Oil Conservation Division
Examiner Hearing
June 27, 2024
Case No. 24569



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

APPLICATION OF WATERBRIDGE STATELINE LLC TO APPROVE SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.

**CASE NO. 24569** 

### **TABLE OF CONTENTS**

Exhibit A: Affidavit of Oliver Seekins

• Exhibit A-1: Application and C-108

Exhibit B: Affidavit of Thomas Tomastik

Exhibit C: Affidavit of Reed Davis

Exhibit D: Self-Affirmed Statement of Deana Bennett re Notice

- Exhibit D-1: Sample Notice Letter
- Exhibit D.2: Mailing List of Interested Parties
- Exhibit D.3: Certified Mailing Tracking List
- Exhibit D.4: Affidavit of Publication

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

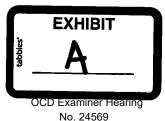
APPLICATION OF WATERBRIDGE STATELINE LLC TO APPROVE SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.

**CASE NO. 24569** (FPNM SWD #3)

### **AFFIDAVIT OF OLIVER SEEKINS**

Oliver Seekins, of lawful age and being duly sworn, declares as follows:

- 1. My name is Oliver Seekins. I work for ALL Consulting as a Project Manager/Regulatory Specialist. I have been retained by WaterBridge Stateline LLC ("WaterBridge") (OGRID No. 330129).
  - 2. I personal knowledge of the matters stated herein.
- 3. I have previously testified before the Oil Conservation Division ("Division") as an expert witness in regulatory matters and permitting salt water disposal wells. My credentials as an expert in regulatory matters and permitting salt water disposal wells have been accepted by the Division and made a matter of record.
  - 4. My area of responsibility includes the area of Lea County in New Mexico.
- 5. I am familiar with the application WaterBridge filed in this matter and I am familiar with the status of the lands in the subject area.
- 6. **Exhibit A-1** is the hearing application in Case No. 24569 that WaterBridge filed with the Division. The application includes the Form C-108, attached as Exhibit A to the Application. In preparing for this hearing, I have reviewed the C-108 and did not identify any changes that require amending the C-108 or affect the accuracy of statements in the C-108.



- 7. In this case, WaterBridge seeks authorization to inject produced water into the Glorieta Sandstone formation through the FPNM SWD #3 well at a surface location 2512' from the North line and 1133' from the west line, Lot 2, Section 29, Township 26 South, Range 38 East, NMPM, Lea County, New Mexico.
- 8. WaterBridge seeks authority to inject produced water into the Glorieta Sandstone formation at a depth of approximately 5,400 feet to 5,775 feet.
- 9. WaterBridge requests that the Division approve a maximum daily injection rate for the well of 20,000 bbls per day.
- 10. The well will be a commercial well, and WaterBridge intends to commence drilling the Well as soon as reasonably possible after receiving the injection order and commence injection within 1-year of receiving the approved injection order or an approved NMOCD authorization to inject extension.
- 11. Attachment 2 in Exhibit A-1 include a map that identifies wells within 2 miles of the Well.
- 12. As noted in Attachment 2, there are two plugged wells within a half-mile of the Well, but neither well penetrates the proposed injection zone.
- 13. Attachment 2 identifies the operators, lessees, mineral and surface owners within two miles of the Well.
- 14. I also reviewed whether there are any fresh water wells within a mile of the Well. I did not find any freshwater wells within one mile of the Well, as noted in Attachment 6 to Exhibit A-1.
- 15. I provided notice information to WaterBridge's counsel based on OCD's regulations, in Rule 19.15.26.8(B), which require notice to the surface owner and to each leasehold

operator, and to any other affected person as that term is defined Rule 19.15.2.7(8). The notice party information is included in Attachment 9 to Exhibit A-1.

- 16. It is my opinion that WaterBridge undertook a good faith effort to locate and identify the correct parties and valid addresses required for notice.
- 17. In my opinion, the granting of WaterBridge's application is in the interests of conservation and the prevention of waste. The Well will provide much needed capacity for produced water, which will, in turn, support oil and gas operators' ability to produce oil and gas.
- 18. The attached exhibits were prepared by me, or compiled from company business records, or were prepared at my direction.
- 19. I attest under penalty of perjury under the laws of the State of New Mexico that the information provided herein is correct and complete to the best of my knowledge and belief.

[Signature page follows]

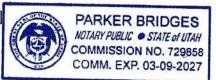
State of Utah

County of Washington

This record was acknowledged before me on June 162024, by Oliver Seekins.

[Stamp]

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Notary Public in and for the

State of Utah Commission Number: 724858

My Commission Expires: 3/9/2027

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

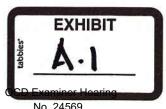
APPLICATION OF WATERBRIDGE STATELINE LLC TO APPROVE SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.

CASE NO. 24569

### APPLICATION

WaterBridge Stateline LLC ("WaterBridge"), OGRID No. 330129, through its undersigned attorneys, hereby submits this application to the Oil Conservation Division pursuant to the provisions of NMSA 1978, § 70-2-12, Rule No. 19.15.26, and Rule 19.15.4.8 for an order approving drilling of a salt water disposal well in Lea County, New Mexico. In support of this application, WaterBridge states as follows:

- (1) WaterBridge proposes to drill the FPNM SWD #3 well at a surface location 2,512' from the North line and 1,133' from the West line, Lot 2, Section 29, Township 26 South, Range 38 East, NMPM, Lea County, New Mexico for the purpose of operating a produced water disposal well.
- (2) WaterBridge seeks authority to inject produced water into the Glorieta Sandstone formation at a depth of approximately 5,400 feet to 5,775 feet.
- (3) WaterBridge requests that the Division approve a maximum daily injection rate for the well of 20,000 bbls per day.
- (4) WaterBridge requests approval of a maximum injection pressure of 1,080 psi for the well.
  - (5) A proposed C-108 for the subject well is attached hereto as Attachment A.



No. 24569 5 (6) The granting of this application will avoid the drilling of unnecessary wells, will prevent waste, and will protect correlative rights.

WHEREFORE, WaterBridge requests that this application be set for hearing before an Examiner of the Oil Conservation Division on June 13, 2024; and that after notice and hearing, the Division enter its order approving this application.

Respectfully submitted,

MODRALL, SPERLING, ROEHL, HARRIS & SISK, P.A.

By: Websa M Bennett

Deana M. Bennett Yarithza Peña

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Albuquerque, New Mexico 87103-2168

Telephone: 505.848.1800 edebrine@modrall.com

deana.bennett@modrall.com

yarithza.pena@modrall.com

Attorneys for Applicant

CASE NO. 24569: Application of WaterBridge Stateline LLC for approval of a salt water disposal well in Lea County, New Mexico. Applicant seeks an order approving disposal into the Glorieta Sandstone formation through the FPNM SWD #3 well at a surface location 2,512' from the North line and 1,133' from the West line, Lot 2, Section 29, Township 26 South, Range 38 East, NMPM, Lea County, New Mexico for the purpose of operating a produced water disposal well. Applicant seeks authority to inject produced water into the Glorieta Sandstone formation at a depth of approximately 5,400 feet to 5,775 feet. Applicant further requests that the Division approve a maximum daily injection rate for the well of 20,000 bbls per day. Said area is located approximately 9.20 miles Southeast of Jal, New Mexico.

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Page 4 of 45 Revised March 23, 2017

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### **NEW MEXICO OIL CONSERVATION DIVISION**

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



A DAAL	TAGTOIL	IVE A	DDIIC	A TION	CHECKLIST
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_	ADMINISTRATIVE APPLICATION CHEC	
	THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXC REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL	
App	Dlicant: WaterBridge Stateline LLC	OGRID Number: 330129
	Name: FPNM SWD#3	API:
Poo	: SWD; Glorieta	Pool Code: 96106
s	UBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PRO INDICATED BELOW	OCESS THE TYPE OF APPLICATION
1)	TYPE OF APPLICATION: Check those which apply for [A]  A. Location – Spacing Unit – Simultaneous Dedication  NSL NSP (PROJECT AREA) NSP (PRORATION UNIT	n □SD
2)	B. Check one only for [1] or [1]  [1] Commingling – Storage – Measurement  DHC   CTB   PLC   PC   OLS   OI  [11] Injection – Disposal – Pressure Increase – Enhanced Oil F   WFX   PMX   SWD   IPI   EOR   PF  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	FOR OCD ONLY  Notice Complete  Application Content Complete
	G. For all of the above, proof of notification or publication is H. No notice required  CERTIFICATION: I hereby certify that the information submitted wi administrative approval is accurate and complete to the best of understand that no action will be taken on this application until the notifications are submitted to the Division.	th this application for my knowledge. I also
	Note: Statement must be completed by an individual with managerial a	nd/or suponisany canacity
	note. Sidement most be completed by an individual with managerial a	na/or supervisory capacity.

	5/13/2024
Oliver Seekins	Date
Print or Type Name	
	918.382.7581
A. S.	Phone Number
Signature Signature	oseekins@all-llc.com
Signature	e-mail Address

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STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, New Mexico 87505 Page 5 of 45 FORM C-108 Revised June 10, 2003

### APPLICATION FOR AUTHORIZATION TO INJECT

L	PURPOSE: Secondary Recovery Pressure Maintenance X Disposal Storage Application qualifies for administrative approval? X Yes No
П.	OPERATOR: WaterBridge Stateline LLC
	ADDRESS: 5555 San Felipe, Ste. 1200 Houston, TX 77056
	CONTACT PARTY: Jessica High - Director, QHSE & Regulatory PHONE: 832-871-4064
ш.	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:
	<ol> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,</li> <li>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.).</li> </ol>
*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: Oliver Seekins TITLE: Project Manager / Regulatory Specialist
	SIGNATURE: DATE: 5/13/2024
*	E-MAIL ADDRESS: oseekins@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:

Application for Authorization to Inject

Well Name: FPNM SWD #3

### III - Well Data (The wellbore diagram is included as Attachment 1)

A.

### (1) General Well Information:

Operator: WaterBridge Stateline LLC (OGRID No. 330129)

Lease Name & Well Number: FPNM SWD #3 Location Footage Calls: 2,512' FNL & 1,133' FWL

Legal Location: Lot 2, S29 T26S R38E

Ground Elevation: 2,991'

Proposed Injection Interval: 5,400' - 5,775'

County: Lea

### (2) Casing Information:

Туре	Hole Size	Casing Size	Casing Weight	Setting Depth	Sacks of Cement	Estimated TOC	Method Determined
Surface	24"	20"	94.0 lb/ft	1,155'	1,175	Surface	Circulation
Intermediate 1	17-1/2"	13-3/8"	54.5 lb/ft	2,630'	1,935	Surface	Circulation
Production Casing	12-1/4"	9-5/8"	40.0 lb/ft	5,775′	1,915	Surface	CBL
Tubing	N/A	5-1/2"	17.0 lb/ft	5,375'	N/A	N/A	N/A

DV Tool set at: 3,000'

### (3) Tubing Information:

5-1/2" (17.0 lb/ft) ceramic-coated tubing with setting depth of 5,375'

(4) Packer Information: ACT AS1-X or equivalent packer set at 5,375'

В.

(1) Injection Formation Name: Glorieta

Pool Name: SWD; Glorieta

Pool Code: 96106

- (2) Injection Interval: Perforated injection between 5,400' 5,775'
- (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.
  - Yates (2,810')
  - Seven Rivers (2,966')
  - Queen (3,468')
  - Penrose (3,720')

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

- Tubb (6,625')
- Devonian (9,041')

### V - Well and Lease Details

The following maps and documents are included in Attachment 2:

- 2-mile Oil & Gas Well Map
- ½-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

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

There are two (2) plugged wells in the ½-mile AOR, however neither penetrates the proposed injection zone.

### VII – Proposed Operation

- (1) Proposed Maximum Injection Rate: 20,000 bpd Proposed Average Injection Rate: 15,000 bpd
- (2) A closed-loop system will be used.
- (3) Proposed Maximum Injection Pressure: 1,080 psi (surface)
  Proposed Average Injection Pressure: Approximately 810 psi (surface)
- (4) Source Water Analysis: The expected injectate will consist of produced water from production wells completed in the Queen, Wolfcamp, Devonian and Ellenburger formations. Analysis of water from these formations is included as Attachment 3.
- (5) Injection Formation Water Analysis: The proposed SWD will be injecting water into the Glorieta Sandstone which is a non-productive zone known to be compatible with formation water from the Queen, Wolfcamp, Devonian and Ellenburger formations. Water analyses from the Glorieta Sandstone in the area are included as Attachment 4.

### VIII – Geologic Description

The proposed injection interval includes the Glorieta Sandstone from 5,400′ - 5,775′. The Permian-aged Glorieta Sandstone is a fine grained and well-to-moderately sorted quartz arenite sandstone that occurs directly below the San Andres Formation. There are multiple zones of high porosity and low resistivity that makes this sandstone a viable injection zone in this area.

Further discussion of the injection formation, overlying and underlying confinement zones, and historic use of the field are included as **Attachment 5**.

The base of the USDW is the Rustler Formation at a depth of approximately 1,130 feet. Depth of the nearest water well in the area is approximately 80 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 will be submitted to the Division upon completion of the well.

### 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 and details of the water well within 1-mile are 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.

In addition, a Seismic Potential Letter detailing the minimal risk of injection-induced seismicity associated with the proposed SWD is included as **Attachment 8**.

### XIII - Proof of Notice

A public notice will be filed with the Hobbs News Sun newspaper, and an affidavit will be included as an exhibit at hearing.

A copy of the application will be mailed to the identified affected persons, with delivery confirmation being provided as an exhibit at hearing. A list of the identified affected persons is included as **Attachment 9**.

## **Attachments**

### Attachment 1:

- C-102
- Wellbore Diagram
- Packer Diagram

### Attachment 2: Area of Review Information:

- 2-Mile Oil & Gas Well Map
- 1/2-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: Confining Zones and Historic Pore Space Use

Attachment 6: Water Well Map and Well Data

Attachment 7: No Hydrologic Connection Statement

Attachment 8: Seismic Potential Letter

Attachment 9: List of Affected Persons

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Page 16 of 110
Page 10 of 45

### Attachment 1

- C-102
- Wellbore Diagram
- Packer Diagram

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(226 S. St. Princis Dr., Sont Pr. NM 8792) Princis (103) 476-7460 Pay (202) 476-7462

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

Revised August 1, 2011 Submit one copy to appropriate District Office

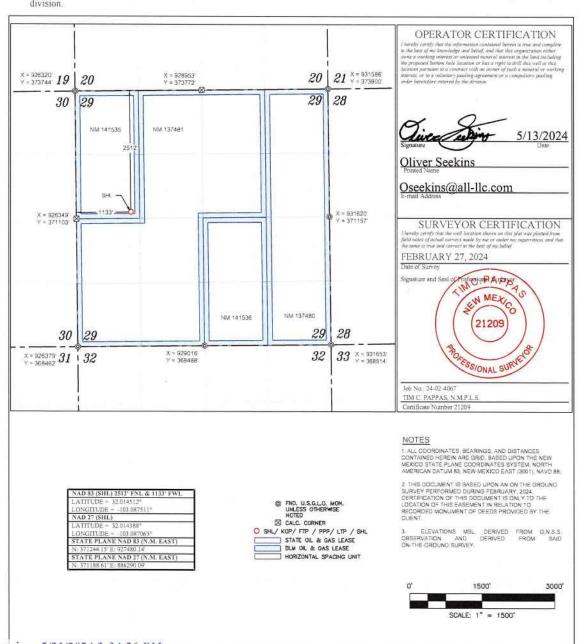
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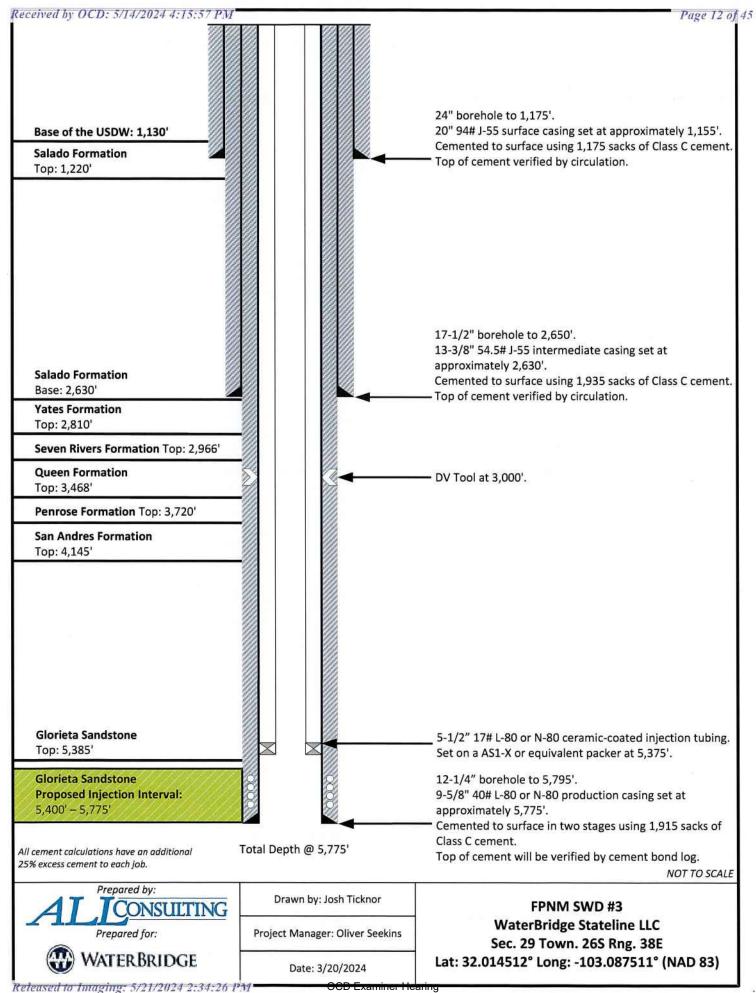
Form C-102

Santa Fe, NM 87505

AP	I Number		eta Well Number #3								
Property C	ode										
OGRID N 330129	ia.			WATER	Operator Name BRIDGE STAT	ELINE LLC	Elevation 2991				
					Surface Location	on.	Pl.				
UL or lot no. LOT 2	Section 29	Township 26 S	Range 38 E	Lot Idn	Feet from the 2512	North/South line NORTH	Feet from the 1133	East/West line WEST	Count		
			Bo	tom Hole	Location If Dif	Terent From Surfa	ace				
UL or lot no	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	Count		
Dedicated Acres	Joint or	Infill (	Consolidation Co	ode Or	der No						

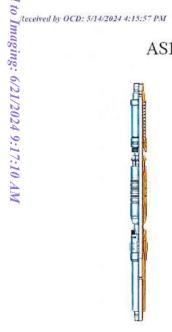
No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.





No. 24569

### AS1-X MECHANICAL PACKER



The ACT ASI-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 ASI-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-spass reduces aviabbing when running and retrieving. The by-spass closes when the packer is set and opens prior to releasing the upper slips when retrieving to allow

The J-slot design allows easy setting and releasing, 14 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 applicanous
- . 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 debns are washed from the slips when the valve is opened, reducing the times for circulation and total retrieval.
- . The full opening enables surrestricted flow and the passage of wire line tools and other packer systems
- . The packer can be not with the T-2 on-off tool, which enables the tubing to be disconnected and retnewed without retnewing the packer

#### OPTIONS:

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

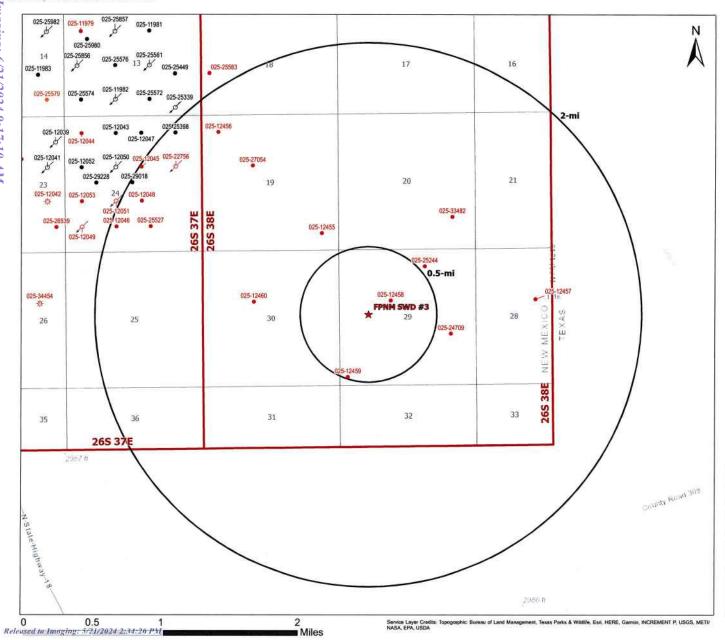
ASI X MECHANICAL PACKER										
CX	SING									
SIZZE (inches)	Weicert (to 8)	PECCHANNOED HOLESZE (kichn)	TOOLOOMAX (subset	TOOL IDMIN (extent	TEREADCONNECTION BOX UP / PIN DOWN	PHRENO				
41/2	12.5-15.1	3 925-3 920	3.650	1.938	2 3/8" EVE	261+3650-90000				
3	11,5-15	4.405-4.560	4.125	1,938	2.3/8 EUE	261-4125-8888				
5	18-203	4.154.4.276	4.000	1.626	23/8" EUE	261-4000-0000				
5.1/2	14:20	4.778-5.012	4.625	2.00	3.378 EUE	261-4625-7000				
5.1/2	144.20	4.778-5.012	4.625	2.38	2.7/8 EDE	261-4625-XXX				
5.1/2	20-23	4.670-4.778	4.500	2,90	2.3/8" EUE	261-4500-0000				
5.1/2	20-23	4.67(>4.778	4,500	2.38	2.7/0" EUE	261-4500 37500				
6.5/8	20-24	5,921+8,094	3,750	3.00	3.1/2 EUE	281-5755/0000				
7	17-26	6.276-8.538	6.000	2.50	2.779° EUE	261-6800-XXX				
2	17-26	6.275-6.538	6.600	3:00	3.1/21 EUE	261-6006-XXXX				
2	36-32	8.094(8.376	5.875	2.50	2.7/8 EUE	361-5875-XXX				
9	26-32	5.024-6.276	5.875	3.00	\$1/2"£0\$	261-5875-4443				
7	39-35	6.004-6.194	5.812	3.00	5 1/2 EUE	261-5812-10000				
7.5/8	24-29.7	6.675-7.025	6.672	2.50	2.7/5 EUE	261-6672-3300				
7.578	24-2977	6.875-7,025	6,672	3.00	3,1/2" EUE	261-6672-XXXX				
7.578	33,7-39	6.625-6.765	6.453	2:50	1.7787EUE	261-6453-XXX				
7.5/8	33.7-39	6.625-6.765	6.453	3.00	3.7/27 \$04	261-6453-XXXX				
9.5/8	32.3.43.5	8.755-9.001	8.500	3.90	3.1/2 EUE	261-6500-3303				
9.5/6	32.3-43.5	9,755-9 001	6.500	4.00	4.1/2 EUE	261-8500-XXXX				
9.5/8	43,5-53.5	5.535-8.755	8.250	3.00	B 1/21 EDE	261-8250-XXXX				
3.5/3	43.5-53.5	8 535-8 755	8.250	4.60	4.1/2 EUE	261-8250-XXX				

'XXXX' is changed as per material / elastomer / end connection.

### Attachment 2

Area of Review Information:

- 2-mile Oil & Gas Well Map
- 1/2-Mile AOR Well Table
- 2-mile Lease Map
- 2-mile Mineral Ownership Map
- 2-mile Surface Ownership Map
- Potash Lease Map



### Legend

- Proposed SWD (1)
- Gas, Active (1)
- Gas, Plugged (2)
- Injection, Active (9)
- Injection, Plugged (3)
- Oil, Active (13)
- Oil, Plugged (20)
- Oil, Temporarily Abandoned (1)

Source Info: NMOCD O&G Wells updated 2/16/2024 (https://www.emnrd.nm.gov/ocd/ocd-data/ftp-server/l)

### **0&G Wells Area of Review**

### FPNM SWD #3

LEA COUNTY, NEW MEXICO

Proj Mgr: Oliver Seekins

May 07, 2024

Mapped by: Ben Bockelmann

**WATERBRIDGE** 



**OCD Examiner Hearing** No. 24569

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		1/2-Mile A	AOR Well Table for FPNM SWD #	3 (Top of Inject	ion Interval: 5,400')		
Well Name	API#	Well Type	Operator	Spud Date	Location (Sec., Tn., Rng.)	Total Vertical Depth (feet)	Penetrate Inj. Zon
Leonard #1	30-025-12458	Plugged	PRE-ONGARD WELL OPERATOR (Dolport Oil Corporation)	12/22/1937	F-29-26S-38E	3707	No
Federal Sinclair #1-29	30-025-12459	Plugged	PRE-ONGARD WELL OPERATOR (John H. Trigg)	1/27/1962	M-29-26S-38E	3889	No

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Proposed SWD **BLM Communitization Units** NMSLO Mineral Leases Private Mineral Leases BLM Authorized O&G Leases

- 1/2-mile AOR Lessees/Unit Operators:
  BLACKBEARD OPERATING LLC (BLM LESSEE)
  MAGNUM PRODUCING LP (BLM LESSEE)
  R&R ROYALTY LTD (BLM LESSEE)

### **Mineral Lease Area of Review**

### FPNM SWD #3

LEA COUNTY, NEW MEXICO

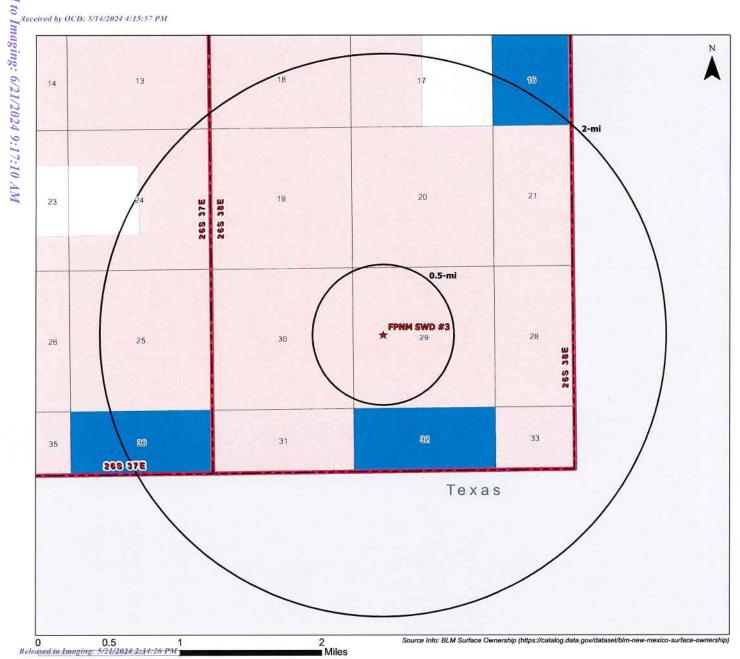
Proj Mgr: Oliver Seekins

May 07, 2024

Mapped by: Ben Bockelmann

WATERBRIDGE

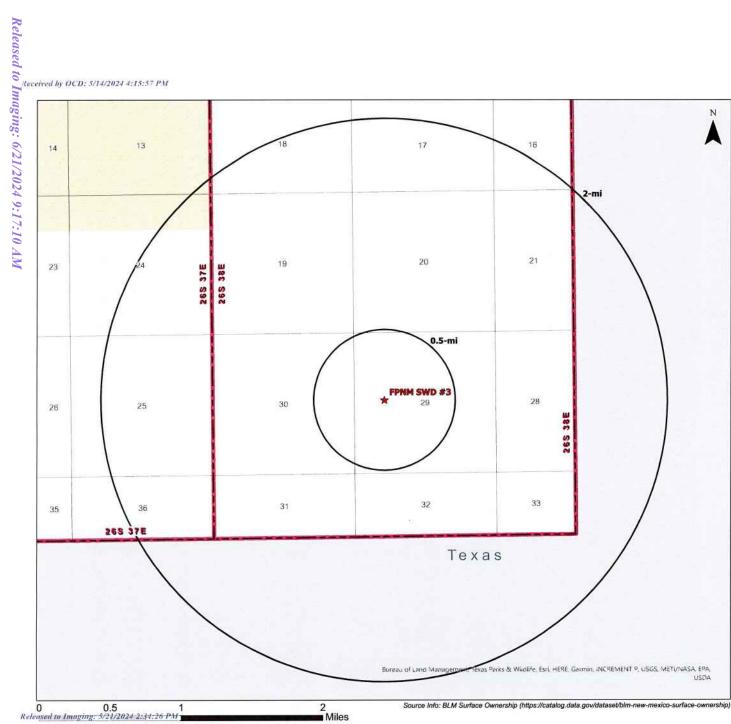






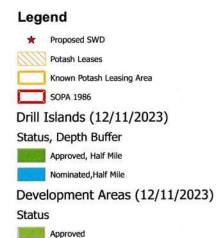
### **Mineral Ownership Area of Review** FPNM SWD #3 LEA COUNTY, NEW MEXICO Proj Mgr: Oliver Seekins Mapped by: May 07, 2024 Ben Bockelmann ALTCONSULTING **WATERBRIDGE**

**OCD Examiner Hearing** No. 24569



Legend \* Proposed SWD Surface Ownership BLM (1) Private (1)

### **Surface Ownership Area of Review** FPNM SWD #3 LEA COUNTY, NEW MEXICO Proj Mgr: Oliver Seekins Mapped by: Ben Bockelmann May 07, 2024 **ALICONSULTING** WATERBRIDGE





**OCD Examiner Hearing** No. 24569

### Attachment 3

Source Water Analysis

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		10			JAM Water	Source	Water Ar	alysis			- 12Y (0					
			WaterB	ridge Stateli	ne LLC - FPNM				onian and El	lenburger Fo	rmations					
Well Name	API	Latitude	Longitude	Section	Township	Range	Unit	Ftgns	Ftgew	County	State	Formation	Tds (mg/L)	Chloride (mg/L)	Bicarbonate (mg/L)	Sulfate (mg/L
GULF STATE #001	3002508458	32.7242317	-103.5246506	26	188	34E	A	660N	660E	LEA	NM	QUEEN	267,000	165,000	216	8
WEST PEARL OUEEN UNIT #103	3002503247	32.6359787	-103.4816437	29	198	35E	C	990N	1980W	LEA	NM.	QUEEN		151,575	141	. 9
WEST PEARL QUEEN UNIT #118	3002503248	32.629612	-103.4773712	29	198	35E	1	19808	1980E	LEA	NM	QUEEN		149,504	35	2
WEST PEARL QUEEN UNI#141	3002503284	32.6223412	-103,4645233	33	198	35E	C	660N	1980W	LEA	NM	QUEEN		138,040	38	4
WHITE CITY PENN GAS COM UNIT 1 #001	3001500408	32.1937523	-104.3088455	29	248	26E	A	660N	660E	EDDY	NM	WOLFCAMP		10,000	645	1,3
HABANERO 17 FEDERAL COM #001H	3001536108	32.2218475	-104.2062683	17	248	27E	A	990N	660E	EDDY	NM	WOLFCAMP	108,205	65,927	146	
SERRANO 29 FEDERAL #001H	3001537763	32.1898842	-104.2062149	29	24S	27E	11	1980N	660E	EDDY	NM	WOLFCAMP	102,136	62,813	183	
SERRANO 29 FEDERAL #001H	3001537763	32.1898842	-104.2062149	29	24S	27E	11	1980N	660E	EDDY	NM	WOLFCAMP	100,995	63,450	268	
CLARA M ROBERTS ETAL #001	3002507265	32.9945259	-103 0748596	26	15S	381	D	336N	330W	1.EA	NM	DEVONIAN	50,630	29,593	823	1,0
OBERHOLIZER #001	3002507164	33.2986488	-103.1388397	7	12S	38E	C	660N	1980W	LEA	NM	DEVONIAN	58,738	33,600	655	1,9
LEA AV STATE #005	3002507201	33.268692	-103.1398849	19	128	38E	C	990N	1650W	LEA	NM	DEVONIAN	57,890	33,208	458	2,0
C S STONE #001	3002507260	33.0045204	-103.0823975	22	15S	38E	G	1980N	1980E	LEA	NM	DEVONIAN	78,690	46,060	354	2,0
CLARA M ROBERTS #001	3002507264	33.0045013	-103.0748672	23	158	38E	E	1980N	330W	LEA	NM	DEVONIAN	91,505	54,638	894	1,8
ROSA SHULTS #001	3002507191	33 272316	-103.1442108	18	128	38E	M	3308	330W	LEA	NM	DEVONIAN	39,824	21,933	647	
HOUSTON A #001	3002507202	33.2632332	-103.1442032	19	128	38E	1	2310S	330W	LEA	NM	DEVONIAN	76,102	44,700	483	
SHELL BROWNING #001	3002507113	33.3240585	-103.1301956	31	118	38E	H	1980N	660E	LEA	NM	DEVONIAN	79,057	46,200	727	2,18
STATE A #002	3002507126	33,32407	-103,1215515	32	118	38E	F	1980N	1980W	LEA	NM	DEVONIAN	85,233	53,250	607	
NEW MEXICO A FEDERAL #001	3002507150	33.3022766	-103.1344833	6	12S	38E	0	660S	1980E	LEA	NM	DEVONIAN	61,815	35,600	580	1,75
NEW MEXICO A FEDERAL #002	3002507151	33.3059044	-103.134491	б	125	3813	3	19808	1980E	LEA	NM	DEVONIAN	61,795	35,600	535	
TAYLOR B #001	3002507155	33.2877579	-103.1344681	7	128	38E	0	660S	1980E	LEA	NM.	DEVONIAN	54,397	30,880	572	
CLARA M ROBERTS #001	3002507264	33.0045013	-103.0748672	23	158	38E	E	1980N	330W	LEA	NM	DEVONIAN	80,811	48,610	883	
ROSE EAVES #001	3002507290	32.8726234	-103.1200638	35	168	38H	N	660S	1980W	LEA	NM	DEVONIAN	48,373	27,670	696	
W W HAMILTON #001	3002507293	32.8762512	-103.1200485	35	168	38E	K	1980S	1980W	LEA	NM	DEVONIAN	41,751	23,780	291	
L COOPER #002	3002507295	32.8689995	-103.1212997	2	17S	38E	C	660N	3300E	LEA	NM	DEVONIAN	38,520	21,600	600	
COOPER A #001	3002507301	32,8438873	-103.1040649	12	178	38E	N	660S	1980W	1.EA	NM	DEVONIAN	29,115	15,640	999	
EDERAL DAVIS #002	3002507305	32.8293381	-103.0954208	13	178	38E	P	660S	660E	LEA	NM	DEVONIAN	35,212	18,540	865	
M HOLLOWAY #001	3002507306	32,8402596	-103.0997314	13	178	38E	В	660N	1980E	1.EA	NM	DEVONIAN	49,286	28,700	645	
WEST DOLLARHIDE DEVONIAN UNIT #104	3002512297	32.1720123	-103.0761032	32	245	38E	1	1980S	660E	LEA	NM	DEVONIAN	50,858	30,200	183	
M HOLLOWAY #001	3002507306	32.8402596	-103.0997314	13	17S	38E	В	660N	1980E	LEA	NM	DEVONIAN	49,290	28,700	645	
WEST DOLLARHIDE DEVONIAN UNIT #104	3002512297	32:1720123	-103.0761032	32	24S	38E	1	1980S	660E	LEA	NM	ELLENBURGER		30,200	183	
A B COATES D #003	3002511748	32.1112633	-103.1177216	24	25S	378	N	998S	2310W	LEA	NM	ELLENBURGER	91,617	57,190	832	
SOUTH JUSTIS UNIT #024	3002511774	32.1040077	-103.1102829	25	25S	37E	H	1650N	660E	LEA	NM	ELLENBURGER	99,800	60,300	195	
SOUTH JUSTIS UNIT #024	3002511774	32.1040077	-103.1102829	25	25S	37E	H	1650N	660E	LEA	NM	ELLENBURGER	98,300	59,400	189	1,65

Page 23 of 45

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### Attachment 4

Injection Formation Water Analysis

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										III a LIVI	i aaar	CI Alialysis					
								-									
					W	aterBı		-				#3 - Glorieta Forma	ation				
Well Name	API	Latitude	Longitude	Section	W	1	ridge	Stateli	ne LLC -	- FPNM	SWD		ation Formation	Tds (mg/L)	Chioride (mg/L)	Bicarbonate (mg/L)	Sulfate (r
Well Name	API 3002511568	<b>Latitude</b> 32.1248627	Longitude -103.1219788	Section 13		1	ridge	Stateli	ne LLC -	- FPNM	SWD	#3 - Glorieta Forma		Tds (mg/L)	Chloride (mg/L) 31,603	Bicarbonate (mg/L)	·
Well Name  LEARCY MCBUFFINGTON #007  LEARCY MCBUFFINGTON #007			-103.1219788		Township	Range	ridge Unit	Stateli Ftgns	ne LLC ·	- FPNM County	SWD State	#3 - Glorieta Forma Field	Formation				1
LEARCY MCBUFFINGTON #007	3002511568	32.1248627	-103.1219788 -103.1219788	13	Township 258	Range 37E	Unit	Stateli Ftgns 660S	Ftgew 990W 990W	County  LEA	State NM	#3 - Glorieta Forma Field JUSTIS	Formation GLORIETA	55,190	31,603	1,158	1
LEARCY MCBUFFINGTON #007 LEARCY MCBUFFINGTON #007	3002511568 3002511568	32.1248627 32.1248627	-103.1219788 -103.1219788	13 13	Township 258 258	37E 37E	Unit	Ftgns 660S 660S	Ftgew 990W 990W 1650W	County  LEA  LEA	State NM NM	Field JUSTIS JUSTIS	Formation GLORIETA GLORIETA	55,190 55,183	31,603 31,600	1,158 1,158	1 1 3
LEARCY MCBUFFINGTON #007 LEARCY MCBUFFINGTON #007 CARLSON FEDERAL #001	3002511568 3002511568 3002511574	32.1248627 32.1248627 32.1330185	-103.1219788 -103.1219788 -103.1198425	13 13 13	25S 25S 25S	37E 37E 37E 37E	Unit	Ftgns 660S 660S 1650N	Ftgew 990W 990W 1650W	County  LEA  LEA  LEA	State NM NM NM	Field  JUSTIS JUSTIS JUSTIS JUSTIS JUSTIS	Formation GLORIETA GLORIETA GLORIETA	55,190 55,183 113,731	31,603 31,600 67,250	1,158 1,158 280	Sulfate (m  1  1  3  2  3  3

### Attachment 5

Confining Zones and Historic Pore Space Use

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### CONFINING ZONES AND HISTORIC PORE SPACE USAGE

For WaterBridge Stateline, LLC's proposed FPNM SWD #3 application in the Lower Permian Glorieta Sandstone in the Central Basin Platform area, the lower San Andres Formation will act as the upper confinement zone, and the lower Glorieta Sandstone as the lower confinement zone, given its low porosity and high resistivity. The proposed location is in T26S., R38E, an area with very limited oil and gas production. Most area wells have been plugged and abandoned, and none penetrate the proposed injection intervals in the Glorieta Sandstone.

The San Andres Formation is a shelf carbonate deposit composed predominantly of dolomite, and in the proposed development area, the lower San Andres Formation is a tight rock with low porosity and high resistivity values. **Figure 1** is a log snip of this upper confining zone of approximately 60 feet in the lower San Andres Formation. The lower confining zone is a tight sandstone unit within the Glorieta Sandstone, which also has low porosity development and high resistivity readings. The Glorieta Sandstone is a fine-grained, well-to-moderately sorted quartz arenite sandstone. **Figure 2** is a log snip of this approximately 30 feet of lower Glorieta Sandstone.

The closest oil and gas production to the FPNM SWD #3 is the active waterflood operation directly to the west. This waterflood operation is the W.H. Rhodes B Federal NCT-1 unit project and was originally operated by Texaco, Inc., with the first waterflood injection commencing in 1964 and continued expansion occurring in 1969, 1973, and 1993 by Texaco Exploration and Production, Inc. Oil production and enhanced oil recovery water injection is into the Yates and Seven Rivers formations at depths ranging from approximately 3,000 to 3,400 feet and primarily located in T26S, R37E. There is no oil or gas production from the Glorieta Sandstone within the two-mile radius of the proposed FPNM SWD #3.

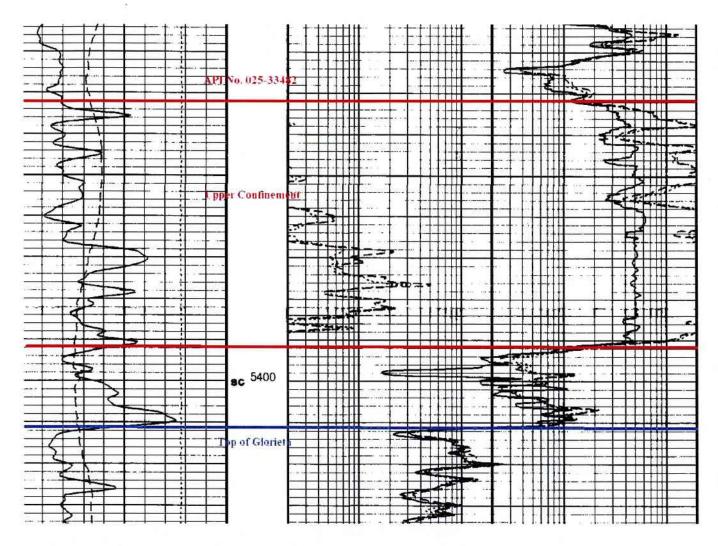


Figure 1. Open Hole Log Snip of the Upper Confining Zone in the Lower San Andres Formation

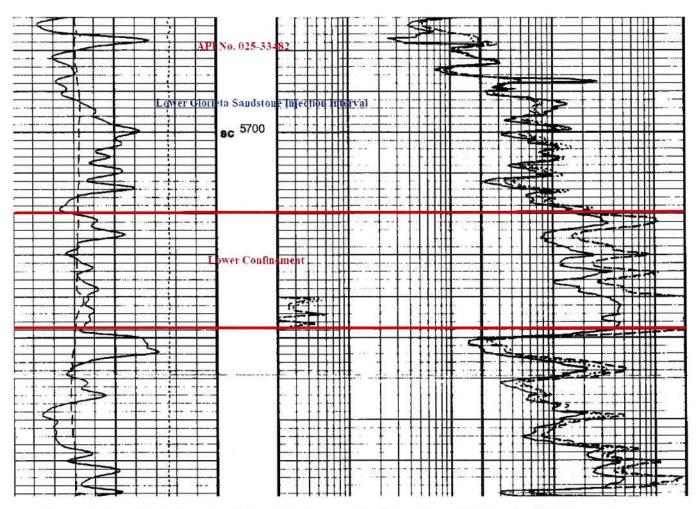


Figure 2. Open Hole Logging Snip of the Lower Confining Zone Within the Glorieta Sandstone

### Attachment 6

Water Well Map and Well Data

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### Legend

roposed SWD (1)

### OSE PODs

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

### **Water Wells Area of Review**

### FPNM SWD #3

LEA COUNTY, NEW MEXICO

Proj Mgr. Oliver Seekins

May 07, 2024

Mapped by: Ben Bockelmann





**OCD Examiner Hearing** No. 24569

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

Water Well Sampling Rationale  WaterBridge Stateline LLC - FPNM SWD #3	
Water Wells Owner Available Contact Information Use Sampling Required	Not

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Page 38 of 110

Page 32 of 45

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# Attachment 7

No Hydrologic Connection Statement

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RE: Waterbridge Stateline LLC - FPNM SWD #3 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 intervals in the Glorieta Sandstone 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 surficial geology is Quaternary alluvial deposits consisting predominantly of sand and caliche. This area is south of the High Plains Aquifer and depths to potable water ranges from 30 to 142 feet below the surface. The USDW is the Rustler Formation and the base of the USDW ranges from 875 to 1,130 feet below the surface.

Based on ALL's assessment and analysis there is containment through multiple confining zones in the San Andres Formation and the Salado evaporite deposits above the Glorieta Sandstone and the USDW and over 4,270 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 Glorieta Sandstone.

Tom Tomastik

Date

Chief Geologist and Regulatory Specialist

ALL Consulting LLC



Page 34 of 45

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Attachment 8

Seismic Potential Letter



March 18, 2024

PN 1703.SWD.11

Mr. Phillip Goetze, P.G. NM EMNRD – Oil Conservation Division 1220 South St. Francis Drive Santa Fe, NM 87505

Subject:

WaterBridge Stateline LLC

FPNM SWD #3 - Seismic Potential Letter

Dear Mr. Goetze,

At the request of WaterBridge Stateline, LLC (WaterBridge), ALL Consulting, LLC (ALL) has assessed the potential injection-induced seismicity risks in the vicinity of WaterBridge's FPNM SWD #3, a proposed saltwater disposal (SWD) facility in Lea County, New Mexico, and summarized the findings in this letter. This assessment used publicly available data to identify the proximity and characteristics of seismic events and known faults to evaluate the potential for the operation of the FPNM SWD #3 to contribute to seismic activity in the area.

# Geologic Evaluation

The FPNM SWD #3 is requesting a permit to inject into the Permian Glorieta Sandstone (Glorieta) at a depth of 5,400-5,775 feet below ground surface (bgs). The Glorieta primarily consists of Permian-age sandstone and is overlain by approximately 60 feet of low porosity carbonate rocks within the lower San Andres Formation, which would prevent the upward migration of injection fluid and serve as the upper confining layer (see Attachment 1). Additionally, approximately 28 feet of low porosity and low permeability other carbonate rocks lie beneath the proposed injection interval and act as a lower confining zone by preventing downward migration of injected fluids into the underlying Tubb Formation (see Attachment 1). A stratigraphic chart depicting the geologic setting is included as Figure 1.1

#### Seismic Events and Fault Data

A review of United States Geological Survey (USGS) and New Mexico Tech Seismological Observatory (NMTSO) earthquake catalogues determined that two (2) seismic events have been recorded within a 100 square mile area [9.08-kilometer (km) radius] around the Subject SWD.

Yang, K.-M., & Dorobek, S. L. (1995). The Permian Basin of west Texas and New Mexico: Tectonic history of a "composite" Foreland Basin and its effects on stratigraphic development. Stratigraphic Evolution of Foreland Basins, 149–174. https://doi.org/10.2110/pec.95.52.0149

WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

The closest recorded seismic event was a M1.68 that occurred on July 22, 2017, and was located approximately 1.78 miles north of the FPNM SWD #3 (see Attachment 2).

Fault data from United States Geological Survey (USGS) and the Texas Bureau of Economic Geology (BEG)2 indicates that the closest known fault is located approximately 0 miles from the FPNM SWD #3 (see Attachment 2). This identified fault is within the Precambrian basement, which is approximately 8,225 feet below the proposed injection interval.<sup>3</sup> Fault data from Sourcewater also indicates the presence of four faults in the sedimentary column, above the Precambrian basement, within the area of review.4 These shallow faults penetrate the Canyon, Cisco, and Wolfcamp formations which begin approximately 2,940 feet below the proposed injection interval. As previously discussed, there are confining barriers beneath the proposed injection interval which will prevent the downward migration of fluids into such faults. A map of the seismic events and faults within 9.08 km of the FPNM SWD #3 is included as Attachment 2.

Figure 1 – Delaware Basin Stratigraphic Chart (Adapted from Yang and Dorobek 1995)

SYSTEM	SERIES/ STAGE	CENTRAL BASIN	DELAWARE BASIN
PERMIAN	OCHOAN,	DEWEY LAKE RUSTLER SALADO	DEWEY LAKE RUSTLER SALADO CASTILE
	GUADALUPIAN	TANSILL YATES SEVEN RIVERS OUEEN GRAYBURG SAN ANDRES GLORIETA	DELAWARE MT GROUP BELL CANYON CHERRY CANYON BRUSHY CANYON
	LEONARDIAN	CLEAR FORK WICHITA	BONE SPRING
	WOLFCAMPIAN	WOLFCAMP	WOLFCAMP
PENNSYLVANIAN	VIRGILIAN	CISCO	CISCO
	MISSOURIAN	CANYON	CANYON
	DESMOINESIAN	STRAWN	STRAWN
	ATOKAN	ATOKA DENO	ATOKA DEND
	MORROWAN	(ABSENT)	MORROW BEND
MISSISSIPPIAN	CHESTERIAN MERAMECIAN OSAGEAN KINDERHOOKIAN	CHESTER BARNETT	CHESTER BARNETT
		KINDERHOOK	KINDERHOOK
DEVONIAN		——WOODFORD—— DEVONIAN	WOODFORD
SILURIAN		SILURIAN SHALE FUSSELMAN	MIDDLE SILURIAN FUSSELMAN
	UPPER	MONTOYA	SYLVAN MONTOYA
ORDOVICIAN	MIDDLE	SIMPSON	SIMPSON
	LOWER	ELLENBURGER	ELLENBURGER
CAMBRIAN	UPPER	CAMBRIAN	CAMBRIAN
PRECAMBRIAN			

#### Seismic Potential Evaluation

Experience in evaluating induced seismic events indicates that most injection-induced seismicity throughout the U.S. (e.g., Oklahoma, Ohio, Texas, New Mexico, and Colorado) occurs as a result of injection into Precambrian basement rock, into overlying formations that are in hydraulic communication with the Precambrian basement rock, or as a result of injection near critically stressed and optimally oriented faults. Seismicity at basement depths occurs because critically stressed faults generally originate in crystalline basement rock and may also extend into overlying sedimentary formations. <sup>5</sup>

<sup>&</sup>lt;sup>2</sup> Horne E. A. Hennings P. H., and Zahm C. K. 2021. Basement structure of the Delaware Basin, in The Geologic Basement of Texas: A Volume in Honor of Peter Flawn, Callahan O. A., and Eichubl P., The University of Texas at Austin, Bureau of Economic Geology.

<sup>&</sup>lt;sup>3</sup> G. Randy Keller, J. M. Hills &; Rabah Djeddi, A regional geological and geophysical study of the Delaware Basin, New Mexico and West Texas, Trans Pecos Region (West Texas) (1980).

<sup>&</sup>lt;sup>4</sup> Formation of Occurrence, Strike, Dip, and Length Interpreted by (Cortina, J. E. and Lemons, C. R. 2019. Houston, TX: Sourcewater, Inc.)

<sup>&</sup>lt;sup>5</sup> Ground Water Protection Council and Interstate Oil and Gas Compact Commission. Potential Injection-Induced Seismicity Associated with Oil & Gas Development: A Primer on Technical and Regulatory Considerations Informing Risk Management and Mitigation. 2015. 141 pages.

Page 37 of 45

WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

Injection into either the Precambrian basement rock or its overlying formations that are hydraulically connected to the basement rock through faulting or fracture networks can increase the pore pressure and may lead to the fault slipping, resulting in a seismic event.<sup>4</sup> As such, the vertical distance between the injection formation and Precambrian basement rock and the presence or lack of faulting within the injection interval are major considerations when determining the risk of injection-induced seismicity.

Geophysical logs from nearby well records show at least 8,225 feet of vertical separation between the injection interval and the Precambrian basement.<sup>3</sup> In addition, injection-induced seismicity is not typically associated with shallow disposal wells in the Central Basin Platform and Delaware Basin areas, such as the FPNM SWD #3.

For injection into the Glorieta Formation to contribute to seismic activity, one of two hypothetical geologic scenarios must exist:<sup>6</sup>

- Scenario #1: Earthquake hypocenters would need to be significantly shallower (several kilometers) than initially identified by the USGS and NMTSO seismic monitoring networks, and thus placing seismic activity high in the sedimentary column, rather than in the Precambrian basement.
- 2. Scenario #2: This scenario would require that both of the following conditions are met:
  - a. Fault Transmissivity: High permeability and transmissive conduits from fault-damaged zones would need to be present below the Glorieta, allowing fluid to migrate through the underlying Tubb Formation and through significantly deeper confining intervals, and eventually into the Precambrian basement.
  - b. Pore Pressure: The injection fluids and bottom hole pressures in the Glorieta would need to exceed existing hydrostatic pressures within the deeper geologic formation in order for injection fluids to migrate downward.

There are no publications or geologic data that suggest either of these scenarios to be true for the area around the FPNM SWD #3.

# Formation Parting Pressure

Class II SWDs in New Mexico are administratively permitted with a maximum pressure gradient of 0.2 psi/ft. Review of New Mexico Oil Conservation Division (OCD) Order IP-476 submitted by Chevron USA Inc. in support of the Vacuum Glorieta West Unit, which is located approximately 60 miles northwest of the FPNM SWD #3, determined the fracture gradient of the Glorieta in the region ranges from 0.26-0.39 psi/ft from approved step-rate tests. Typical SWD permitting standards in New Mexico, and the requested operating parameters of the FPNM SWD #3, would indicate that formation parting pressure would not be exceeded by the FPNM SWD #3.

<sup>&</sup>lt;sup>6</sup> Skoumal, Robert J., et al. "Induced Seismicity in the Delaware Basin, Texas." *Journal of Geophysical Research: Solid Earth*, vol. 125, no. 1, 2020, doi:10.1029/2019jb018558.

Page 38 of 45

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WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

### Conclusion

As an expert on the issue of induced seismicity, seismic monitoring, and mitigation, it is my opinion that the potential for the FPNM SWD #3 to cause injection-induced seismicity is expected to be minimal, at best. This conclusion assumes the FPNM SWD #3 will be operated below formation parting pressure and is based on (1) the presence of numerous confining layers above and below the injection interval, (2) the significant vertical distance between the injection zone and Precambrian basement rock in which the nearest fault has been identified, and (3) the vertical distance from, and lack of historic seismicity on, identified shallow faults in the area of review.

Sincerely,

ALL Consulting, LLC

Reed Davis Geophysicist Received by OCD: 6/21/2024 9:12:37 AM
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Page 45 of 110
Page 39 of 45

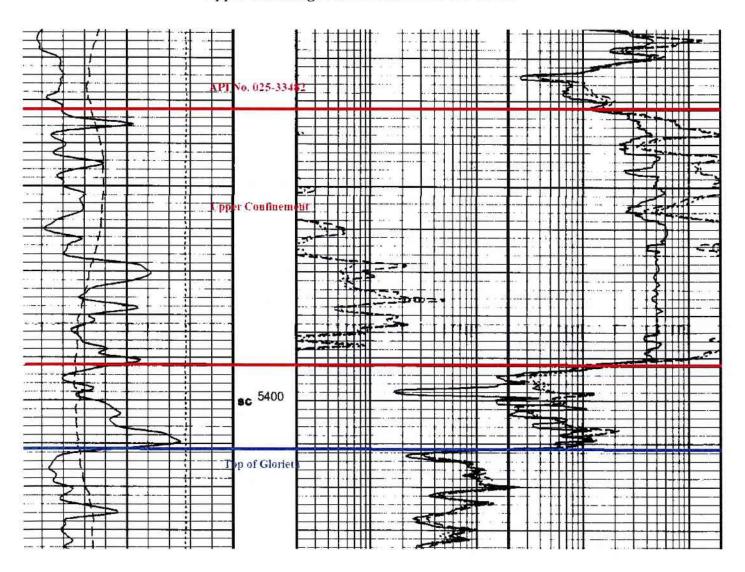
WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

> Attachment 1 Upper and Lower Confining Zones

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WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

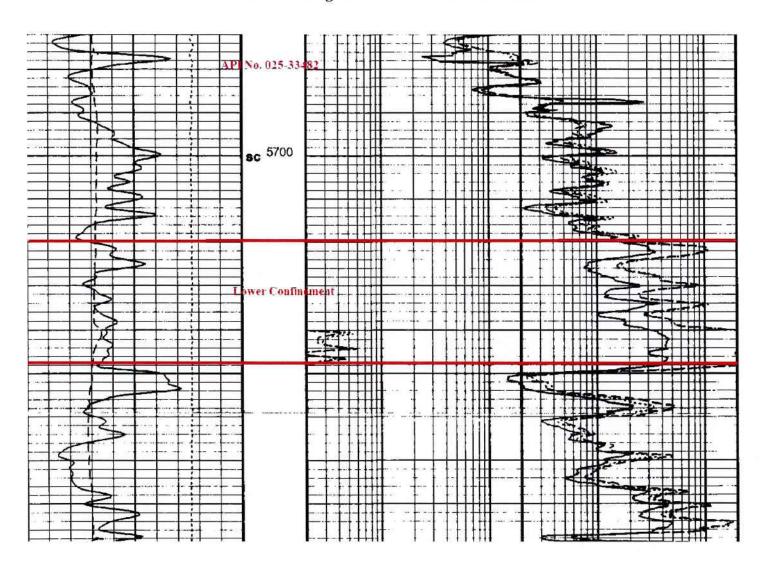
# Upper Confining Zone from API No. 025-33482



Page 41 of 45

WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

# Lower Confining Zone from API No. 025-33482



Page 42 of 45

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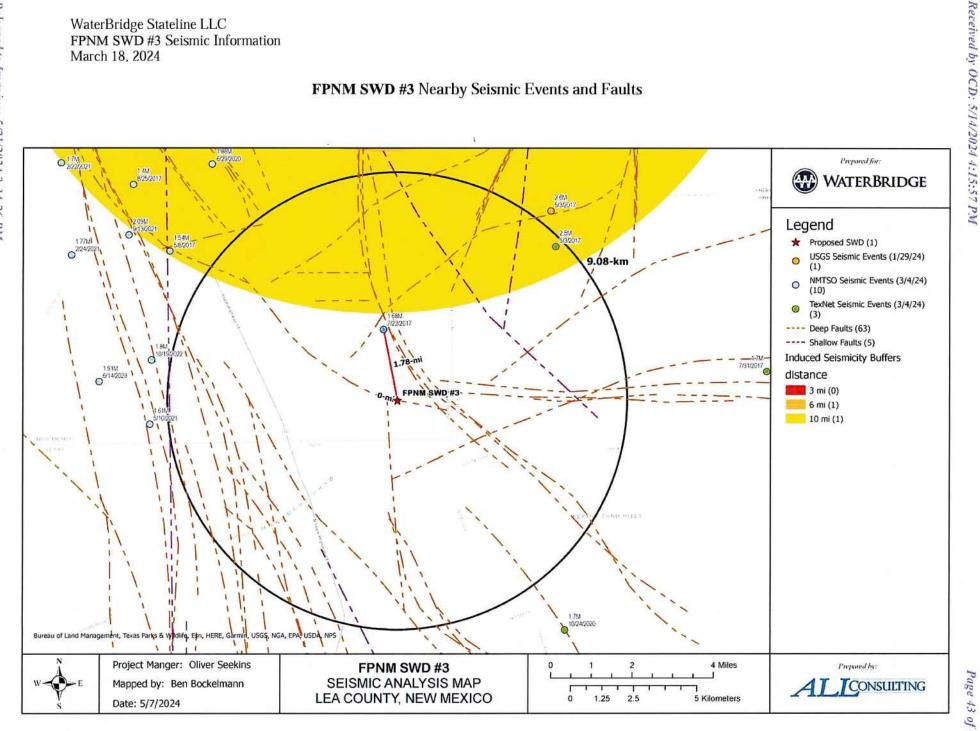
WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

> Attachment 2 Seismic Event Map

> > Page 8

WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

# FPNM SWD #3 Nearby Seismic Events and Faults



Attachment 9

List of affected Persons

TO MISSION SOURCE SET AND						
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		501114 CIVID 112 N				
			ce of Application Recipients			
Affected Party Classification	Entity - Proof of Notice	Entity - As Mapped/Exhibited	Address	City	State	Zip Code
Surface Owner	D.K. Boyd	N/A	3317 Andrews Hwy	Midland	TX	79703
NMOCD District Office	New Mexico Oil Conservation District 1	N/A	1625 N. French Dr	Hobbs	NM	88240
Mineral Owner	New Mexico Bureau of Land Management	N/A	301 Dinosaur Trail	Sante Fe	NM	87508
BLM - Lessee	Blackbeard Operating, LLC	Blackbeard Operating LLC	1751 River Run, Ste 405	Fort Worth	TX	76107
BLM - Lessee	Magnum Producing, LP	Magnum Producing LP	500 N Shoreline Blvd, Ste 322	Corpus Christi	TX	78401
BLM - Lessee	R&R Royalty LTD.	R&R Royalty LTD	500 N Shoreline Blvd, Ste 322	Corpus Christi	TX	78401
	ived notification of this C-108 application.					

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

APPLICATION OF WATERBRIDGE STATELINE LLC TO APPROVE SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.

> CASE NO. 24569 (FPNM SWD #3)

# AFFIDAVIT OF THOMAS E TOMASTIK

Thomas E. Tomastik, of lawful age and being duly sworn, declares as follows:

- My name is Thomas E. Tomastik. I work for ALL Consulting as a Chief Geologist and Regulatory Specialist. I have been retained by WaterBridge Stateline LLC ("WaterBridge") (OGRID No. 330129).
  - 2. I personal knowledge of the matters stated herein.
- 3. I have previously testified before the Oil Conservation Division ("Division") as an expert witness in petroleum engineering and petroleum geology and my credentials as have been accepted by the Division and made a matter of record.
  - 4. My area of responsibility includes the area of Lea County in New Mexico.
- 5. I am familiar with the application WaterBridge filed in this matter and I am familiar with the status of the lands in the subject area.
- 6. I undertook a hydrologic evaluation related to the proposed FPNM SWD #3 well (the "Well"), which is included as Attachment 7 to Exhibit A-1.
- 7. WaterBridge seeks authorization to inject produced water into the Glorieta Sandstone at the Well at a depth of approximately 5,400 feet to 5,775 feet.



No. 2456 50

- 8. I examined available geologic and engineering data and found no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water ("USDW").
- 9. In my opinion, there is containment through multiple confining zones in the San Andres Formation and the Salado evaporite deposits above the Glorieta Sandstone and the USDW and over 4,270 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 Glorieta Sandstone.
- 10. In addition, WaterBridge's wellbore design will isolate any known freshwater zones and is protective of USDWs.
- 11. All of the well data and operations information required by the C-108 is included in the C-108 attached as Exhibit A-1. The proposed well design is contained in Attachment 1 to the C-108 and described in Section III.A of the C-108.
- 12. In my opinion, the well design will be protective of freshwater and USDWs in the area and protective of correlative rights.
- 13. A water chemistry analysis is provided as Attachments 3 and 4 to Exhibit A-1. Based on this water chemistry analysis, in my opinion and based on my experience, there will not be a compatibility issue between the injection fluids and the fluids within the injection interval.
- 14. The estimated average surface injection pressure is expected to be approximately 810 psi. The maximum surface injection pressure will be 1,080 psi, based on the Division's guideline limiting surface injection pressures to 0.2 psi per foot of depth to the top-most injection interval. The proposed injection volumes can be achieved without exceeding the maximum surface

injection pressure. Injection pressures and volumes will be continuously monitored through an electronic SCADA system.

- 15. In my opinion, the granting of WaterBridge's application is in the interests of conservation and the prevention of waste.
- 16. The attached exhibits were prepared by me, or compiled from company business records, or were prepared at my direction.
- 17. I attest under penalty of perjury under the laws of the State of New Mexico that the information provided herein is correct and complete to the best of my knowledge and belief.

[Signature page follows]

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Louise & Forcastos

State of OKlahoma

County of Wagurer

This record was acknowledged before me on June 2024, by Thomas E. Tomastik.

[Stamp]

RITA GIORDANO

NOTARY PUBLIC STATE OF OKLAHOMA

Commission # 15000795 Expires 01/27/27

My Commission Expires:

Notary Public in and for the State of OKIA NOWA

Commission Number:

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

APPLICATION OF WATERBRIDGE STATELINE LLC TO APPROVE SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.

**CASE NO. 24569 (FPNM SWD #3)** 

# **AFFIDAVIT OF REED DAVIS**

Reed Davis, of lawful age and being duly sworn, declares as follows:

- 1. My name is Reed Davis. I work for ALL Consulting as a Geophysicist. I have been retained by WaterBridge Stateline LLC ("WaterBridge") (OGRID No. 330129).
  - 2. I personal knowledge of the matters stated herein.
- 3. I have previously testified before the Oil Conservation Division ("Division") as an expert witness in geology and geophysics and my credentials have been accepted by the Division and made a matter of record.
  - 4. My area of responsibility includes the area of Lea County in New Mexico.
- 5. I am familiar with the application WaterBridge filed in this matter and I am familiar with the status of the lands and geology in the subject area.
- 6. In this case, WaterBridge seeks authorization to inject produced water into the Glorieta Sandstone formation through the FPNM SWD #3 well (the "Well") into the Glorieta Sandstone formation at a depth of approximately 5,400 feet to 5,775 feet.
- 7. Exhibit A-1, Attachment 8, contains a statement I prepared that includes an overview of the geology of this area, as well as information regarding the low potential for induced seismicity if WaterBridge's application is granted.
- 8. Based on my geology study, I have concluded that the Glorieta Sandston is well suited for injection because it is bounded by both an upper confining layer and a lower confining



layer, which will prevent migration of the injected fluids. The Glorieta primarily consists of Permian-age sandstone and is overlain by approximately 60 feet of low porosity carbonate rocks within the lower San Andres Formation, which would prevent the upward migration of injection fluid and serve as the upper confining layer. Additionally, approximately 28 feet of low porosity and low permeability other carbonate rocks lie beneath the proposed injection interval and act as a lower confining zone by preventing downward migration of injected fluids into the underlying Tubb Formation. Attachment 1 to my Letter are geophysical logs which depict the intervals above and below the proposed injection interval.

- 9. In my opinion, operating the Well will not impact the correlative rights of mineral owners because the proposed injection will remain within the target injection interval due to the upper and lower confining zones. There is no oil and gas production from the Glorieta Sandstone within the two-mile radius of the Well.
- 10. I also prepared a statement regarding seismicity, which was included in the C-108, also as Attachment 8.
- 11. Based on my study, in my opinion, the potential for the Well to cause injection-induced seismicity is expected to be minimal because (1) the presence of numerous confining layers above and below the injection interval, (2) the significant vertical distance between the injection zone and Precambrian basement rock in which the nearest fault has been identified, and (3) the vertical distance from, and lack of historic seismicity on, identified shallow faults in the area of review.
- 12. In my opinion, the granting of WaterBridge's application is in the interests of conservation and the prevention of waste.
- 13. The attached exhibits were prepared by me, or compiled from company business records, or were prepared at my direction.

14. I attest under penalty of perjury under the laws of the State of New Mexico that the information provided herein is correct and complete to the best of my knowledge and belief.

[Signature page follows]

Reed Davis

State of \_\_\_\_

County of Tuls 9

This record was acknowledged before me on June <u>10</u>2024, by Reed Davis.

[Stamp]

Notary Public in and for the State of Owlahom

Commission Number: 19011374

My Commission Expires: 11/11/2027

PALOMA LUCERO
Notary Public, State of Oklahoma
Commission # 19011374
My Commission Expires 11-11-2027

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

APPLICATION OF WATERBRIDGE STATELINE LLC TO APPROVE SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.

**CASE NO. 24569** 

# SELF-AFFIRMED DECLARATION OF DEANA M. BENNETT

Deana M. Bennett, attorney in fact and authorized representative of WaterBridge Stateline, LLC, the Applicant herein, declares as follows:

- 1) The above-referenced Application was provided under notice letter, dated June 4, 2024, attached hereto, as Exhibit D.1.
- Exhibit D.2 is the mailing list, which show the notice letters were delivered to the USPS 2) for mailing on June 4, 2024.
- Exhibit D.3 is the certified mailing tracking information, which is automatically compiled 3) by CertifiedPro, the software Modrall uses to track the mailings. This spreadsheet shows the names and addresses of the parties to whom notice was sent and the status of the mailing.
- 4) Exhibit D.4 is the Affidavit of Publication from the Hobbs News-Sun confirming that notice was published on June 9, 2024.
- 5) I attest under penalty of perjury under the laws of the State of New Mexico that the information provided herein is correct and complete to the best of my knowledge and belief.

Dated: June 19, 2024

**EXHIBIT** 



June 4, 2024

Deana M. Bennett 505.848.1834 dmb@modrall.com

# VIA CERTIFIED MAIL RETURN RECEIPT REQUESTED

Re: APPLICATION OF WATERBRIDGE STATELINE LLC TO APPROVE SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.

**CASE NO. 24569** 

TO: AFFECTED PARTIES

This letter is to advise you that WaterBridge Stateline, LLC ("WaterBridge") has filed the enclosed application.

In Case No. 24569, WaterBridge Stateline LLC seeks an order approving disposal into the Glorieta Sandstone formation through the FPNM SWD #3 well at a surface location 2,512' from the North line and 1,133' from the West line, Lot 2, Section 29, Township 26 South, Range 38 East, NMPM, Lea County, New Mexico for the purpose of operating a produced water disposal well. Applicant seeks authority to inject produced water into the Glorieta Sandstone formation at a depth of approximately 5,400 feet to 5,775 feet. Applicant further requests that the Division approve a maximum daily injection rate for the well of 20,000 bbls per day. Said area is located approximately 9.20 miles Southeast of Jal, New Mexico.

The hearing is set for June 27, 2024 beginning at 8:30 a.m. The hearing will be conducted in a hybrid fashion, both in-person at the Energy, Minerals, Natural Resources Department, Wendell Chino Building, Pecos Hall, 1220 South St. Francis Drive, 1st Floor, Santa Fe, NM 87505 and via a virtual meeting platform. To participate in the electronic hearing, see the instructions posted on the docket for the hearing date: https://www.emnrd.nm.gov/ocd/hearing-info/.

As a party who may be affected by this application, we are notifying you of your right to appear at the hearing and participate in this case, including the right to present evidence either in support of or in opposition to the

EXHIBIT
D.2

Modrall Sperling Roehl Harris & Sisk P.A.

500 Fourth Street NW Suite 1000 Albuquerque, New Mexico 87102

PO Box 2168 Albuquerque, New Mexico 87103-2168

Tel: 505.848.1800 www.modrall.com Page 2

application. Failure to appear at the hearing may preclude you from any involvement in this case at a later date.

You are further notified that if you desire to appear in this case, then you are requested to file a Pre-Hearing Statement with the Division at least four business days in advance of a scheduled hearing before the Division or the Commission, but in no event later than 5:00 p.m. mountain time, on the Thursday preceding the scheduled hearing date, with a copy delivered to the undersigned.

Sincerely,

Deana M. Bennett Attorney for Applicant

Neena M. Bennett

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

APPLICATION OF WATERBRIDGE STATELINE LLC TO APPROVE SALT WATER DISPOSAL WELL IN LEA COUNTY, NEW MEXICO.

CASE NO. 24569

# APPLICATION

WaterBridge Stateline LLC ("WaterBridge"), OGRID No. 330129, through its undersigned attorneys, hereby submits this application to the Oil Conservation Division pursuant to the provisions of NMSA 1978, § 70-2-12, Rule No. 19.15.26, and Rule 19.15.4.8 for an order approving drilling of a salt water disposal well in Lea County, New Mexico. In support of this application, WaterBridge states as follows:

- (1) WaterBridge proposes to drill the FPNM SWD #3 well at a surface location 2,512' from the North line and 1,133' from the West line, Lot 2, Section 29, Township 26 South, Range 38 East, NMPM, Lea County, New Mexico for the purpose of operating a produced water disposal well.
- (2) WaterBridge seeks authority to inject produced water into the Glorieta Sandstone formation at a depth of approximately 5,400 feet to 5,775 feet.
- (3) WaterBridge requests that the Division approve a maximum daily injection rate for the well of 20,000 bbls per day.
- (4) WaterBridge requests approval of a maximum injection pressure of 1,080 psi for the well.
  - (5) A proposed C-108 for the subject well is attached hereto as Attachment A.

(6) The granting of this application will avoid the drilling of unnecessary wells, will prevent waste, and will protect correlative rights.

WHEREFORE, WaterBridge requests that this application be set for hearing before an Examiner of the Oil Conservation Division on June 13, 2024; and that after notice and hearing, the Division enter its order approving this application.

Respectfully submitted,

MODRALL, SPERLING, ROEHL, HARRIS & SISK, P.A.

By:

Earl E. DeBrine, Jr.

Deana M. Bennett

Yarithza Peña

Post Office Box 2168

500 Fourth Street NW, Suite 1000

Albuquerque, New Mexico 87103-2168

Telephone: 505.848.1800

edebrine@modrall.com

deana.bennett@modrall.com

yarithza.pena@modrall.com

Attorneys for Applicant

Page 3 of 45

CASE NO. 24569: Application of WaterBridge Stateline LLC for approval of a salt water disposal well in Lea County, New Mexico. Applicant seeks an order approving disposal into the Glorieta Sandstone formation through the FPNM SWD #3 well at a surface location 2,512' from the North line and 1,133' from the West line, Lot 2, Section 29, Township 26 South, Range 38 East, NMPM, Lea County, New Mexico for the purpose of operating a produced water disposal well. Applicant seeks authority to inject produced water into the Glorieta Sandstone formation at a depth of approximately 5,400 feet to 5,775 feet. Applicant further requests that the Division approve a maximum daily injection rate for the well of 20,000 bbls per day. Said area is located approximately 9.20 miles Southeast of Jal, New Mexico.

**Page 4 of 45**Revised March 23, 2017

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STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, New Mexico 87505 Page 5 of 45 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						
П.	OPERATOR: WaterBridge Stateline LLC						
	ADDRESS: 5555 San Felipe, Ste. 1200 Houston, TX 77056						
	CONTACT PARTY: Jessica High - Director, QHSE & Regulatory PHONE: 832-871-4064						
ш.	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:						
	<ol> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,</li> <li>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.).</li> </ol>						
*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 dat and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.						
ХШ.	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: Oliver Seekins TITLE: Project Manager / Regulatory Specialist						
	SIGNATURE: DATE: 5/13/2024						
*	E-MAIL ADDRESS: oseekins@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:						

Application for Authorization to Inject

Well Name: FPNM SWD #3

# III - Well Data (The wellbore diagram is included as Attachment 1)

A.

### (1) General Well Information:

Operator: WaterBridge Stateline LLC (OGRID No. 330129)

Lease Name & Well Number: FPNM SWD #3 Location Footage Calls: 2,512' FNL & 1,133' FWL

Legal Location: Lot 2, S29 T26S R38E

Ground Elevation: 2,991'

Proposed Injection Interval: 5,400' - 5,775'

County: Lea

#### (2) Casing Information:

Туре	Hole Size	Casing Size	Casing Weight	Setting Depth	Sacks of Cement	Estimated TOC	Method Determined
Surface	24"	20"	94.0 lb/ft	1,155'	1,175	Surface	Circulation
Intermediate 1	17-1/2"	13-3/8"	54.5 lb/ft	2,630'	1,935	Surface	Circulation
Production Casing	12-1/4"	9-5/8"	40.0 lb/ft	5,775′	1,915	Surface	CBL
Tubing	N/A	5-1/2"	17.0 lb/ft	5,375'	N/A	N/A	N/A

DV Tool set at: 3,000'

#### (3) Tubing Information:

5-1/2" (17.0 lb/ft) ceramic-coated tubing with setting depth of 5,375'

(4) Packer Information: ACT AS1-X or equivalent packer set at 5,375'

В.

(1) Injection Formation Name: Glorieta

Pool Name: SWD; Glorieta

Pool Code: 96106

- (2) Injection Interval: Perforated injection between 5,400' 5,775'
- (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.
  - Yates (2,810')
  - Seven Rivers (2,966')
  - Queen (3,468')
  - Penrose (3,720')

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

- Tubb (6,625')
- Devonian (9,041')

### V - Well and Lease Details

The following maps and documents are included in Attachment 2:

- 2-mile Oil & Gas Well Map
- ½-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

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

There are two (2) plugged wells in the ½-mile AOR, however neither penetrates the proposed injection zone.

# VII - Proposed Operation

- (1) Proposed Maximum Injection Rate: 20,000 bpd Proposed Average Injection Rate: 15,000 bpd
- (2) A closed-loop system will be used.
- (3) Proposed Maximum Injection Pressure: 1,080 psi (surface) Proposed Average Injection Pressure: Approximately 810 psi (surface)
- (4) Source Water Analysis: The expected injectate will consist of produced water from production wells completed in the Queen, Wolfcamp, Devonian and Ellenburger formations. Analysis of water from these formations is included as Attachment 3.
- (5) Injection Formation Water Analysis: The proposed SWD will be injecting water into the Glorieta Sandstone which is a non-productive zone known to be compatible with formation water from the Queen, Wolfcamp, Devonian and Ellenburger formations. Water analyses from the Glorieta Sandstone in the area are included as Attachment 4.

# VIII - Geologic Description

The proposed injection interval includes the Glorieta Sandstone from 5,400' - 5,775'. The Permian-aged Glorieta Sandstone is a fine grained and well-to-moderately sorted quartz arenite sandstone that occurs directly below the San Andres Formation. There are multiple zones of high porosity and low resistivity that makes this sandstone a viable injection zone in this area.

Further discussion of the injection formation, overlying and underlying confinement zones, and historic use of the field are included as **Attachment 5**.

The base of the USDW is the Rustler Formation at a depth of approximately 1,130 feet. Depth of the nearest water well in the area is approximately 80 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 will be submitted to the Division upon completion of the well.

# 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 and details of the water well within 1-mile are 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.

In addition, a Seismic Potential Letter detailing the minimal risk of injection-induced seismicity associated with the proposed SWD is included as **Attachment 8**.

#### XIII - Proof of Notice

A public notice will be filed with the Hobbs News Sun newspaper, and an affidavit will be included as an exhibit at hearing.

A copy of the application will be mailed to the identified affected persons, with delivery confirmation being provided as an exhibit at hearing. A list of the identified affected persons is included as **Attachment 9**.

# **Attachments**

#### Attachment 1:

- C-102
- Wellbore Diagram
- Packer Diagram

### Attachment 2: Area of Review Information:

- 2-Mile Oil & Gas Well Map
- 1/2-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: Confining Zones and Historic Pore Space Use

Attachment 6: Water Well Map and Well Data

Attachment 7: No Hydrologic Connection Statement

Attachment 8: Seismic Potential Letter

Attachment 9: List of Affected Persons

Page 10 of 45

Received by OCD: 5/14/2024 4:15:57 PM

# Attachment 1

- C-102
- Wellbore Diagram
- Packer Diagram

OCD Examiner Hearing No. 24569 70 District IV

Page 11 of 45

#### Received by OCD: 5/14/2024 4:15:57 PM

Phone (175) 197-0101 Feb. (175) 193-0730 District II

#77.8 Part R.; Arman, NM 8020 Phone (579) 768-1183 Fas (579) 148-9710 District III Plant (303) 734 F;78 Fix (305) 134 kt 20

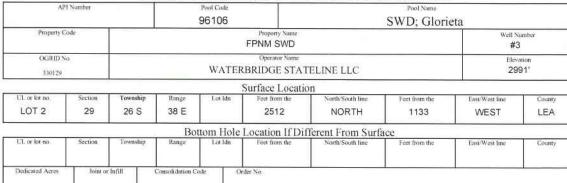
(270.5 R. Finners Dr., Santa Fr., NM 8750) Plante (103) 474-5400 Frs. (205) 476-7-62

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

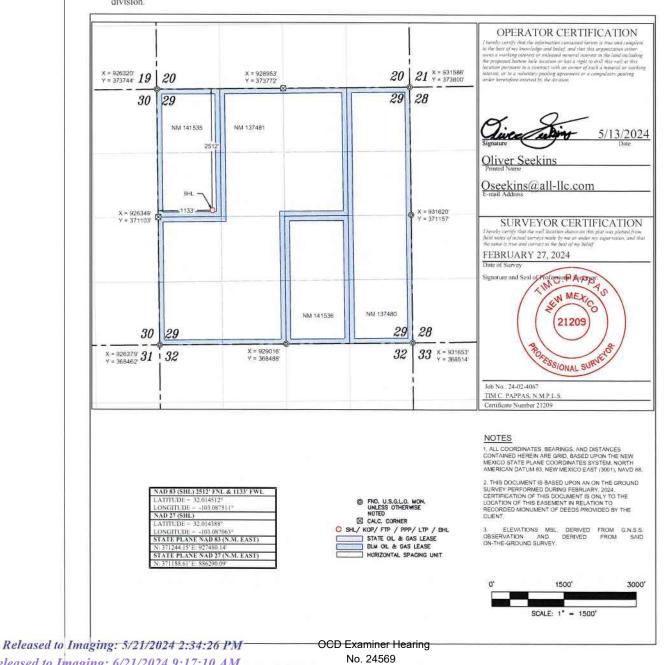
Form C-102 Revised August 1, 2011 Submit one copy to appropriate District Office

☐ AMENDED REPORT

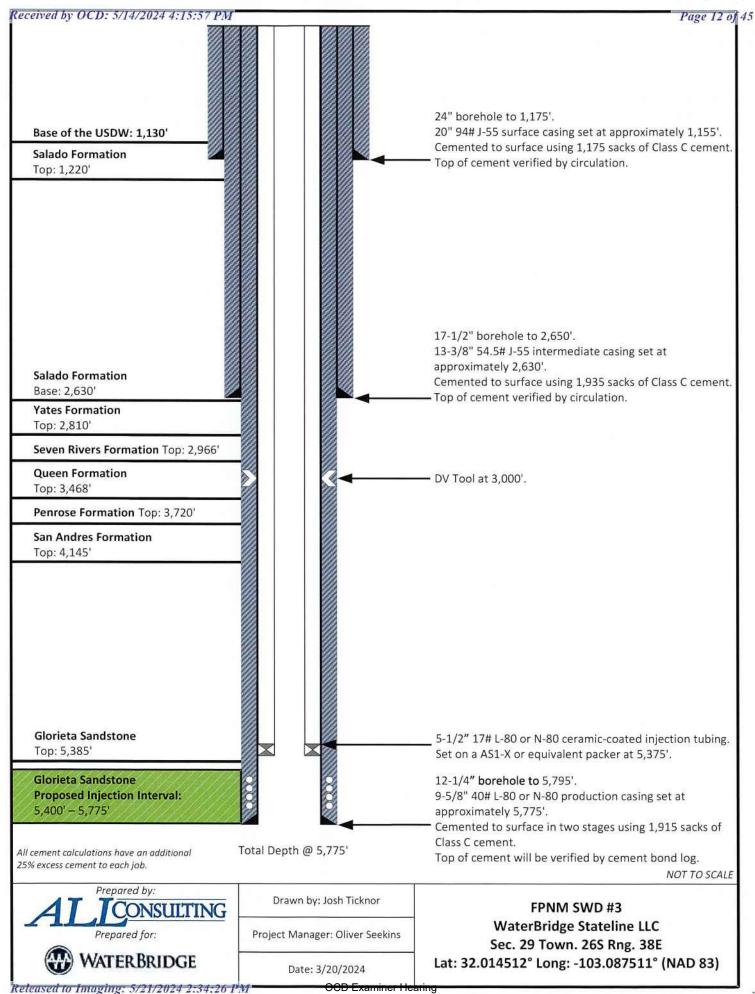
#### WELL LOCATION AND ACREAGE DEDICATION PLAT



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



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No. 24569 72

## AS1-X MECHANICAL PACKER



The ACT AS1-X Packer is the most versable 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 ASI-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

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 value is below the upper slips so that debns 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

	ASI-X MEXCHANICAL PACKER											
CA	SPG					7						
SIZE (inches)	WEXEIT (be #)	RECOMMENDED FELLE SIZE (cutor)	TOOL OO MAX posted	TOOL ID MIR (exchan)	TEREAD CONNECTION BOX	PARTINO						
4,1/2	13.5-15.1	3.826-3.920	3.650	1,938	2.3/8" EUE	261-3650-XXXX						
5	11,5-15	4,408-4,560	4.125	1.938	2.3/8° EUE	261-4125-XXXX						
5	18-20.8	4.154-4.276	4.000	1.938	2.3/8" EUE	261-4000-XXXX						
5.1/2	14-20	4,778-5.012	4.625	2.00	2.3/8" EUE	261-4625-XXXX						
5,1/2	14-20	4.778-5.012	4.625	2.38	2.7/8" EUE	261-4625-XXXX						
5.1/2	20-23	4,670-4,778	4.500	2.00	2.3/8° EUE	261-4500-XXXX						
5,1/2	20-23	4.670-4.778	4,500	2.38	2.7/8" EUE	261-4500-XXXX						
6,5/\$	20-24	5.921-6.094	5.750	3.00	3,1/2°EUE	261-5750-XXXX						
7	17-26	6.276-6.538	6.000	2.50	2.7/8" EUE	261-6000-XXXX						
. 7	17-26	6.276-6,538	6.000	3.00	3,1/2" EUE	261-6000-XXXX						
7	26-32	6.094-6.276	5.875	2.50	2.7/8" EUE	261-5875-XXXX						
7	26-32	6.094-6.276	5.875	3.00	3.1/2" EUE	261-5875-XXXX						
7	29-35	6,004-6,184	5.812	3.00	3.1/2* EUE	261-5812-XXXX						
7.5/8	24-29.7	6.875-7.025	6,672	2.50	2.7/8"EUE	261-6672-XXXX						
7.5/8	24-29.7	6.875-7.025	6.672	3.00	3.1/2" EUE	261-6672-XXXX						
7.5/8	33.7-39	6,625-6.765	6.453	2.50	2.7/8"EUE	261-6453-XXXX						
7.5/8	33.7-39	6.625-6.765	6.453	3.00	3,1/2" EUE	261-6453-XXXX						
9.5/8	32.3-43.5	8.755-9.001	8,500	3.00	3.1/2" EUE	261-8500-XXXX						
9.5/8	32.3-43.5	8,755-9,001	8,500	4.00	4.1/2" EUE	261-8500-XXXX						
9.5/8	43.5-53.5	8.535-8.755	8.250	3.00	3.1/2" EUE	261-8250-XXXX						
9.5/8	43.5-53.5	8.535-8.755	8.250	4.00	4,1/2" EUE	261-8250-XXXX						

'XXXX' is changed as per material / elastomer / end connection

Page 14 of 45

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#### Attachment 2

Area of Review Information:

- 2-mile Oil & Gas Well Map
- 1/2-Mile AOR Well Table
- 2-mile Lease Map
- 2-mile Mineral Ownership Map
- 2-mile Surface Ownership Map
- Potash Lease Map

0.5

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Miles

#### Legend

- Proposed SWD (1)
- Gas, Active (1)
- Gas, Plugged (2)
- Injection, Active (9)
- Injection, Plugged (3)
- Oil, Active (13)
- Oil, Plugged (20)
- Oil, Temporarily Abandoned (1)

Source Info: NMOCD O&G Wells updated 2/16/2024 (https://www.emnrd.nm.gov/ocd/ocd-data/ftp-server/l)

#### **0&G Wells Area of Review**

## FPNM SWD #3

LEA COUNTY, NEW MEXICO

Proj Mgr: Oliver Seekins

May 07, 2024

Mapped by: Ben Bockelmann

WATERBRIDGE \*\*



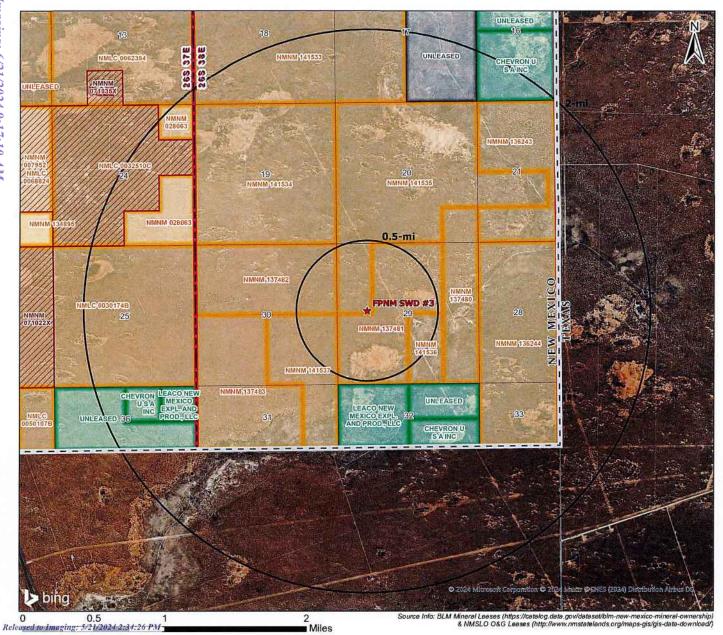
**OCD Examiner Hearing** No. 24569 75

2986 ft

Service Layer Credits: Topographic; Bureau of Land Management, Texas Parks & Wildlife, Esri, HERE, Germin, INCREMENT P, USGS, METV NASA, EPA, USDA

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Well Name	API#	Well Type	AOR Well Table for FPNM SWD #	Spud Date	Location (Sec., Tn., Rng.)	Total Vertical Depth (feet)	Penetrate Inj. Zor
Leonard #1	30-025-12458	Plugged	PRE-ONGARD WELL OPERATOR (Dolport Oil Corporation)	12/22/1937	F-29-26S-38E	3707	No
Federal Sinclair #1-29	30-025-12459	Plugged	PRE-ONGARD WELL OPERATOR (John H. Trigg)	1/27/1962	M-29-26S-38E	3889	No

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#### Legend

Proposed SWD **BLM Communitization Units** NMSLO Mineral Leases Private Mineral Leases

#### 1/2-mile AOR Lessees/Unit Operators:

**BLM Authorized O&G Leases** 

- BLACKBEARD OPERATING LLC (BLM LESSEE)
   MAGNUM PRODUCING LP (BLM LESSEE)
- . R&R ROYALTY LTD (BLM LESSEE)

#### **Mineral Lease Area of Review**

#### FPNM SWD #3

LEA COUNTY, NEW MEXICO

Proj Mgr: Oliver Seekins

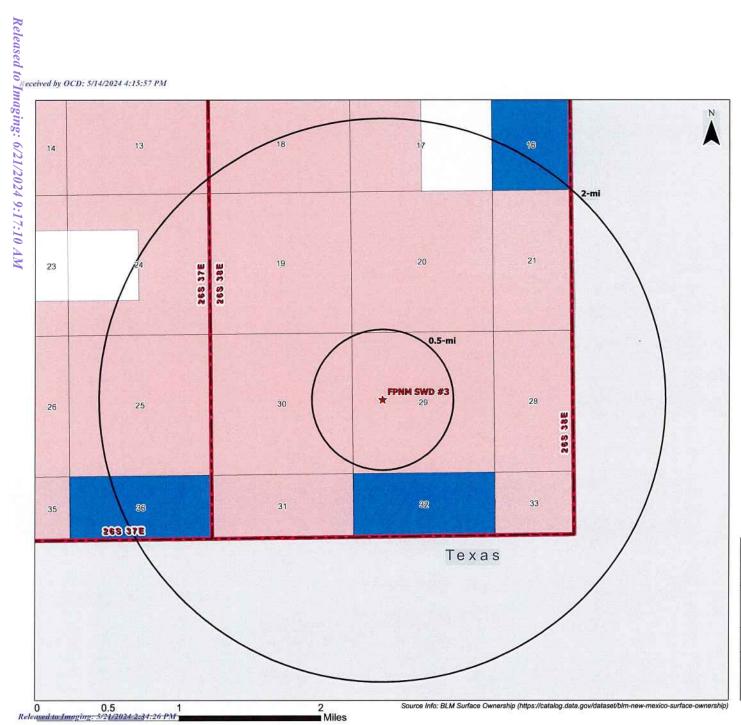
May 07, 2024

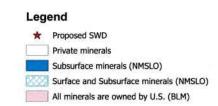
Mapped by: Ben Bockelmann

Prepared for WATERBRIDGE



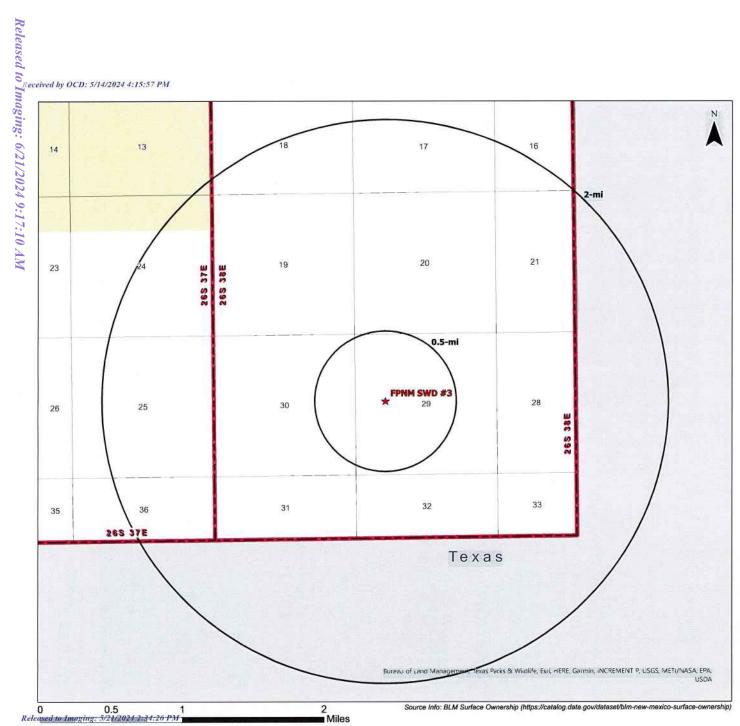
AT JONSULTING







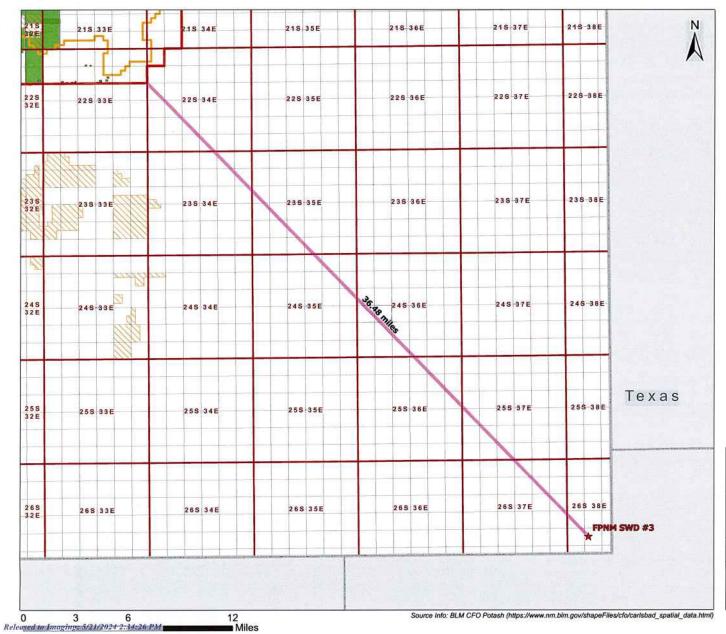
**OCD Examiner Hearing** No. 24569 78







**OCD Examiner Hearing** No. 24569 79







**OCD Examiner Hearing** No. 24569

Page 83 of 110

Page 21 of 45

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Attachment 3

Source Water Analysis

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Sulfate (mg/L)	Bicarbonate (mg/L)	Chloride (mg/L)	Tds (mg/L)	Formation
881	216	165,000	267,000	QUEEN
940	141	151,575		QUEEN
257	35	149,504		QUEEN
418	38	138,040		QUEEN
1,320	.645	10,000		VOLECAME
	146	65,927	108,205	WOLFCAMP
- 0	183	62,813	102,136	VOLECAMP.
0	268	63,450	100,995	WOLFCAMP
1,073	823	29,593	50,630	DEVONIAN
1,920	655	33,600	58,738	DEVONIAN
2,082	458	33,208	57,890	DEVONIAN
2,038	354	46,060	78,690	DEVONIAN
1,887	894	54,638	91,505	DEVONIAN
1,896	647	21,933	39,824	DEVONIAN
1,700	483	44,700	76,102	DEVONIAN
2,184	727	46,200	79,057	DEVONIAN
2,812	607	53,250	85,233	DEVONIAN
1,750	580	35,600	61,815	DEVONIAN
2,000	535	35,600	61,795	DEVONIAN
2,288	572	30,880	54,397	DEVONIAN
1,663	883	48,610	80,811	DEVONIAN
1,845	696	27,670	48,373	DEVONIAN
1,753	291	23,780	41,751	DEVONIAN
1,700	600	21,600	38,520	DEVONIAN
2,337	999	15,640	29,115	DEVONIAN
3,080	865	18,540	35,212	DEVONIAN
1,558	645	28,700	49,286	DEVONIAN
980	183	30,200	50,858	DEVONIAN
1,558	645	28,700	49,290	DEVONIAN
980	183	30,200		LENBURGER
1,387	832	57,190	91,617	LENBURGER
1,650	195	60,300	99,800	LENBURGER
1,650	189	59,400	98,300	LENBURGER

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	yanayas alla			Acad to		Source	Water A	nalysis	growings:		00 m =		The Xon			
			WaterB	ridge Stateli	ne LLC - FPNM	SWD #3 - Q	ueen, Wol	fcamp, Dev	onian and E	llenburger Fo	rmations		vertical in		Parket Lang III	
Well Name	API	Latitude	Longitude	Section	Township	Range	Unit	Ftgns	Ftgew	County	State	Formation	Tds (mg/L)	Chloride (mg/L)	Bicarbonate (mg/L)	Sulfate (mg/L)
GULF STATE #001	3002508458	32.7242317	-103.5246506	26	185	34E	A	660N	660E	LEA	NM	QUEEN	267,000	165,000		
WEST PEARL OUTEN UNIT #103	3002503247	32.6359787	-103.4816437	- 29	198	35E	C	990N	1980W	LEA	NM	OUEEN	207,000	151,575		
WEST PEARL QUEEN UNIT #118	3002503248	32.629612	-103.4773712	29	198	351	i i	19808	19801	LEA	NM	OUEEN		149,504		
WEST PEARL QUEEN UNI #141	3002503284	32.6223412	+103.4645233	33	198	35E	e e	660N	1980W	LEA	NM	OUEEN		138,040		
WHITE CITY PENN GAS COM UNIT 1 #001	3001500408	32.1937523	-104.3088455	- 29	248	26E	A	660N	660E	EDDY	NM	WOLFCAMP		10,000		
HABANERO 17 FEDERAL COM #001H	3001536108	32.2218475	-104.2062683	17	248	27E	À	990N	660E	EDDY	NM	WOLFCAMP	108,205	65,927		
SERRANO 29 FEDERAL #001H	3001537763	32.1898842	-104.2062149	29	248	27E	н	1980N	660E	EDDY	NM	WOLFCAMP	102,136	62,813	183	
SERRANO 29 FEDERAL #00111	3001537763	32.1898842	-104.2062149	29	248	27E	11	1980N	660E	EDDY	NM	WOLFCAMP	100,995	63,450		
CLARA M ROBERTS ETAL #001	3002507265	32.9945259	-103.0748596	26	158	38E	D	330N	330W	LEA	NM	DEVONIAN	50,630	29,593	823	
OBERHOLTZER #001	3002507164	33.2986488	-103.1388397	7	12S	38E	C	660N	1980W	LEA	NM	DEVONIAN	58,738	33,600	655	
EA AV STATE #005	3002507201	33.268692	-103.1398849	19	128	38E	C	990N	1650W	LEA	NM	DEVONIAN	57,890	33,208	458	
S STONE #001	3002507260	33:0045204	-103.0823975	22	15S	38E	G	1980N	1980E	LEA	NM	DEVONIAN	78,690	46,060		
LARA M ROBERTS #001	3002507264	33.0045013	-103.0748672	23	158	38E	F.	1980N	330W	LEA	NM	DEVONIAN	91,505	54,638	894	
ROSA SHULTS #001	3002507191	33.272316	-103.1442108	18	128	38E	M	330S	330W	LEA	NM	DEVONIAN	39,824	21,933	647	
HOUSTON A #001	3002507202	33.2632332	-103.1442032	19	12S	38E	1	23108	330W	LEA	NM	DEVONIAN	76,102	44,700	483	
SHELL BROWNING #001	3002507113	33.3240585	-103,1301956	31	115	38E	Н	1980N	660E	LEA	NM	DEVONIAN	79,057	46,200	727	
STATE A #002	3002507126	33,32407	-103.1215515	32	118	38E	P	1980N	1980W	LEA	NM	DEVONIAN	85,233	53,250		
NEW MEXICO A FEDERAL #001	3002507150	33,3022766	-103.1344833	6	128	38E	0	660S	1980E	LEA	NM	DEVONIAN	61,815	35,600		
NEW MEXICO A FEDERAL #002	3002507151	33.3059044	-103.134493	6	128	381	i i	19805	1980E	LEA	NM	DEVONIAN	61,795	35,600		
IAYLOR B #001	3002507155	33.2877579	-103.1344681	7	128	38E	- 0	660S	19801	LEA	NM	DEVONIAN	54,397	30,880		
LARA M ROBERTS #001	3002507264	33.0045013	-103.0748672	-23	158	381	E	1980N	330W	LEA	NM	DEVONIAN	80,811	48,610		
ROSE EAVES #001	3002507290	32.8726234	-103.1200638	35	165	381	N	660S	1980W	LEA	NM	DEVONIAN	48.373	27,670	696	
W W HAMILTON #001	3002507293	32.8762512	-103.1200485	35	16S	38E	K	1980S	1980W	LEA	NM	DEVONIAN	41,751	23,780	291	
COOPER #002	3002507295	12.8689995	-103:1212997	2	178	381	C	660N	3300E	LEA	NM	DEVONIAN	38,520	21,600		
COOPER A #001	3002507301	32.8438873	-103.1040649	12	17S	38E	N	660S	1980W	LEA	NM	DEVONIAN	29,115	15,640	999	
EDERAL DAVIS #002	3002507305	32.8293381	-103.0954208	13	178	38E	P	6605	660E	LEA	NM	DEVONIAN	35,212	18,540	865	
M HOLLOWAY #001	3002507306	32,8402596	-103.0997314	13	178	38E	В	560N	1980E	LEA	NM	DEVONIAN	49,286	28,700	645	
WEST DOLLARHIDE DEVONIAN UNIT #104	3002512297	32,1720123	-103.0761032	32	24S	381	1	1980S	6601	LEA	NM	DEVONIAN	50,858	30,200	183	
M HOLLOWAY #001	3002507306	32.8402596	-103.0997314	13	178	38E	В	660N	1980E	LEA	NM	DEVONIAN	49,290	28,700	645	
WEST DOLLARHIDE DEVONIAN UNIT #104	1002512297	32.1720123	-103.0761032	32	245	381:	- 1	19805	6601	LEA	NM	ELLENBURGER		30,200	183	
A B COATES D #003	3002511748	32.1112633	-103.1177216	24	25S	37E	N	990S	2310W	LEA	NM	ELLENBURGER	91,617	57,190	832	
SOUTH JUSTIS UNIT #024	3002511774	32,1040077	-103.1102829	25	258	37E	H	1650N	660E	LEA	NM	ELLENBURGER	99,800	60,300	195	
SOUTH JUSTIS UNIT #024	3002511774	32.1040077	-103.1102829	25	258	371	11	1650N	6601	LEA	NM	ELLENBURGER	98,300	59,400	13.5	

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#### Attachment 4

Injection Formation Water Analysis

							Ir	njectio	on For	mation	Wate	r Analysis					
	Brist Will		pile te june	di ile	W	aterBr	idge :	Stateli	ne LLC -	FPNM	SWD#	3 - Glorieta Forma	ition	office and the state of the sta	No. of Park		
Well Name	API	Latitude	Longitude	Section	Township	Range	Unit	Ftgns	Ftgew	County	State	Field	Formation	Tds (mg/L)	Chloride (mg/L)	Bicarbonate (mg/L)	Sulfate (mg/L
LEARCY MCBUFFINGTON #007	3002511568	32.1248627	-103.1219788	13	255	37E	М	660S	990W	LEA	NM	JUSTIS	GLORIETA	55,190	31,603	1,158	1,804
LEARCY MCBUFFINGTON #007	3002511568	32.1248627	-103.1219788	13	255	37E	М	6605	990W	LEA	NM	JUSTIS	GLORIETA	55,183	31,600	1,158	1,804
CARLSON FEDERAL #001	3002511574	32.1330185	-103.1198425	13	255	37E	F	1650N	1650W	LEA	NM	JUSTIS	GLORIETA	113,731	67,250	280	3,013
CARLSON FEDERAL #001	3002511574	32.1330185	-103.1198425	13	255	37E	F	1650N	1650W	LEA	NM	JUSTIS	GLORIETA	101,412	60,660	963	2,996
LANGLIE FEDERAL #001	3002511592	32.1293945	-103.1273041	14	255	37E		23105	660E	LEA	NM	JUSTIS	GLORIETA	113,937	67,370	280	3,018
LANGLIE FEDERAL #001	3002511592	32.1293945	-103.1273041	14	255	37E	1	23105	660E	LEA	NM	JUSTIS	GLORIETA	113,817	67,250	274	3,067

#### Attachment 5

Confining Zones and Historic Pore Space Use



## CONFINING ZONES AND HISTORIC PORE SPACE USAGE

For WaterBridge Stateline, LLC's proposed FPNM SWD #3 application in the Lower Permian Glorieta Sandstone in the Central Basin Platform area, the lower San Andres Formation will act as the upper confinement zone, and the lower Glorieta Sandstone as the lower confinement zone, given its low porosity and high resistivity. The proposed location is in T26S., R38E, an area with very limited oil and gas production. Most area wells have been plugged and abandoned, and none penetrate the proposed injection intervals in the Glorieta Sandstone.

The San Andres Formation is a shelf carbonate deposit composed predominantly of dolomite, and in the proposed development area, the lower San Andres Formation is a tight rock with low porosity and high resistivity values. **Figure 1** is a log snip of this upper confining zone of approximately 60 feet in the lower San Andres Formation. The lower confining zone is a tight sandstone unit within the Glorieta Sandstone, which also has low porosity development and high resistivity readings. The Glorieta Sandstone is a fine-grained, well-to-moderately sorted quartz arenite sandstone. **Figure 2** is a log snip of this approximately 30 feet of lower Glorieta Sandstone.

The closest oil and gas production to the FPNM SWD #3 is the active waterflood operation directly to the west. This waterflood operation is the W.H. Rhodes B Federal NCT-1 unit project and was originally operated by Texaco, Inc., with the first waterflood injection commencing in 1964 and continued expansion occurring in 1969, 1973, and 1993 by Texaco Exploration and Production, Inc. Oil production and enhanced oil recovery water injection is into the Yates and Seven Rivers formations at depths ranging from approximately 3,000 to 3,400 feet and primarily located in T26S, R37E. There is no oil or gas production from the Glorieta Sandstone within the two-mile radius of the proposed FPNM SWD #3.

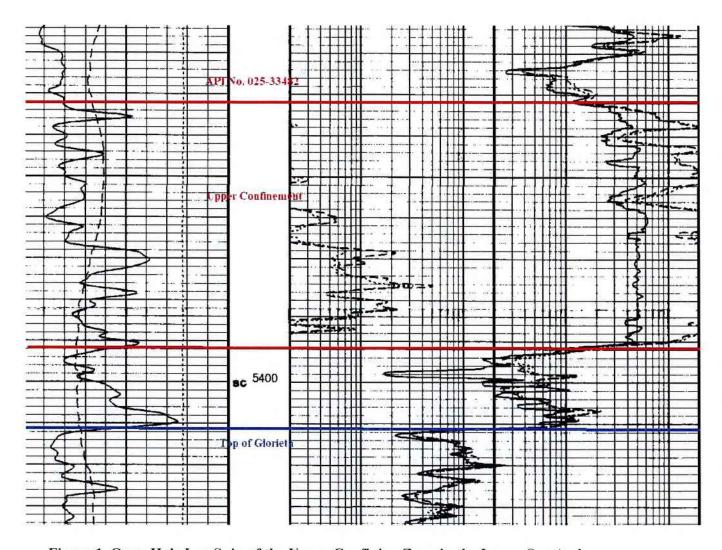


Figure 1. Open Hole Log Snip of the Upper Confining Zone in the Lower San Andres Formation

Page 28 of 45

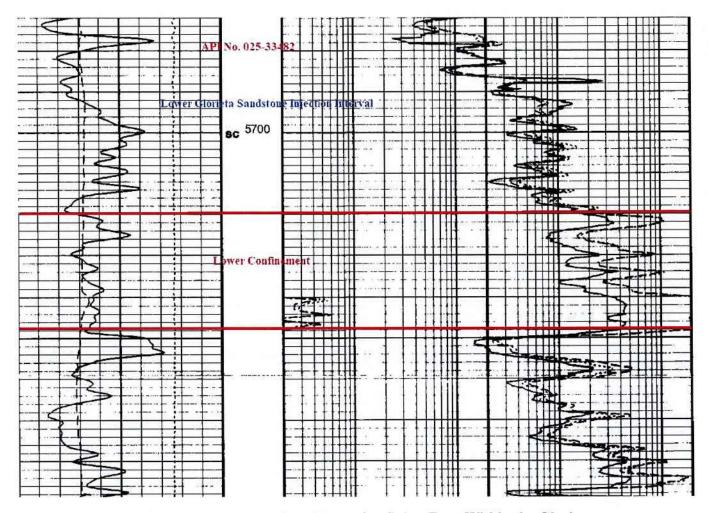


Figure 2. Open Hole Logging Snip of the Lower Confining Zone Within the Glorieta Sandstone

#### Attachment 6

Water Well Map and Well Data



#### Legend

★ Proposed SWD (1)

#### OSE PODs

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

## **Water Wells Area of Review**

#### FPNM SWD #3

LEA COUNTY, NEW MEXICO

Proj Mgr: Oliver Seekins

May 07, 2024

Mapped by: Ben Bockelmann





Water Well Sampling Rationale  WaterBridge Stateline LLC - FPNM SWD #3  Water Wells Owner Available Contact Information Use Sampling Required
Water Wells Owner Available Contact Information Use Sampling Required
Mater Mens Sampling Required
The trees of the t

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#### Attachment 7

No Hydrologic Connection Statement



## RE: Waterbridge Stateline LLC - FPNM SWD #3 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 intervals in the Glorieta Sandstone 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 surficial geology is Quaternary alluvial deposits consisting predominantly of sand and caliche. This area is south of the High Plains Aquifer and depths to potable water ranges from 30 to 142 feet below the surface. The USDW is the Rustler Formation and the base of the USDW ranges from 875 to 1,130 feet below the surface.

Based on ALL's assessment and analysis there is containment through multiple confining zones in the San Andres Formation and the Salado evaporite deposits above the Glorieta Sandstone and the USDW and over 4,270 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 Glorieta Sandstone.

Tom Tomastik

Chief Geologist and Regulatory Specialist

ALL Consulting LLC

Date



Attachment 8

Seismic Potential Letter



March 18, 2024

PN 1703.SWD.11

Mr. Phillip Goetze, P.G. NM EMNRD – Oil Conservation Division 1220 South St. Francis Drive Santa Fe, NM 87505

Subject:

WaterBridge Stateline LLC

FPNM SWD #3 - Seismic Potential Letter

Dear Mr. Goetze,

At the request of WaterBridge Stateline, LLC (WaterBridge), ALL Consulting, LLC (ALL) has assessed the potential injection-induced seismicity risks in the vicinity of WaterBridge's FPNM SWD #3, a proposed saltwater disposal (SWD) facility in Lea County, New Mexico, and summarized the findings in this letter. This assessment used publicly available data to identify the proximity and characteristics of seismic events and known faults to evaluate the potential for the operation of the FPNM SWD #3 to contribute to seismic activity in the area.

## Geologic Evaluation

The FPNM SWD #3 is requesting a permit to inject into the Permian Glorieta Sandstone (Glorieta) at a depth of 5,400-5,775 feet below ground surface (bgs). The Glorieta primarily consists of Permian-age sandstone and is overlain by approximately 60 feet of low porosity carbonate rocks within the lower San Andres Formation, which would prevent the upward migration of injection fluid and serve as the upper confining layer (see Attachment 1). Additionally, approximately 28 feet of low porosity and low permeability other carbonate rocks lie beneath the proposed injection interval and act as a lower confining zone by preventing downward migration of injected fluids into the underlying Tubb Formation (see Attachment 1). A stratigraphic chart depicting the geologic setting is included as Figure 1.1

#### Seismic Events and Fault Data

A review of United States Geological Survey (USGS) and New Mexico Tech Seismological Observatory (NMTSO) earthquake catalogues determined that two (2) seismic events have been recorded within a 100 square mile area [9.08-kilometer (km) radius] around the Subject SWD.

<sup>&</sup>lt;sup>1</sup> Yang, K.-M., & Dorobek, S. L. (1995). The Permian Basin of west Texas and New Mexico: Tectonic history of a "composite" Foreland Basin and its effects on stratigraphic development. *Stratigraphic Evolution of Foreland Basins*, 149–174. https://doi.org/10.2110/pec.95.52.0149

WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

The closest recorded seismic event was a M1.68 that occurred on July 22, 2017, and was located approximately 1.78 miles north of the FPNM SWD #3 (see Attachment 2).

Fault data from United States Geological Survey (USGS) and the Texas Bureau of Economic Geology (BEG)2 indicates that the closest known fault is located approximately 0 miles from the FPNM SWD #3 (see Attachment 2). This identified fault is within the Precambrian basement, which is approximately 8,225 feet below the proposed injection interval.<sup>3</sup> Fault data from Sourcewater also indicates the presence of four faults in the sedimentary column, above the Precambrian basement, within the area of review.4 These shallow faults penetrate the Canyon, Cisco, and Wolfcamp formations which begin approximately 2,940 feet below the proposed injection interval. As previously discussed, there are confining barriers beneath the proposed injection interval which will prevent the downward migration of fluids into such faults. A map of the seismic events and faults within 9.08 km of the FPNM SWD #3 is included as Attachment 2.

Figure 1 – Delaware Basin Stratigraphic Chart (Adapted from Yang and Dorobek 1995)

SYSTEM	SERIES/ STAGE	CENTRAL BASIN PLATFORM	DELAWARE BASIN
	OCHOAN.	DEWEY LAKE RUSTLER SALADO	DEWEY LAKE RUSTLER SALADO CASTILE
PERMIAN	GUADALUPIAN	TANSILL YATES SEVEN RIVERS QUEEN GRAYBURG SAN ANDRES	DELAWARE MT GROUP BELL CANYON CHERRY CANYON BRUSHY CANYON
	LEONARDIAN	CLEAR FORK WICHITA	BONE SPRING
	WOLFCAMPIAN	WOLFCAMP	WOLFCAMP
	VIRGILIAN	CISCO	CISCO
PENNSYLVANIAN	MISSOURIAN	CANYON	CANYON
	DESMOINESIAN	STRAWN	STRAWN
	ATOKAN	ATOKA DELLA	ATOKA
	MORROWAN	(ABSENT)	MORROW BEND
MISSISSIPPIAN	CHESTERIAN MERAMECIAN OSAGEAN	CHESTER BARNETT	CHESTER BARNETT
	KINDERHOOKIAN	KINDERHOOK	KINDERHOOK
DEVONIAN		WOODFORD DEVONIAN	WOODFORD
SILURIAN		SILURIAN SHALE FUSSELMAN	MIDDLE SILURIAN FUSSELMAN
	UPPER	MONTOYA	SYLVAN MONTOYA
ORDOVICIAN	MIDDLE	SIMPSON	SIMPSON
	LOWER	ELLENBURGER	ELLENBURGER
CAMBRIAN	UPPER	CAMBRIAN	CAMBRIAN
PRECAMBRIAN			

#### Seismic Potential Evaluation

Experience in evaluating induced seismic events indicates that most injection-induced seismicity throughout the U.S. (e.g., Oklahoma, Ohio, Texas, New Mexico, and Colorado) occurs as a result of injection into Precambrian basement rock, into overlying formations that are in hydraulic communication with the Precambrian basement rock, or as a result of injection near critically stressed and optimally oriented faults. Seismicity at basement depths occurs because critically stressed faults generally originate in crystalline basement rock and may also extend into overlying sedimentary formations. <sup>5</sup>

<sup>&</sup>lt;sup>2</sup> Horne E. A. Hennings P. H., and Zahm C. K. 2021. Basement structure of the Delaware Basin, in The Geologic Basement of Texas: A Volume in Honor of Peter Flawn, Callahan O. A., and Eichubl P., The University of Texas at Austin, Bureau of Economic Geology.

<sup>&</sup>lt;sup>3</sup> G. Randy Keller, J. M. Hills & Rabah Djeddi, A regional geological and geophysical study of the Delaware Basin, New Mexico and West Texas, Trans Pecos Region (West Texas) (1980).

<sup>&</sup>lt;sup>4</sup> Formation of Occurrence, Strike, Dip. and Length Interpreted by (Cortina, J. E. and Lemons, C. R. 2019. Houston, TX: Sourcewater, Inc.)

<sup>&</sup>lt;sup>5</sup> Ground Water Protection Council and Interstate Oil and Gas Compact Commission. Potential Injection-Induced Seismicity Associated with Oil & Gas Development: A Primer on Technical and Regulatory Considerations Informing Risk Management and Mitigation. 2015. 141 pages.

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WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

Injection into either the Precambrian basement rock or its overlying formations that are hydraulically connected to the basement rock through faulting or fracture networks can increase the pore pressure and may lead to the fault slipping, resulting in a seismic event. <sup>4</sup> As such, the vertical distance between the injection formation and Precambrian basement rock and the presence or lack of faulting within the injection interval are major considerations when determining the risk of injection-induced seismicity.

Geophysical logs from nearby well records show at least 8,225 feet of vertical separation between the injection interval and the Precambrian basement.<sup>3</sup> In addition, injection-induced seismicity is not typically associated with shallow disposal wells in the Central Basin Platform and Delaware Basin areas, such as the FPNM SWD #3.

For injection into the Glorieta Formation to contribute to seismic activity, one of two hypothetical geologic scenarios must exist:<sup>6</sup>

- Scenario #1: Earthquake hypocenters would need to be significantly shallower (several kilometers) than initially identified by the USGS and NMTSO seismic monitoring networks, and thus placing seismic activity high in the sedimentary column, rather than in the Precambrian basement.
- 2. Scenario #2: This scenario would require that both of the following conditions are met:
  - a. Fault Transmissivity: High permeability and transmissive conduits from fault-damaged zones would need to be present below the Glorieta, allowing fluid to migrate through the underlying Tubb Formation and through significantly deeper confining intervals, and eventually into the Precambrian basement.
  - b. Pore Pressure: The injection fluids and bottom hole pressures in the Glorieta would need to exceed existing hydrostatic pressures within the deeper geologic formation in order for injection fluids to migrate downward.

There are no publications or geologic data that suggest either of these scenarios to be true for the area around the FPNM SWD #3.

# **Formation Parting Pressure**

Class II SWDs in New Mexico are administratively permitted with a maximum pressure gradient of 0.2 psi/ft. Review of New Mexico Oil Conservation Division (OCD) Order IP-476 submitted by Chevron USA Inc. in support of the Vacuum Glorieta West Unit, which is located approximately 60 miles northwest of the FPNM SWD #3, determined the fracture gradient of the Glorieta in the region ranges from 0.26-0.39 psi/ft from approved step-rate tests. Typical SWD permitting standards in New Mexico, and the requested operating parameters of the FPNM SWD #3, would indicate that formation parting pressure would not be exceeded by the FPNM SWD #3.

<sup>6</sup> Skoumal, Robert J., et al. "Induced Seismicity in the Delaware Basin, Texas." Journal of Geophysical Research: Solid Earth, vol. 125, no. 1, 2020, doi:10.1029/2019jb018558.

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## Conclusion

As an expert on the issue of induced seismicity, seismic monitoring, and mitigation, it is my opinion that the potential for the FPNM SWD #3 to cause injection-induced seismicity is expected to be minimal, at best. This conclusion assumes the FPNM SWD #3 will be operated below formation parting pressure and is based on (1) the presence of numerous confining layers above and below the injection interval, (2) the significant vertical distance between the injection zone and Precambrian basement rock in which the nearest fault has been identified, and (3) the vertical distance from, and lack of historic seismicity on, identified shallow faults in the area of review.

Sincerely,

ALL Consulting, LLC

Reed Davis Geophysicist Received by OCD: 6/21/2024 9:12:37 AM
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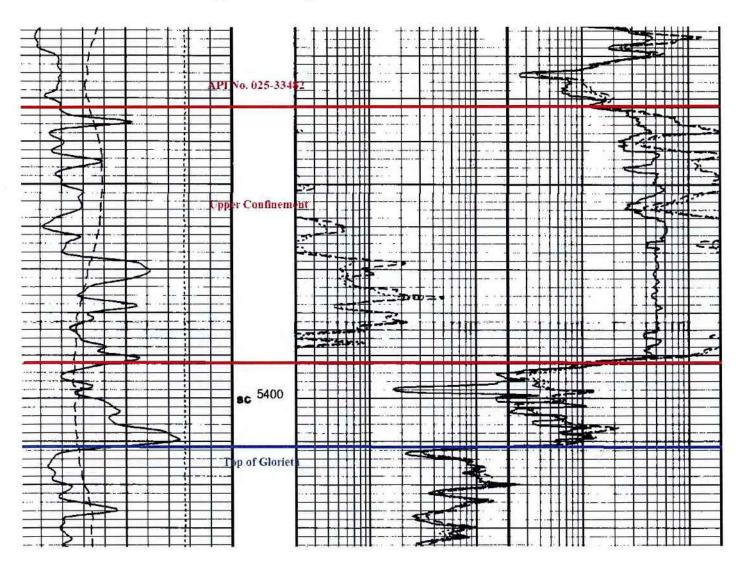
Page 101 of 110
Page 39 of 45

WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

> Attachment 1 Upper and Lower Confining Zones

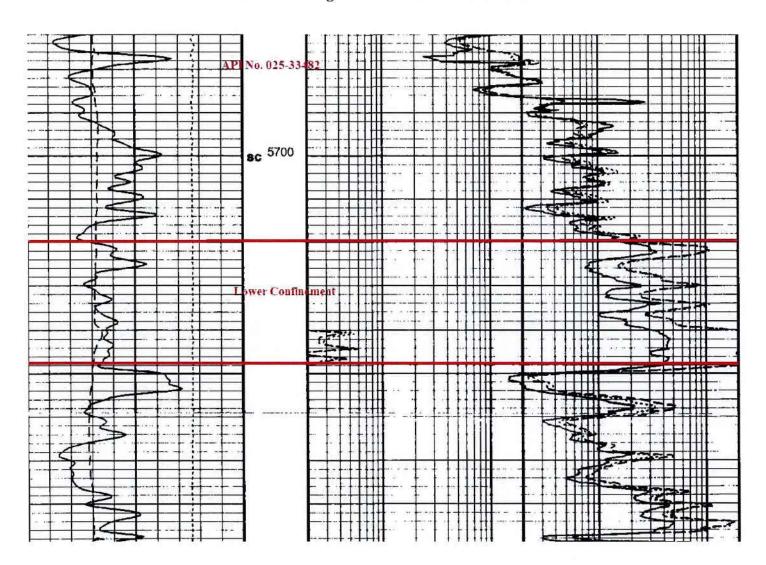
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Upper Confining Zone from API No. 025-33482



WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

## Lower Confining Zone from API No. 025-33482

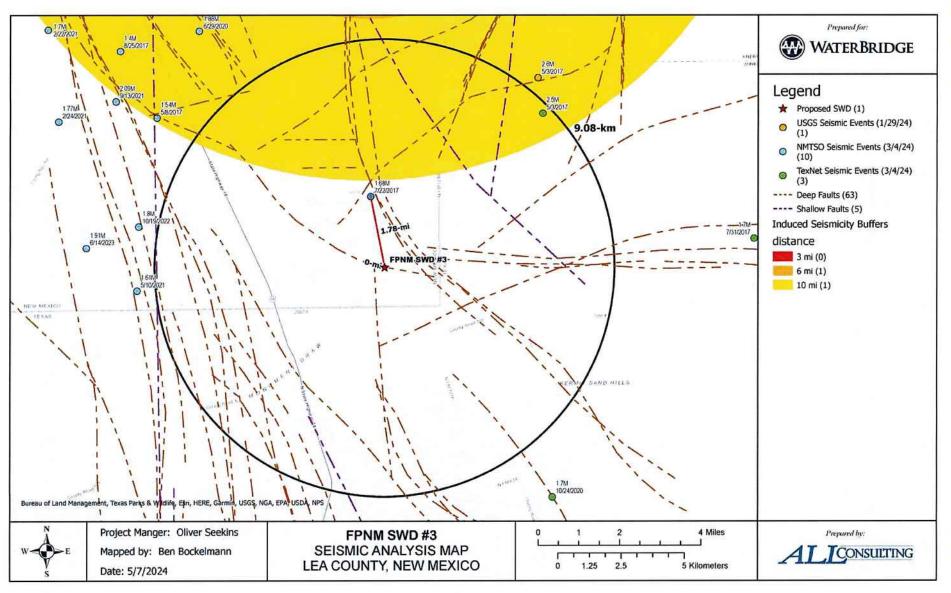


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Page 42 of 45

WaterBridge Stateline LLC FPNM SWD #3 Seismic Information March 18, 2024

> Attachment 2 Seismic Event Map

# FPNM SWD #3 Nearby Seismic Events and Faults



Attachment 9

List of affected Persons

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			Page
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	DATE OF THE OWNER.		
FPNM SWD #3 - Notice of Applicat			
Affected Party Classification Entity - Proof of Notice Entity - As Mapped/Exhibited Ad	ress City	State	Zip Code
Surface Owner D.K. Boyd N/A 3317 An	rews Hwy Midland	TX	79703
NMOCD District Office New Mexico Oil Conservation District 1 N/A 1625 N.	French Dr Hobbs	NM	88240
Mineral Owner New Mexico Bureau of Land Management N/A 301 Din	saur Trail Sante Fe	NM	87508
BLM - Lessee Blackbeard Operating, LLC Blackbeard Operating LLC 1751 River	Run, Ste 405 Fort Worth	TX	76107
BLM - Lessee Magnum Producing, LP Magnum Producing LP 500 N Shoreli	e Blvd, Ste 322 Corpus Christi	TX	78401
BLM - Lessee R&R Royalty LTD. R&R Royalty LTD 500 N Shoreli	e Blvd, Ste 322 Corpus Christi	TX	78401
Note: The affected parties above received notification of this C-108 application.			

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Karlene Schuman Modrall Sperling Roehl Harris & Sisk P.A. 500 Fourth Street, Suite 1000 Albuquerque NM 87102

#### PS Form 3877

# Type of Mailing: CERTIFIED MAIL 06/04/2024

Firm Mailing Book ID: 267098

Line	USPS Article Number	Name, Street, City, State, Zip		Postage	Service Fee	RR Fee	Rest.Del.Fee	Reference Contents
1	9314 8699 0430 0121 8962 89	D.K. Boyd 3317 Andrews Hwy Midland TX 79703		\$2.59	\$4.40	\$2.32	\$0.00	12240.0001.24569. Notice
2	9314 8699 0430 0121 8962 96	New Mexico Oil Conservation District 1 1625 N. French Dr. Hobbs NM 88240		\$2.59	\$4.40	\$2.32	\$0.00	12240.0001.24569. Notice
3	9314 8699 0430 0121 8963 02	New Mexico Bureau of Land Management 301 Dinosaur Trail Santa Fe NM 87508		\$2.59	\$4.40	\$2.32	\$0.00	12240.0001.24569. Notice
4	9314 8699 0430 0121 8963 19	Blackbeard Operating, LLC 1751 River Run, Ste 405 Fort Worth TX 76107		\$2.59	\$4.40	\$2.32	\$0.00	12240.0001.24569. Notice
5	9314 8699 0430 0121 8963 26	Magnum Producing, LP 500 N. Shoreline Blvd., Ste 322 Corpus Christi TX 78401		\$2.59	\$4.40	\$2.32	\$0.00	12240.0001.24569. Notice
6	9314 8699 0430 0121 8963 33	R&R Royalty Ltd. 500 N. Shoreline Blvd, Ste 322 Corpus Christi TX 78401		\$2.59	\$4.40	\$2.32	\$0.00	12240.0001.24569. Notice
			Totals:	\$15.54	\$26.40	\$13.92	\$0.00	
			L FIZTO		Grand	Total:	\$55.86	

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Listed by Sender	

**Total Number of Pieces** Received at Post Office Postmaster: Name of receiving employee

Dated:



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<b>外国发现的基本社会创造</b>	Generated: 6/20/2024 7:47:25 AM										
USPS Article Number	Date Created	Reference Number	Name 1	City	State	Zip	Mailing Status	Service Options	Mail Delivery Date		
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9314869904300121896326	2024-06-04 2:35 PM	12240.0001.24569.	Magnum Producing, LP	Corpus Christi	TX	78401	Delivered	Return Receipt - Electronic, Certified Mail	2024-06-10 10:17 AM		
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9314869904300121896289	2024-06-04 2:35 PM	12240.0001.24569.	D.K. Boyd	Midland	TX	79703	Delivered	Return Receipt - Electronic, Certified Mail	2024-06-07 11:42 AM		



# **Affidavit of Publication**

STATE OF NEW MEXICO COUNTY OF LEA

I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

> Beginning with the issue dated June 09, 2024 and ending with the issue dated June 09, 2024.

Publisher

Sworn and subscribed to before me this 9th day of June 2024.

Business Manager

My commission expires

January 29, 2027

(Seal) STATE OF NEW MEXICO

NOTARY PUBLIC

GUSSIE RUTH BLACK

COMMISSION # 1087526

COMMISSION EXPIRES 01/29/2027

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said publication has been made.

#### LEGAL NOTICE June 9, 2024

CASE NO. 24568: Notice to all affected parties, as well as heirs and devisees of: D.K. Boyd; New Mexico Oll Conservation District 1; New Mexico Bureau of Land Management; Apache Corporation; FAE II Operating LLC; LeaCo Operating, LLC; Magnum Producing, LP; Burlington Resources Oll & Gas Company LP; BXP Energy Resources V, LLC; MNA Enterprises LTD CO of the Application of WaterBridge Stateline LLC for approval of a salt water disposal well in Lea County, New Mexico. The State of New Mexico through its Oil Conservation Division hereby gives notice that the Division will conduct a public hearing at 8:30 a.m. on June 27, 2024 to consider this application. The hearing will be conducted in a hybrid fashion, both in-person at the Energy, Minerals, Natural Resources Department, Wendell Chino Building, Pecos Hall, 1220 South St. Francis Drive, 1st Floor, Santa Fe, NM 87505 and via a virtual meeting platform, To participate in the electronic hearing, see the instructions posted on the docket for the hearing date: <a href="https://www.emnrd.nm.gov/ocd/hearing-info/">https://www.emnrd.nm.gov/ocd/hearing-info/</a>. Applicant seeks an order approving disposal into the Glorleta Sandstone formation through the FPNM SWD #1 well at a surface location 2532 from the North line and 1545 from the East line, Unit G, Section 25, Township 26 South, Range 37 East, NMPM, Lea County, New Mexico for the purpose of operating a produced water disposal well. Applicant seeks authority to inject produced water into the Glorieta Sandstone formation at a depth of approximately 5,350 feet to 5,725 feet. Applicant further requests that the Division approve a maximum daily injection rate for the well of 20,000 bbls per day. Said area is located approximately 8.2 miles Southeast of Jal, New Mexico.

CASE NO. 24569: Notice to all affected parties, as well as heirs and devisees of: D.K. Boyd; New Mexico Oll Conservation District 1; New Mexico Bureau of Land Management; Blackbeard Operating, LLC; Magnum Producing, LP; R&R Royalty LTD of the Application of WaterBridge Stateline LLC for approval of a salt water disposal well in Lea County, New Mexico. The State of New Mexico through its Oil Conservation Division hereby gives notice that the Division will conduct a public hearing at 8:30 a.m. on June 27, 2024 to consider this application. The hearing will be conducted in a hybrid fashion, both in-person at the Energy, Minerals, Natural Resources Department, Wendell Chino Building, Pecos Hall, 1220 South St. Francis Drive, 1st Floor, Santa Fe, NM 87505 and via a virtual meeting platform. To participate in the electronic hearing, see the Instructions posted on the docket for the hearing date: https://www.emnrd.nm.gov/ocd/hearing-info/. Applicant seeks an order approving disposal into the Glorieta Sandstone formation through the FPNM SWD #3 well at a surface location 2,512' from the North line and 1,133' from the West line, Lot 2, Section 29, Township 26 South, Range 38 East, NMPM, Lea County, New Mexico for the purpose of operating a produced water disposal well. Applicant seeks authority to Inject produced water into the Glorieta Sandstone formation at a depth of approximately 5,400 feet to 5,775 feet. Applicant further requests that the Division approve a maximum daily injection rate for the well of 20,000 bbls per day. Said area is located approximately 9.20 miles Southeast of Jal, New Mexico.

CASE NO. 24570; Notice to all affected parties, as well as heirs and devisees of: D.K. Boyd; New Mexico Oil Conservation District 1; New Mexico Bureau of Land Management; Armstrong Energy Corporation; R&R Royalty, Ltd.; Ida Kristine Hanson; Elizabeth W., Goff et al. of the Application of WaterBridge Stateline LLC for approval of a salt water disposal well in Lea County, New Mexico. The State of New Mexico through its Oil Conservation Division hereby gives notice that the Division will conduct a public hearing at 8:30 a.m. on June 27, 2024 to consider this application. The hearing will be conducted in a hybrid fashion, both in-person at the Energy, Minerals, Natural Resources Department, Wendell Chino Building, Pecos Hall, 1220 South St. Francis Drive, 1st Floor, Santa Fe, NM 87505 and via a virtual meeting platform To participate in the electronic hearing, see the instructions posted on the docket for the hearing date: https://www.emnrd.nm.gov/ocd/hearing-info/. Applicant seeks an order approving disposal into the Glorieta Sandstone formation through the FPNM SWD #6 well at a surface location 1,964 from the North line and 2,170 from the West line, Unit F, Section 17, Township 26 South, Range 38 East, NMPM, Lea County, New Mexico for the purpose of operating a produced water disposal well. Applicant seeks authority to inject produced water into the Glorieta Sandstone formation at a depth of approximately 5,400 feet to 5,775 feet. Applicant further requests that the Division approve a maximum dally injection rate for the well of 20,000 bils per day. Said area is located approximately 7,94 miles Southeast of Jal, New Mexico.

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DOLORES SERNA MODRALL, SPERLING, ROEHL, HARRIS & P. O. BOX 2168 ALBUQUERQUE, NM 87103-2168

