Initial

Application

Part I

Received: 06/24/2022

June 20, 2022

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

Subject: Waterbridge Stateline, LLC – Long Shot SWD # 1
Application for Authorization to Inject

To Whom It May Concern,

On behalf of Waterbridge Stateline, LLC (Waterbridge) ALL Consulting, LLC (ALL) is submitting the enclosed Application for Authorization to Inject for the Long Shot SWD #1, a proposed salt water disposal well, in Eddy County, NM.

Should you have any questions regarding the enclosed application, please contact Nate Alleman at (918) 382-7581 or nalleman@all-llc.com.

Sincerely,

ALL Consulting

Nate Alleman

Sr. Regulatory Specialist

RECEIVED:	06/24/2022	REVIEWER:	TYPE:	SWD	APP NO:	pJZT2218739005

ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

NEW MEXICO OIL CONSERVATION DIVISION
- Geological & Engineering Bureau –
1220 South St. Francis Drive, Santa Fe, NM 87505



1220 South St. Francis Drive, Sa	inta Fe, NM 87505
ADMINISTRATIVE APPLICA	ATION CHECKLIST
THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APF REGULATIONS WHICH REQUIRE PROCESSING AT	
Applicant: Waterbridge Stateline, LLC	OGRID Number: <u>330129</u>
Well Name: <u>Long Shot SWD #1</u> Pool: SWD; Cisco	API: Pending Pool Code: 96099
Ooi. <u>9000, Cisco</u>	1 001 00dc. <u>70077</u>
SUBMIT ACCURATE AND COMPLETE INFORMATION REC INDICATED B	
1) TYPE OF APPLICATION: Check those which apply for	[A] SWD-2494
A. Location – Spacing Unit – Simultaneous Dedica	
■ NSL ■ NSP(project area)	NSP(proration unit) SD
B. Check one only for [I] or [II]	
[1] Commingling – Storage – Measurement	
[] Injection – Disposal – Pressure Increase – Ei □ WFX □ PMX SWD □ IPI	TEOR PPR
	FOR OCD ONLY
2) NOTIFICATION REQUIRED TO: Check those which ap	ply. Notice Complete
A. X Offset operators or lease holders B. Royalty, overriding royalty owners, revenue	
C. Application requires published notice	Application Content
D. X Notification and/or concurrent approval by	SLO Complete
E. X Notification and/or concurrent approval by	BLM
F. X Surface owner G.X For all of the above, proof of notification or	publication is attached, and/or.
H. No notice required	, , , , , , , , , , , , , , , , , , , ,
2) CERTIFIC ATION. I be a law a cartiful that the diaforms of an arms of a management of the control of the con	
 CERTIFICATION: I hereby certify that the information administrative approval is accurate and complete t 	1 1
understand that no action will be taken on this app	
notifications are submitted to the Division.	
Note: Statement must be completed by an individual	with managerial and/or supervisory capacity.
	6-20-2022
Nathan Alleman	Date
Print or Type Name	010 200 7501
1	918-382-7581 Phone Number
Alt. Allema	
/Volum / I/Warman	Nalleman@all-llc.com
Signature	e-mail Address

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

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

FORM C-108 Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I.	PURPOSE: Secondary Recovery Pressure Maintenance X Disposal Storage Application qualifies for administrative approval? Yes No
II.	OPERATOR: Waterbridge Stateline, LLC
	ADDRESS: 5555 San Felipe, Suite 1200, Houston, TX 77056
	CONTACT PARTY: Nathan 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?YesNo If yes, give the Division order number authorizing the project:No
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:
	 Proposed average and maximum daily rate and volume of fluids to be injected; Whether the system is open or closed; Proposed average and maximum injection pressure; Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and, 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: Nathan Alleman TITLE: Regulatory Specialist - Consultant
	SIGNATURE: DATE: 06-20-2022
XV.	E-MAIL ADDRESS: Nalleman@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: Long Shot SWD #1

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: Long Shot SWD #1 Location Footage Calls: 812 FSL & 2,220 FEL Legal Location: Unit Letter O, S18 T20S R27E

Ground Elevation: 3,308'

Proposed Injection Interval: 8,320' - 8,995'

County: Eddy

(2) Casing Information:

Туре	Hole Size	Casing Size	Casing Weight	Setting Depth	Sacks of Cement	Estimated TOC	Method Determined
Surface	26"	20"	94.0 lb/ft	400'	420	Surface	Circulation
Intermediate 1	17-1/2"	13-3/8"	61.0 & 54.5 lb/ft	2,520'	1,840	Surface	Circulation
Production Casing	12-1/2"	9-5/8"	53.5 lb/ft	9,300′	2,225	2,300′	CBL
Tubing	N/A	5-1/2"	20.0 lb/ft	8,300'	N/A	N/A	N/A

DV Tool set at: 5,800'

(3) Tubing Information:

5-1/2" (20.0 lb/ft) of ceramic-coated tubing with setting depth of 8,300'

(4) Packer Information: Baker Hughes Hornet or equivalent packer set at 8,300'

В.

(1) Injection Formation Name: Cisco

Pool Name: SWD; Cisco **Pool Code:** 96099

- (2) Injection Interval: Perforated injection between 8,320′ 8,995′
- (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.
 - Queen (730')
 - Bone Spring (2,485')
 - Wolfcamp (7,810)

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

Strawn (8,995')

V – Well and Lease Maps

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

- 2-mile Oil & Gas Well Map
- 1/2-mile Well Detail List
- Penetrating Wellbore Diagrams (Plugged Wells)
- 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 wells within the 1/2-mile AOR is included in **Attachment 2**.

There are two wells that penetrates the injection zone, both have been properly cased and cemented to isolate the injection zone. Wellbore diagrams and casing information for these wells are also included in **Attachment 2**.

VII – Proposed Operation

- (1) Proposed Maximum Injection Rate: 30,000 bpd Proposed Average Injection Rate: 17,500 bpd
- (2) A closed system will be used.
- (3) Proposed Maximum Injection Pressure: 1,664 psi (surface)
 Proposed Average Injection Pressure: approximately 1,248 psi (surface)
- (4) Source Water Analysis: It is expected that the injectate will consist of produced water from production wells completed in the Delaware, Wolfcamp and Bone Spring 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 Cisco formation which is a non-productive zone known to be compatible with formation water from the Delaware, Wolfcamp and Bone Spring formations. Water analyses from the Cisco formation in the area are included in *Attachment 4*.

VIII – Geologic Description

The proposed injection interval includes the Cisco formation from 8,320-8,995 feet. This formation consists of interbedded carbonate rocks including dolomites and limestones. Several thick intervals of porous and permeable carbonate rock capable of taking water are present within the subject formation in the area.

The freshwater formation is the Yates at a depth of approximately 375 feet. Water well depths in the area range from approximately 50 - 210 feet below ground surface.

Additional geology information can be found in the hydrologic connection statement included in **Attachment 7**

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, 2 groundwater wells are located within 1-mile of the proposed SWD location; however, state water well data and conversations with water well owners has revealed that only 1 of the water wells are currently in use. A water samples was collected on April 27th, 2022.

A water well map, details of water wells within 1-mile, and any associated water analyses are 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 signed No Hydrologic Connection Statement is included in Attachment 7.

XIII – Proof of Notice

A Public Notice was filed with the Carlsbad Current-Argus newspaper and an affidavit is included in **Attachment 6**.

A copy of the application was mailed to the OCD District Office, landowner, and leasehold operators within 1/2-mile of the proposed SWD location. A list of the recipients, as well as delivery confirmations, are included in **Attachment 8**.

Karst Analysis

In addition to the information formally requested as part of the C-108 application, ALL Consulting has included a Karst analysis in **Attachment 6** to address the identified concerns of permitting an SWD in a high-risk Karst area.

Attachment 1:

- C-102
- Wellbore Diagram

Attachment 2: Area of Review Information:

- 2-mile Oil & Gas Well Map
- 1/2-Mile Well Detail List
- Penetrating Wellbore Diagram (Plugged Wells)
- 2-mile Lease Map
- 2-mile Mineral Ownership Map
- 2-mile Surface Ownership Map
- Potash Lease Map

Attachment 3: Source Water Analyses

Attachment 4: Injection Formation Water Analyses

Attachment 5: Water Well Map and Well Data

Attachment 6: Karst Analysis

Attachment 7: No Hydrologic Connection Statement

Attachment 8: Public Notice Affidavit and Notice of Application Confirmations

- C-102
- Wellbore Diagram

District I 1625 N. French Dr., Hobbs, NM 88240

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

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

☐ AMENDED REPORT

Phone: (575) 393-6161 Fax: (575) 393-0720 District II 811 S. First St., Artesia, NM 88210 Phone: (575) 748-1283 Fax: (575) 748-9720 District III 1000 Rio Brazos Road, Aztec, NM 87410 Phone: (505) 334-6178 Fax: (505) 334-6170 District IV

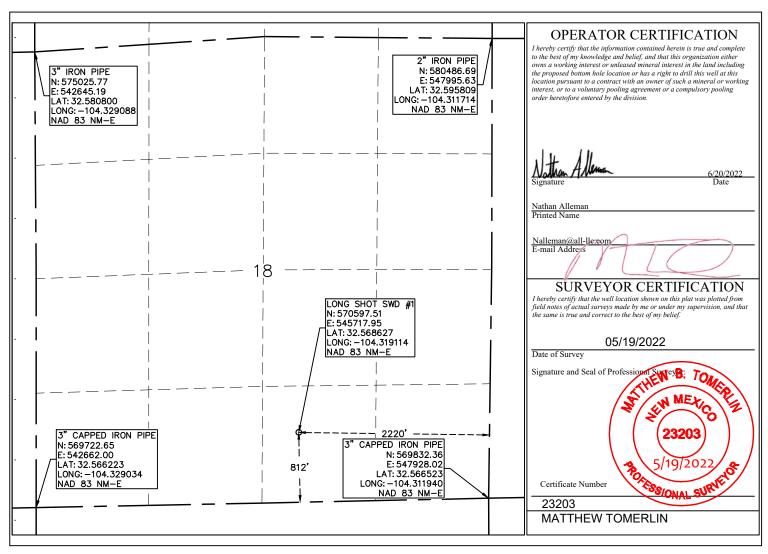
1220 S. St. Francis Dr., Santa Fe, NM 87505 Phone: (505) 476-3460 Fax: (505) 476-3462

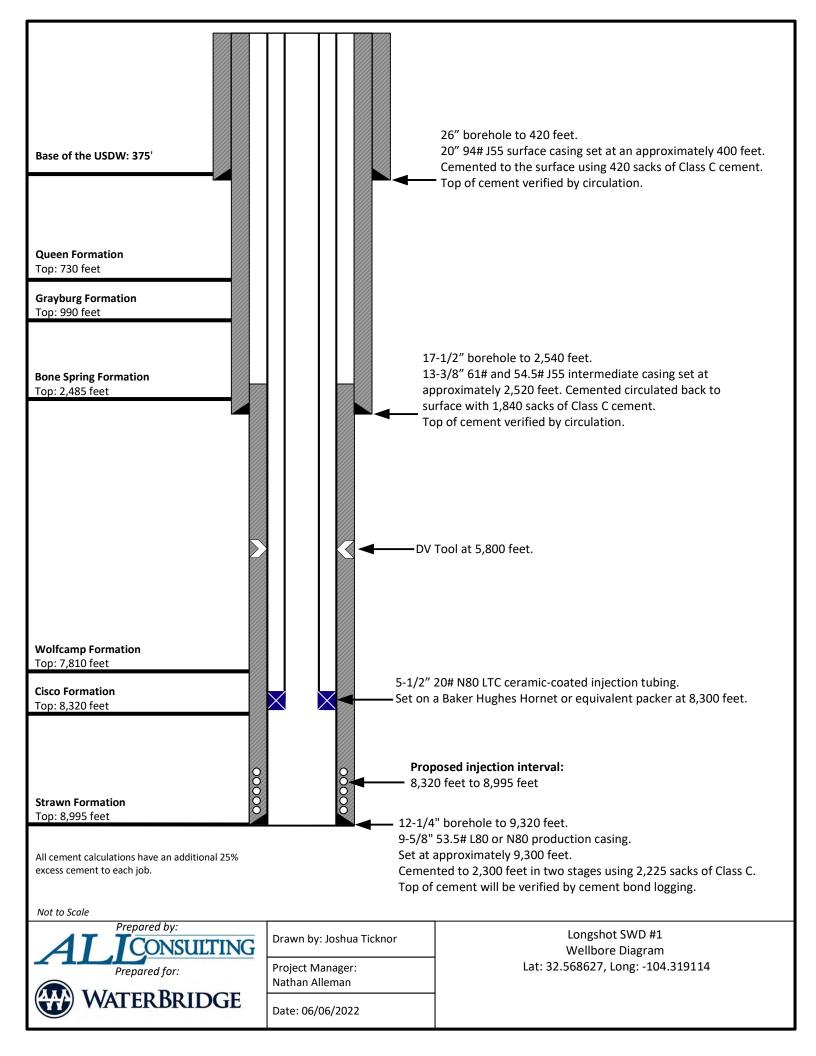
WELL LOCATION AND ACREAGE DEDICATION PLAT

Santa Fe, NM 87505

API	Number			Pool Code			Pool Name		
				96099			SWD; CISCO		
Property Co	ode		•		Property Name			Well Nu	mber
				l	ONG SHOT SW	/D		1	
OGRID No	Э.			Elevat	ion				
330129	9			WATI	ERBRIDGE STA	TELINE		33	308'
UL or lot no.	Section	Township	Range	Feet from the	East/West line	County			
0	18	20 S	27 E		812'	SOUTH	2220'	EAST	EDDY
			Bot	tom Hole	Location If Dif	ferent From Surfa	ice		
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
Dedicated Acres	Joint or	Infill	Consolidation Co						
2.812									
	•								

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.





HORNET Packer

Product Family No. H64682

HORNET EL Packer

Product Family No. H64683

APPLICATION

The mechanically set HORNET™ packer offers ease of operation with quarter-turn right to set and release. Converting it for wireline-setting applications is simple and inexpensive. The HORNET packer provides for landing in compression, tension, or neutral positions. Every component from the jay track, to the internal bypass, to the packing-element system and the upper slip assembly has been developed to ensure the HORNET's setting and releasing reliability.

The HORNET EL packer is run and set on electric line using an E- 4^{TM} (Product Family No. H43702) with a slow-set power charge or a J^{TM} setting tool (Product Family No. H41371) and a special wireline adapter kit. An L- 10^{TM} type on/off seal nipple is run on top of the packer to connect the tubing to the packer and to house a blanking plug when the packer is used as a temporary bridge plug.

Advantages

Upper Slip Assembly:

- Thoroughly tested across API minimum to maximum casing ID tolerances for each specified casing weight, for setting and releasing reliability
- Slip-wicker configuration providing bidirectional-load support with solid upper cone to support highest tensile loads
- Staged-release action eliminates high-overpull requirement
- Minimal set-down weight required to anchor slips

Internal Bypass Seal:

- Durable bypass seal design provides sealing after unloading, under differential pressures
- No O-ring sealing system

Packing Element System:

- Fully tested to combined ratings at the API's maximum ID tolerance
- Patented enhancements to control overboost
- High-performance, three-piece element system

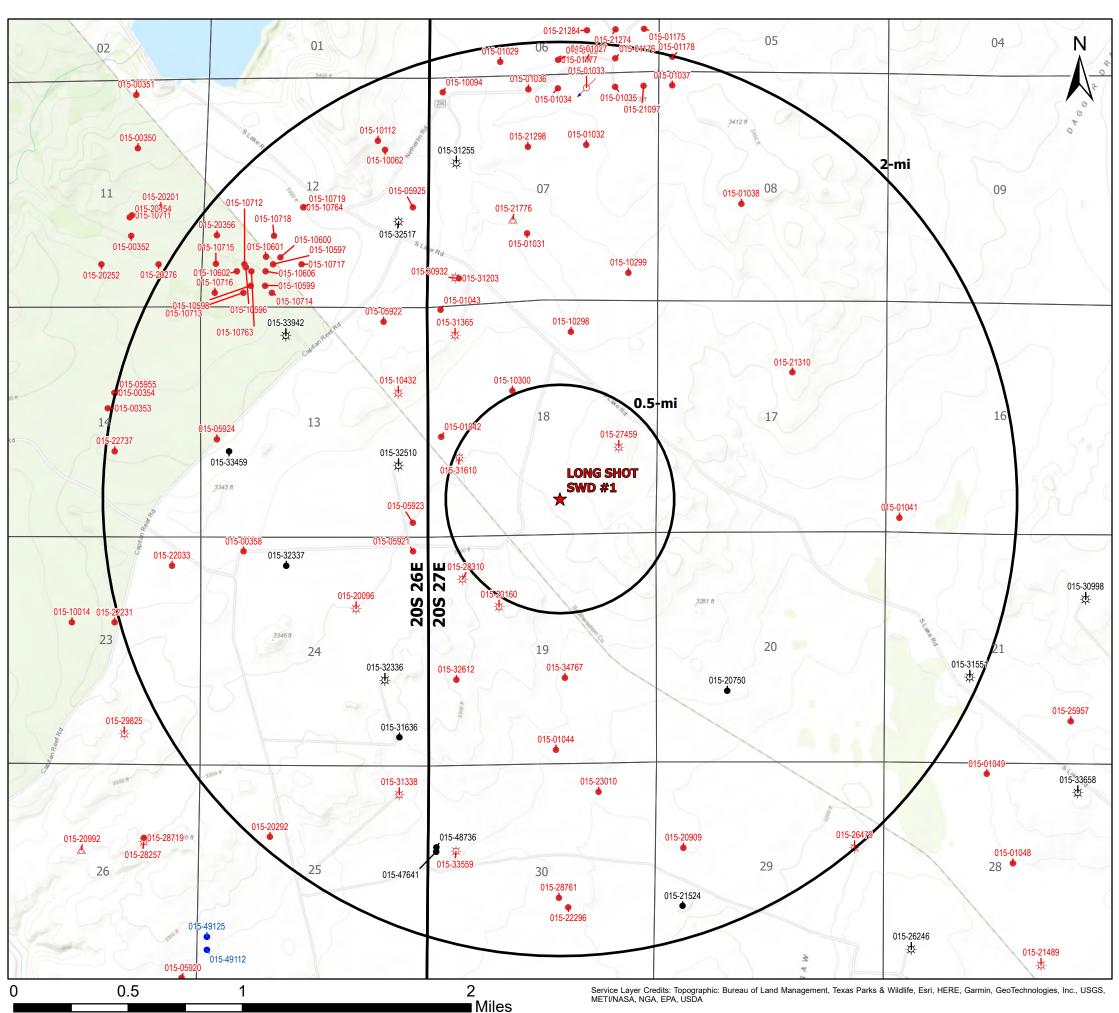
Lower Slip and Jay Assembly:

- Slips and drag blocks tested to maximum API tolerance ID for positive set and ease of release
- One-quarter-turn right setting and releasing action
- Packoff of packing elements with applied tension or compression
- Spacing in jay ensures opening of internal bypass, before slip releasing action begins—important to both ease of release and safety
- Automatically returns to running position



Area of Review Information:

- 2-mile Oil & Gas Well Map
- 1/2-Mile Well Detail List
- Penetrating Wellbore Diagram (Plugged Wells)
- 2-mile Lease Map
- 2-mile Mineral Ownership Map
- 2-mile Surface Ownership Map
- Potash Lease Map



Legend

- ★ Proposed SWD
- ⇔ Gas, Active (9)
- Gas, Plugged (14)
- ✓ Injection, Plugged (1)
- Oil, Active (7)
- Oil, New (2)
- Oil, Plugged (83)
- △ Salt Water Injection, Plugged (2)

Source Info: NMOCD O&G Wells updated 5/10/2022 (https://www.emnrd.nm.gov/ocd/ocd-data/ftp-server/l)



	AOR Tabulation for Long Shot SWD #1 (Top of Injection Interval: 8,320')														
Well Name	API#	Well Type	Operator	Spud Date	Location (Sec., Tn., Rng.)	Total Vertical Depth (feet)	Penetrate Inj. Zone?								
DAVIS 18 #002	30-015-31610	Plugged	OXY USA INC	2/15/2001	L-18-20S-27E	Plugged (10,550)	Yes								
KANSAS CITY SINGER 18 #001	30-015-27459	Plugged	SANTA FE ENERGY OPERATING PARTNERS L P	6/18/1993	I-18-20S-27E	Plugged (10,665)	Yes								
Notes: Both popotrating walls have been properly p	ugged and aband	anad ta isalata tha	Cisso formation												

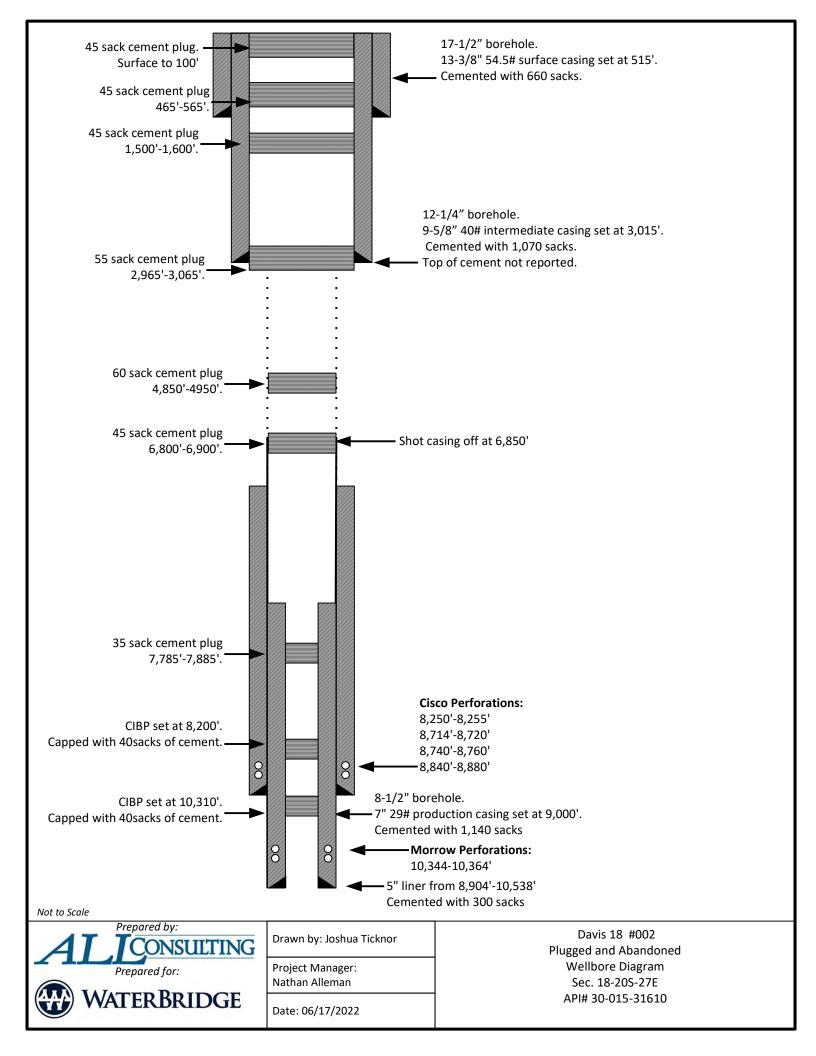
Notes: Both penetrating wells have been properly plugged and abandoned to isolate the Cisco formation.

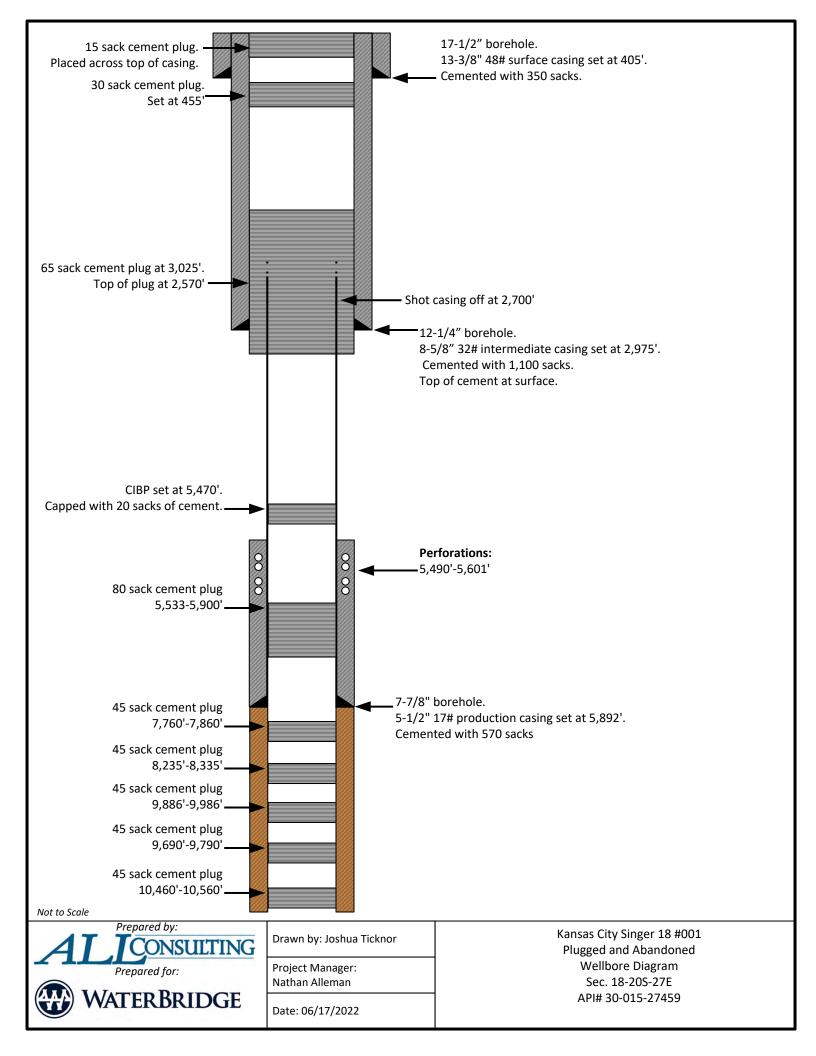
Ca	Casing Information for Wells Penetrating the Long Shot SWD #1 Injection Zone														
Well News	Well Name Surface Casing														
weii Name	Set Depth	Casing Size	TOC	TOC Method Determined	Sks of Cement	Hole size									
DAVIS 18 #002	515'	13-3/8"	Surface	Circulation	660	17-1/2"									
KANSAS CITY SINGER 18 #001	405'	13-3/8"	Surface	Circulation	350	17-1/2"									

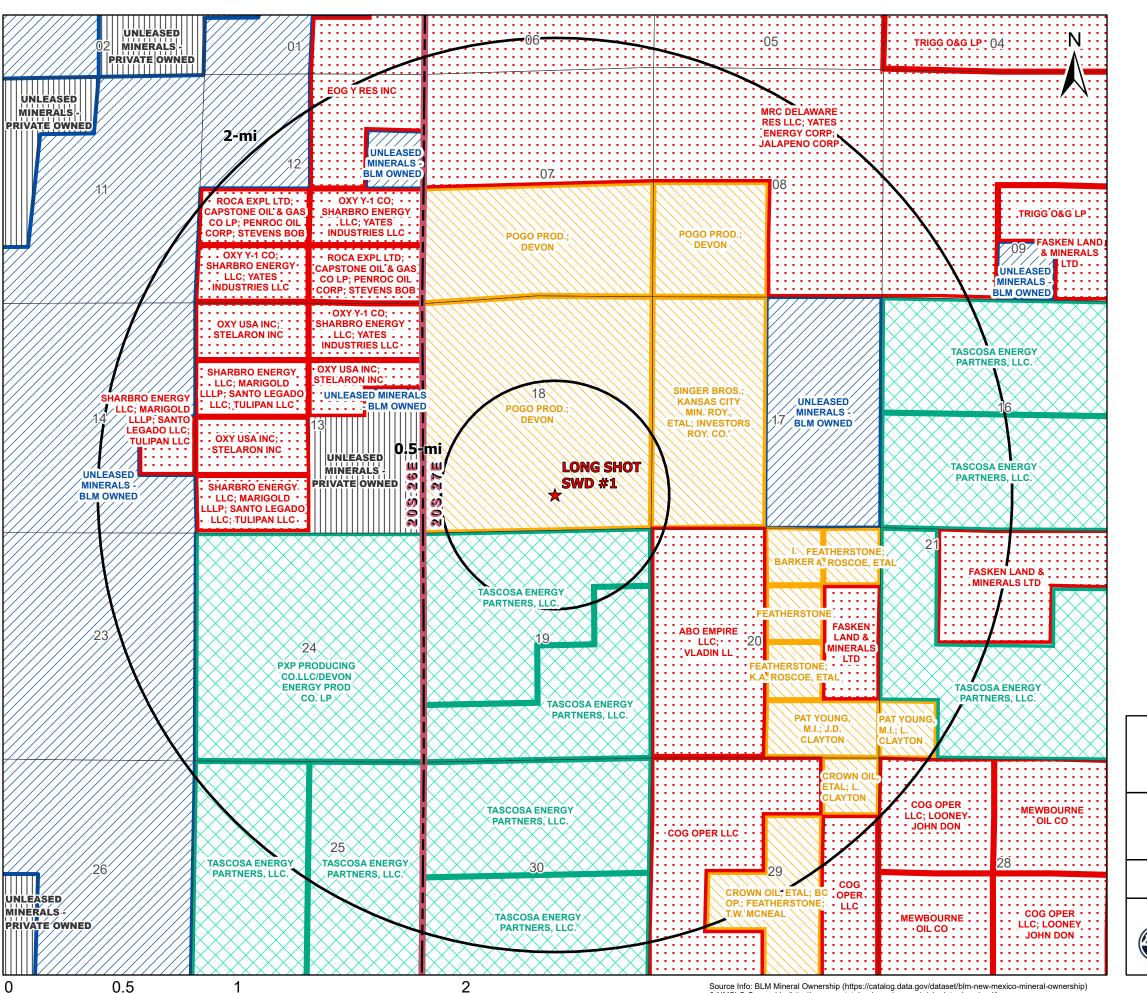
Well Name	Intermediate Casing												
vven name	Set Depth	Casing Size	Size TOC TOC Method Determined		Sks of Cement	Hole Size							
DAVIS 18 #002	3,015'	9-5/8"	Not Reported	Not Reported	1,070	12-1/4"							
KANSAS CITY SINGER 18 #001	2,975'	8-5/8"	Surface	Circulation	1,100	12-1/4"							

Well Name		Production Casing												
vven name	Set Depth	Casing Size	TOC	TOC Method Determined	Sks of Cement	Hole Size								
DAVIS 18 #002	9,000'	7"	9,950'	CBL	1,140	8-1/2"								
KANSAS CITY SINGER 18 #001	5,872'	5-1/2"	4,921'	Calculated	570	7-7/8"								

Well Name			Packer				
well Name	Set Depth	Tubing/liner Size	Lining/tubing Material	Sks of Cement	Packer Type	Packer Set Depth	
DAVIS 18 #002	8,904' - 10,538'	5"	Unlisted	300	N/A	N/A	
KANSAS CITY SINGER 18 #001	N/A	N/A	N/A	N/A	N/A	N/A	







■ Miles

Legend

★ Proposed SWD

NMSLO Mineral Leases

BLM Mineral Leases

Private Mineral Leases

Unleased Minerals/Unknown - Private Owned

Unleased Minerals - BLM Owned

Mineral Lease Area of Review

LONG SHOT SWD #1

EDDY COUNTY, NEW MEXICO

Proj Mgr: Nate Alleman

June 20, 2022

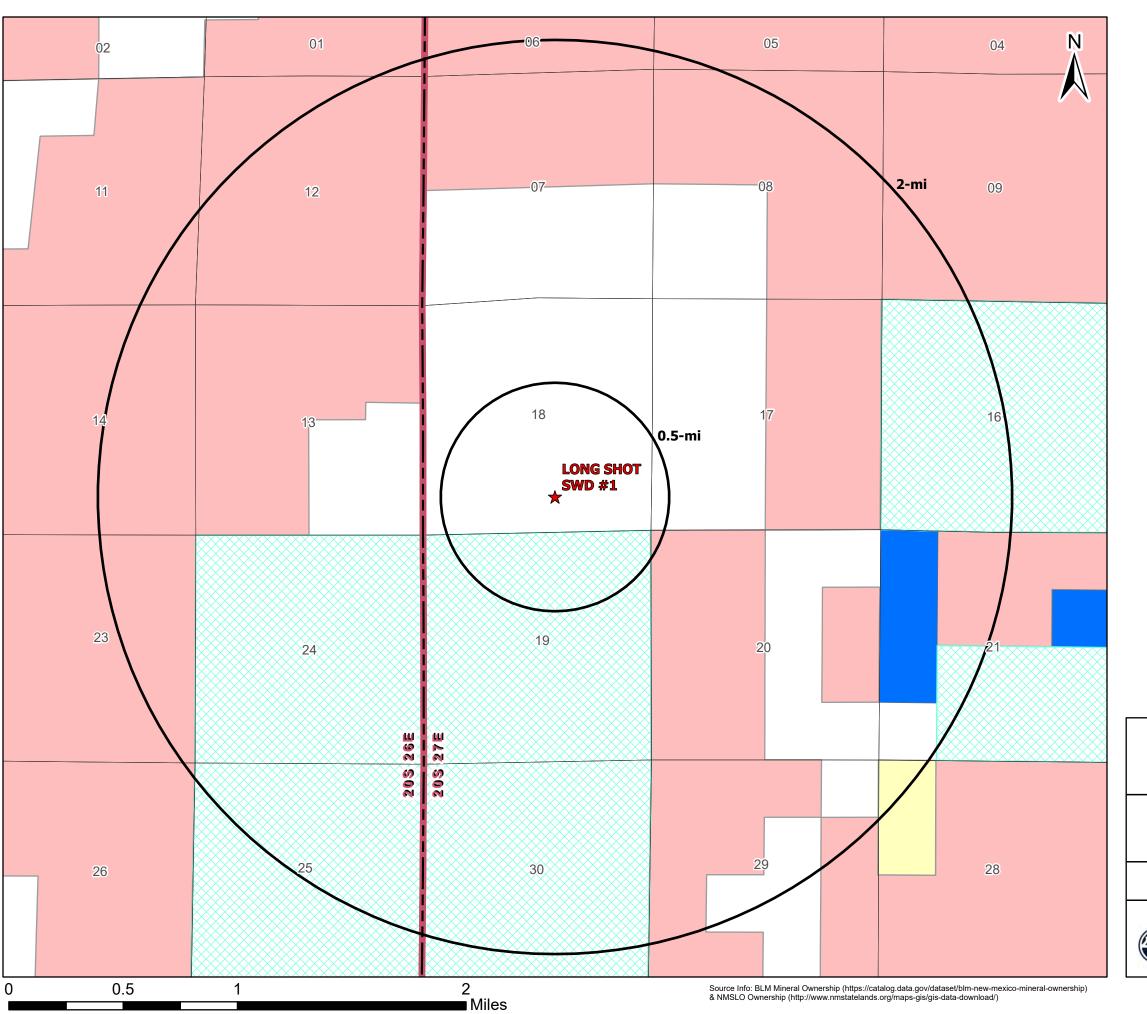
Mapped by: Ben Bockelmann

Prepared for:

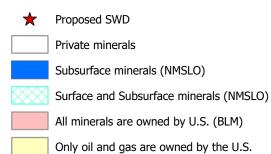




& NMSLO Ownership (http://www.nmstatelands.org/maps-gis/gis-data-download/)



Legend



Mineral Ownership Area of Review

LONG SHOT SWD #1

EDDY COUNTY, NEW MEXICO

Proj Mgr: Nate Alleman

May 20, 2022

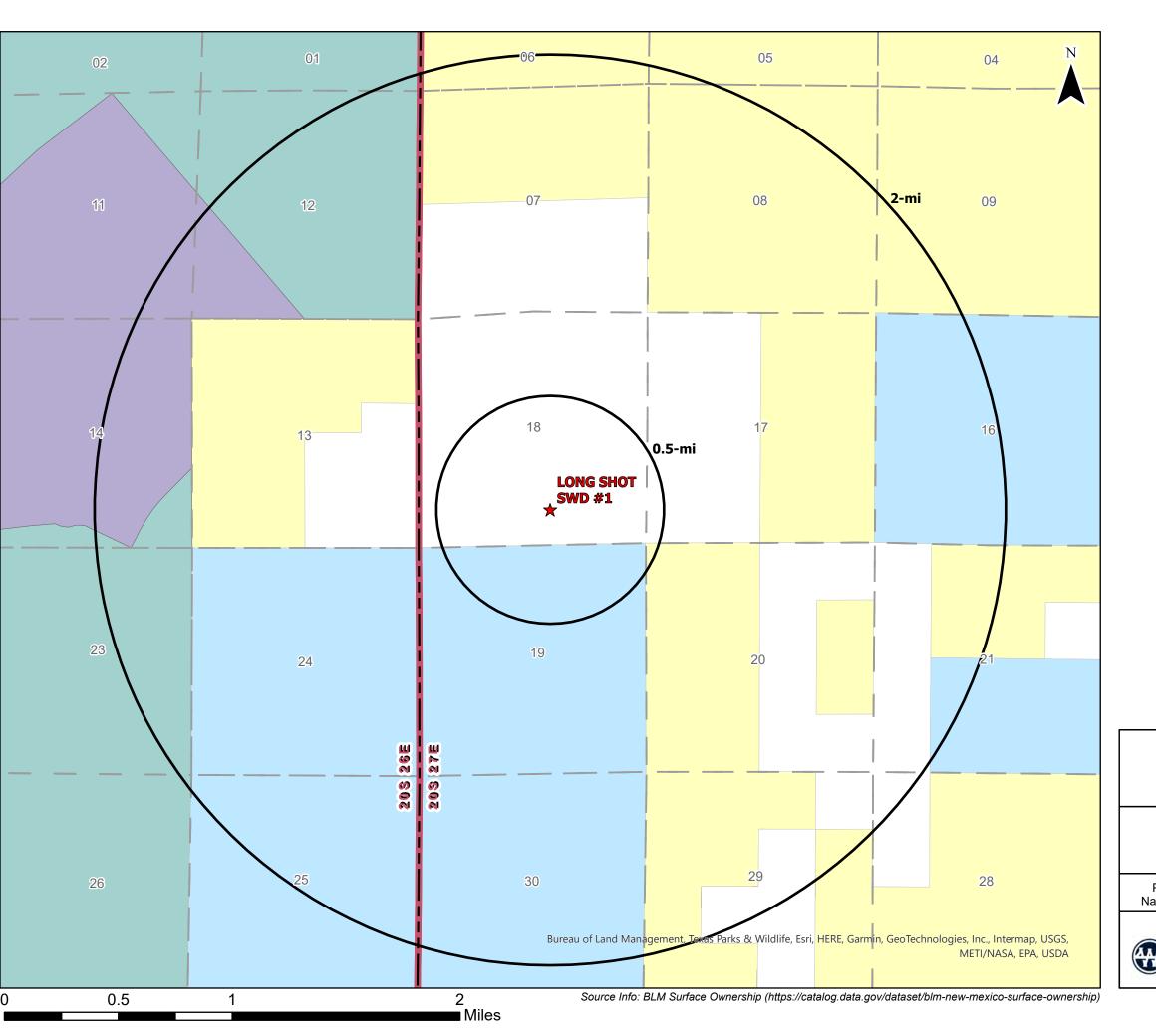
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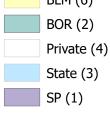
WATERBRIDGE



Prepared by:



Legend ★ Proposed SWD Surface Ownership own BLM (6)





LONG SHOT SWD #1

EDDY COUNTY, NEW MEXICO

Proj Mgr: Nate Alleman

May 20, 2022

Mapped by: Ben Bockelmann





031	032	033 T 1 7	034 \$ R 2 4	E 035	036	031	032			034 R 2 5 E	035	036	031	032	033 17 S	034 R 2 6 E	035	036	031	032	033 17 S	034 R 2 7 E	035	036	031	032	033 [1 7 S]	034 R 2 8 E	035	036	031	032	033 Г 1 7 S I	034 R 2 9 E	035	031
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006	005		\$ R 2 4		001	006	005	T1	9 S R	2 5 E		001	006	005		R 2 6 E		001	006			R 2 7 E		001	006		19S 004			001	006	005		R 2 9		001 006
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031	032	033	034 T 2 0 S	035 R 2 4	036	031	032 T	2 Γ 2 0	33 S R 2	034 5 E	035	036	031	032 T 2	033 0 S R 2	034 2 6 E	035	036	031	032 T 2 (033) S R 2	034 2 7 E	035	036	031	032 T 2	033 0 S R 2	034 8 E	035	036	031	032 T 2	033 0 S R	03 <mark>4 29 E</mark>	035	03
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Legend



Withdrawn

Potash Leases Area of Review

LONG SHOT SWD #1

EDDY COUNTY, NEW MEXICO

Proj Mgr: Nate Alleman

May 20, 2022

Mapped by: Ben Bockelmann

Prepared for:

WATERBRIDGE



3 6 12 Miles

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

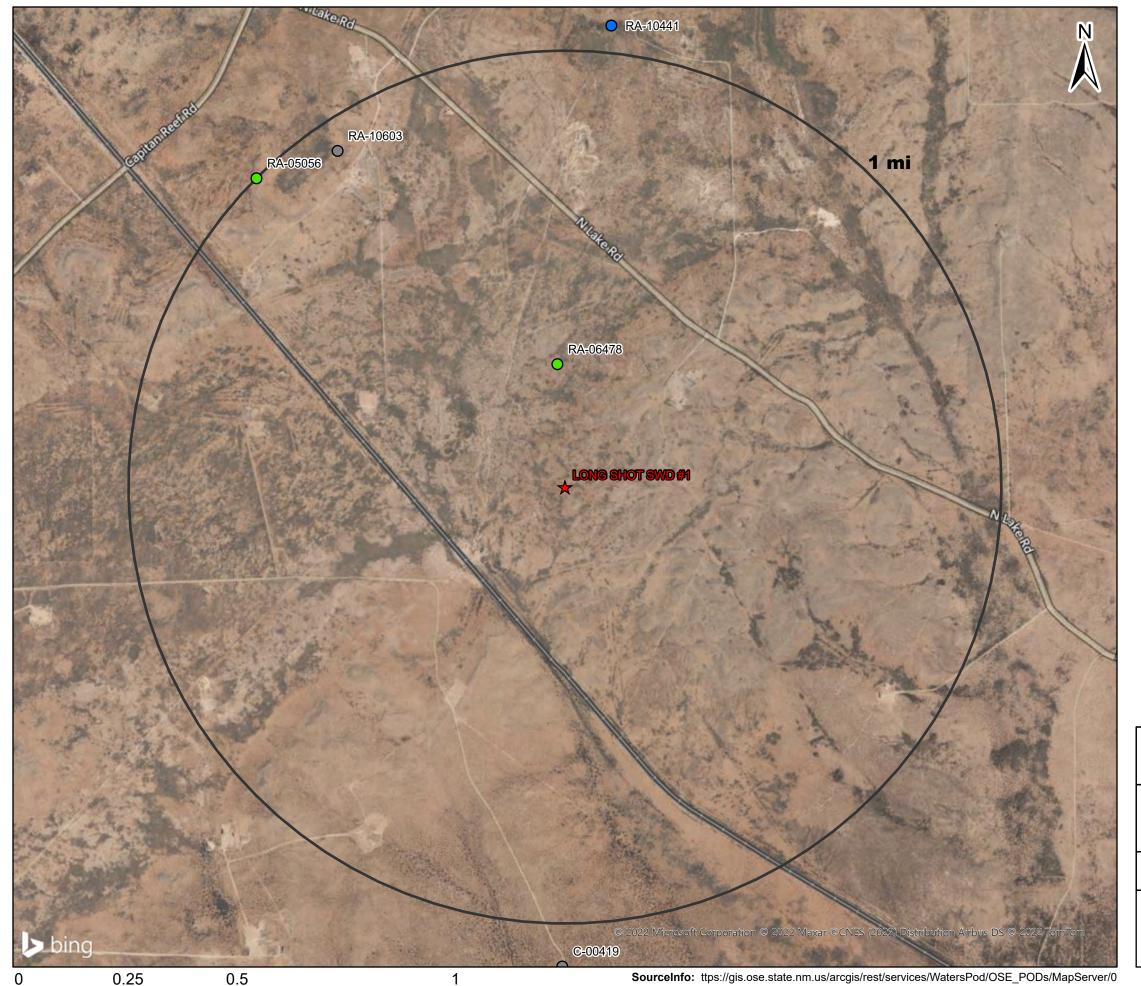
Source Water Analyses

					Wa	aterbri	dge S	Statelir	ne - Bo	ne Spri	ng, De	laware, & Wolf	camp Formations					
Wellname	API	Latitude	Longitude	Section	Township	Range	Unit	Ftgns	Ftgew	County	State	Company	Field	Formation	Tds (mg/L)	Chloride (mg/L)	Bicarbonate (mg/L)	Sulfate (mg/L)
BURTON FLAT DEEP UNIT #052H	3001540693	32.5116844	-104.1690369	3	215	27E	Н	4000N	50E	EDDY	NM			BONE SPRING 1ST SAND	155191.3	97600	658.8	725
BURTON FLAT DEEP UNIT #055H	3001540682	32.5139542	-104.1690063	3	21S	27E	Α	3175N	50E	EDDY	NM			BONE SPRING 1ST SAND	175293.2	110483.2	793	
BURTON FLAT DEEP UNIT #049H	3001540707	32.5175247	-104.1705322	3	21S	27E	Α	1875N	535E	EDDY	NM			BONE SPRING 1ST SAND	192123.7	113742.1	2200	
CERF 10 FEDERAL #003H	3001541058	32.498394	-104.1872559	9	21S	27E	Α	1275N	300E	EDDY	NM			BONE SPRING 1ST SAND	195011	115854.3	2318	
CERF 10 FEDERAL COM #004H	3001541059	32.4982567	-104.1872559	9	21S	27E	Н	1325N	300E	EDDY	NM			BONE SPRING 1ST SAND	204728.2	120015.1	2427	
BURTON FLAT DEEP UNIT #054H	3001540503	32.5063286	-104.1687851	2	21S	27E	L	1570S	50W	EDDY	NM			BONE SPRING 2ND SAND	214072.7	129855.2	671	
LONE TREE DRAW 13 STATE #007H	3001541650	32.4871902	-104.1454391	13	21S	27E	С	150N	1980W	EDDY	NM			BONE SPRING 2ND SAND	210720.3	125168.4	183	
LONE TREE DRAW 13 STATE COM #008H	3001541738	32.4872093	-104.140892	13	21S	27E	В	150N	1980E	EDDY	NM			BONE SPRING 2ND SAND	217521.8	136229.4		798.6
INDIAN FLATS BASS FEDERAL #005	3001522671	32.4303894	-104.0584564	35	21S	28E	N	330S	2310W	EDDY	NM	BASS ENTERPRISES	INDIAN FLATS	DELAWARE	144959	95967.9	200.202	1882.77
INDIAN FLATS BASS FEDERAL #006	3001522673	32.4303932	-104.0561905	35	21S	28E	0	330S	2310E	EDDY	NM	BASS ENTERPRISES	INDIAN FLATS	DELAWARE	163756	110195	134.566	1662.22
INDIAN FLATS BASS FEDERAL #001	3001524968	32.438549	-104.0637589	35	21S	28E	E	1980N	660W	EDDY	NM	BASS ENTERPRISES	INDIAN FLATS	DELAWARE	136419	89021	397.842	1681.59
BIG EDDY FEDERAL #098	3001524707	32.4960899	-104.1280518	7	21S	28E	F	2180N	1980W	EDDY	NM	DAKOTA	FENTON NORTHWEST	DELAWARE	153408	103522	718.9	247.744
CONNIE C STATE #002	3001502301	32.6337662	-104.1241302	25	195	28E	Н	1980N	660E	EDDY	NM		OUTPOST	DELAWARE	55498	32420	601	984
LONE TREE DRAW 13 STATE COM #002H	3001540372	32.4871712	-104.1494293	13	21S	27E	D	150N	750W	EDDY	NM			DELAWARE-BRUSHY CANYON	234863.1	142662.1	159	
LONE TREE DRAW 13 STATE COM #004H	3001540522	32.4872055	-104.1422195	13	21S	27E	В	150N	2390E	EDDY	NM			DELAWARE-BRUSHY CANYON	241475.8	144690.2	76.5	
LONE TREE DRAW 13 STATE #003H	3001541134	32.4871864	-104.1459274	13	215	27E	С	150N	1830W	EDDY	NM			DELAWARE-BRUSHY CANYON	239078.6	144881.5	220	

Injection Formation Water Analyses

								Wa	terbrid	ge Stat	eline -	Cisco Formation	on					
Wellname	API	Latitude	Longitude	Section	Township	Range	Unit	Ftgns	Ftgew	County	State	Company	Field	Formation	Tds (mg/L)	Chloride (mg/L)	Bicarbonate (mg/L)	Sulfate (mg/L)
KIMBALL 6 FEDERAL #001	3001510746	32.42635	-104.44072	6	22S	25E	4	718N	801W	EDDY	NM		INDIAN BASIN	CISCO	5606	1350	476	1900
SPRING SWD #001	3001500129	32.52066	-104.394409	4	21S	25E	Α	660N	830E	EDDY	NM		SEVEN RIVERS HILLS	CISCO	31485	17000	635	2500
SPRING SWD #001	3001500129	32.52066	-104.394409	4	21S	25E	Α	660N	830E	EDDY	NM		SEVEN RIVERS HILLS	CISCO	31580	17370	502	2310
INDIAN BASIN #001	3001510093	32.4759	-104.576233	14	21S	23E	K	16509	1650W	EDDY	NM		INDIAN BASIN	CISCO	8531	. 3238	846	1700
MARATHON FEDERAL #001	3001510373	32.46138	-104.559059	24	21S	23E	К	16509	1650W	EDDY	NM		INDIAN BASIN	CISCO	162225	99300	32	750
MARATHON FEDERAL #001	3001510373	32.46138	-104.559059	24	21S	23E	К	16509	1650W	EDDY	NM		INDIAN BASIN	CISCO	179962	110124	. 80	832
JOHN AGU #002	3001526468	32.57923	-104.552399	14	20S	24E	Α	660N	660E	EDDY	NM		DAGGER DRAW	CISCO	216236	53321	72619	952
JENNY COM #001	3001526469	32.66355	-104.513435	17	195	25E	Е	1750N	660W	EDDY	NM		DAGGER DRAW	CISCO		46850	183	12.5
DAGGER DRAW #002	3001500116	32.62995	-104.517548	30	195	25E	I	19699	629E	EDDY	NM		DAGGER DRAW	CISCO	7858	3		
DAGGER DRAW #002	3001500116	32.62995	-104.517548	30	195	25E	I	19698	629E	EDDY	NM		DAGGER DRAW	CISCO	7622			

- Water Well Map
- Well Data
- Water Sampling Results



Miles

Legend

★ Proposed SWD

NMOSE PODs

Status

- Active (1)
- Pending (2)
- Change Location of Well (0)
- Capped (0)
- Plugged (0)
- Incomplete (0)
- Unknown (2)

Water Wells Area of Review

LONG SHOT SWD #1

EDDY COUNTY, NEW MEXICO

Proj Mgr: Nate Alleman

May 20, 2022

Mapped by: Ben Bockelmann





Prepared by:

		W	ater Well Sampling Rationale		
			Long Shot SWD #1		
Water Wells	Owner	Available Contact Information	Use	Sampling Required	Notes
RA-06478	YUCCA DRILLING CO.	Not available	Prospecting or development of natural resources	No	Well was required to be plugged after its one year use permit. Authorization to use expired on, or before, 04/09/1980.
RA-10603	DAGGER DRAW RANCH INC.	Steve McCutcheon Work: 505-234-3690 Cell: 505-457-2550	Prospecting or development of natural resources	Yes	Sampled on: 4/27/2022
RA-05056	YATES DRILLING COMPANY	575-748-1471	Prospecting or Development of natural resources	No	Well was required to be plugged after its one year use permit. Authorization to use expired on or before 11/06/1966.
Note:					



May 13, 2022

OLIVER SEEKINS

ALL CONSULTING, LLC 1718 S. CHEYENNE AVE.

TULSA, OK 74119

RE: DAGGER DRAW SWD

Enclosed are the results of analyses for samples received by the laboratory on 04/28/22 8:25.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-21-14. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/ga/lab accred certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2 Total Haloacetic Acids (HAA-5)
Method EPA 524.2 Total Trihalomethanes (TTHM)
Method EPA 524.4 Regulated VOCs (V1, V2, V3)

Cardinal Laboratories is accredited through the State of New Mexico Environment Department for:

Method SM 9223-B Total Coliform and E. coli (Colilert MMO-MUG)
Method EPA 524.2 Regulated VOCs and Total Trihalomethanes (TTHM)

Method EPA 552.2 Total Haloacetic Acids (HAA-5)

Celey D. Keine

Accreditation applies to public drinking water matrices for State of Colorado and New Mexico.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

Reported:

13-May-22 09:07



Analytical Results For:

ALL CONSULTING, LLC 1718 S. CHEYENNE AVE. TULSA OK, 74119 Project: DAGGER DRAW SWD
Project Number: NOT GIVEN

N

Project Manager: OLIVER SEEKINS

Fax To: NA

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received	
RA - 08073 RA - 10441	H221744-01 H221744-02	Water Water	27-Apr-22 00:00 27-Apr-22 00:00	28-Apr-22 08:25 28-Apr-22 08:25	
RA - 10603	H221744-03	Water	27-Apr-22 00:00	28-Apr-22 08:25	

Cardinal Laboratories *=Accredited Analyte

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Celey D. Keine



ALL CONSULTING, LLC 1718 S. CHEYENNE AVE. TULSA OK, 74119

Project: DAGGER DRAW SWD

Project Number: NOT GIVEN

Reported: 13-May-22 09:07

Project Manager: OLIVER SEEKINS

Fax To: NA

RA - 10603 H221744-03 (Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
			Cardi	nal Laborato	ories					
Inorganic Compounds										
Alkalinity, Bicarbonate	20.0		5.00	mg/L	1	2040415	AC	29-Apr-22	310.1	
Alkalinity, Carbonate	<1.00		1.00	mg/L	1	2040415	AC	29-Apr-22	310.1	
Chloride*	140		4.00	mg/L	1	2042824	AC	28-Apr-22	4500-Cl-B	
Conductivity*	2980		1.00	umhos/cm @ 25°C	1	2042828	GM	29-Apr-22	120.1	
pH*	5.64		0.100	pH Units	1	2042828	GM	29-Apr-22	150.1	
Temperature °C	19.7			pH Units	1	2042828	GM	29-Apr-22	150.1	
Resistivity	3.36			Ohms/m	1	2042828	GM	29-Apr-22	120.1	
Specific Gravity @ 60° F	1.004		0.000	[blank]	1	2042831	GM	02-May-22	SM 2710F	
Sulfate*	1660		500	mg/L	50	2042816	AC	28-Apr-22	375.4	
TDS*	2730		5.00	mg/L	1	2042907	GM	02-May-22	160.1	
Alkalinity, Total*	16.0		4.00	mg/L	1	2040415	AC	29-Apr-22	310.1	
TSS*	10.0		2.00	mg/L	1	2050209	AC	03-May-22	160.2	

Green Analytical Laboratories

Total Recoverable Metals by	7 ICP (E200.7)							
Barium*	< 0.250	0.250	mg/L	5	B221186	AES	10-May-22	EPA200.7
Calcium*	379	0.500	mg/L	5	B221186	AES	10-May-22	EPA200.7
Hardness as CaCO3	1490	3.31	mg/L	5	[CALC]	AES	10-May-22	2340 B
Iron*	21.9	0.250	mg/L	5	B221186	AES	10-May-22	EPA200.7
Magnesium*	131	0.500	mg/L	5	B221186	AES	10-May-22	EPA200.7
Potassium*	14.0	5.00	mg/L	5	B221186	AES	10-May-22	EPA200.7
Sodium*	161	5.00	mg/L	5	B221186	AES	10-May-22	EPA200.7
Strontium*	6.38	0.500	mg/L	5	B221186	AES	10-May-22	EPA200.7

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Celecy D. Keine



ALL CONSULTING, LLC 1718 S. CHEYENNE AVE. TULSA OK, 74119 Project: DAGGER DRAW SWD

Project Number: NOT GIVEN

Reported: 13-May-22 09:07

Project Manager: OLIVER SEEKINS

Fax To: NA

Inorganic Compounds - Quality Control

Cardinal Laboratories

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2040415 - General Prep - Wet Chem										
Blank (2040415-BLK1)				Prepared &	Analyzed:	04-Apr-22				
Alkalinity, Carbonate	ND	1.00	mg/L							
Alkalinity, Bicarbonate	5.00	5.00	mg/L							
Alkalinity, Total	4.00	4.00	mg/L							
LCS (2040415-BS1)				Prepared &	Analyzed:	04-Apr-22				
Alkalinity, Carbonate	ND	2.50	mg/L				80-120			
Alkalinity, Bicarbonate	280	12.5	mg/L				80-120			
Alkalinity, Total	230	10.0	mg/L	250		92.0	80-120			
LCS Dup (2040415-BSD1)				Prepared &	Analyzed:	04-Apr-22				
Alkalinity, Carbonate	ND	2.50	mg/L				80-120		20	
Alkalinity, Bicarbonate	292	12.5	mg/L				80-120	4.37	20	
Alkalinity, Total	240	10.0	mg/L	250		96.0	80-120	4.26	20	
Batch 2042816 - General Prep - Wet Chem										
Blank (2042816-BLK1)				Prepared &	Analyzed:	28-Apr-22				
Sulfate	ND	10.0	mg/L							
LCS (2042816-BS1)				Prepared &	: Analyzed:	28-Apr-22				
Sulfate	20.0	10.0	mg/L	20.0		99.8	80-120			
LCS Dup (2042816-BSD1)				Prepared &	: Analyzed:	28-Apr-22				
Sulfate	20.1	10.0	mg/L	20.0		100	80-120	0.599	20	
Batch 2042824 - General Prep - Wet Chem										
Blank (2042824-BLK1)				Prepared &	: Analyzed:	28-Apr-22				
Chloride	ND	4.00	mg/L							

Cardinal Laboratories

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Celey D. Keine



ALL CONSULTING, LLC 1718 S. CHEYENNE AVE. TULSA OK, 74119 Project: DAGGER DRAW SWD

Project Number: NOT GIVEN

Reported: 13-May-22 09:07

Project Manager: OLIVER SEEKINS

Fax To: NA

Inorganic Compounds - Quality Control

Cardinal Laboratories

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2042824 - General Prep - Wet Chem										
LCS (2042824-BS1)				Prepared &	Analyzed:	28-Apr-22				
Chloride	100	4.00	mg/L	100		100	80-120			
LCS Dup (2042824-BSD1)				Prepared &	Analyzed:	28-Apr-22				
Chloride	100	4.00	mg/L	100		100	80-120	0.00	20	
Batch 2042828 - General Prep - Wet Chem										
LCS (2042828-BS1)				Prepared: 2	8-Apr-22 A	analyzed: 2	9-Apr-22			
Conductivity	104000		uS/cm	100000		104	80-120			
pH	7.11		pH Units	7.00		102	90-110			
Duplicate (2042828-DUP1)	Source: H221744-01			Prepared: 2	8-Apr-22 A	analyzed: 2	9-Apr-22			
Conductivity	3650	1.00 1	umhos/cm @ 25°C)	3630			0.549	20	
рН	7.12	0.100	pH Units		7.06			0.846	20	
Resistivity	2.74		Ohms/m		2.75			0.549	20	
Temperature °C	19.8		pH Units		20.0			1.01	200	
Batch 2042831 - General Prep - Wet Chem										
Duplicate (2042831-DUP1)	Sou	ırce: H221744	-01	Prepared: 2	8-Apr-22 A	nalyzed: 0	2-May-22			
Specific Gravity @ 60° F	1.003	0.000	[blank]		1.004			0.131	20	
Batch 2042907 - Filtration										
Blank (2042907-BLK1)				Prepared: 2	9-Apr-22 A	analyzed: 0	2-May-22			
TDS	ND	5.00	mg/L							

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Celey D. Keine



ALL CONSULTING, LLC 1718 S. CHEYENNE AVE. TULSA OK, 74119 Project: DAGGER DRAW SWD

Project Number: NOT GIVEN

Reported: 13-May-22 09:07

Project Manager: OLIVER SEEKINS

Fax To: NA

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2042907 - Filtration										
LCS (2042907-BS1)				Prepared: 2	29-Apr-22 A	analyzed: 0	2-May-22			
TDS	528		mg/L	500		106	80-120			
Duplicate (2042907-DUP1)	Sourc	e: H221744-	01	Prepared: 2	29-Apr-22 A	analyzed: 0	2-May-22			
TDS	3410	5.00	mg/L		3480			2.23	20	
Batch 2050209 - Filtration										
Blank (2050209-BLK1)				Prepared: ()2-May-22	Analyzed: (3-May-22			
TSS	ND	2.00	mg/L							
Duplicate (2050209-DUP1)	Sourc	e: H221744-	01	Prepared: ()2-May-22	Analyzed: (3-May-22			
TSS	ND	2.00	mg/L		ND				52.7	

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Celeg D. Keine



ALL CONSULTING, LLC 1718 S. CHEYENNE AVE. TULSA OK, 74119

Project: DAGGER DRAW SWD

Reported: 13-May-22 09:07

Project Number: NOT GIVEN

Project Manager: OLIVER SEEKINS

Fax To: NA

Total Recoverable Metals by ICP (E200.7) - Quality Control

Green Analytical Laboratories

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Ratch	B221186 -	Total Re	coverable	by ICP
Daten	D441100 -	IULAI IX	CUVCI abic	\mathbf{p}_{1}

Blank (B221186-BLK1)				Prepared: 06-Ma	y-22 Analyzed:	10-May-22			
Magnesium	ND	0.100	mg/L						
Strontium	ND	0.100	mg/L						
Calcium	ND	0.100	mg/L						
Sodium	ND	1.00	mg/L						
Iron	ND	0.050	mg/L						
Barium	ND	0.050	mg/L						
Potassium	ND	1.00	mg/L						
LCS (B221186-BS1)				Prepared: 06-Ma	y-22 Analyzed:	10-May-22			
Strontium	2.07	0.100	mg/L	2.00	103	85-115			
Sodium	1.66	1.00	mg/L	1.62	103	85-115			
Potassium	4.10	1.00	mg/L	4.00	103	85-115			
Barium	1.03	0.050	mg/L	1.00	103	85-115			
Magnesium	10.4	0.100	mg/L	10.0	104	85-115			
Iron	2.07	0.050	mg/L	2.00	103	85-115			
Calcium	2.03	0.100	mg/L	2.00	101	85-115			
LCS Dup (B221186-BSD1)				Prepared: 06-Ma	y-22 Analyzed:	10-May-22			
Iron	2.09	0.050	mg/L	2.00	105	85-115	1.35	20	
Potassium	4.11	1.00	mg/L	4.00	103	85-115	0.134	20	
Calcium	2.08	0.100	mg/L	2.00	104	85-115	2.63	20	
Sodium	1.66	1.00	mg/L	1.62	103	85-115	0.0281	20	
Barium	1.04	0.050	mg/L	1.00	104	85-115	0.868	20	
Strontium	2.09	0.100	mg/L	2.00	104	85-115	0.940	20	
Magnesium	10.6	0.100	mg/L	10.0	106	85-115	1.30	20	

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Celecy D. Keine



Notes and Definitions

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

** Samples not received at proper temperature of 6°C or below.

*** Insufficient time to reach temperature.

- Chloride by SM4500Cl-B does not require samples be received at or below 6°C

Samples reported on an as received basis (wet) unless otherwise noted on report

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Celeg D. Keine

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240 (575) 393-2326 FAX (575) 393-2476

Company Name:	all Consulting	BILL TO	ANALYSIS REQUEST
r roject manager:	Oliver Seekins	P.O. #:	
ess:	8 & Chevenne Au	Company:	
city: wsa	State: OK Zip: 74119		Fee
Phone #: 418-3	418-382-7581 Fax#:	Address:	<u> </u>
Project #:	Project Owner:	City:	5 Ly Ba
Project Name:	Dagger Draw Sh	State: Zip:	571
Project Location:		#	Sies
Sampler Name:		Fax #:	Av.
FOR LAB USE ONLY		rax #;	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
			etal
Lab I.D.	(G)RAB OR (C)C	GROUNDWATER WASTEWATER SOIL OIL SLUDGE OTHER: ACID/BASE: CE/COOL OTHER:	Cation Spec TSS T. Me T. Ho Besis
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analyses. All claims including those for negligence and any other service. In no event shall Cardinal be liable for incidental or conse affiliates or successors arising out of or related to the performance	negligence and any other cause whatsoever shall be deemed waved unless ma ble for incidental or consequental damages, including without limitation, busines sisted to the performance of services hereunder by Cardinal, regardless of where	analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal to the amount paid by the client for the service. In no event shall cardinal be lable for incidental or consequential damages, including without invalation, business interruptions, loss of use, or loss of profits incurred by client, its subcliantes, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based once any of the above selected services.	for the opplicable distribution of the applicable distribution
Charley	Time: National Received By	0.0.0.0	Verbal Result: ☐ Yes ☐ No Add'I Phone #: All Results are emailed. Please provide Email address:
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Delivered By: (Circle One)		n CHECKED BY:	cteria (only) S
FORM-000 N 3.2 10/07/21	corrected rempC		_[

Bacteria (only) Sample Condition
Cool Intact Observed Temp. °C

Yes Yes
No Corrected Temp. °C

Corrected Temp. °C

Attachment 6

Karst Analysis



WATERBRIDGE STATELINE LLC – LONG SHOT SWD #1 AND SNIPER SWD #1 RESPONSES TO HIGH-RISK KARST AREAS

Introduction

ALL Consulting (ALL) has been informed by the New Mexico Oil Conservation Division (OCD) that the proposed locations of Waterbridge Stateline LLC's (Waterbridge) Long Shot SWD #1 and Sniper SWD #1 Class II saltwater disposal (SWD) well applications are within the area OCD has designated as high-risk karst. **Figure 1** is the location of the proposed SWDs. OCD has requested that ALL include additional information within these applications to address OCD's concerns with the high-risk karst area. This additional information needs to include:

- 1. An explanation on how ALL determined the deepest underground sources of drinking water (USDW);
- 2. An evaluation of the geology to determine that there was no direct evidence of karst features in the immediate area;
- 3. Provide an affirmative statement that the proposed well designs and confining zones will protect the USDW; and
- 4. Provide a detailed description of both the upper and lower confining zones above and below the proposed injection interval in the Cisco Formation.

Karst in Southeastern New Mexico

ALL has reviewed more recently published geologic publications on the Capitan Reef Complex and karst areas in southeastern New Mexico and then also examined the well completion records and the closest open hole geophysical logs to the proposed Long Shot SWD #1 and Sniper SWD #1 well locations. Anthropogenic sinkholes in the Permian salt beds of southeastern New Mexico are often associated with historic oilfield development due to improperly cased oil and water supply wells and salt-solution mining activity (Land 2013). Manmade sinkholes are caused by the dissolution of the salt beds in the Upper Permian Salado Formation by introduction of freshwater or groundwater into the salt beds. **Figure 2** shows the location of these sinkholes in southeastern New Mexico. Naturally occurring sinkholes are often associated with upward migration of groundwater flow from karstic aquifers of regional extent that underlie the Permian evaporite deposits (Land 2013). In the area of Dagger Draw, naturally occurring sinkholes in the Seven Rivers Formation are exposed along the eastern shore of Lake McMillan and are probably confined to a narrow band along the base of the McMillan Escarpment (Cox 1967).

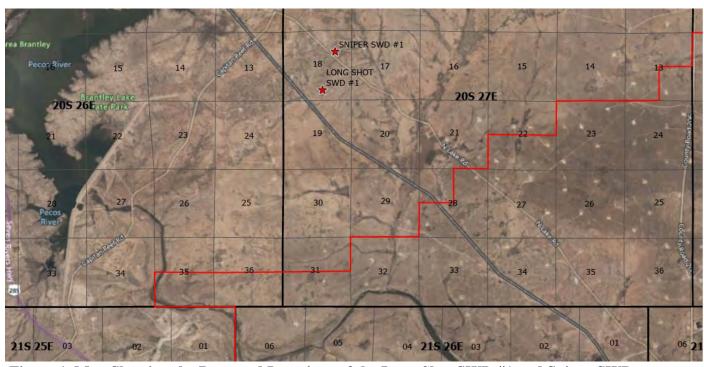


Figure 1. Map Showing the Proposed Locations of the Long Shot SWD #1 and Sniper SWD

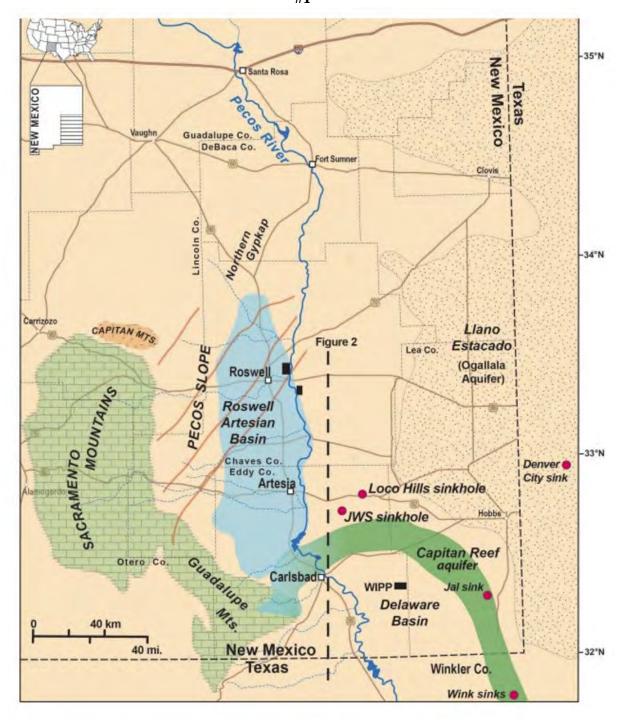


Figure 2. Regional Map of the Lower Pecos Region of Southeastern New Mexico Showing Location of Sinkholes (Land 2013)

Geology of the Dagger Draw Area

The surficial and shallow geology in the Dagger Draw area consists of the Yates Formation, Seven Rivers Formation, and Queen Formation of the Upper Permian Artesia Group. According to the snip of the surficial geologic map of Cox (1967), the surface geology of the area of the proposed Long Shot SWD #1 and Sniper SWD #1 well locations is the Yates Formation. **Figure** 3 is a snip of this surficial geologic map showing the proposed SWD locations in relation to the Yates Formation surface geology.

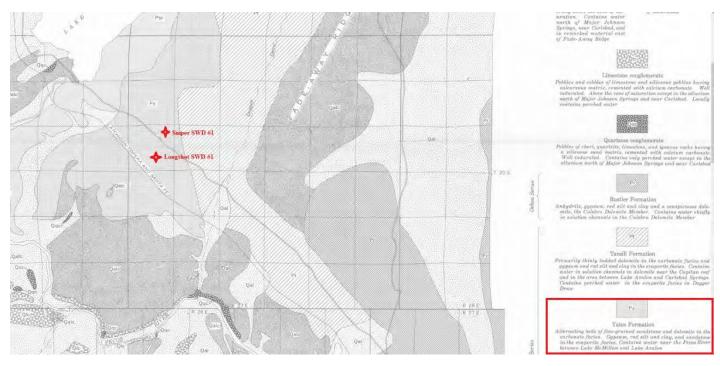


Figure 3. Map Showing the Surficial Geology of the Proposed SWD Locations (Cox 1967)

Additionally, ALL evaluated and assessed the shallow geology in the area by reviewing open hole geophysical logs. Well API No. 015-10298, which is located just to the north of the Sniper SWD #1 location, has a shallow gamma ray log section and ALL has identified the shallow geologic formations on this log snip in **Figure 4**.

The Yates Formation consists of about 300 feet of alternating beds of sandstone and dolomite in the carbonate facies and about the same thickness of gypsum, red clay, silt, and sandstone in the evaporite facies (Cox 1967). The Yates Formation yields water to stock wells near the Pecos River between Lake McMillan and Lake Avalon (Cox 1967). Most of these stock wells are in the evaporite facies of the Yates Formation near Rocky Arroyo west of the river and near Dagger Draw east of the Pecos River (Cox 1967). Underlying the Yates Formation is the Seven Rivers Formation. The Seven Rivers Formation consists of about 300 feet of dolomite with a few sandy beds in the carbonate facies and anhydrite, gypsum, red silt, and clay in the evaporite facies between the uppermost sandstone in the Queen Formation and the basal sandstone of the Yates Formation (Cox 1967). Groundwater moves through solution channels in the Yates Formation east of the Pecos River between Major Johnson Springs and Lake Avalon (Cox 1967).

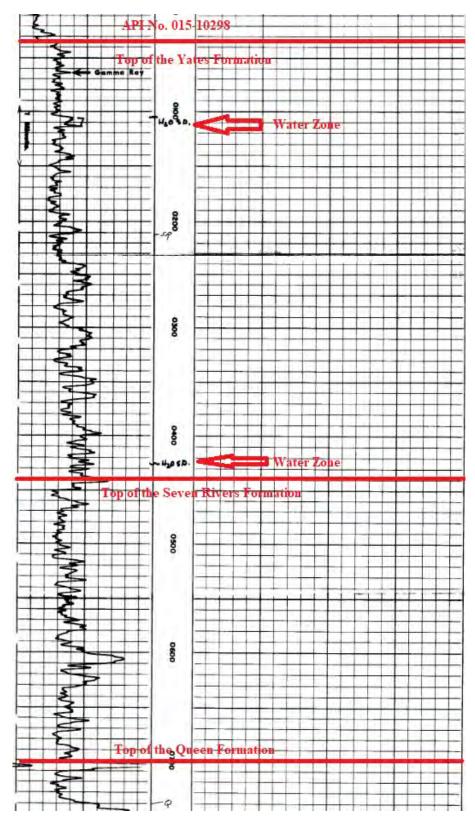


Figure 4. Gamma Ray Geophysical Log from Well API No. 015-10298 Showing the Tops of the Shallow Formations and Occurrence of Water Zones in the Well

Addressing OCD's High-Risk Karst Area Concerns

Based on ALL's extensive geologic and hydrogeologic evaluation of the Dagger Draw and Long Shot SWD #1 and Sniper SWD #1 proposed well locations, below are ALL's responses to these OCD concerns.

- 1. An explanation on how ALL determined the deepest underground sources of drinking water (USDW).
 - a. ALL determined the base of the USDW after geological and hydrogeological analysis and evaluation of several open hole geophysical logs and publications within the vicinity of the proposed SWDs. Figure 4 shows locations of water zones within the Yates Formation. Figure 5 is a map showing the different groundwater zones and the location of the proposed SWDs. Based on ALL's analysis, the base of the USDW will be the bottom of the Yates Formation and using the ground elevations of the proposed SWDs the base of the USDW will be approximately 365 to 375 feet below the surface. ALL is proposing that Waterbridge set 20" surface casing to a depth of 400 feet and cement back to the surface to ensure isolation of the base of the USDW.
- 2. An evaluation of the geology to determine that there was no direct evidence of karst features in the immediate area.
 - a. ALL performed an extensive geologic and hydrogeologic assessment of potential high-risk karst in the immediate area of the proposed SWDs in the Dagger Draw. Based on the evaluation of published geologic and hydrogeologic reports and maps, the immediate area of the proposed SWDs does not look to be an area of risk for karst development. Additionally, ALL assessed Google Earth and scanned the immediate area for any evidence of active or inactive surface sinkholes and none were detected. Based on ALL's research on the published reports on the karst, the naturally occurring sinkholes were located farther to the west in the area of Lake McMillan. If during the drilling into the Seven River Formation, circulation is lost due to dissolution of evaporites or solution channels, a drilling mud program may be implemented along with the utilization of lost circulation material (LCM) as needed.
- 3. Provide an affirmative statement that the proposed well designs and confining zones will protect the USDW.
 - a. ALL's proposed well construction and cementing plans will provide multiple layers of protection of the USDW. The surface casing will be set 25 feet below the base of the USDW and cemented back to the surface. An intermediate casing string set into the top of the Bone Spring Formation and cemented back to the surface and then the production casing will be set through the proposed injection interval in the Cisco Formation and cemented back in two stages up into the intermediate casing string for approximately 200 feet. The well construction and cementing plan provides for three layers of isolation

and protection of the USDW from any possible migration of injection fluids out of the proposed injection interval. There are multiple confining zones in both shale and in low porosity and low permeable carbonate rocks which will prevent upward migration of injected fluids. Additionally, there is at least 7,920 of vertical separation between the top of the Cisco Formation and the base of the USDW. There is no hydrologic connection between the Cisco injection interval and the USDW.

- 4. Provide a detailed description of both the upper and lower confining zones above and below the proposed injection interval in the Cisco Formation.
 - a. There are multiple shale beds that will serve as upper confinement above the top of the proposed injection interval in the Cisco Formation (Figure 6). Additional confining zones can be located farther above these zones on this open hole geophysical log for API No. 015-10298. There is lower confinement with shale beds at the base of the Cisco Formation (Figure 7) and with the low porosity and low permeability carbonate rocks directly below the Cisco Formation in the upper part of the Strawn Formation, which is also labeled on Figure 7. Both upper and lower confining zones will act as barriers to fluid flow out of the permitted Cisco Formation injection zone.



Figure 5. Map Showing the Location of the Proposed SWDs in Relation to the Groundwater in the Permian Formations in the Immediate Area (Cox 1967)

References

Cox, E.R. 1967. "Geology and Hydrology Between Lake McMillan and Carlsbad Springs Eddy County, New Mexico." U.S. Geological Survey Water Supply Paper 1828, https://pubs.usgs.gov/wsp/1828/report.pdf (accessed June 9, 2022).;

Land, Lewis. 2013. "Evaporite Karst in the Permian Basin Region of West Texas and Southeastern New Mexico: The Human Impact." 13th Sinkhole Conference, NCKRI Symposium 2, www.researchgate.net/publication/313021019 (accessed June 9, 2022).

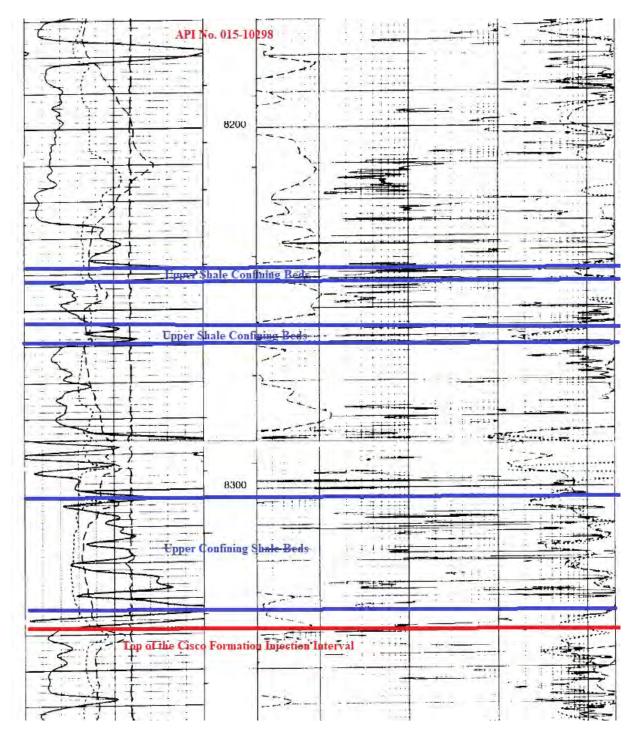


Figure 6. Open Hole Geophysical Log of API No. 015-10298 Showing the Upper Confining Zones for the Proposed Cisco Formation SWDs

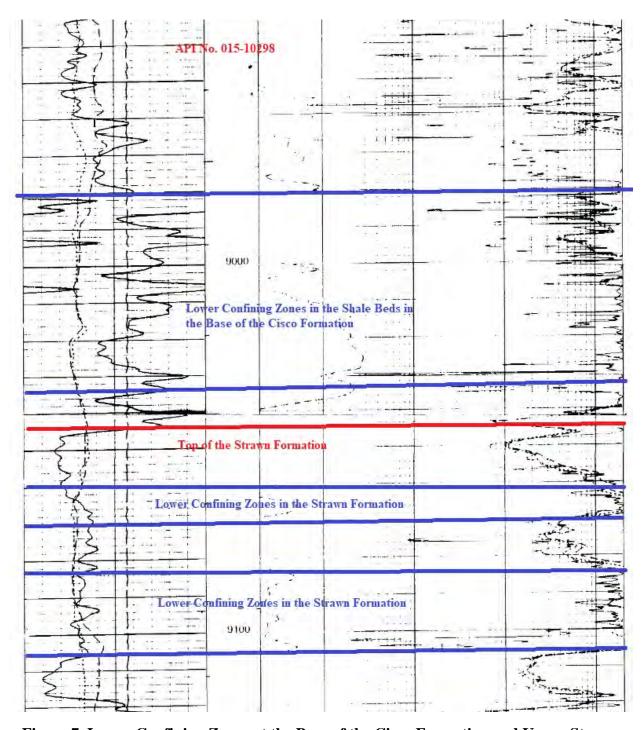


Figure 7. Lower Confining Zones at the Base of the Cisco Formation and Upper Strawn Formation in the Open Hole Geophysical Log for API No. 015-10298

|--|

June 16, 2022

Tom Tomastik

Date

Chief Geologist and Regulatory Specialist

Certified Petroleum Geologist #6354

ALL Consulting, LLC

Attachment 7

No Hydrologic Connection Statement



RE: Waterbridge Operating LLC - Longshot SWD #1 and Sniper SWD #1 applications, Eddy County, New Mexico

ALL Consulting LLC (ALL) has performed a through hydrologic investigation related to the two saltwater disposal wells (SWD) listed above. The investigation was conducted to determine if there where any existing or potential connections between the proposed injection intervals in the Cisco Formation 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 Eddy County, New Mexico. Based on ALL's assessment and analysis there is containment through multiple confining zones above the Cisco Formation and the USDW and over 7,900 of vertical separation between the base of the USDW and the top of the injection interval. Additionally, there is no evidence of extensive faulting that would allow for communication between the USDW and the Cisco Formation.

Tom Tomastik

Chief Geologist and Regulatory Specialist

Jon Tomastille

ALL Consulting LLC

Date

June 19, 2022



Attachment 8 Public Notice Affidavit and Notice of Application Confirmations

APPLICATION FOR AUTHORIZATION TO INJECT

NOTICE IS HEREBY GIVEN: That Waterbridge Stateline, LLC, 5555 San Felipe, Suite 1200, Houston, TX 77056, 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: Long Shot SWD #1

Located 11.49 miles northwest of Carlsbad, NM SW 1/4 SE 1/4, Section 18, Township 20S, Range 27E 812' FSL & 2,220' FEL

Eddy County, NM

NAME AND DEPTH OF DISPOSAL ZONE: Cisco (8,320' – 8,995')

30,000 Bbls/day EXPECTED MAXIMUM INJECTION RATE:

EXPECTED MAXIMUM INJECTION PRESSURE: 1,664 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.

Affidavit of Publication Ad # 0005299487 This is not an invoice

ALL CONSULTING- CARL SBAD 1718 SOUTH CHEYENNE AVENUE

TULSA, OK 74119

I, a legal clerk of the Carlsbad Current Argus, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof in editions dated as follows:

06/15/2022

Subscribed and sworn before me this June 15, 2022:

late of WI, County of Brown NOTARY PUBLIC

My commission expires

APPLICATION FOR AUTHORIZATION TO INJECT

NOTICE IS HEREBY GIVEN: That Waterbridge Stateline, LLC, 5555 San Felipe, Suite 1200, Houston, TX 77056, is requesting that the New Mexico Oil Conservation Di-TX 77056, 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: Long Shot SWD #1
Located 11.49 miles northwest of Carlsbad, NM
SW ¼ SE ¼, Section 18, Township 20S, Range 27E
812' FSL & 2,220' FEL
Eddy County, NM
NAME AND DEPTH OF DISPOSAL ZONE: Cisco (8,320' – 8,995')
EXPECTED MAXIMUM INJECTION RATE: 30,000 Bbls/day
EXPECTED MAXIMUM INJECTION PRESSURE: 1,664 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 constitution. mation may be obtained by contacting Nate Alleman at 918-382-7581. #5299487, Current Argus, June 15, 2022

SARAH BERTELSEN Notary Public State of Wisconsin

Ad # 0005299487 PO #: 5299487 # of Affidavits1

This is not an invoice

Long Shot SWD #1 - Notice of Application Recipients						
Entity	Address	City	State	Zip Code		
Land Owner						
DBR Land, LLC	840 Gessner RD, Suite 100	Houston	TX	77024		
OCD District						
NMOCD District 2	506 W. Texas	Artesia	NM	88210		
Leasehold Operators						
ABO EMPIRE, LLC	P.O. Box 900	Artesia	NM	88211		
Commission of Public Lands - State Land Office	310 Old Santa Fe Trail	Santa Fe	NM	87501		
Devon Energy (DEVON)	333 W. Sheridan Ave	Oklahoma City	OK	73102		
Kansas City Mineral Royalty Co.	6520 N. Western Ave #300	Oldaharra Citra	O.L.	76442		
(KANSAS CITY MIN. ROY. ETAL)		Oklahoma City	Ok	76113		
Freeport McMoRan	333 N Central Ave	Phoenix	AZ	85004		
(INVESTORS ROY. CO)						
New Mexico BLM	620 E Greene St.	Carlsbad	NM	88220		
POGO Production Company, LLC (POGO PROD.)	P.O. Box 10340	Midland	TX	79701		
Singer Bros., a Co-Partnership (SINGER BROS.)	P.O. Box 755	Tulsa	OK	74101		
Tascosa Energy Partners, LLC	9.1 W. Missouri Ave	Midland	TX	79701		
(TASCOSA ENERGY PARTNERS, LLC)		iviidiaiid				
VLADIN LLC	P.O. Box 100	Artesia	NM	88211		

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 1/2-mile well detail list (Attachment 2) or on the 2-mile Mineral Lease Map (Attachment 2). Investors Royalty Co. was acquired by Dalco Oil company, who was subsequently acquired by Sabine Production Company (Sabine Corporation) and finally sold to Freeport McMoRan. As suchFreeport McMoRan was notified as part of this application process.

ALL Consulting, LLC 1718 S Cheyenne Ave Tulsa OK 74119

Place label at top of the center of the envelope and fold at dotted line.



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DBR Land, LLC 840 GESSNER RD STE 100 HOUSTON TX 77024-4143



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