

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 Katherine Federal SWD #1, to drilled at a location 707' FNL and 1,992' FEL, Unit B, Section 24, Township 25 South, Range 32 East, N.M.P.M., Lea County, New Mexico.
2. Applicant proposes to set a packer at 17,700' feet below the surface of the earth and then inject into the Devonian Silurian formation at depths between 17,720' through 19,000' 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.

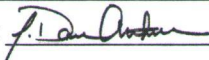
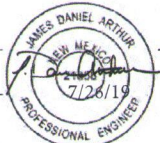
Respectfully submitted,

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:  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:

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

III. WELL DATA

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

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

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

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

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

XIV. PROOF OF NOTICE

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

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

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

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

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

Application for Authorization to Inject
Well Name: Katherine 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: Katherine Federal SWD #1
Location Footage Calls: 707' FNL & 1,992' FEL
Legal Location: Unit Letter B, S24 T25S R32E
Ground Elevation: 3,478'
Proposed Injection Interval: 17,720' – 19,000'
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	865'	880	Surface	Circulation
Intermediate 1	14-3/4"	13-3/8"	68.0 lb/ft	4,910'	1,100	Surface	Circulation
Intermediate 2	12-1/4"	9-5/8"	53.5 lb/ft	14,500'	4,800	Surface	Circulation
Liner	8-1/2"	7-5/8"	39.0 lb/ft	17,720	280	14,300 (TOL)	CBL

(3) Tubing Information:

4-1/2" (composite weight string) of fiberglass-coated tubing with setting depth of 17,700'

(4) Packer Information: Lok-set or equivalent packer set at 17,700'

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 17,720' – 19,000'

(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 (4,910')
- Bone Springs (9,800')
- Wolfcamp (12,000')
- Atoka (14,650')
- Morrow (15,400')

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:** 3,544 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 17,720 – 19,000 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 840 feet. Water well depths in the area range from approximately 70 - 420 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

Ground Level Elevation: 3,478'

32" Borehole to 140'
30" Conductor casing set @ approximately 120'
Cemented to surface.
Cement top verified by circulation to surface.

24" Borehole to 885'
20" 133# J55 BTC surface casing set @ approximately 865'
Cemented to surface with 880 sacks.
Cement top verified by circulation to surface.

14.75" Borehole to 4,930'
13.375" 68# N80 LTC intermediate casing set @ approximately 4,910'
Cemented to surface with 1,100 sacks.
Cement top verified by circulation to surface.

12.25" Borehole to 14,520'
9.625" 53.5# L80 LTC intermediate casing set @ approximately 14,500'
Cemented to surface with 4,800 sacks in two stages.
Cement top verified by circulation to surface.

4.5" (composite weight string) fiberglass-coated tubing
Set on Lokset packer (or equivalent) at approximately 17,700'

8.5" Borehole to 17,740'
7.625" 39# P110 Ultra FJ liner set @ 17,720'
Cemented 200' inside the 9.625" 2nd intermediate casing with 280 sacks of cement.
Estimated top of cement will be at 14,300 feet. Radial cement bond log will confirm top of cement.

Open Hole injection interval
6.5" Borehole to 19,000'

Total Depth @ 19,000'
PBTD @ 19,000'

Permian Rustler Formation
USDW
Top: 840'

Permian Delaware Mountain Group
Top: 4,910'

Permian Bone Spring Formation
Top: 9,800'

Permian Wolfcamp Formation
Top: 12,000'

Pennsylvanian Strawn Formation
Top: 14,500'

Pennsylvanian Atoka Formation
Top: 14,650'

Pennsylvanian Morrow Formation
Top: 15,400'

Devonian Shale
Top: 17,720'

Silurian-Fusselman Formation
Injection Zone
Base: 19,000'

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
Katherine Federal SWD #1
Section 24, Twp 25S, Rng 32E
707' FNL & 1,992' FEL
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.

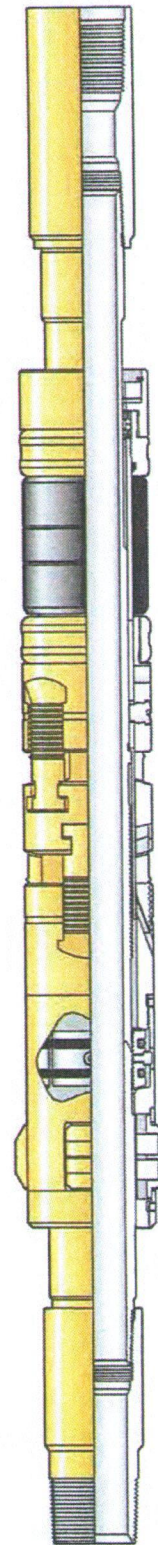
Advantages

- 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			3.786	96.2
		9.5-10.5	43A4	1.978	50.2	3.786	96.2
		15-18	43B			4.140	105.2
5	127.0	11.5-15	43C	1.978	50.2	4.265	108.3
		26	43C			4.265	108.3
5-1/2	139.7	20-23	45A2	1.978	50.2	4.515	114.7
		15.5-20	45A4			4.656	118.3
		13-15.5	45B			4.796	121.8
		26	45B			4.796	121.8
6	152.4	20-23	45C	1.978	50.2	5.078	129.0
		15-18	45D			5.171	131.3
		34	45E			5.421	137.7
6-5/8	168.3	24-32	45F	1.978	50.2	5.499	139.7
		24	47A2			5.671	144.0
		17-24	45G			5.796	147.2
		17-20	47A4			5.827	148.0
7	177.8	38	47A2	2.441	62.0	5.671	144.0
		32-35	47A4			5.827	148.0
		26-29	47B2			5.983	152.0
		23-26	47B4			6.093	154.8
		17-20	47C2			6.281	159.5
7-5/8	193.7	33.7-39	47C4	2.441	62.0	6.468	164.3
		24-29.7	47D2			6.687	169.9
		20-24	47D4			6.827	173.4
8-5/8	219.1	44-49	49A2	3.500	88.9	7.327	186.1
		32-40	49A4			7.546	191.7
		20-28	49B			7.796	198.0
9-5/8	244.5	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

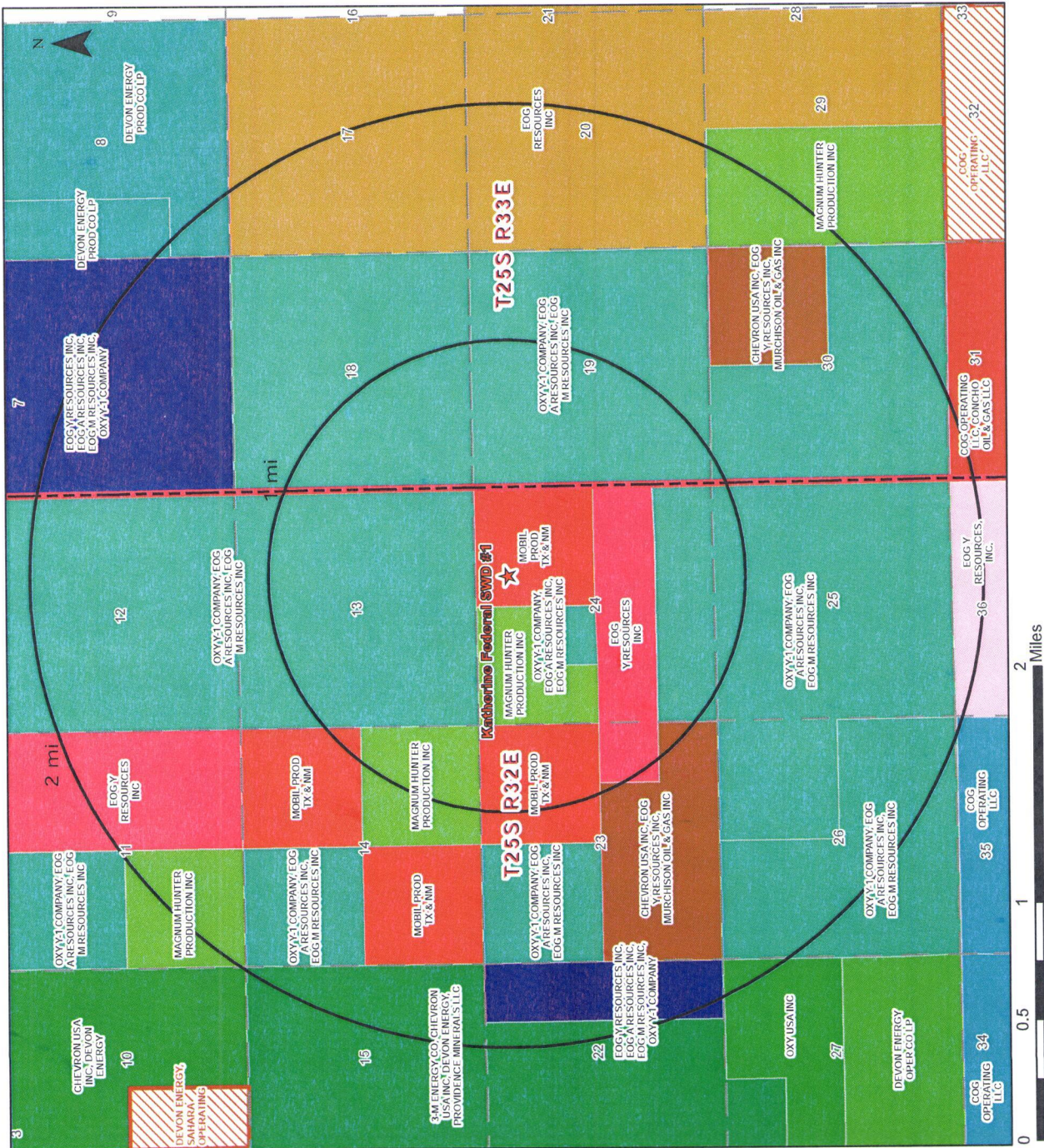


Prepared for: Vista Disposal Solutions, LLC

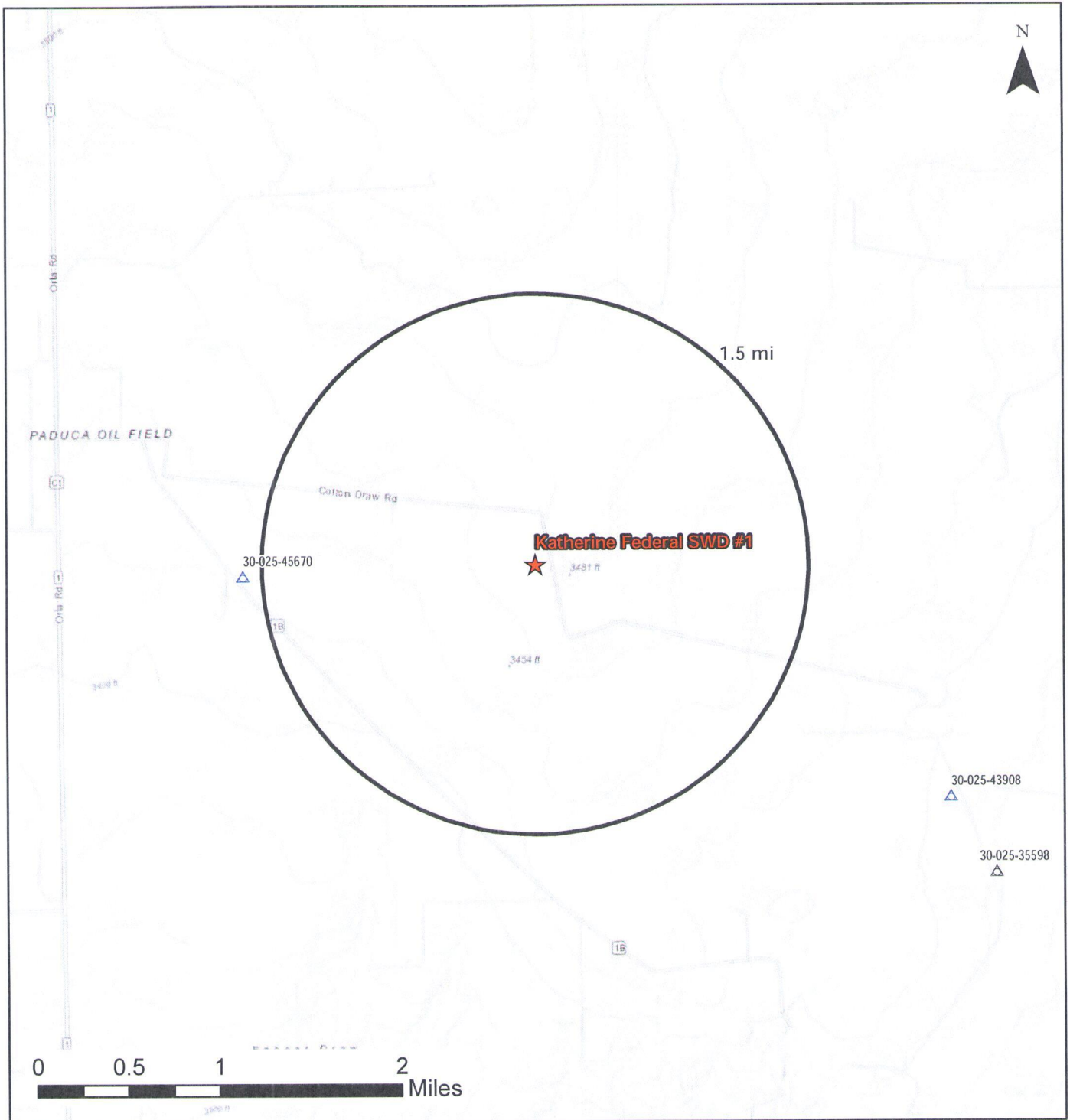
Prepared by: ALL CONSULTING

Legend

- ★ Proposed SWD
- Private Mineral Leases
- BLM Mineral Leases
- 3-M ENERGY CO, CHEVRON USA INC, DEVON ENERGY, PROVIDENCE MINERALS LLC
- CHEVRON USA INC, DEVON ENERGY
- CHEVRON USA INC, EOG Y RESOURCES INC, MURCHISON OIL & GAS INC
- COG OPERATING LLC
- COG OPERATING LLC, CONCHO OIL & GAS LLC
- DEVON ENERGY OPER CO LP
- DEVON ENERGY PROD CO LP
- EOG RESOURCES INC
- EOG Y RESOURCES INC
- EOG Y RESOURCES INC, EOG A RESOURCES INC, EOG M RESOURCES INC, OXY Y-1 COMPANY
- MAGNUM HUNTER PRODUCTION INC
- MOBIL PROD TX & NM
- OXY USA INC
- OXY Y-1 COMPANY, EOG A RESOURCES INC, EOG M RESOURCES INC
- NMSLO Mineral Leases
- EOG Y RESOURCES, INC.



Mineral Lease Area of Review		
Katherine 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: ALL CONSULTING



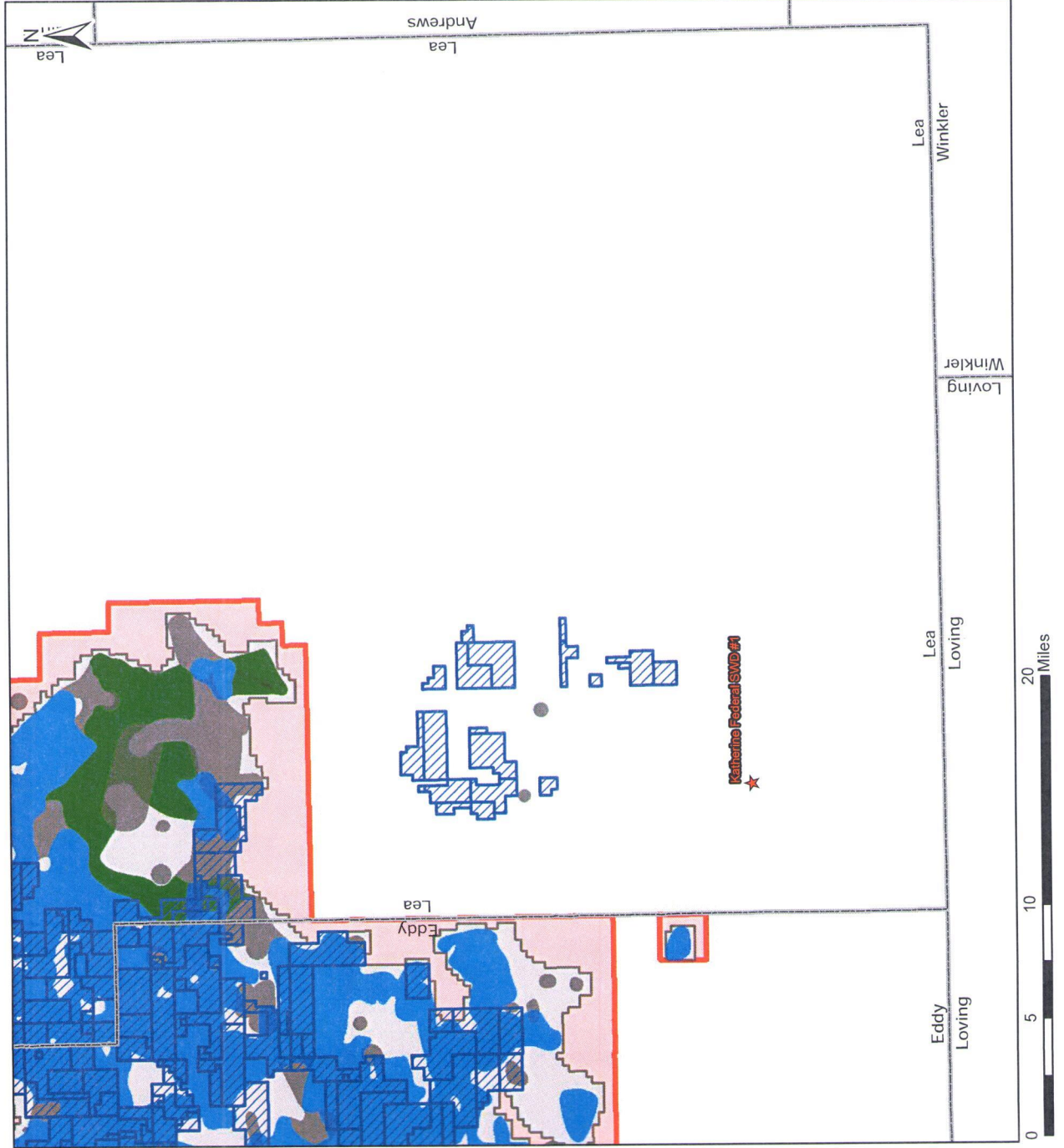
Katherine Federal SWD #1 Deep SWDs AOR		
Proj Mgr: Dan Arthur	Jul 9, 2019	Mapped by: Ben Bockelmann
Prepared for: Vista Disposal Solutions, LLC		
Prepared by: ALLCONSULTING		

Legend







- ★ Proposed SWD Devonian/Silurian SWDs
- △ Salt Water Injection, Active (2)
- △ Salt Water Injection, New (2)


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 Katherine Federal SWD #1 (Top of Injection Interval: 17,720')							
Well Name	API#	Well Type	Operator	Spud Date	Location (Sec., Tn., Rng.)	Total Vertical Depth (feet)	Penetrate Inj. Zone?
FUGGLES 14 FEDERAL COM #001H	30-025-42302	O	CIMAREX ENERGY CO.	Not drilled	P-14-25S-32E	Proposed (9,457)	No
PADUCA AIG FED. #001	30-025-30387	Plugged	DEVON ENERGY PRODUCTION COMPANY, LP	5/26/1988	I-23-25S-32E	Plugged (16,131)	No
AUDACIOUS 19 FEDERAL #721H	30-025-45039	O	EOG RESOURCES INC	8/26/2018	3-19-25S-33E	12,654	No
AUDACIOUS 19 FEDERAL #706H	30-025-45042	O	EOG RESOURCES INC	Not drilled	K-19-25S-33E	Proposed (12,317)	No
AUDACIOUS 19 FEDERAL #709H	30-025-45045	O	EOG RESOURCES INC	9/6/2018	K-19-25S-33E	12,311	No
AUDACIOUS 19 FEDERAL #707H	30-025-45043	O	EOG RESOURCES INC	Not drilled	K-19-25S-33E	Proposed (12,312)	No
AUDACIOUS 19 FEDERAL #710H	30-025-45046	O	EOG RESOURCES INC	8/27/2018	3-19-25S-33E	12,333	No
RESOLUTE BTO FEDERAL COM #002H	30-025-41452	O	EOG RESOURCES INC	10/18/2015	G-24-25S-32E	9,209	No
AUDACIOUS 19 FEDERAL #722H	30-025-45040	O	EOG RESOURCES INC	9/7/2018	K-19-25S-33E	12,640	No
AUDACIOUS 19 FEDERAL #603H	30-025-45041	O	EOG RESOURCES INC	Not drilled	K-19-25S-33E	Proposed (12,145)	No
AUDACIOUS 19 FEDERAL #708H	30-025-45044	O	EOG RESOURCES INC	9/1/2018	K-19-25S-33E	12,327	No
PADUCA UNIT #002	30-025-28928	Plugged	EOG Y RESOURCES, INC.	11/19/1984	A-23-25S-32E	Plugged (5,000)	No
FEDERAL O #001	30-025-22137	O	JKM ENERGY, LLC	5/24/1967	P-14-25S-32E	4,904	No
PRE-ONGARD WELL #001	30-025-08384	Plugged	PRE-ONGARD WELL OPERATOR (Robert B. Holt & Texas Crude Oil Co.)	4/19/1961	3-19-25S-33E	Plugged (5,023)	No
PRE-ONGARD WELL #002	30-025-22430	Plugged	PRE-ONGARD WELL OPERATOR (Joseph I O'Neill, Jr.)	2/13/1968	I-14-25S-32E	Plugged (4,896)	No
PRE-ONGARD WELL #001	30-025-23584	Plugged	PRE-ONGARD WELL OPERATOR (Patoil Corporation)	11/9/1970	N-13-25S-32E	Plugged (4,957)	No
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		
Katherine 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: 

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	Lee	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	18.04		
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		
					Aluminum:				
Carbon Dioxide:	0.50 PPM	Hydrogen Sulfide:		0 PPM	Chromium:				
Oxygen:		pH at time of sampling:		7	Copper:				
Comments:		pH at time of analysis:			Lead:				
		pH used in Calculation:		7	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	Figms	County	State	Company	Field	Formation	Tds_mgl	Chloride_mgl	Bicarbonate_mgl	Sulfate_mgl
STATE B COM #001	3002509716	-103.2212524	36 24S	36E	C	600N	1880W	LEA	NM	NM	CUSTER	DEVONIAN	DEVONIAN	176234	107400	128	1004
FARNSWORTH FEDERAL #006	3002511950	-103.162468	4 26S	37E	A	660N	990E	LEA	NM	NM	CROSBY	DEVONIAN	DEVONIAN	315931	20450	302	591
ARNOTT RAMSAY NCT-B #003	3002511863	-103.1784439	32 25S	37E	A	660N	660E	LEA	NM	NM	CROSBY	DEVONIAN	DEVONIAN	100382		476	
ARNOTT RAMSAY NCT-B #003	3002511863	-103.1784439	32 25S	37E	A	660N	660E	LEA	NM	NM	CROSBY	DEVONIAN	DEVONIAN	158761			
COPPER MOUNT	3002511818	-103.056723	28 25S	37E	J	103S	1056723	1981E	LEA	NM	CROSBY	DEVONIAN	DEVONIAN	27506	15270	1089	1079
STATE NJ A #001	3002511398	-103.1273346	2 25S	37E	A	663N	660E	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	105350	59300	660	4950
WESTATES FEDERAL #004	3002511389	-103.1241226	1 25S	37E	E	1980N	330W	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	80880	46200	340	3050
WESTATES FEDERAL #004	3002511389	-103.1241226	1 25S	37E	E	1980N	330W	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	84900	48600	840	2650
WESTATES FEDERAL #004	3002511389	-103.1241226	1 25S	37E	E	1980N	330W	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	72200	41000	370	2950
WESTATES FEDERAL #004	3002511389	-103.1241226	1 25S	37E	E	1980N	330W	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	80900	46200	340	3050
WESTATES FEDERAL #004	3002511389	-103.1241226	1 25S	37E	E	1980N	330W	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	77600	44000	550	3240
WESTATES FEDERAL #004	3002511389	-103.1241226	1 25S	37E	E	1980N	330W	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	135000	77000	650	5810
WESTATES FEDERAL #004	3002511389	-103.1241226	1 25S	37E	E	1980N	330W	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	114000	65000	280	5110
WESTATES FEDERAL #004	3002511389	-103.1241226	1 25S	37E	E	1980N	330W	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	135000	77000	500	5320
WESTATES FEDERAL #008	3002511393	-103.1241226	1 25S	37E	E	1620N	330W	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	91058	51020	376	4783
WESTATES FEDERAL #008	3002511393	-103.1241226	1 25S	37E	E	1620N	330W	LEA	NM	NM	JUSTIS	JUSTIS NORTH	FUSSELMAN	86847	50450	363	2544
STATE V #009	3002511777	-103.1119434	25 25S	37E	A	990N	990E	LEA	NM	NM	JUSTIS	JUSTIS	FUSSELMAN	219570	129000	990	4630
STATE V #009	3002511777	-103.1119434	25 25S	37E	A	990N	990E	LEA	NM	NM	JUSTIS	JUSTIS	FUSSELMAN	163430	96000	290	3780
SOUTH JUSTIS UNIT #023C	3002511760	-103.1184616	25 25S	37E	C	660N	2080W	LEA	NM	NM	JUSTIS	JUSTIS	FUSSELMAN	63817	35870	960	3442
CARLSON A #002	3002511764	-103.1113434	25 25S	37E	I	2310S	990E	LEA	NM	NM	JUSTIS	JUSTIS	FUSSELMAN	208280	124000	510	3400
CARLSON B 25 #004	3002511784	-103.1113434	25 25S	37E	P	990S	990E	LEA	NM	NM	JUSTIS	JUSTIS	FUSSELMAN	184030	112900	58	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

Katherine Federal SWD #1
Lea County, New Mexico

Proj Mgr:
Dan Arthur

August 05, 2019

Mapped by:
Ben Bockelmann

Prepared by:

ALL CONSULTING

Water Well Sampling Rationale						
Vista Disposal Solutions, LLC - Katherine 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 Katherine 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 Katherine 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 707 FNL & 1,992 FEL of Section 24, in T25-S and R32-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 10.8 miles northeast 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 1.6 miles to the west (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 7.9 miles east 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 Katherine Federal SWD #1
July 16, 2019

Exhibits

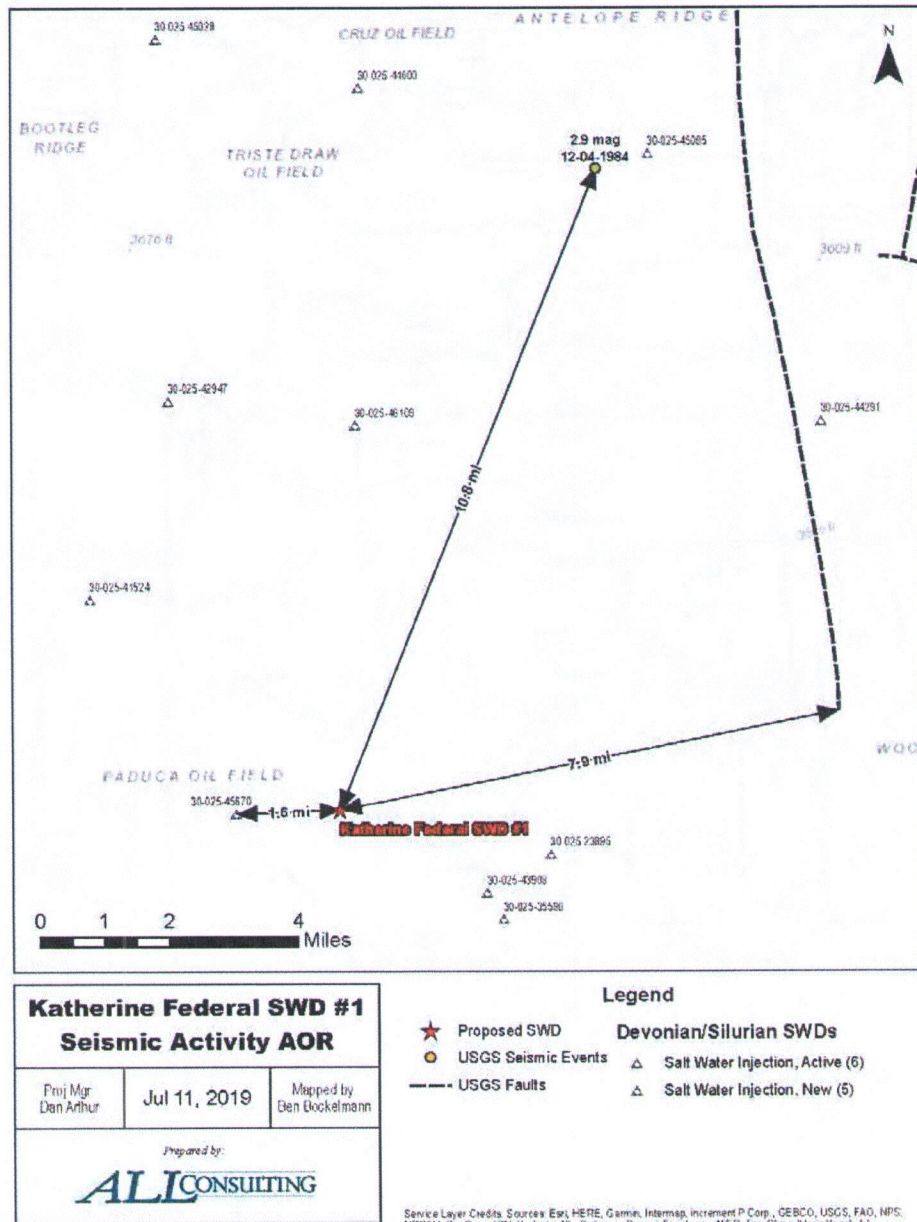


Exhibit 1. Map Showing the Distances from Known and Inferred Faults, Seismic Event, and Closest Deep Injection Well

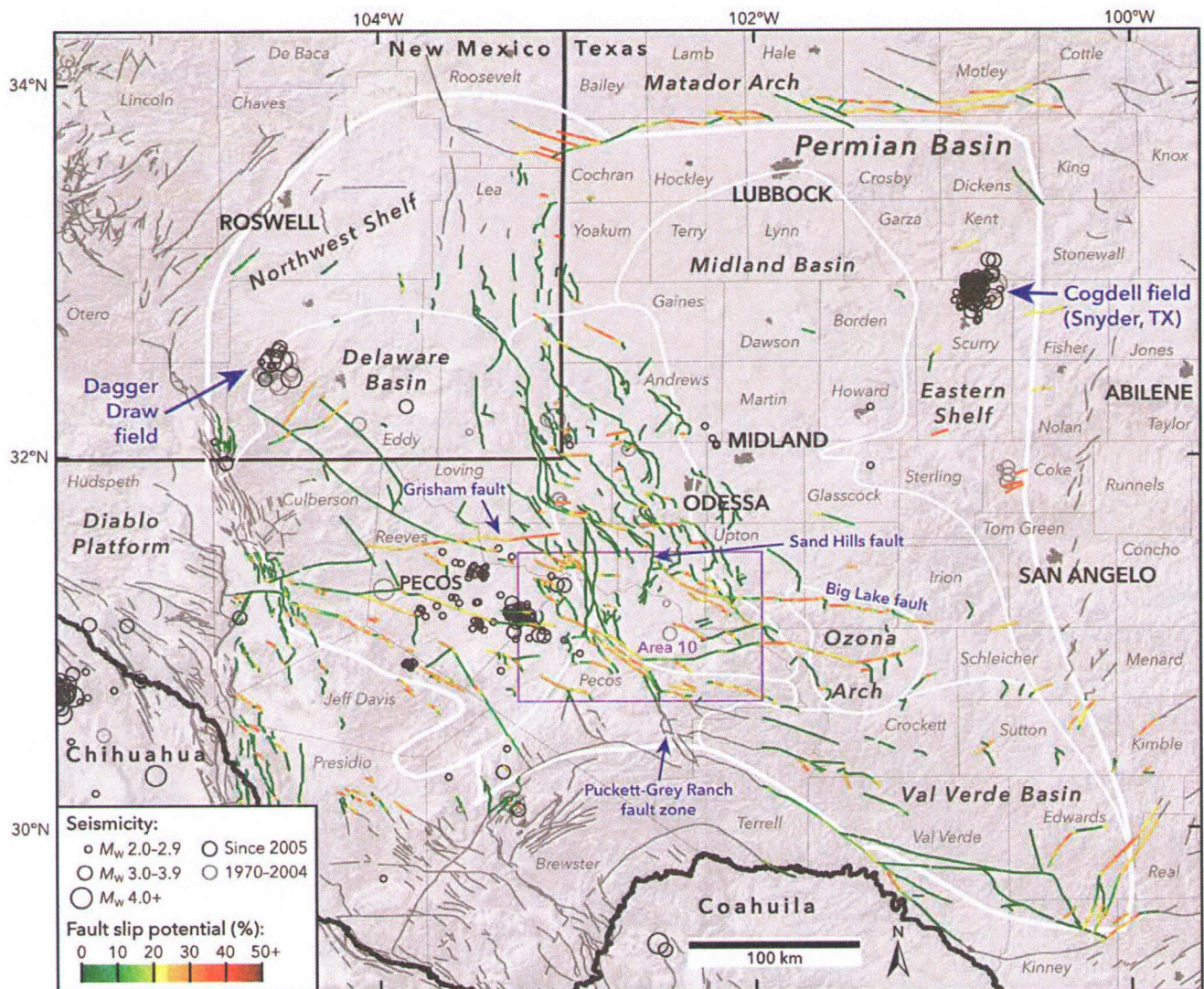


Exhibit 2. Results of the Snee and Zoback (2018) Probabilistic FSP Analysis Across the Permian Basin

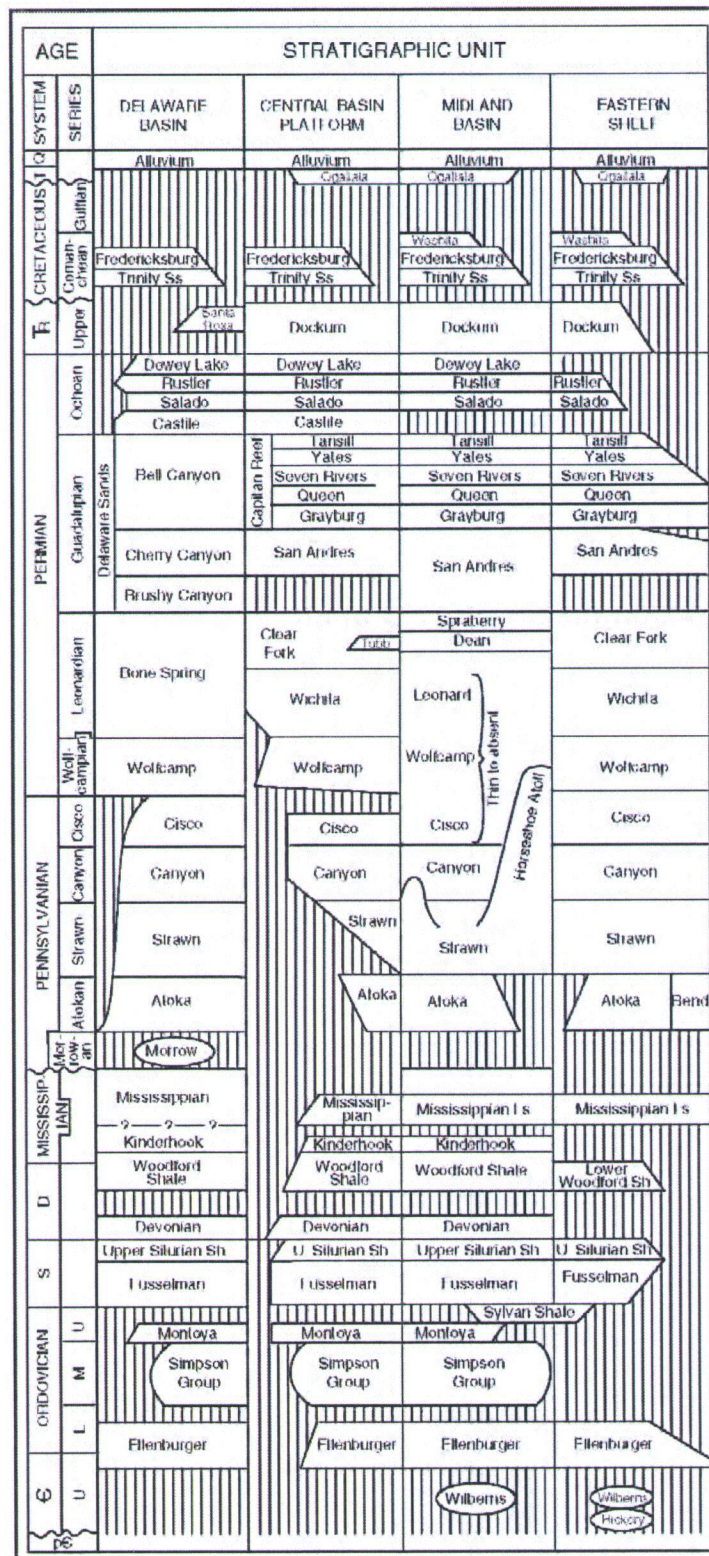


Exhibit 3. Delaware Basin Stratigraphic Chart (Ball 1995)

Attachment 7

Public Notice Affidavit and Notice of Application Confirmations

Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

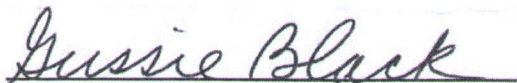
I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

Beginning with the issue dated
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and ending with the issue dated
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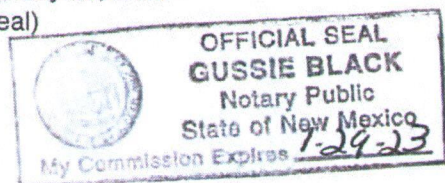
Sworn and subscribed to before me this
6th day of July 2019.



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 NOTICE JULY 6, 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: Katherine Federal SWD #1
NW 1/4 NE 1/4, Section 24, Township 25S, Range 32E
707' FNL & 1,992' FEL
Lea County, NM

NAME AND DEPTH OF DISPOSAL ZONE: Devonian - Silurian (17,720' - 19,000')

EXPECTED MAXIMUM INJECTION RATE: 30,000 Bbls/day

EXPECTED MAXIMUM INJECTION PRESSURE: 3,544 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 Allemen at 918-382-7581.
#34407

67115320

00230515

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

Katherine 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
Cimarex Energy Co.	600 N. Marienfield St. Suite 600	Midland	TX	79701
EOG A Resources, Inc. (EOG A RESOURCES INC)	P.O. Box 900	Artesia	NM	88211
EOG M Resources, Inc. (EOG M RESOURCES INC)	P.O. Box 840	Artesia	NM	88211
EOG Resources, Inc. (EOG RESOURCES INC)	104 S. 4th Street	Artesia	NM	88210
EOG Y Resources, Inc. (EOG Y RESOURCES INC)	104 S. 4th Street	Artesia	NM	88210
JKM Energy, LLC	26 E Compress Road	Artesia	NM	88210
Magnum Hunter Production, Inc. (MAGNUM HUNTER PRODUCTION INC)	202 S. Cheyenne Ave., Suite 1000	Tulsa	OK	74103
Mobil Producing Texas & New Mexico (MOBIL PROD TX & NM)	P.O. Box 1760	Denver City	TX	79323
Murchison Oil & Gas Inc. (MURCHISON OIL & GAS INC)	7250 Dallas Parkway, Suite 1400	Plano	TX	75024
OXY-1 Company	P.O. Box 27570	Houston	TX	77227
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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Midland TX 79701-4405

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Artesia NM 88211-0900

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EOG Resources, Inc.
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Artesia NM 88210-2123

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Carlsbad NM 88220-6292

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