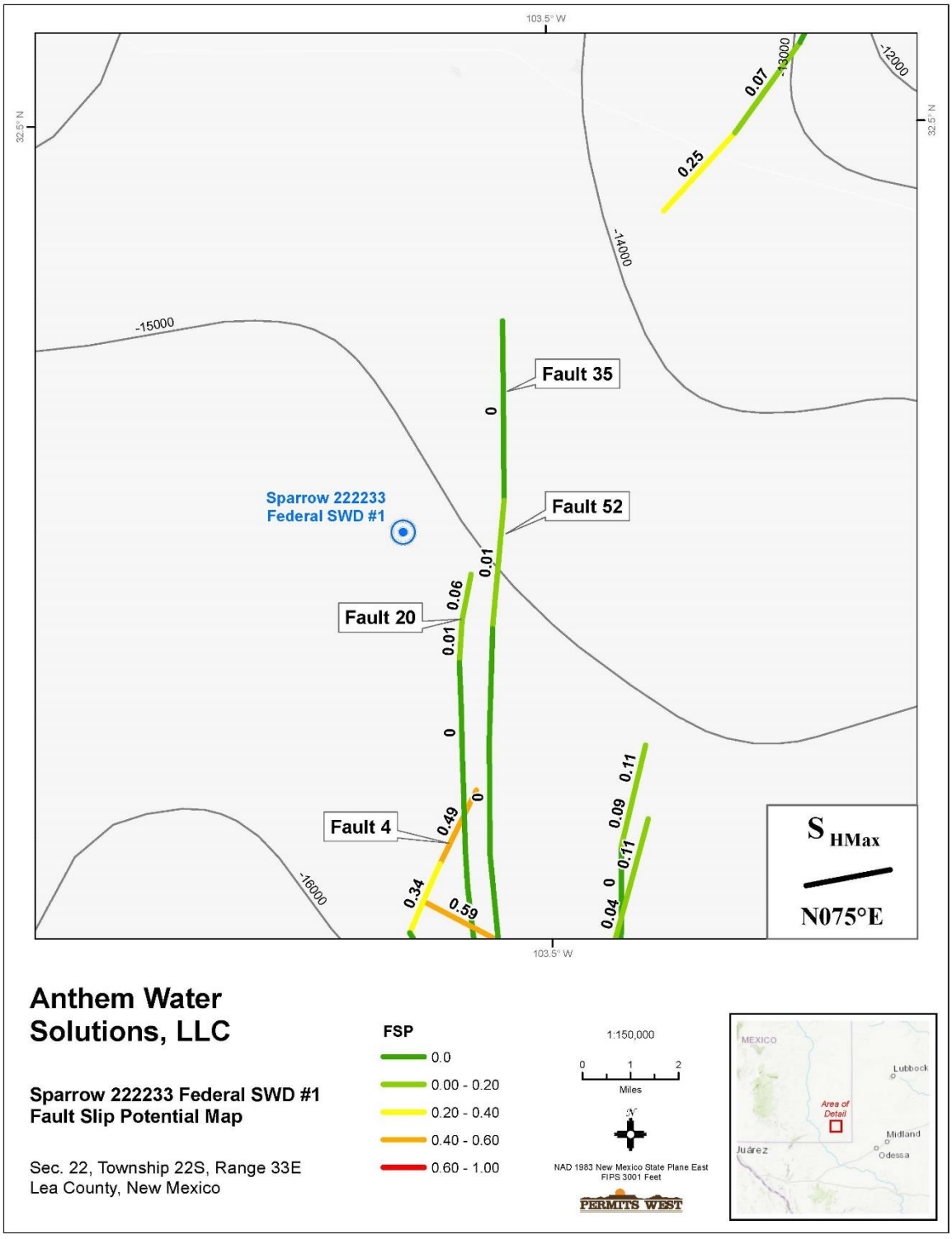


Figure 2. Precambrian fault map of Jal, NM. Faults are colored based on probability of fault slip as modeled using Fault Slip Potential software (Walsh and Zoback, 2016). Labeled values represent the calculated fault slip potential using the parameters indicated in Table 2. Contours show the top of the Precambrian basement in feet below sea level.

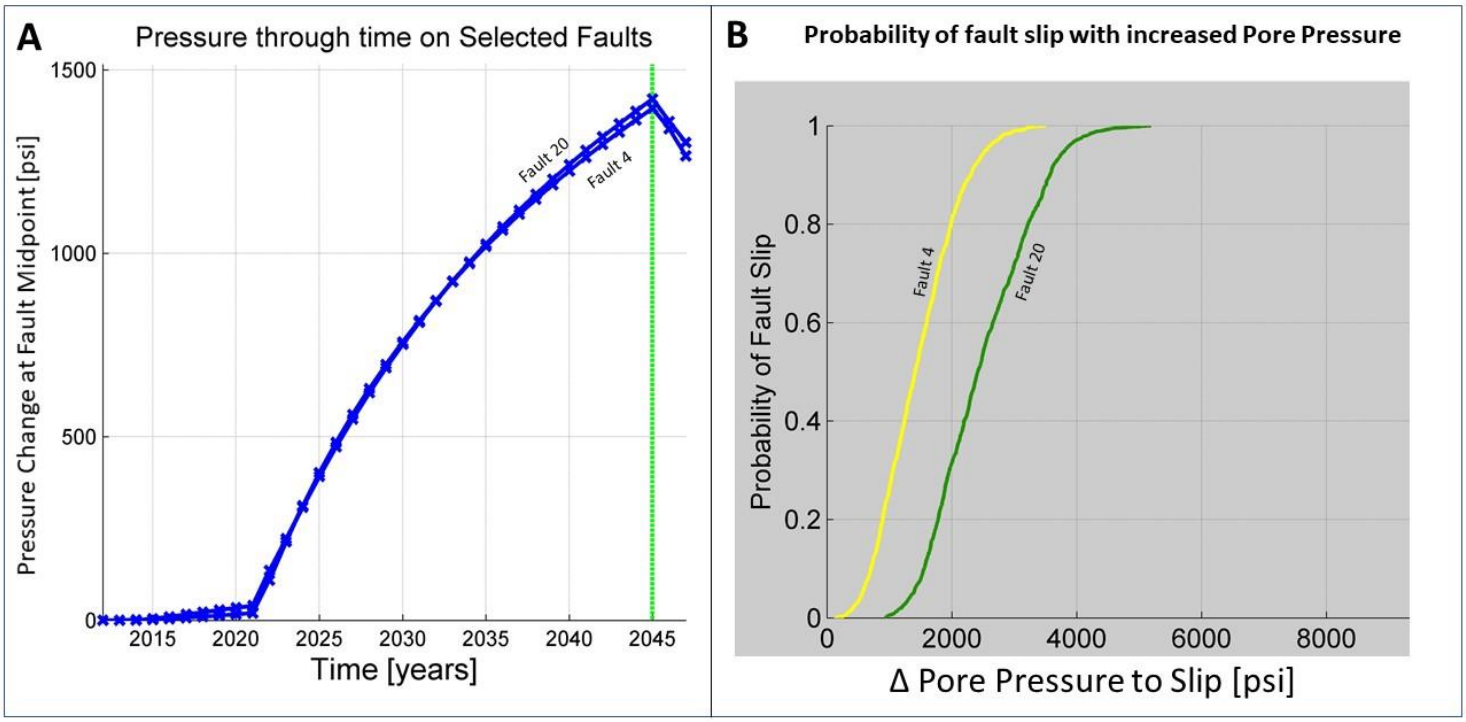


Figure 3. A) Plot showing the modeled change of pore pressure on nearby faults through time as a response to the proposed SWD well. B) Plot showing the required pore pressure increase needed to produce specific probabilities of fault slip on nearby faults.

References Cited

Comer, J. B., 1991, Stratigraphic Analysis of the Upper Devonian Woodford Formation, Permian Basin, West Texas and Southeastern New Mexico: The University of Texas at Austin, Bureau of Economic Geology, Report of Investigations No. 201, 63 p.

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Walsh, F. R., Zoback, M. D., Pais, D., Weingarten, M., and Tyrrell, T. (2017) FSP 1.0: A Program for Probabilistic Estimation of Fault Slip Potential Resulting From Fluid Injection, User Guide from the Stanford Center for Induced and Triggered Seismicity, available at SCITS.Stanford.edu/software

Zoback, M. L., and M. D. Zoback, 1980, State of stress in the conterminous United States: Journal of Geophysical Research, 85, no. B11, 6113–6156, https://doi.org/10.1029/JB085iB11p06113.

Attachment 6: Public Notice Affidavit

Affidavit of Publication

STATE OF NEW MEXICO)
) ss.
COUNTY OF LEA)

John Graham being first duly sworn on oath deposes and says that he is Publisher of THE LOVINGTON LEADER, a once a week newspaper of general paid circulation published in the English language at Lovington, Lea County, New Mexico; that said newspaper has been so published in such county continuously and uninterruptedly for a period in excess of Twenty-six (26) consecutive weeks next prior to the first publication of the notice hereto attached as hereinafter shown; and that said newspaper is in all things duly qualified to publish legal notices within the meaning of Chapter 167 of the 1937 Session Laws of the State of New Mexico.

That the notice which is hereto attached, entitled Legal Notice was published in a regular and entire issue of THE LOVINGTON LEADER and not in any supplement thereof, for one (1) day(s), beginning with the issue of July 8, 2021 and ending with the issue of July 8 , 2021.

And that the cost of publishing said notice is the sum of $ 48.86 which sum has been (Paid) as Court Costs.

John Graham, Publisher
Subscribed and sworn to before me this 2nd day of August, 2021.

Gina Fort

Gina Fort
Notary Public, Lea County, New Mexico
My Commission Expires June 30, 2022

Official Seal
GINA FORT
Notary Public
State of New Mexico
My Comm. Expires 6/30/22

APPLICATION FOR AUTHORITY TO INJECT

To Whom it May Concern,

NOTICE IS HEREBY GIVEN; That Anthem Water Solutions, LLC, 5914 W. Courtyard Dr., Suite 320, Austin Texas, 78730, is requesting that the New Mexico Oil Conservation Division administratively approve the APPLICATION FOR AUTHORITY TO INJECT as follow:

PURPOSE: The intended purpose of the injection well is to dispose of salt water produced from permitted oil and gas wells.

WELL NAME AND LOCATION: Sparrow 222233 Federal SWD 1 Located 25 miles West of Eunice. NE1/4 of the SE1/4 Section 22, Township 22S, Range 33E, 2471' from South Line & 135' from East Line, Lea County, New Mexico.

NAME AND DEPTH OF DISPOSAL ZONE: Devonian-Silurian (15445' – 16192')

EXPECTED MAXIMUM INJECTION RATE: 30,000 barrels/day

EXPECTED MAXIMUM INJECTION PRESSURE: 3089 psi (surface)

Objections or requests for hearing must be filed with the New Mexico Oil Conservation Division within fifteen (15) days. Any objections or requests for hearing should be mailed to the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505.

Additional information may be obtained by contacting Marshall Tippen (972) 795-4201.

Published in the Lovington Leader July 8, 2021

Attachment 6: List of Notification Applicants & Delivery Confirmations

Sparrow 222233 Federal SWD 1 - Notice of Application Receipts				
Entity	**Address**	**City**	**State**	**Zip Code**
Landowner and Mineral Owner				
New Mexico BLM	620 E Greene St.	Carlsbad	NM	88220
OCD District				
NMOCD District 1	1625 N. French Drive	Hobbs	NM	88240
Leasehold Operators (1-mile)				
CHEVRON USA INC	1400 SMITH ST	HOUSTON	TX	77002
XTO HOLDINGS LLC	22777 SPRINGWOODS VILLAGE PKWY	SPRING	TX	77389
MCLANE MONTY	P.O. BOX 9451	MIDLAND	TX	79708
ENGLE FRED L	P.O. BOX 26245	MILWAUKEE	WI	53226
EOG RESOURCES INC	P.O. BOX 4362	HOUSTON	TX	77210
MARATHON OIL PERMIAN LLC	539 South Main St	Findlay	OH	45840

Notes: The table above shows the Entities who were idenfified as parties of interest requiring notification on either the 1-mile well detail list (Attachment 2) or on the 2-mile Mineral Lease Map (Attachment 2).

ANTHEM
WATER SOLUTIONS

Marshall Tippen
Anthem Water Solutions, LLC
3300 North A Street, Building 2, Suite 222
Midland, Texas 79705

New Mexico BLM
620 E Greene St.
Carlsbad, NM 88220

APPLICATION FOR AUTHORITY TO INJECT

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Regards,

Marshall Tippen

ANTHEM
WATER SOLUTIONS

Marshall Tippen
Anthem Water Solutions, LLC
3300 North A Street, Building 2, Suite 222
Midland, Texas 79705

NMOCD District 1
1625 N. French Drive
Hobbs, NM 88240

APPLICATION FOR AUTHORITY TO INJECT

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Additional information may be obtained by contacting Marshall Tippen (972) 795-4201.

Regards,

Marshall Tippen

ANTHEM
WATER SOLUTIONS

Marshall Tippen
Anthem Water Solutions, LLC
3300 North A Street, Building 2, Suite 222
Midland, Texas 79705

CHEVRON USA INC
1400 SMITH ST
HOUSTON, TX 77002

APPLICATION FOR AUTHORITY TO INJECT

To Whom it May Concern,

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Objections or requests for hearing must be filed with the New Mexico Oil Conservation Division within fifteen (15) days. Any objections or requests for hearing should be mailed to the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505.

Additional information may be obtained by contacting Marshall Tippen (972) 795-4201.

Regards,

Marshall Tippen

ANTHEM
WATER SOLUTIONS

Marshall Tippen
Anthem Water Solutions, LLC
3300 North A Street, Building 2, Suite 222
Midland, Texas 79705

XTO HOLDINGS LLC
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

APPLICATION FOR AUTHORITY TO INJECT

To Whom it May Concern,

NOTICE IS HEREBY GIVEN; That Anthem Water Solutions, LLC, 5914 W. Courtyard Dr., Suite 320, Austin Texas, 78730, is requesting that the New Mexico Oil Conservation Division administratively approve the APPLICATION FOR AUTHORITY TO INJECT as follow:

PURPOSE: The intended purpose of the injection well is to dispose of salt water produced from permitted oil and gas wells.

WELL NAME AND LOCATION: Sparrow 222233 Federal SWD 1 Located 25 miles West of Eunice. NE1/4 of the SE1/4 Section 22, Township 22S, Range 33E, 2471‘ from South Line & 135’ from East Line, Lea County, New Mexico.

NAME AND DEPTH OF DISPOSAL ZONE: Devonian-Silurian (15445’ – 16192’)

EXPECTED MAXIMUM INJECTION RATE: 30,000 barrels/day

EXPECTED MAXIMUM INJECTION PRESSURE: 3089 psi (surface)

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ANTHEM
WATER SOLUTIONS

Marshall Tippen
Anthem Water Solutions, LLC
3300 North A Street, Building 2, Suite 222
Midland, Texas 79705

MCLANE MONTY
P.O. BOX 9451
MIDLAND, TX 79708

APPLICATION FOR AUTHORITY TO INJECT

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Marshall Tippen

ANTHEM
WATER SOLUTIONS

Marshall Tippen
Anthem Water Solutions, LLC
3300 North A Street, Building 2, Suite 222
Midland, Texas 79705

ENGLE FRED L
P.O. BOX 26245
MILWAUKEE, WI 53226

APPLICATION FOR AUTHORITY TO INJECT

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Regards,

Marshall Tippen

ANTHEM
WATER SOLUTIONS

Marshall Tippen
Anthem Water Solutions, LLC
3300 North A Street, Building 2, Suite 222
Midland, Texas 79705

EOG RESOURCES INC
P.O. BOX 4362
HOUSTON, TX 77210

APPLICATION FOR AUTHORITY TO INJECT

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Regards,

Marshall Tippen

ANTHEM
WATER SOLUTIONS

Marshall Tippen
Anthem Water Solutions, LLC
3300 North A Street, Building 2, Suite 222
Midland, Texas 79705

MARATHON OIL PERMIAN LLC
539 South Main St
Findlay, OH 45840

APPLICATION FOR AUTHORITY TO INJECT

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Regards,

Marshall Tippen

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Anthem Water Solutions
5914 W. Courtyard Dr., Ste 320
Austin TX 78730-4924

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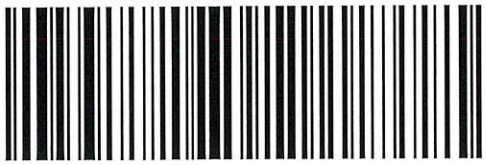

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Marathon Oil Permian LLC
539 South Main St
Findlay OH 45840-3229

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5914 W. Courtyard Dr., Ste 320
Austin TX 78730-4924

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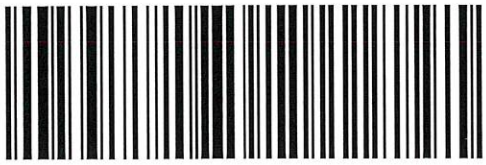

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Monty McLane
P.O. Box 9451
Midland TX 79708-9451

Jack Ball
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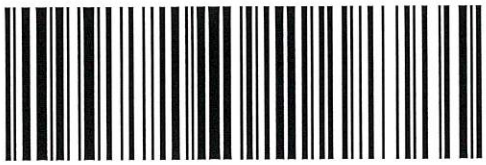

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New Mexico BLM
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Carlsbad NM 88220

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Anthem Water Solutions
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Austin TX 78730-4924

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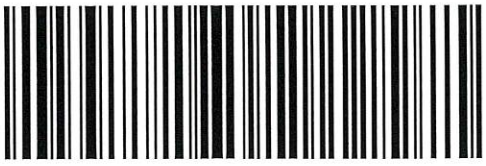

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Anthem Water Solutions
5914 W. Courtyard Dr., Ste 320
Austin TX 78730-4924

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