

BEFORE THE NEW MEXICO OIL CONSERVATION DIVISION

APPLICATION OF VISTA DISPOSAL SOLUTIONS, LLC
FOR A SALT WATER DISPOSAL WELL,
IN LEA COUNTY, NEW MEXICO.

Case No. _____

APPLICATION FOR SALT WATER DISPOSAL

Vista Disposal Solutions, LLC by and through its undersigned attorney, applies for an order approving a salt water disposal well, and in support thereof, states:

1. Applicant seeks an order proposing a salt water disposal well its Muir Federal SWD #1, to drilled at a location 1,556' FSL and 2,665' FWL, Unit K, Section 30, Township 26 South, Range 34 East, N.M.P.M., Lea County, New Mexico.
2. Applicant proposes to set a packer at 17,500' feet below the surface of the earth and then inject into the Devonian Silurian formation at depths between 17,520' through 18,800' open hole, as stated in the attached C-108.
3. Attached hereto as Exhibit A is the C-108.
4. The granting of this application will prevent waste and protect correlative rights.

WHEREFORE, Applicant requests that, after notice and hearing, the Division enter its order approving this application.

Respectfully submitted,

PADILLA LAW FIRM, P.A.

/s/ ERNEST L. PADILLA

ERNEST L. PADILLA,

Attorney for Vista Disposal Solutions, LLC


PO Box 2523

Santa Fe, New Mexico 87504

505-988-7577

padillalaw@qwestoffice.net

APPLICATION FOR AUTHORIZATION TO INJECT

- I. PURPOSE: Secondary Recovery Pressure Maintenance X Disposal
Storage Application qualifies for administrative approval? X Yes No
- II. OPERATOR: Vista Disposal Solutions, LLC
ADDRESS: 12444 NM 10th St., Building G, Suite 202-512, Yukon, OK 73099
CONTACT PARTY Nate Alleman PHONE: 918-382-7581
- III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection.
Additional sheets may be attached if necessary.
- IV. Is this an expansion of an existing project? Yes X No
If yes, give the Division order number authorizing the project: _____
- V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- VII. Attach data on the proposed operation, including:
1. Proposed average and maximum daily rate and volume of fluids to be injected;
 2. Whether the system is open or closed;
 3. Proposed average and maximum injection pressure;
 4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
 5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
- *VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- *X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).
- *XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
- NAME: Dan Arthur, P.E., SPEC TITLE: President/Chief Engineer
SIGNATURE: [Signature] DATE: 8/12/2019
E-MAIL ADDRESS: darthur@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: _____

III. WELL DATA

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

- (1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.
- (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
- (3) A description of the tubing to be used including its size, lining material, and setting depth.
- (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

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

- (1) The name of the injection formation and, if applicable, the field or pool name.
- (2) The injection interval and whether it is perforated or open-hole.
- (3) State if the well was drilled for injection or, if not, the original purpose of the well.
- (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- (5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

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

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

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

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

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

Application for Authorization to Inject
Well Name: Muir Federal SWD #1

III – Well Data *(The Wellbore Diagram is included as Attachment 1)*

A.

(1) General Well Information:

Operator: Vista Disposal Solutions, LLC (OGRID No. 329051)
Lease Name & Well Number: Muir Federal SWD #1
Location Footage Calls: 1,556' FSL & 2,665' FWL
Legal Location: Unit Letter K, S30 T26S R34E
Ground Elevation: 3,362'
Proposed Injection Interval: 17,520' – 18,800'
County: Lea

(2) Casing Information:

Type	Hole Size	Casing Size	Casing Weight	Setting Depth	Sacks of Cement	Estimated TOC	Method Determined
Surface	24"	20"	133.0 lb/ft	845'	860	Surface	Circulation
Intermediate 1	14-3/4"	13-3/8"	68.0 lb/ft	5,290'	1,180	Surface	Circulation
Intermediate 2	12-1/4"	9-5/8"	53.5 lb/ft	14,500'	4,810	Surface	Circulation
Liner	8-1/2"	7-5/8"	39.0 lb/ft	17,520	260	14,300 (TOL)	CBL

(3) Tubing Information:

4-1/2" (composite weight string) of fiberglass-coated tubing with setting depth of 17,500'

(4) Packer Information: Lok-set or equivalent packer set at 17,500'

B.

(1) Injection Formation Name: Devonian and Silurian-Fusselman formations

Pool Name: SWD; DEVONIAN - SILURIAN

Pool Code: 97869

(2) Injection Interval: Open-hole injection between 17,520' – 18,800'

(3) Drilling Purpose: New Drill for Salt Water 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.

- Delaware (5,290')
- Bone Springs (9,700')
- Wolfcamp (12,400')
- Atoka (14,650')
- Morrow (15,000')

Underlying Oil and Gas Zones: No underlying oil and gas zones exist.

V – Well and Lease Maps

The following maps are included in **Attachment 2**:

- 2-mile Oil & Gas Well Map
- 2-mile Lease Map
- 1.5-mile Deep SWD Map (Devonian/Silurian SWDs)
- 1-mile Well Detail List
- Potash Lease Map

VI – AOR Well List

There are no wells within the 1-mile AOR that penetrate the proposed injection zone.

A list of the wells within the 1-mile AOR is included in **Attachment 2**.

VII – Proposed Operation

- (1) **Proposed Maximum Injection Rate:** 30,000 bpd
Proposed Average Injection Rate: 15,000 bpd
- (2) A closed system will be used.
- (3) **Proposed Maximum Injection Pressure:** 3,504 psi (surface)
Proposed Average Injection Pressure: approximately 1,500 – 2,000 psi (surface)
- (4) **Source Water Analysis:** It is expected that the injectate will consist of produced water from production wells completed in the Wolfcamp and Bone Springs formations. Analysis of water from these formations is included in **Attachment 3**.
- (5) **Injection Formation Water Analysis:** The proposed SWD will be injecting water into the Devonian and Silurian-Fusselman formations which is a non-productive zone known to be compatible with formation water from the Wolfcamp and Bone Springs formations. Water analyses from the Devonian-Silurian formation in the area are included in **Attachment 4**.

VIII – Geologic Description

The proposed injection interval includes the Devonian and Silurian-Fusselman formations from 17,520 – 18,800 feet. These formations consist of carbonates including light colored dolomite and chert intervals interspersed with some tight limestone intervals. Several thick sections of porous dolomite capable of taking water are present within the subject formations in the area.

The freshwater formation is the Rustler at a depth of approximately 820 feet. Water well depths in the area range from approximately 135 - 300 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, no groundwater wells are located within 1-mile of the proposed SWD location; therefore, no groundwater samples were collected in association with this application.

A water well map of the area is included in **Attachment 5**.

XII – No Hydrologic Connection Statement

No 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 letter from a knowledgeable and qualified expert stating that there is a low risk of seismic activity from the proposed injection activities is included in **Attachment 6**.

XIII – Proof of Notice

A Public Notice was filed with the Hobbs News-Sun newspaper and an affidavit is included in **Attachment 7**.

A copy of the application was mailed to the OCD District Office, landowner, and leasehold operators within 1-mile of the proposed SWD location. A list of the recipients, as well as delivery confirmations, are included in **Attachment 7**.

Attachments

Attachment 1: Wellbore Diagram

Attachment 2: Area of Review Information:

- 2-mile Oil & Gas Well Map
- 2-mile Lease Map
- 1.5-mile Deep SWD Map (Devonian/Silurian SWDs)
- 1-mile Well Detail List
- Potash Lease Map

Attachment 3: Source Water Analyses

Attachment 4: Injection Formation Water Analyses

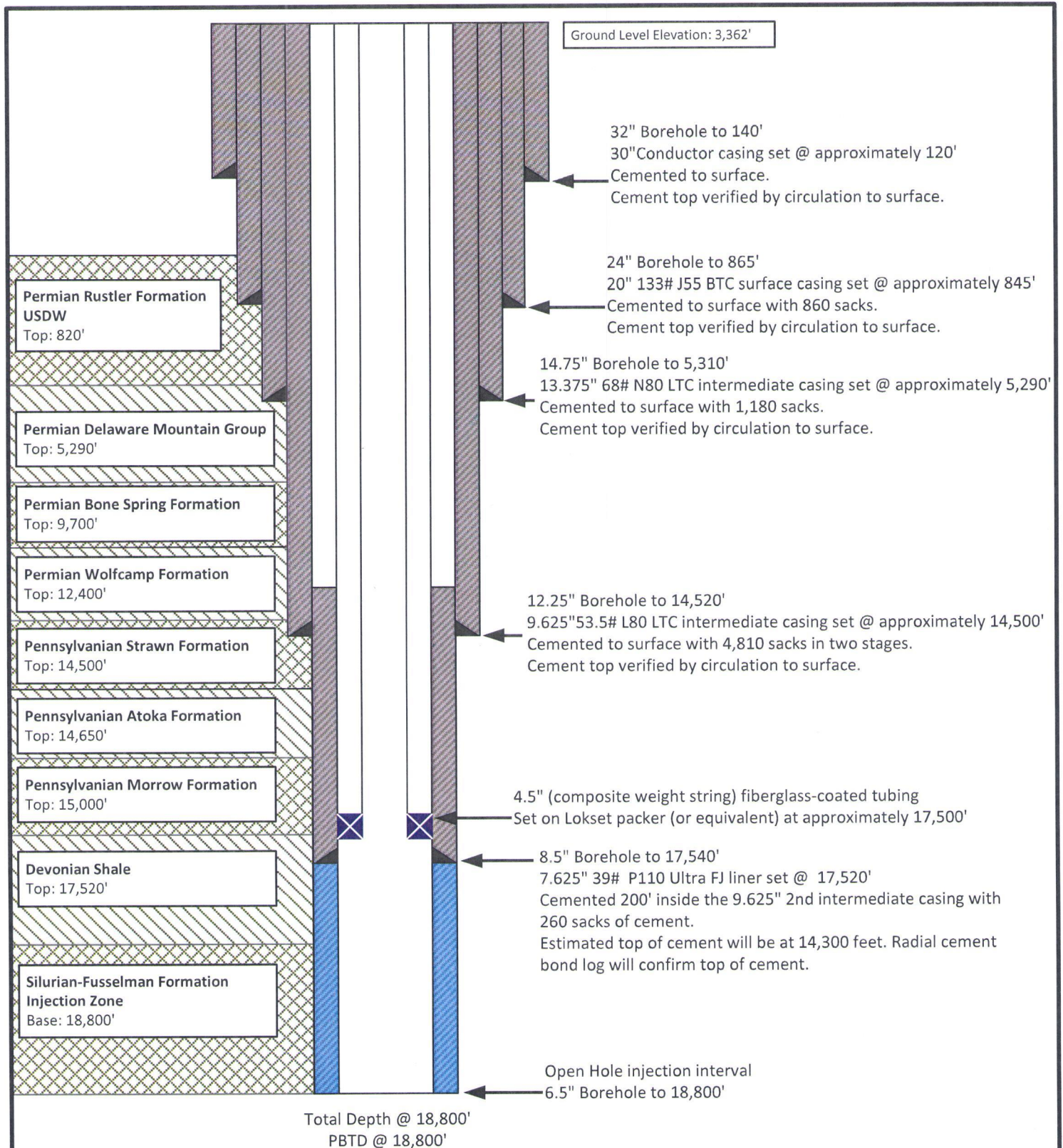
Attachment 5: Water Well Map and Well Data

Attachment 6: Induced Seismicity Assessment Letter

Attachment 7: Public Notice Affidavit and Notice of Application Confirmations

Attachment 1

Wellbore Diagram



Note: Listed depths and cement volumes are approximates based on available information. All cement calculations use yield of 1.18 cubic foot per sack and include 25% excess.

NOT TO SCALE

Prepared by:

ALLCONSULTING

Drawn by: Joshua Ticknor

Project Manager:
Dan Arthur

Date: 8/5/2019

Vista Disposal Solutions, LLC
Muir Federal SWD #1
Section 30, Twp 26S, Rng 34E
1,556' FSL & 2,665' FWL
Lea County, NM

A-3 and AL-2 LOK-SET Retrievable Casing Packers

Product Family No. H64630 and H64628

APPLICATION

The A-3™ LOK-SET™ packer combines advantages of a retrievable packer with the features of a permanent packer. An ability to lock down tubing forces makes the A-3 suitable for a broad range of applications, including production, injection, zone isolation, and remedial operations. The AL-2™ LOK-SET packer is similar to the A-3, and has a larger bore.

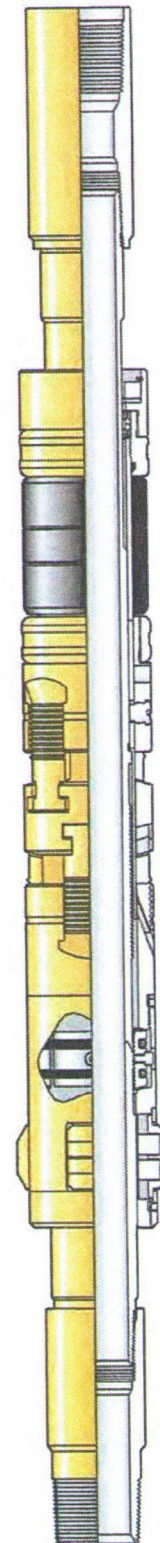
Advantages

- Holds pressure from above and below, without relying on set-down weight, tubing tension, or hydraulic hold down
- Provides tubing anchoring with tension applied, suitable for pumping wells or injection, controlling tubing forces related to change fluid temperatures
- Opposed, non-transferring, dovetail slips prevent packer movement associated with changing differential pressures, while allowing the landing of the tubing in tension, neutral or compression
- Right-hand tubing rotation controls setting and releasing
- Packing element compression locks in by ratcheting action of lock segments, which restricts rotation to one direction

Accessories

To provide a simple and reliable injection system for retrieving an injection string without having to unseat the packer:

L-10 or L-316 on-off sealing connectors, Product Family Nos. H68420 and H68422. Baker Hughes blanking plug can be used in the seating nipple profile of the on-off sealing connector to provide a means of plugging the lower zone while the tubing is being pulled.



A-3 LOK-SET
Retrievable Casing Packer
Product Family No. H64630

SPECIFICATION GUIDES

A-3™ LOK-SET Retrievable Casing Packer, Product Family No. H64630

Casing			Packer				
OD		Weight *	Size	Nom ID		Max Gage Ring OD	
in.	mm	lb/ft		in.	mm	in.	mm
4	101.6	9.5-12.9	41A2	1.500	38.1	3.244	82.4
4-1/2	144.3	21.6-23.6	41A2	1.500	38.1	3.244	82.4
4	101.6	9.5	41A4	1.500	38.1	3.423	112.4
4-1/2	114.3	18.8	41A4	1.500	38.1	3.423	112.4
		13.5-17.7	41B			3.578	90.9
		11.6-13.5	43A2	1.978	50.2	3.786	96.2
		9.5-10.5	43A4			3.786	96.2
5	127.0	15-18	43B	1.978	50.2	4.140	105.2
		11.5-15	43C			4.265	108.3
5-1/2	139.7	26	43C	1.978	50.2	4.265	108.3
		20-23	45A2			4.515	114.7
		15.5-20	45A4			4.656	118.3
		13-15.5	45B			4.796	121.8
6	152.4	26	45B	1.978	50.2	4.796	121.8
		20-23	45C			5.078	129.0
		15-18	45D			5.171	131.3
6-5/8	168.3	34	45E	1.978	50.2	5.421	137.7
		24-32	45F			5.499	139.7
		24	47A2	2.441	62.0	5.671	144.0
		17-24	45G	1.978	50.2	5.796	147.2
7	177.8	17-20	47A4	2.441	62.0	5.827	148.0
		38	47A2	2.441	62.0	5.671	144.0
		32-35	47A4			5.827	148.0
		26-29	47B2			5.983	152.0
7-5/8	193.7	23-26	47B4			6.093	154.8
		17-20	47C2			6.281	159.5
		33.7-39	47C4	2.441	62.0	6.468	164.3
8-5/8	219.1	24-29.7	47D2			6.687	169.9
		20-24	47D4			6.827	173.4
		44-49	49A2	3.500	88.9	7.327	186.1
9-5/8	244.5	32-40	49A4			7.546	191.7
		20-28	49B			7.796	198.0
		47-53.5	51A2	3.500	88.9	8.234	209.1
		40-47	51A4			8.452	214.7
		29.3-36	51B			8.608	218.6

AL-2™ Large Bore LOK-SET Retrievable Casing Packer Product Family No. H64628

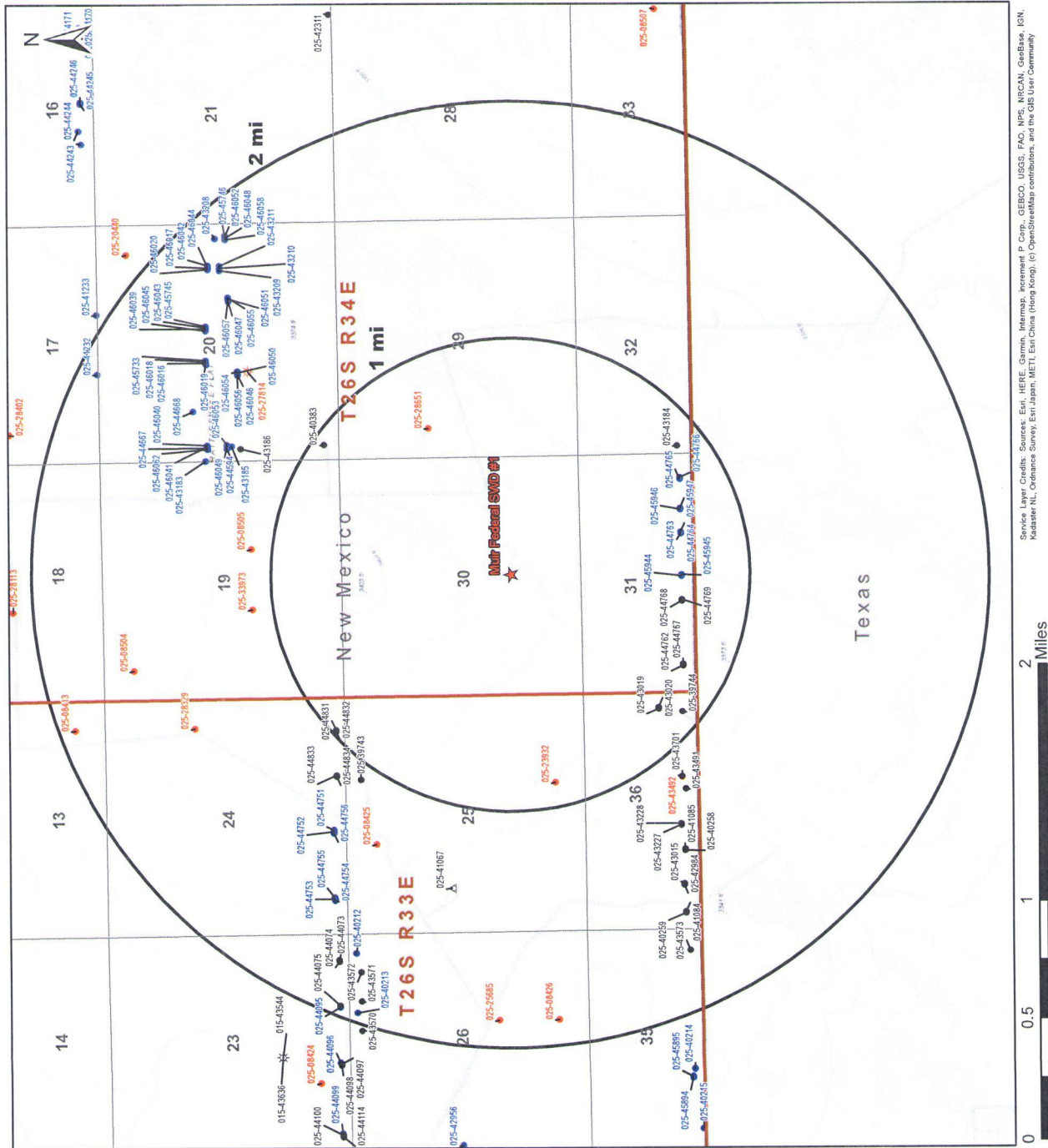
Casing			Packer					
OD		Weight *	Size	Nom ID		Max Gage Ring OD		Max Diameter of Compressed Drag Block
in.	mm	lb/ft		in.	mm	in.	mm	in.
5-1/2	139.7	20	45A2 x 2-3/8	2.375	60.3	4.562	115.9	4.592
		15.5-17	45A4 x 2-3/8			4.656	118.3	4.750
		13	45B x 2-3/8			4.796	121.8	4.902
6	152.4	26	45B x 2-3/8	2.375	60.3	4.796	121.8	4.902

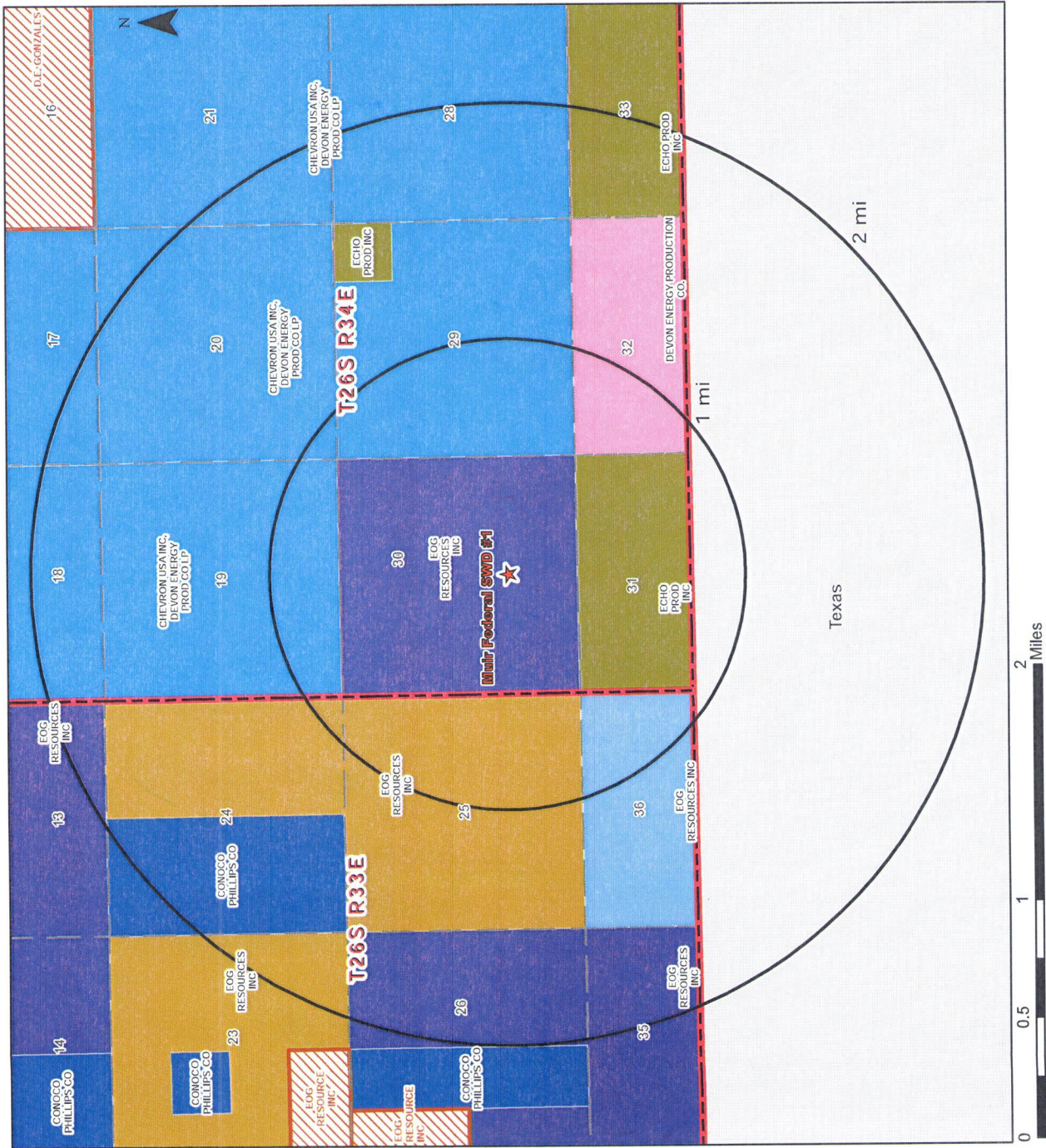
- When selecting a packer for a casing weight common to two weight ranges (same OD), choose the packer size shown for the lighter of the two weight ranges. Example: for 7-in. (177.8 mm) OD 26 lb/ft casing use packer size 47B4. Under certain circumstances the other packer size may be run, such as when running in mixed casing strings.
- Repair kits, including such items as packing elements, seal rings, etc., are available for redressing Baker Retrievable Packers. Contact your Baker Hughes representative. Use only Baker Hughes repair parts.

Attachment 2

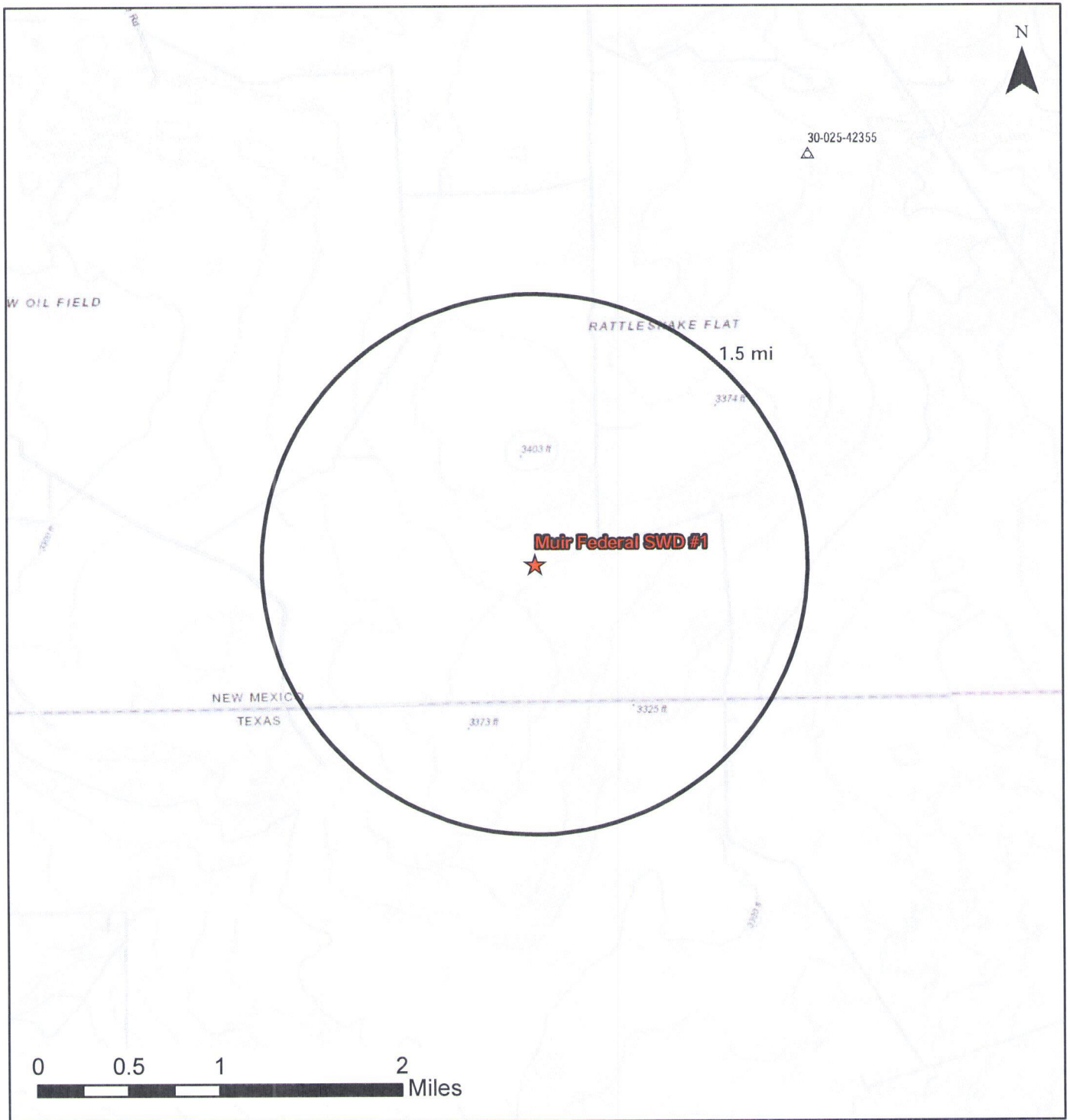
Area of Review Information:

- 2-mile Oil & Gas Well Map
- 2-mile Lease Map
- 1.5-mile Deep SWD Map (Devonian/Silurian SWDs)
- 1-mile Well Detail List
- Potash Lease Map





Mineral Lease Area of Review		
Muir Federal SWD #1 Lea County, New Mexico		
Proj Mgr: Dan Arthur	July 15, 2019	Mapped by: Ben Bockelmann
Prepared for: Vista Disposal Solutions, LLC		Prepared by: ALICONSULTING



Muir Federal SWD #1 Deep SWDs AOR

Proj Mgr:
Dan Arthur

Jul 9, 2019

Mapped by:
Ben Bockelmann

Prepared for:

Vista Disposal Solutions, LLC

Prepared by:

ALLCONSULTING

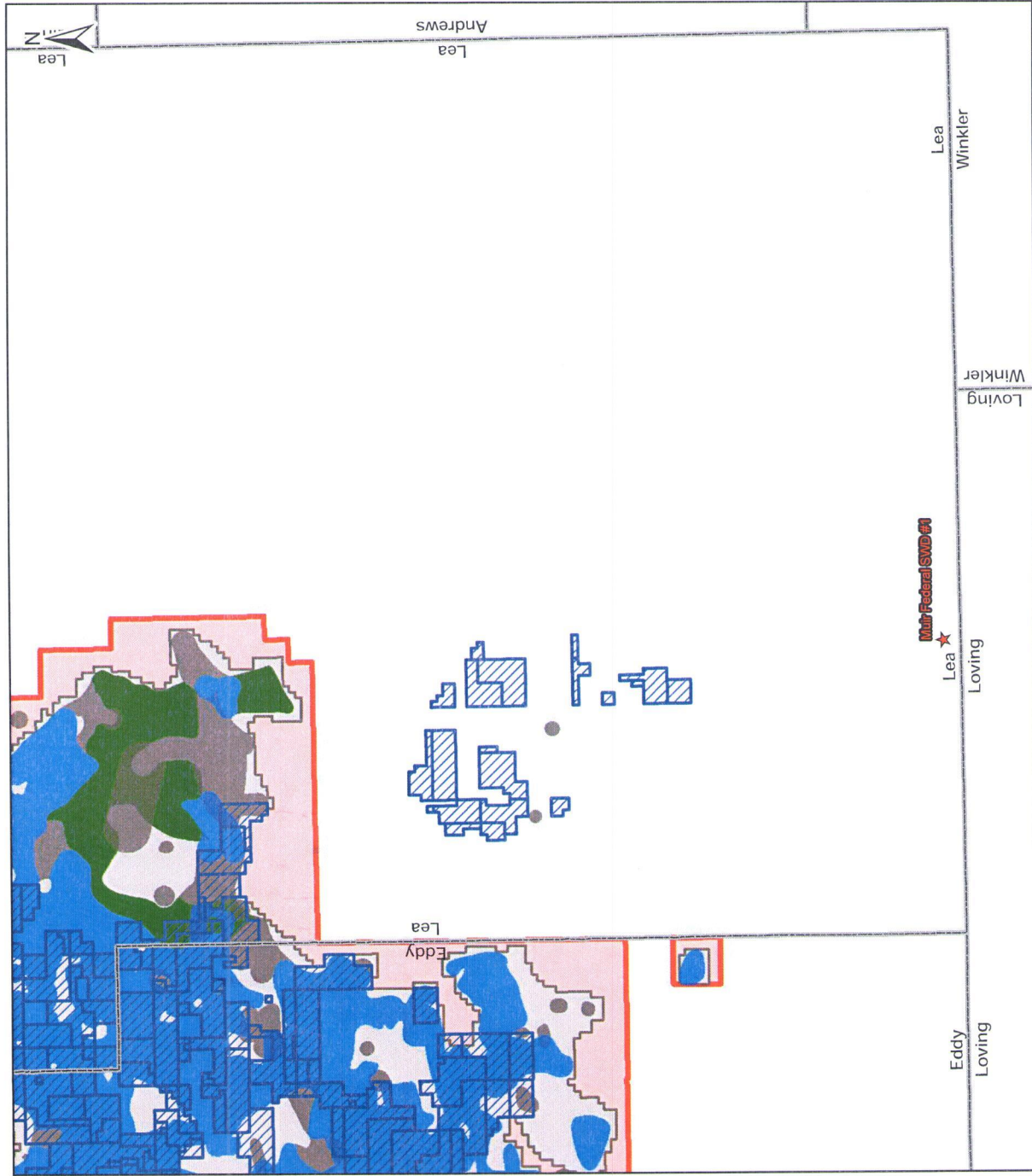
Legend

- ★ Proposed SWD Devonian/Silurian SWDs
- △ Salt Water Injection, Active (1)

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

AOR Tabulation for Muir Federal SWD #1 (Top of Injection Interval: 17,520')							
Well Name	API#	Well Type	Operator	Spud Date	Location (Sec., Tn., Rng.)	Total Vertical Depth (feet)	Penetrate Inj. Zone?
ENDURANCE 36 STATE FEDERAL COM #703H	30-025-43020	O	EOG RESOURCES INC	2/22/2017	1-36-26S-33E	12,668	No
PHILLY 31 FEDERAL COM #706H	30-025-44763	O	EOG RESOURCES INC	Not drilled	4-31-26S-34E	Proposed (12,710)	No
ENDURANCE 36 STATE FEDERAL COM #702H	30-025-43019	O	EOG RESOURCES INC	2/20/2017	1-36-26S-33E	12,646	No
PHILLY 31 FEDERAL COM #705H	30-025-45944	O	EOG RESOURCES INC	Not drilled	3-31-26S-34E	Proposed (12,715)	No
PHILLY 31 FEDERAL COM #712H	30-025-45947	O	EOG RESOURCES INC	Not drilled	5-31-26S-34E	Proposed (12,720)	No
PHILLY 31 FEDERAL COM #710H	30-025-45945	O	EOG RESOURCES INC	Not drilled	3-31-26S-34E	Proposed (12,723)	No
PHILLY 31 FEDERAL COM #711H	30-025-45946	O	EOG RESOURCES INC	Not drilled	5-31-26S-34E	Proposed (12,718)	No
PEACHTREE 24 FEDERAL COM #701H	30-025-44831	O	EOG RESOURCES INC	1/16/2018	P-24-26S-33E	12,688	No
PHILLY 31 FEDERAL COM #709H	30-025-44766	O	EOG RESOURCES INC	Not drilled	5-31-26S-34E	Proposed (12,721)	No
PHILLY 31 FEDERAL COM #704H	30-025-44769	O	EOG RESOURCES INC	6/27/2018	3-31-26S-34E	12,763	No
ENDURANCE 36 STATE FEDERAL COM #001H	30-025-39744	O	EOG RESOURCES INC	8/15/2010	1-36-26S-33E	9,736	No
PHILLY 31 FEDERAL COM #701H	30-025-44762	O	EOG RESOURCES INC	6/8/2018	2-31-26S-34E	12,717	No
PHILLY 31 FEDERAL COM #708H	30-025-44765	O	EOG RESOURCES INC	Not drilled	5-31-26S-34E	Proposed (12,711)	No
PHILLY 31 FEDERAL COM #703H	30-025-44768	O	EOG RESOURCES INC	7/25/2018	3-31-26S-34E	12,723	No
PEACHTREE 24 FEDERAL COM #702H	30-025-44832	O	EOG RESOURCES INC	12/24/2018	P-24-26S-33E	12,674	No
PHILLY 31 FEDERAL COM #707H	30-025-44764	O	EOG RESOURCES INC	Not drilled	4-31-26S-34E	Proposed (12,713)	No
PHILLY 31 FEDERAL COM #702H	30-025-44767	O	EOG RESOURCES INC	6/9/2018	2-31-26S-34E	12,702	No
GREEN WAVE 20 32 FEDERAL STATE COM #003H	30-025-43184	O	DEVON ENERGY PRODUCTION COMPANY, LP	8/28/2017	L-20-26S-34E	10,917	No
GREEN WAVE 20 FEDERAL #001H	30-025-40383	O	DEVON ENERGY PRODUCTION COMPANY, LP	3/25/2012	M-20-26S-34E	9,487	No
PRE-ONGARD WELL #001	30-025-23932	Plugged	PRE-ONGARD WELL OPERATOR (Tenneco Oil Company)	11/5/1971	O-25-26S-33E	Plugged (5,404)	No
PRE-ONGARD WELL #001	30-025-28651	Plugged	PRE-ONGARD WELL OPERATOR (Chevron U.S.A. Inc.)	7/2/1984	E-29-26S-34E	Plugged (15,562)	No
Notes: No wells within the 1-mile AOR penetrate the injection interval.							

Notes: No wells within the 1-mile AOR penetrate the injection interval.



Legend

- ★ Proposed SWD
- Potash Leases
- Ore Type - Measured
- Ore Type - Indicated
- Ore Type - Inferred
- KPLA
- SOPA

Potash Leases Area of Review		
Muir Federal SWD #1 Lea County, New Mexico		
Proj Mgr: Dan Arthur	July 06, 2019	Mapped by: Ben Bockelmann
Prepared for: Vista Disposal Solutions, LLC		Prepared by: ALJ CONSULTING

Attachment 3

Source Water Analyses

Wolfcamp



Water Analysis

Date: 23-Aug-11

2708 West County Road, Hobbs NM 88240

Phone (575) 392-5556 Fax (575) 392-7307

Analyzed For

Brushy Draw 1#1

Company	Well Name	County	State
	BD	Lea	New Mexico

Sample Source

Swab Sample

Sample #

1

Formation

Depth

Specific Gravity	1.170	SG @ 60 °F	1.172
pH	6.30	Sulfides	Absent
Temperature (°F)	70	Reducing Agents	

Cations

Sodium (Calc)	in Mg/L	77,962	in PPM	66,520
Calcium	in Mg/L	4,000	in PPM	3,413
Magnesium	in Mg/L	1,200	in PPM	1,024
Soluble Iron (FE2)	in Mg/L	10.0	in PPM	9

Anions

Chlorides	in Mg/L	130,000	in PPM	110,922
Sulfates	in Mg/L	250	in PPM	213
Bicarbonates	in Mg/L	127	in PPM	108
Total Hardness (as CaCO3)	in Mg/L	15,000	in PPM	12,799
Total Dissolved Solids (Calc)	in Mg/L	213,549	in PPM	182,209
Equivalent NaCl Concentration	in Mg/L	182,868	in PPM	156,031

Scaling Tendencies

*Calcium Carbonate Index 507,520

Below 500,000 Remote / 500,000 - 1,000,000 Possible / Above 1,000,000 Probable

*Calcium Sulfate (Gyp) Index 1,000,000

Below 500,000 Remote / 500,000 - 10,000,000 Possible / Above 10,000,000 Probable

*This Calculation is only an approximation and is only valid before treatment of a well or several weeks after treatment.

Remarks RW=.048@70F

Report # 3188

Sec 22, T25S, R28E

North Permian Basin Region
P.O. Box 740
Sundown, TX 79372-0740
(806) 228-8121
Lab Team Leader - Sheila Hernandez
(432) 495-7240

Bone Spring

Water Analysis Report by Baker Petrolite

Company:		Sales RDT:	33514.1
Region:	PERMIAN BASIN	Account Manager:	TONY HERNANDEZ (575) 910-7135
Area:	ARTESIA, NM	Sample #:	534665
Lease/Platform:	PINOCHLE 'BPN' STATE COM	Analysis ID #:	106795
Entity (or well #):	2 H	Analysis Cost:	\$90.00
Formation:	UNKNOWN		
Sample Point:	WELLHEAD		

Summary		Analysis of Sample 534665 @ 75 F					
Sampling Date:	03/10/11	Anions	mg/l	meq/l	Cations	mg/l	meq/l
Analysis Date:	03/18/11	Chloride:	109618.0	3091.92	Sodium:	70275.7	3058.82
Analyst:	SANDRA GOMEZ	Bicarbonate:	2135.0	34.99	Magnesium:	195.0	16.04
TDS (mg/l or g/m3):	184911.1	Carbonate:	0.0	0.	Calcium:	844.0	42.12
Density (g/cm3, tonne/m3):	1.113	Sulfate:	747.0	15.55	Strontium:	220.0	5.02
Anion/Cation Ratio:	1	Phosphate:			Barium:	0.8	0.01
		Borate:			Iron:	6.5	0.23
		Silicate:			Potassium:	889.0	22.22
Carbon Dioxide:	0.50 PPM	Hydrogen Sulfide:		0 PPM	Aluminum:		
Oxygen:		pH at time of sampling:		7	Chromium:		
Comments:		pH at time of analysis:		7	Copper:		
		pH used in Calculation:		7	Lead:		
					Manganese:	0.100	0.
					Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite CaCO ₃		Gypsum CaSO ₄ ·2H ₂ O		Anhydrite CaSO ₄		Celestite SrSO ₄		Barite BaSO ₄		CO ₂ Press
F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	1.08	188.52	-1.20	0.00	-1.18	0.00	-0.11	0.00	0.58	0.29	1.72
100	0	1.10	206.05	-1.29	0.00	-1.20	0.00	-0.15	0.00	0.35	0.29	2.35
120	0	1.12	224.17	-1.36	0.00	-1.19	0.00	-0.17	0.00	0.16	0.00	3.17
140	0	1.13	243.17	-1.42	0.00	-1.18	0.00	-0.18	0.00	0.00	0.00	4.21

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.
 Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.
 Note 3: The reported CO₂ pressure is actually the calculated CO₂ fugacity. It is usually nearly the same as the CO₂ partial pressure.

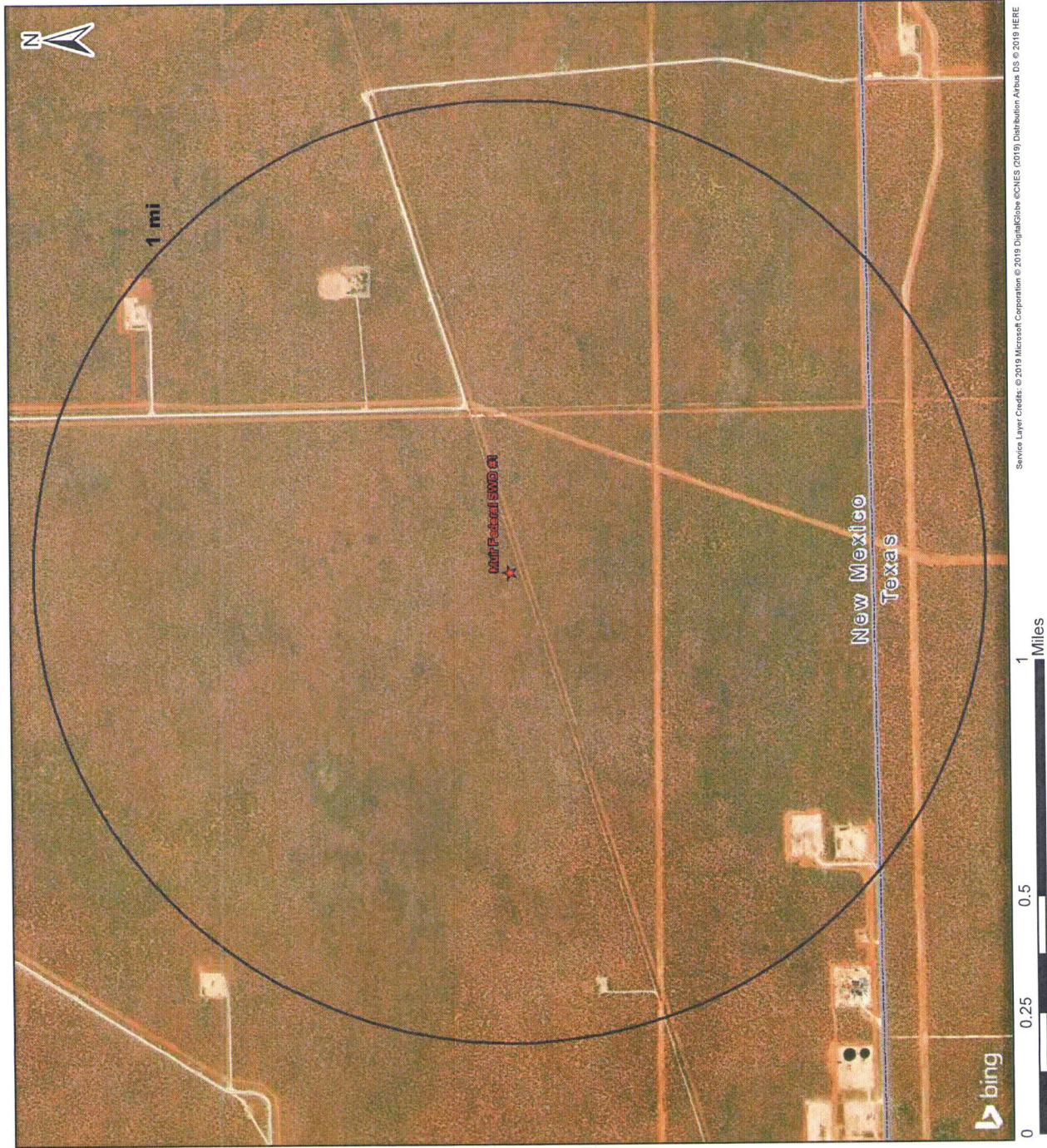
Attachment 4

Injection Formation Water Analyses

Injection Formation Water Analysis																	
Vista Disposal Solutions, LLC - Devonian and Silurian-Fuselman Formations																	
Wellname	API	Latitude	Longitude	Section	Township	Range	Unit	Eggs	County	State	Company	Field	Formation	Tds_mg/L	Chloride_mg/L	Bicarbonate_mg/L	Sulfate_mg/L
STATE B COM #001	3002509716	-103.2212524	-103.2212524	36	24S	36E	C	600N	1880W	LEA	NM		DEVONIAN	176234	107400		128
FARNSWORTH FEDERAL #006	3002511950	-103.162468	-103.162468	4	26S	37E	A	660N	990E	LEA	NM	CROSSBY	DEVONIAN	31931	20450		302
ARNOTT RAMSAY NCT-18 #003	3002511863	-103.092228	-103.1784439	32	25S	37E	A	660N	660E	LEA	NM	CROSSBY	DEVONIAN	100382			476
ARNOTT RAMSAY NCT-18 #003	3002511863	-103.092228	-103.1784439	32	25S	37E	A	660N	660E	LEA	NM	CROSSBY	DEVONIAN	158761			
COPPER #001	3002511818	-103.0566723	-103.16566723	28	25S	37E	J	1980S	1981E	LEA	NM	CROSSBY	DEVONIAN	27506	15270		1089
STATE N1 #001	3002511398	-103.162749	-103.1273346	2	25S	37E	A	663N	660E	LEA	NM	JUSTIS	DEVONIAN	105350	59300		660
WESTSITES FEDERAL #004	3002511389	-103.161129	-103.1241226	1	25S	37E	E	1980N	330W	LEA	NM	JUSTIS	FUSSELMAN	80880	8400		3050
WESTSITES FEDERAL #004	3002511389	-103.161129	-103.1241226	1	25S	37E	E	1980N	330W	LEA	NM	JUSTIS	FUSSELMAN	84900	48600		340
WESTSITES FEDERAL #004	3002511389	-103.161129	-103.1241226	1	25S	37E	E	1980N	330W	LEA	NM	JUSTIS	FUSSELMAN	72200	41000		2960
WESTSITES FEDERAL #004	3002511389	-103.161129	-103.1241226	1	25S	37E	E	1980N	330W	LEA	NM	JUSTIS	FUSSELMAN	80900	46200		3050
WESTSITES FEDERAL #004	3002511389	-103.161129	-103.1241226	1	25S	37E	E	1980N	330W	LEA	NM	JUSTIS	FUSSELMAN	77600	44000		3240
WESTSITES FEDERAL #004	3002511389	-103.161129	-103.1241226	1	25S	37E	E	1980N	330W	LEA	NM	JUSTIS	FUSSELMAN	135000	6500		5810
WESTSITES FEDERAL #004	3002511389	-103.161129	-103.1241226	1	25S	37E	E	1980N	330W	LEA	NM	JUSTIS	FUSSELMAN	114000	65000		280
WESTSITES FEDERAL #004	3002511389	-103.161129	-103.1241226	1	25S	37E	E	1980N	330W	LEA	NM	JUSTIS	FUSSELMAN	135000	77000		5300
WESTSITES FEDERAL #004	3002511389	-103.161129	-103.1241226	1	25S	37E	E	1980N	330W	LEA	NM	JUSTIS	FUSSELMAN	91058	51020		4783
WESTSITES FEDERAL #008	3002511393	-103.162121	-103.1241226	1	25S	37E	E	1620N	330W	LEA	NM	JUSTIS	FUSSELMAN	86847	50450		363
WESTSITES FEDERAL #008	3002511393	-103.162121	-103.1241226	1	25S	37E	E	1620N	330W	LEA	NM	JUSTIS	FUSSELMAN	219570	129000		4630
STATE Y #009	3002511777	-103.105682	-103.1113434	25	25S	37E	A	990N	990E	LEA	NM	JUSTIS	FUSSELMAN	163430	96000		290
STATE Y #009	3002511777	-103.105682	-103.1113434	25	25S	37E	A	990N	990E	LEA	NM	JUSTIS	FUSSELMAN	35870	37800		3442
STATE Y #009	3002511760	-103.1184678	-103.1184678	25	25S	37E	C	660N	2080W	LEA	NM	JUSTIS	FUSSELMAN	63817	35870		360
SOUTH JUSTIS UNIT #023C	3002511766	-103.1184678	-103.1184678	25	25S	37E	I	2310S	990E	LEA	NM	JUSTIS	FUSSELMAN	208280	124000		510
CARLSON A #002	3002511764	-103.113434	-103.113434	25	25S	37E	I	2310S	990E	LEA	NM	JUSTIS	FUSSELMAN	184030	112900		380
CARLSON B #004	3002511784	-103.096756	-103.1113434	25	25S	37E	P	990S	990E	LEA	NM	JUSTIS	FUSSELMAN	184030	68		1806

Attachment 5

Water Well Map and Well Data



Legend

- ★ Proposed SWD
- NMOSE PODs
- Status
 - Active (0)
 - Pending (0)
 - Change Location of Well (0)
 - Capped (0)
 - Plugged (0)
 - Incomplete (0)
 - Unknown (0)

Water Wells Area of Review

Muir Federal SWD #1
Lea County, New Mexico

Proj Mgr:
Dan Arthur

August 05, 2019

Mapped by:
Ben Bockelmann

Prepared by:

ALLCONSULTING

Water Well Sampling Rationale						
Vista Disposal Solutions, LLC - Muir Federal SWD #1						
SWD	Water Wells	Owner	Available Contact Information	Use	Sampling Required	Notes
Note: No water wells are present within 1 mile of the proposed SWD location.						

Attachment 6

Induced Seismicity Assessment Letter

July 16, 2019

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

Subject: Induced Seismicity Potential Statement for the Muir Federal SWD #1

Dear Mr. Goetze,

This letter provides information regarding the seismic potential associated with injection operations associated with Vista Disposal Solutions, LLC (Vista), proposed Muir Federal SWD #1, hereinafter referred to as the “Subject Well.”

As outlined herein, based on my experience as an expert on the issue of induced seismicity, it is my opinion that the potential for the proposed injection well to cause injection-induced seismicity is expected to be minimal, at best. This conclusion is based on (1) the lack of historic seismic activity and faulting in the area, (2) the low fault slip potential (FSP) of Precambrian faults in the area, (3) the presence of confining layers, and (4) the overall vertical distance between the proposed injection zone and basement rock.

The Subject Well, is located 1,556’ FSL & 2,665’ FWL of Section 30, in T26-S and R34-E of Lea County, New Mexico. Historically, the Eddy and Lea Counties area has experienced very limited recorded seismic activity (per the U.S. Geological Survey [USGS] earthquake catalog database). There has been one known seismic event located within a 25-mile radius of the proposed Subject Well. The closest recorded seismic event was a M2.9 that occurred on December 4th, 1984, and was located approximately 17.8 miles north of the Subject Well (See Exhibit 1). The closest Class IID well injecting into the same formations (Devonian-Silurian) of the Subject Well is approximately 2.7 miles to the northeast (See Exhibit 1).

Vista does not own either 2D or 3D seismic reflection data in the area of the Subject Well. Fault data from USGS indicates that the closest known fault is approximately 9.1 miles north of the Subject Well (See Exhibit 1).

In a recent paper written by Snee and Zoback (2018) entitled “State of Stress in the Permian Basin, Texas and New Mexico: Implications for Induced Seismicity,” the authors found that large groups of mostly north-south striking Precambrian basement faults, predominantly located along the Central Basin Platform, the western Delaware Basin, and large parts of the Northwest Shelf (which includes Eddy and Lea counties, New Mexico) have low FSP at the modeled fluid-pressure

perturbation. The map in Exhibit 2 depicts the low probability risk of FSP for the Delaware Basin and Northwest Shelf areas (Snee and Zoback 2018).

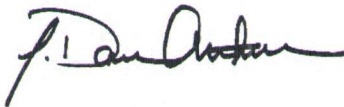
Geologic analysis indicates that the proposed Devonian-Silurian injection zone is overlain by approximately 200 to 400 feet of Woodford Shale, which is the upper confining zone and will serve as a barrier for upward injection fluid migration. Additionally, the Simpson Group that lies directly below the Montoya Formation will act as a lower confining zone to prohibit fluids from migrating downward into the underlying Ellenburger Formation and Precambrian basement rock. See the stratigraphic column for the Delaware Basin included in Exhibit 3.

In the Eddy and Lea Counties area of New Mexico, the Simpson Group is comprised of a series of Middle to Upper Ordovician carbonates, several sandstones, and sandy shales that range from approximately 350 to 650 feet thick (Jones 2008). This group of rocks is capped by the limestones of the Bromide Formation, which is approximately 200 feet thick in this area (Jones 2008). The closest deep well drilled into the Precambrian basement was completed by the Skelly Oil Company in 1975. This well is located in Section 17, Range 36E, Township 25S of Lea County (API No.30-025-25046) and encountered 602 feet of Ellenburger Formation before reaching the top of the Precambrian granite at a depth of 18,920 feet. Based on the estimated thickness of the Simpson Group and Ellenburger Formation in this area, the Precambrian basement should be approximately 1,000 to 1,200 feet below the bottom of the proposed injection zones in the Subject Well.

Conclusion

As an expert on the issue of induced seismicity, it is my opinion that the potential for the proposed injection well to cause injection-induced seismicity is expected to be minimal, at best. This conclusion is based on (1) the lack of historic seismic activity and faulting in the area, (2) the low FSP of Precambrian faults in the area, (3) the presence of confining layers, and (4) the overall vertical distance between the proposed injection zone and basement rock.

Sincerely,
ALL Consulting

A handwritten signature in black ink, appearing to read "J. Daniel Arthur".

J. Daniel Arthur, P.E., SPEC
President and Chief Engineer

Enclosures
References
Exhibits

References

Ball, Mahlon M. 1995. "Permian Basin Province (044)." In *National Assessment of United States Oil and Gas Resources—Results, Methodology, and Supporting Data*. U.S. Geological Survey. <https://certmapper.cr.usgs.gov/data/noga95/prov44/text/prov44.pdf> (accessed June 18, 2018).

Green, G.N., and G.E. Jones. 1997. "The Digital Geologic Map of New Mexico in ARC/INFO Format." U.S. Geological Survey Open-File Report 97-0052. <https://mrdata.usgs.gov/geology/state/state.php?state=NM> (accessed June 14, 2018).

Jones, Rebecca H. 2008. "The Middle-Upper Ordovician Simpson Group of the Permian Basin: Deposition, Diagenesis, and Reservoir Development." http://www.beg.utexas.edu/resprog/permianbasin/PBGSP_members/writ_synth/Simpson.pdf (accessed June 19, 2018).

Snee, Jens-Erik Lund, and Mark D. Zoback. 2018. "State of Stress in the Permian Basin, Texas and New Mexico: Implications for Induced Seismicity." *The Leading Edge* 37, no. 2 (February 2018): 127-34.

U.S. Geological Survey (USGS). No date. Earthquakes Hazard Program: Earthquake Catalog. <https://earthquake.usgs.gov/earthquakes/search/> (accessed June 14, 2018).

Induced Seismicity Potential Statement for the Muir Federal SWD #1
July 16, 2019

Exhibits

Induced Seismicity Potential Statement for the Muir Federal SWD #1
July 16, 2019

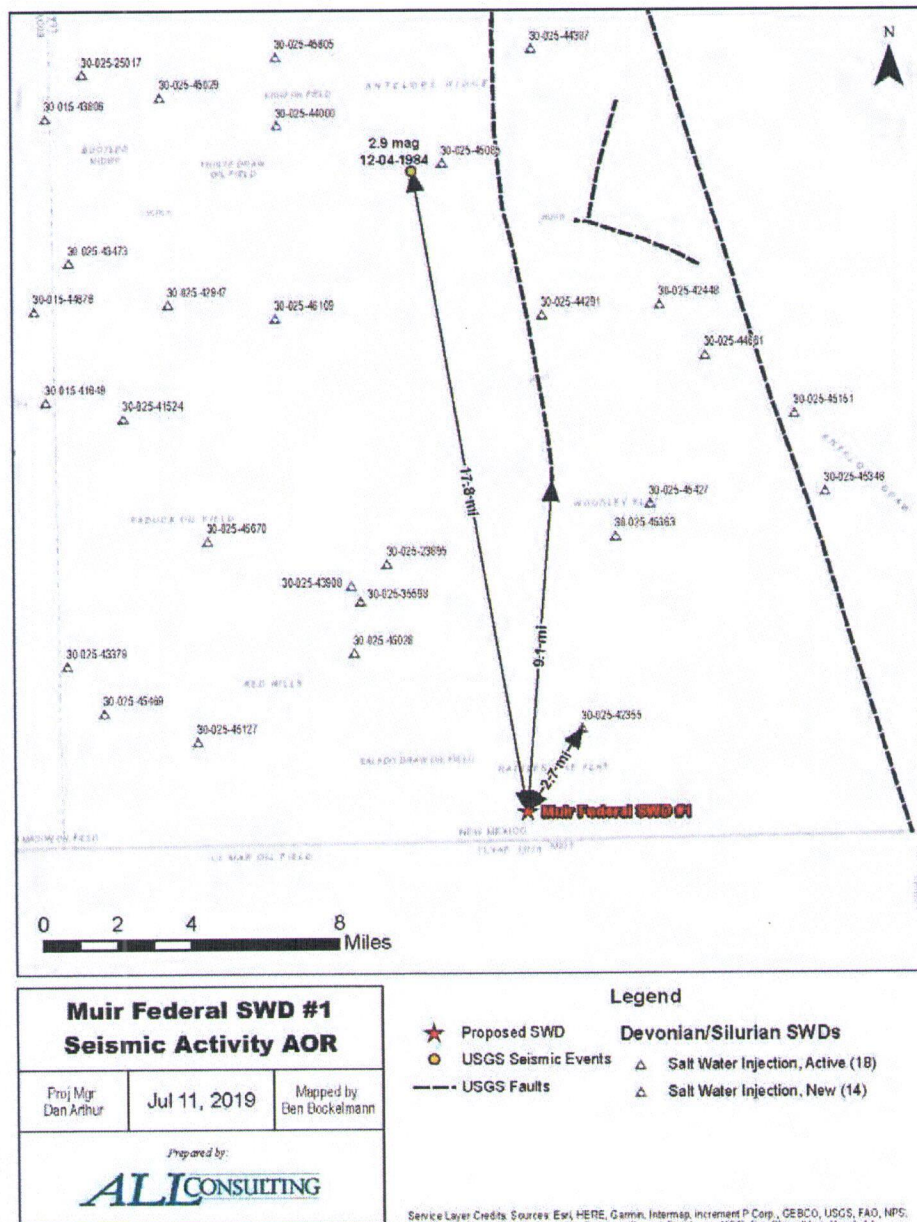


Exhibit 1. Map Showing the Distances from Known and Inferred Faults, Seismic Event, and Closest Deep Injection Well

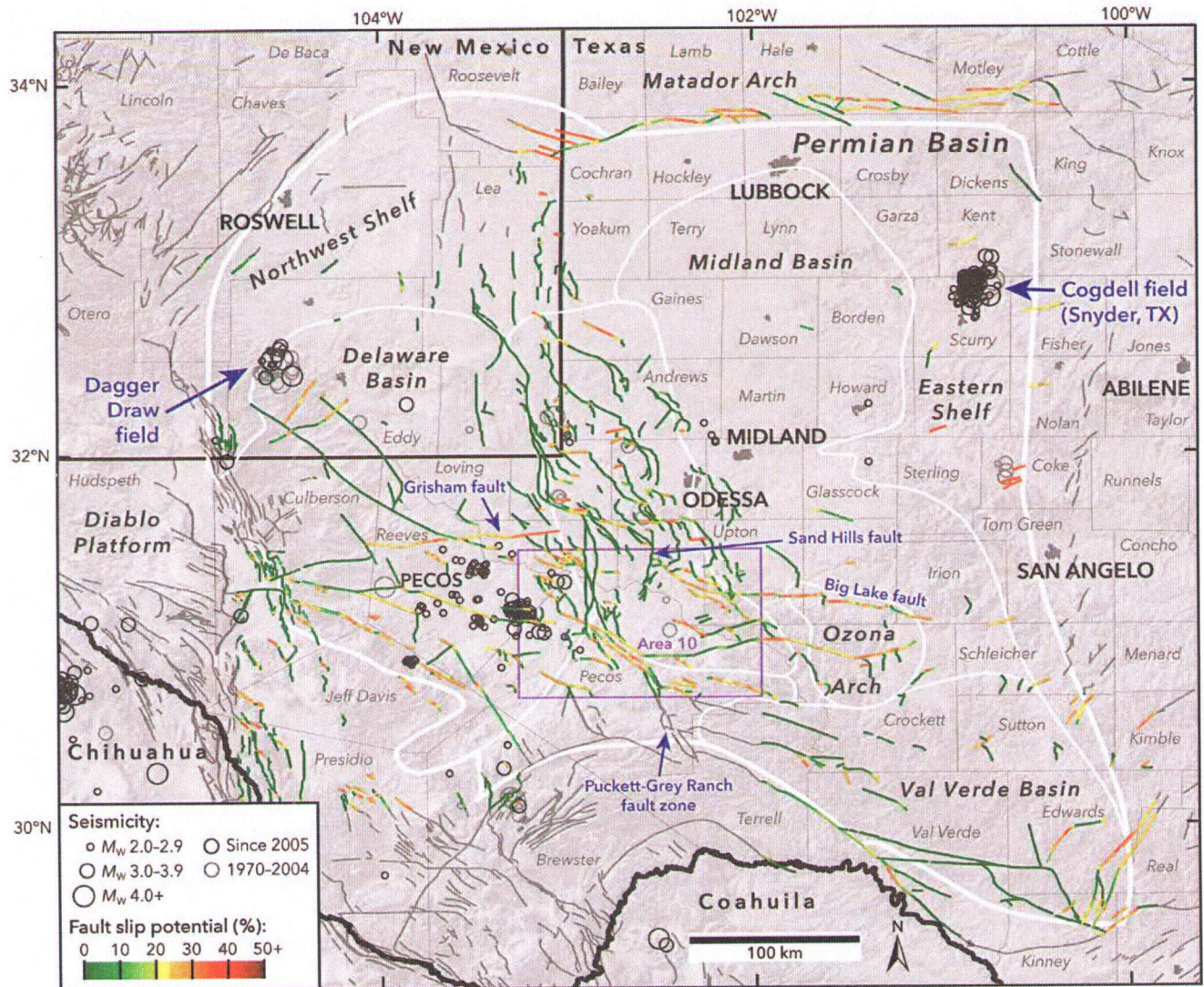


Exhibit 2. Results of the Snee and Zoback (2018) Probabilistic FSP Analysis Across the Permian Basin

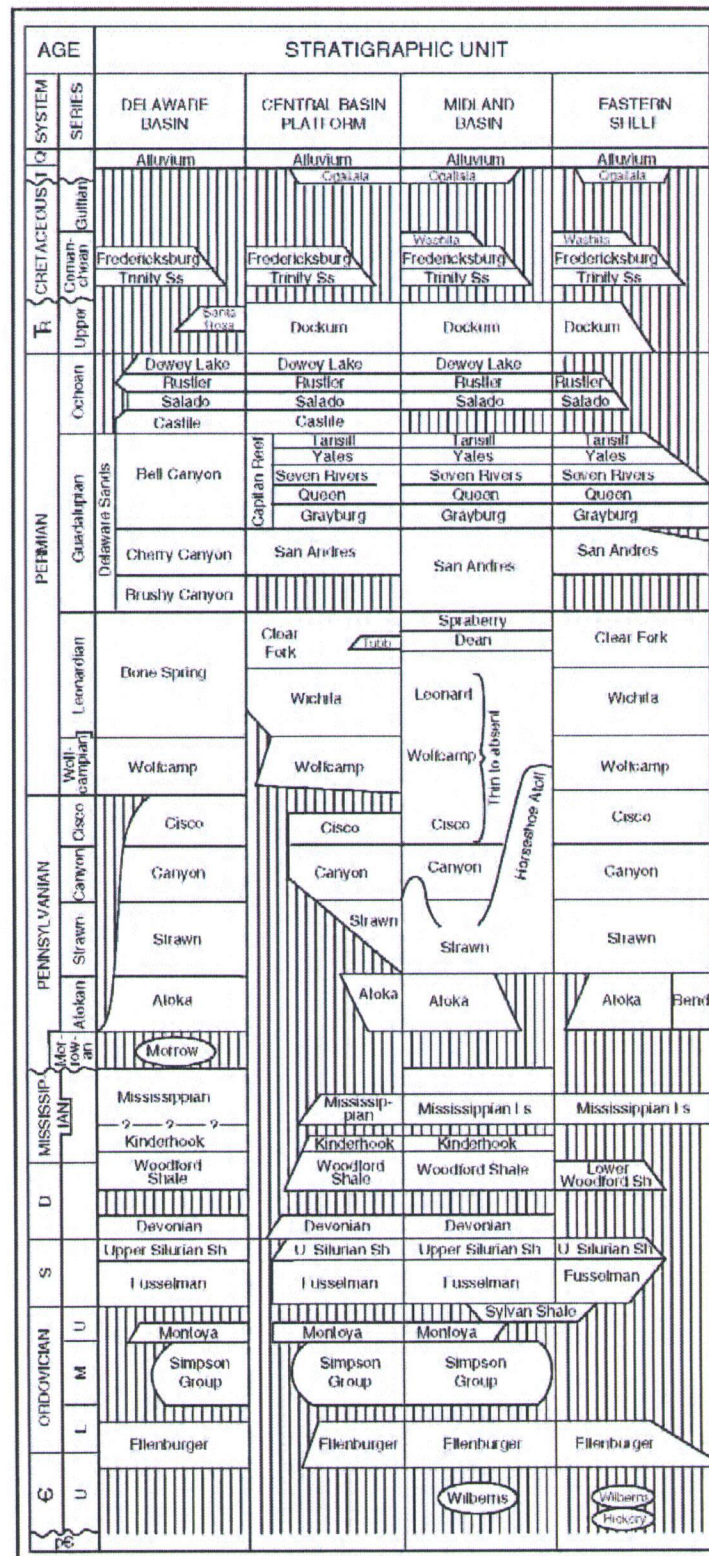


Exhibit 3. Delaware Basin Stratigraphic Chart (Ball 1995)

Attachment 7

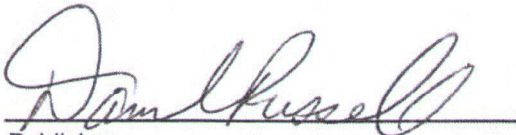
Public Notice Affidavit and Notice of Application Confirmations

Affidavit of Publication

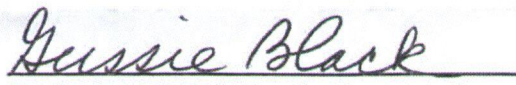
STATE OF NEW MEXICO
COUNTY OF LEA

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
July 07, 2019
and ending with the issue dated
July 07, 2019.

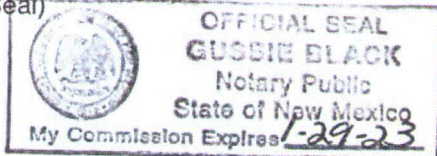

Publisher

Sworn and subscribed to before me this
7th day of July 2019.


Business Manager

My commission expires
January 29, 2023

(Seal)



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

LEGAL	LEGAL
LEGAL NOTICE JULY 7, 2019	
APPLICATION FOR AUTHORIZATION TO INJECT	
NOTICE IS HEREBY GIVEN: That Vista Disposal Solutions, LLC, 12444 NW 10th St., Building G, Suite 202-512, Yukon, OK 73099, is requesting that the New Mexico Oil Conservation Division administratively approve the APPLICATION FOR AUTHORIZATION TO INJECT as follows:	
PURPOSE: The intended purpose of the injection well is to dispose of salt water produced from permitted oil and gas wells.	
WELL NAME AND LOCATION: Muir Federal SWD #1 NE 1/4 SW 1/4, Section 30, Township 26S, Range 34E 1,558' FSL & 2,665' FWL Lea County, NM	
NAME AND DEPTH OF DISPOSAL ZONE: Devonian - Silurian (17,520 - 18,800)	
EXPECTED MAXIMUM INJECTION RATE: 30,000 Bbls/day	
EXPECTED MAXIMUM INJECTION PRESSURE: 3,504 psi (surface)	
Objections or requests for hearing must be filed with the New Mexico Oil Conservation Division within fifteen (15) days. Any objection or request for hearing should be mailed to the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505.	
Additional information may be obtained by contacting Nate Alleman at 918-382-7581. #34409	

67115320

00230520

DANIEL ARTHUR
ALL CONSULTING
1718 S. CHEYENNE AVE.
TULSA, OK 74119

Muir Federal SWD #1 - Notice of Application Recipients				
Entity	Address	City	State	Zip Code
Landowner & Mineral Owner				
New Mexico BLM	620 E Greene St.	Carlsbad	NM	88220
OCD District				
NMOCD District 1	1625 N. French Drive	Hobbs	NM	88240
Leasehold Operators				
Chevron USA Inc. (CHEVRON USA INC)	6301 Deauville	Midland	TX	79706
Commision of Public Lands - State Land Office	310 Old Santa Fe Trail	Santa Fe	NM	87501
Devon Energy Production Company, LP (DEVON ENERGY PROD CO LP) (DEVON ENERGY PRODUCTION CO.)	6488 Seven Rivers Hwy.	Artesia	NM	88210
ECHO Production, Inc. (ECHO PROD INC)	P.O. Box 1210	Graham	TX	76450
EOG Resources, Inc. (EOG RESOURCES INC)	104 S. 4th Street	Artesia	NM	88210
Railroad Commission of Texas Technical Permitting Section - UIC Program (TEXAS)	P.O. Box 12967	Austin	TX	78711
Notes: The table above shows the Entities who were identified as parties of interest requiring notification on either the 1-mile well detail list (Attachment 2) or on the 2-mile Mineral Lease Map (Attachment 2). The names listed above in parenthesis, are the abbreviated entity names used on either the 1-mile well detail list (Attachment 2) or on the 2-mile Mineral Lease Map (Attachment 2).				

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Railroad Commission of Texas
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Commission of Public Lands
State Land Office
310 Old Santa Fe Trail
Santa Fe NM 87501-2708