

Initial Application Part I

Received: 12/21/2018

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

RECEIVED: <u>12/21/2018</u>	REVIEWER:	TYPE:	APP NO: <u>DMAM19004 S1010</u>
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ABOVE THIS TABLE FOR OCD DIVISION USE ONLY

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



ADMINISTRATIVE APPLICATION CHECKLIST

THIS CHECKLIST IS MANDATORY FOR ALL ADMINISTRATIVE APPLICATIONS FOR EXCEPTIONS TO DIVISION RULES AND REGULATIONS WHICH REQUIRE PROCESSING AT THE DIVISION LEVEL IN SANTA FE

Applicant: <u>Solaris Water Midstream, LLC</u>	OGRID Number: <u>371643</u>
Well Name: <u>Breckenridge State SWD No.1</u>	API: <u>30-025-45151</u>
Pool: <u>Proposed: SWD; Devonian-Silurian</u>	Pool Code: <u>97869</u>

SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED BELOW

- 1) **TYPE OF APPLICATION:** Check those which apply for [A]
- A. Location – Spacing Unit – Simultaneous Dedication
 NSL NSP (PROJECT AREA) NSP (PRORATION UNIT) SD
- B. Check one only for [I] or [II]
- [I] Commingling – Storage – Measurement
 DHC CTB PLC PC OLS OLM
- [II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery
 WFX PMX SWD IPI EOR PPR

SWD-1883

DEC 24 2018 AM 09:13

- 2) **NOTIFICATION REQUIRED TO:** Check those which apply.
- A. Offset operators or lease holders
 B. Royalty, overriding royalty owners, revenue owners
 C. Application requires published notice
 D. Notification and/or concurrent approval by SLO
 E. Notification and/or concurrent approval by BLM
 F. Surface owner
 G. For all of the above, proof of notification or publication is attached, and/or,
 H. No notice required

FOR OCD ONLY	
<input type="checkbox"/>	Notice Complete
<input type="checkbox"/>	Application Content Complete

3) **CERTIFICATION:** I hereby certify that the information submitted with this application for administrative approval is **accurate** and **complete** to the best of my knowledge. I also understand that **no action** will be taken on this application until the required information and notifications are submitted to the Division.

Note: Statement must be completed by an individual with managerial and/or supervisory capacity.

Ben Stone
 Print or Type Name

Signature

12/19/2018
 Date

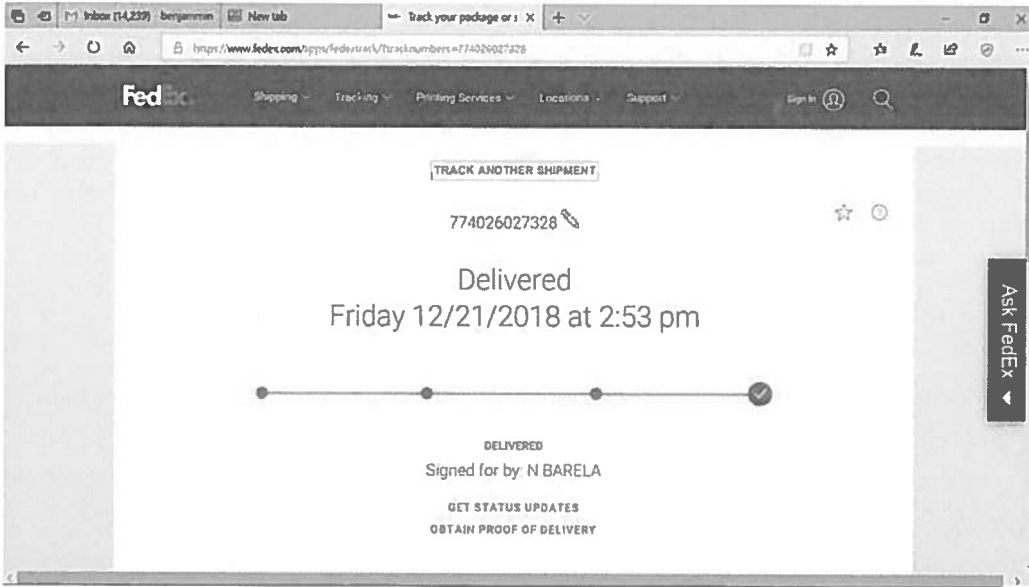
903-488-9850
 Phone Number

ben@sosconsulting.us
 e-mail Address

McMillan, Michael, EMNRD

From: ben@sosconsulting.us
Sent: Friday, January 4, 2019 2:00 PM
To: McMillan, Michael, EMNRD
Subject: [EXT] Breckenridge delivery to OCD via FedEx...

Mike – screenshot of tracking...
Thanks,
Ben



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December 19, 2018

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

Attn: Ms. Heather Riley, Director

Re: Application of Solaris Water Midstream, LLC to drill and permit for salt water disposal the Breckenridge State SWD Well No.1, to be located in Section 32, Township 24 South, Range 35 East, NMPM, Lea County, New Mexico.

Dear Ms. Riley,

Please find the enclosed REVISED and updated form C-108 Application for Authority to Inject, supporting the above-referenced request for salt water disposal. The well will be operated as a commercial endeavor offering operators in the area additional options for produced water disposal. This application was mostly prepared by ALL Consulting, LLC but Solaris has since moved the proposed location to accommodate offset concerns. The revised application package includes new AOR maps and a new notice list. ***All other details of the proposed SWD are as originally planned and that portion of the application is utilized for most of those items.***

Published legal notice runs December 20, 2018 in the Hobbs News-Sun and all offset operators and other interested parties have been notified individually. The well is located on state land and minerals. There are state and federal lands & minerals and private minerals within the one-mile radius notice area; the State Land Office, Bureau of Land Management and offset operators have been notified of this application.

Solaris Water Midstream is a major provider of salt water disposal services to operators in southeast New Mexico and seeks to optimize efficiency, both economically and operationally, of all its operations. Approval of this application is consistent with that goal as well as the NMOCD's mission of preventing waste and protection of correlative rights.

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

Best regards,

A handwritten signature in blue ink, appearing to read 'Ben Stone', is written over a light blue circular stamp.

Ben Stone, Partner
SOS Consulting, LLC
Agent for Solaris Water Midstream, LLC

Cc: Application attachment and file

APPLICATION FOR AUTHORIZATION TO INJECT

- I. PURPOSE: ***Salt Water Disposal*** and the application ***QUALIFIES*** for administrative approval.
- II. OPERATOR: ***Solaris Water Midstream, LLC***
ADDRESS: ***701 Tradewinds Blvd., Suite C, Midland, TX 79706***

CONTACT PARTY: ***Agent: SOS Consulting, LLC – Ben Stone (903) 488-9850***
- III. WELL DATA: ***All well data and applicable wellbore diagrams are ATTACHED.***
- IV. ***This is not an expansion of an existing project.***
- V. ***A map is attached*** 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. A tabulation is attached of data on all wells of public record within the area of review which penetrate the proposed injection zone. ***There are NO (0) Wells in the subject AOR which Penetrate the proposed Devonian interval.*** The data includes a description of each well's type, construction, date drilled, location, depth, and a schematic of any plugged well illustrating all plugging detail. ***NO P&A Wells penetrate.***
- VII. ***The following data is ATTACHED*** 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. ***Appropriate geologic data on the injection zone is ATTACHED*** 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. ***Stimulation program – a conventional acid job may be performed to clean and open the formation.***
- *X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted). ***Well Logs will be filed with OCD.***
- *XI. ***There are NO water wells/ PODs within one mile of the proposed salt water disposal well.***
- XII. ***An affirmative statement is ATTACHED that available geologic and engineering data has been examined and no evidence was found*** of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.
- XIII. ***"Proof of Notice" section on the next page of this form has been completed and ATTACHED. There are 5 offset lessees and/or operators within 1 mile and state and federal minerals - all have been noticed. Well location is State.***
- 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: ***Ben Stone*** TITLE: ***SOS Consulting, LLC agent for Solaris Water Midstream, LLC***

SIGNATURE:  DATE: ***12/19/2018***

E-MAIL ADDRESS: ***ben@sosconsulting.us***

- * 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

FORM C-108 – APPLICATION FOR AUTHORIZATION TO INJECT (cont.)

III. WELL DATA – *The following information and data is included (See ATTACHED Wellbore Schematic):*

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 *pursuant to the following criteria is ATTACHED.*

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.

C-108 - Item III

Subject Well Data

The following exhibits were part of the original ALL Consulting, LLC C-108 application for this well.

These exhibits include Well Construction Detail, Operational Narrative, Geological Assessment with Formation Tops and an Hydrological Affirmative Statement.

Application for Authorization to Inject

Well Name: Breckenridge State SWD #1

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

A.

(1) General Well Information:

Operator: Solaris Water Midstream, LLC

Lease Name & Well Number: Breckenridge State SWD #1

Well Footage: ~~2,595' FSL & 1,545' FWL~~ **Moved to 300' FSL & 500' FEL**

Location: S32 T24S R35E

Casing Information:

Type	Hole Size	Casing Size	Casing Weight	Setting Depth	Sacks of Cement	Estimated TOC	Method Determined
Surface	24"	20"	94.0 lb/ft	800'	1,020	Surface	Circulation
Intermediate 1	17-1/2"	13-3/8"	54.5 lb/ft	5,400'	3,170	Surface	Circulation
Intermediate 2	12-1/4"	9-5/8"	53.5 lb/ft	12,990'	3,420	Surface	Circulation
Liner	8-1/2"	7-5/8"	39 lb/ft	15,770'	200	12,690'(TOL)	CBL

(2) Tubing Information:

5-1/2" (23#) Internal Plastic Coated Tubing swedged down to 5" (18#) with setting depth of 15,750'

(3) Packer Information: Lok-set or equivalent packer set at 15,750'

B.

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

(2) Injection Interval: Open-hole injection between 15,770' – 17,150'

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

(4) Other Perforated Intervals: No other perforated intervals exist.

(5) Overlying Oil and Gas Zones:

- Delaware (5,380')
- Bone Springs (9,100')
- Wolfcamp (12,255')
- Atoka (13,800')
- Morrow (14,425')

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

V – Well and Lease Maps

A well map and lease map are included in *Attachment 2*.

VI – AOR Well List

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

VII – Proposed Operation

- (1) Proposed Maximum Injection Rate: ~~30,000 bpd~~ **Solaris increase to 40,000 bpd**
Proposed Average Injection Rate: 15,000 bpd
- (2) A closed system will be used.
- (3) Proposed Maximum Injection Pressure: 3,154 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 well will be injecting water into the Devonian and Silurian-Fusselman formation which is known to be compatible with formation water from the Wolfcamp and Bone Springs formations. . Water analyses from Silurian-Fusselman could not be located; however, water analyses from the Devonian formation in the area are included in ~~Attachment 4~~.

VIII – Geologic Description

The proposed injection interval includes the Devonian and Silurian-Fusselman formations from 15,770 – 17,150 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 775 feet. Water well depths in the area range from 97-431 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 the 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 the AOR of the proposed SWD location. A list of recipients, as well as delivery confirmations, are included in ~~Attachment 7~~.

SURFACE ELEVATION 3,303' TOTAL DEPTH 17,250'

MUD LOGGING E LOGGING/ DIRECTIONAL	CASING SIZE (IN.) CEMENT (SACKS)	RKB DRILL DEPTH MD TVD	BOPE	FORMATION	HOLE SIZE (IN.)	MUD WT.	FRAC GRAD	TUBING
	GRND LEVEL - RKB GL FLEV. -	32 3,303						
	30" GROUT TO SURFACE	120 / 120	OPEN		32"	8.8		
	20" 94# J55 BTC 1,020 SACKS, CEMENTED TO SURFACE	775 800 / 800	26-3/4"-3M ANNULAR/DIVERTER	PERMIAN RUSTLER FM (USDW)	24"	8.4		
MUD LOGGING TO BEGIN AT 2500'	13 3/8" 54.5# J-55	5,380 5,400 / 5,400	21-3/4"-5M ANNULAR 21-3/4"-5M BOP	PERMIAN DELAWARE MTN. GROUP	17 1/2"	9.5 to 10.0		5 1/2" (23#) IPC TUBING
DV TOOL AT ±3,300' IN 9 1/2" OPEN HOLE, ECP BELOW	3,170 SACKS, CEMENTED TO SURFACE	9,100 12,255		PERMIAN BONE SPRING FM. PERMIAN WOLFCAMP FM.	12 1/4"	9.4 to 10.0		
	TOL 9 5/8" 53.5# P110 BTC 3,420 SACKS, CEMENTED TO SURFACE IN TWO STAGES	12,690 / 12,690 12,990 / 12,990	13-5/8" -10M ANNULAR 13-5/8" -10M BOP	PENNSYLVANIAN STRAWN FM.		10.0 12.5		
	7 5/8" 39# P110, ST-1	13,610 13,800 14,425 15,770 15,770 / 15,770		PENNSYLVANIAN ATOKA FM. PENNSYLVANIAN MORROW FM. DEVONIAN	8 1/2"	12.5 to 14.6		5" (18#) IPC TUBING
	200 SACKS, EST. TOC 12,690' BACK UP INTO THE 9 1/2" CASING (AFFIXED WITH PADFL CEMENT EPOXY) (100)		13-5/8" -10M ANNULAR 13-5/8" -10M BOP			14.6	LOK-SET PACKER (OR EQUIV) AT 15,750'	15,750'
RUN #1 GR/NEUTRON USIT/CBL	17,350 - 0 15,770 - 0 DUAL 0"	17,150 TD 17,250 / 17,250	13-5/8" -10M ANNULAR 13-5/8" -10M BOP	Base of FUSSELMAN FM	6 1/2"	9.0		

BRECKENRIDGE STATE SWD #1

SECTION 32 T-24-S, R-35-E
2,595' FSL & 1,545' FWL

LEA COUNTY, NEW MEXICO

PN # 1680 NM.00

JUNE 2018



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SIZE
A

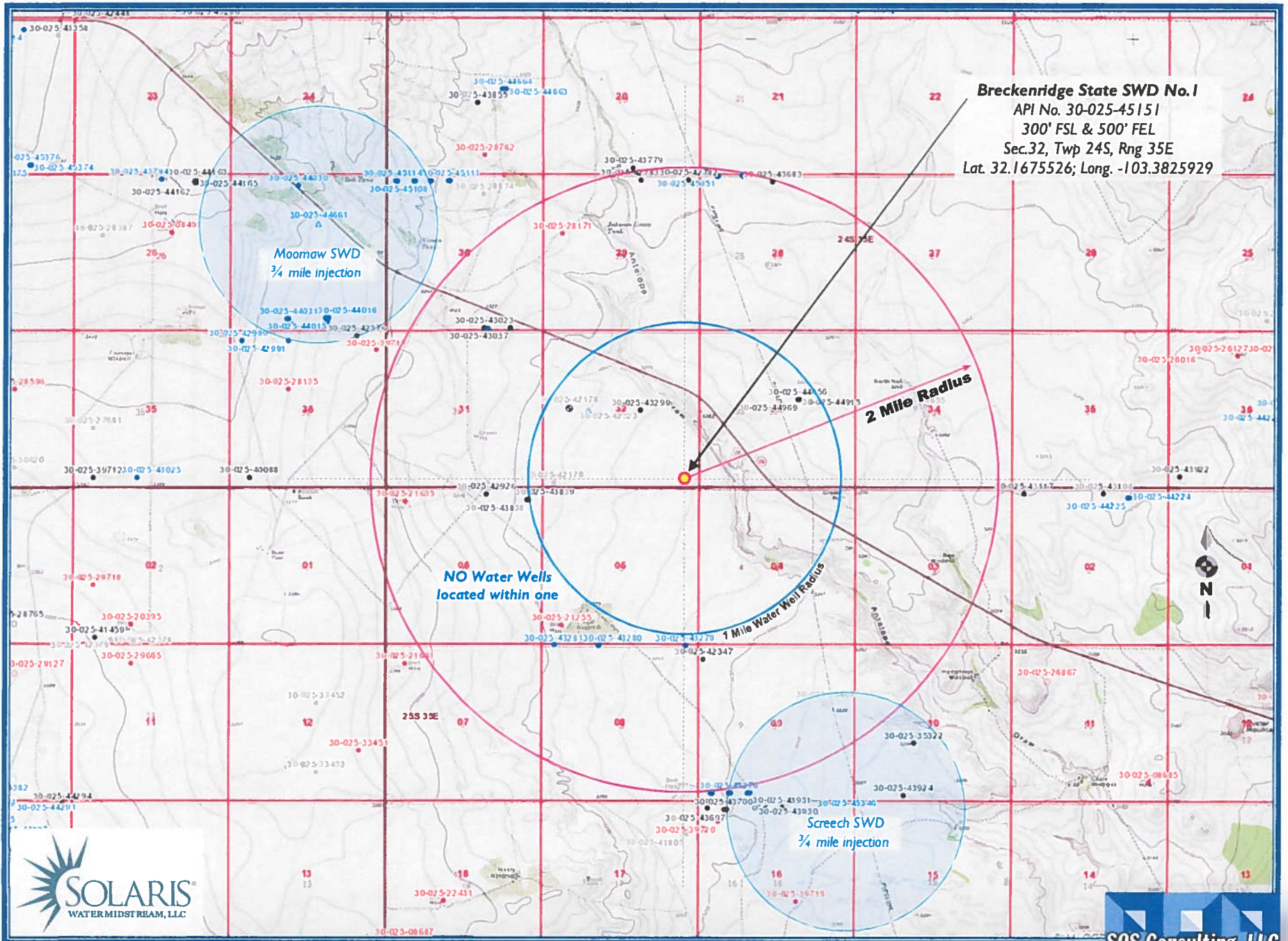
SCALE

NTS

WELL BORE DATA SHEET

Breckenridge State SWD No.1 - Area of Review / 2 Miles

(Attachment to NMOCD Form C-108 - Item V)



Breckenridge State SWD No.1
API No. 30-025-45151
300' FSL & 500' FEL
Sec.32, Twp 24S, Rng 35E
Lat. 32.1675526; Long. -103.3825929

Moomaw SWD
3/4 mile injection

NO Water Wells
located within one

1 Mile Water Well Radius

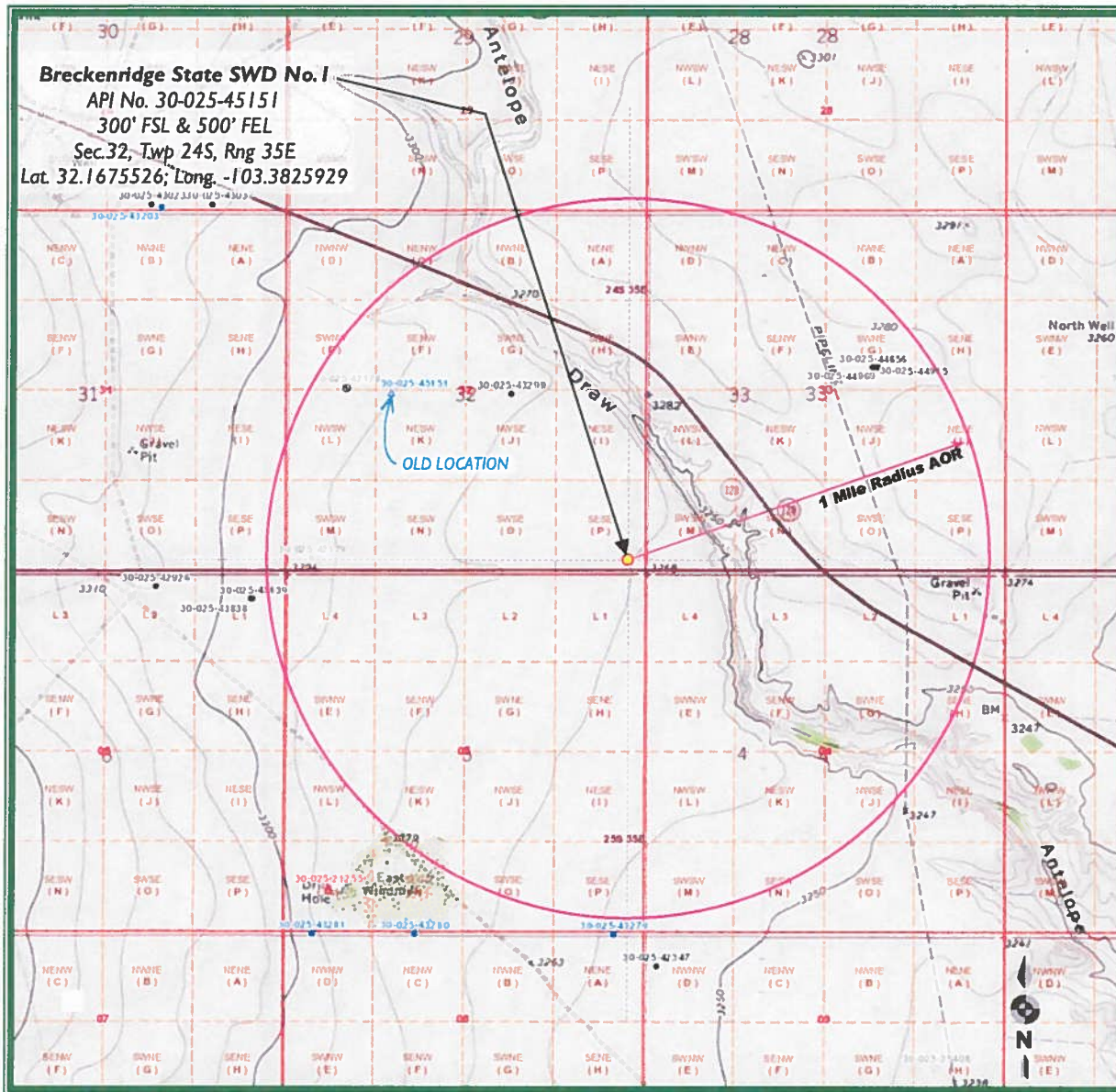
2 Mile Radius

Screech SWD
3/4 mile injection

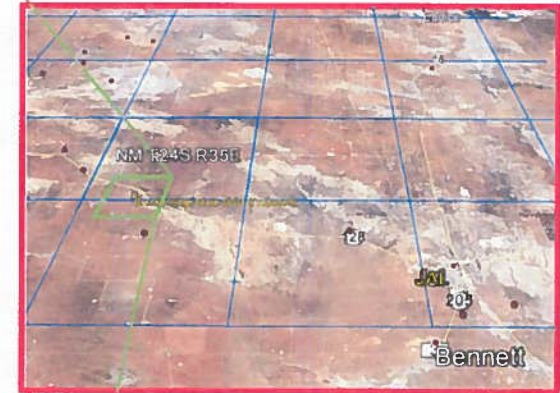


Breckenridge State SWD Well No.1 - Area of Review / Overview Map

(Attachment to NMOCD Form C-108, Application for Authority to Inject.)



10.7 miles W/NW of Jal, NM



C-108 ITEM VII – PRODUCED WATER ANALYSES

This information was provided as part of the original C-108 application submitted by ALL Consulting, LLC

Water Analyses follow this page.

Attachment 3
Source Water Analyses

Wolfcamp



Water Analysis

Date: 23-Aug-11

2708 West County Road, Hobbs NM 88240
Phone (575) 392-5556 Fax (575) 392-7307

Analyzed For

Brushy Draw 1#1

Company	Well Name	County	State
	BD	Lea	New Mexico

Eddy 1-265-29E

Sample Source	Swab Sample	Sample #	
		1	

Formation	Depth
-----------	-------

Specific Gravity	1.170	SG @ 60 °F	1.172
pH	8.30	Sulfides	Absent
Temperature (°F)	70	Reducing Agents	

Cations

Sodium (Calc)	in Mg/L	77,982	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) 228-6121

Lab Team Leader - Shella Hernandez

(432) 495-7240

Bone Spring

Water Analysis Report by Baker Petrolite

Company:		Sales RDT:	33514.1
Region:	PERMIAN BASIN	Account Manager:	TONY HERNANDEZ (576) 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			
		Anions		Cations	
		mg/l	meq/l	mg/l	meq/l
Sampling Date:	03/10/11	Chloride:	109616.0	Sodium:	70276.7
Analysis Date:	03/18/11	Bicarbonate:	2135.0	Magnesium:	195.0
Analyst:	SANDRA GOMEZ	Carbonate:	0.0	Calcium:	844.0
TDS (mg/l or g/m3):	184911.1	Sulfate:	747.0	Strontium:	220.0
Density (g/cm3, tonne/m3):	1.113	Phosphate:		Barium:	0.8
Anion/Cation Ratio:	1	Borate:		Iron:	6.5
		Silicate:		Potassium:	869.0
				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
				Nickel:	0.

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
		Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	
80	0	1.08	188.62	-1.20	0.00	-1.18	0.00	-0.11	0.00	0.58	0.29	1.72
100	0	1.10	208.06	-1.29	0.00	-1.20	0.00	-0.15	0.00	0.35	0.29	2.36
120	0	1.12	224.17	-1.38	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

wellname	api	section	township	range	county	state	formation	sampledate	ph	specificgravity	specificgravity_temp_f	tds_mgl	resistivity_ohm_cm	resistivity_ohm_cm_temp_f	conductivity	conductivity_temp_f	sodium_mgl	calcium_mgl	magnesium_mgl	chloride_mgl	bicarbonate_mgl	sulfate_mgl
JURNEGAN POINT #001	3001510200	5	24S	25E	EDDY	NM	DEVONIAN	12/14/1964 0:00	7			203100								121300	175	2220
WHITE CITY PENN GAS COM UNIT 1 #001	3001500400	29	24S	26E	EDDY	NM	DEVONIAN	3/1/1960 0:00	7	1.012	60	0.36	75	2596	64	6072	1002	132	10120	653	1336	

Source: Co-Tech (<https://gsa-oh.nmt.edu/gotech/Water/producedwater.aspx>)

C-108 - Item VIII

Geological Data

EARTHQUAKE / SEISMIC INFORMATION SUPPLEMENT

The following attachment is the seismic assessment of the area for the Breckenridge State SWD project.

Mr. Dan Arthur of ALL Consulting, LLC is an expert in the field.

This exhibit is was provided and included in the original location C-108.

Attachment 6

Induced Seismicity Assessment Letter

August 7, 2018

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 Breckenridge State SWD #1

Dear Mr. Goetze,

This letter provides information regarding the seismic potential associated with injection operations associated with Solaris Water Midstream, LLC's (Solaris), proposed Breckenridge State 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 2,595' FSL & 1,545' FWL of Section 32, in T24-S and R35-E of Lea County, New Mexico. Historically, the Lea County area has experienced very limited recorded seismic activity (per the U.S. Geological Survey [USGS] earthquake catalog database). The closest recorded seismic event was a M2.9 that occurred on December 4, 1984, and was located approximately 11.46 miles northwest of the subject well (See Exhibit 1). The closest Class IID well injecting into the same formations (Devonian-Silurian) of the Subject Well is approximately 2.10 miles to the northwest (See Exhibit 1).

Solaris 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 35.45 miles west 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



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

Enclosures
References
Exhibits

Induced Seismicity Potential Statement for the Breckenridge State SWD #1
August 7, 2018

References

Induced Seismicity Potential Statement for the Breckenridge State SWD #1
August 7, 2018

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 Breckenridge State SWD #1
August 7, 2018

Exhibits

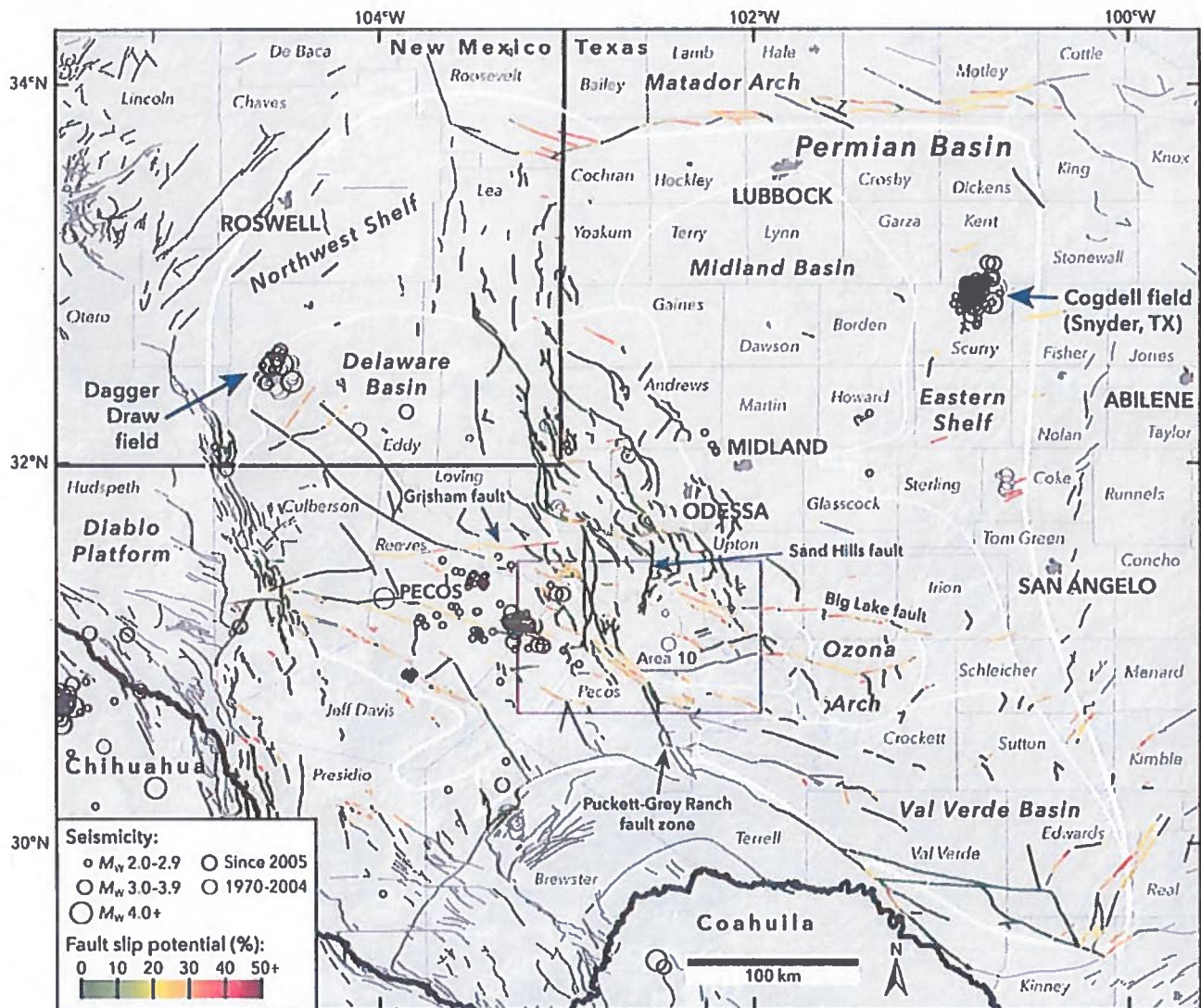


Exhibit 2. Results of the Snee and Zoback (2018) Probabilistic FSP Analysis Across the Permian Basin

Induced Seismicity Potential Statement for the Breckenridge State SWD #1
 August 7, 2018

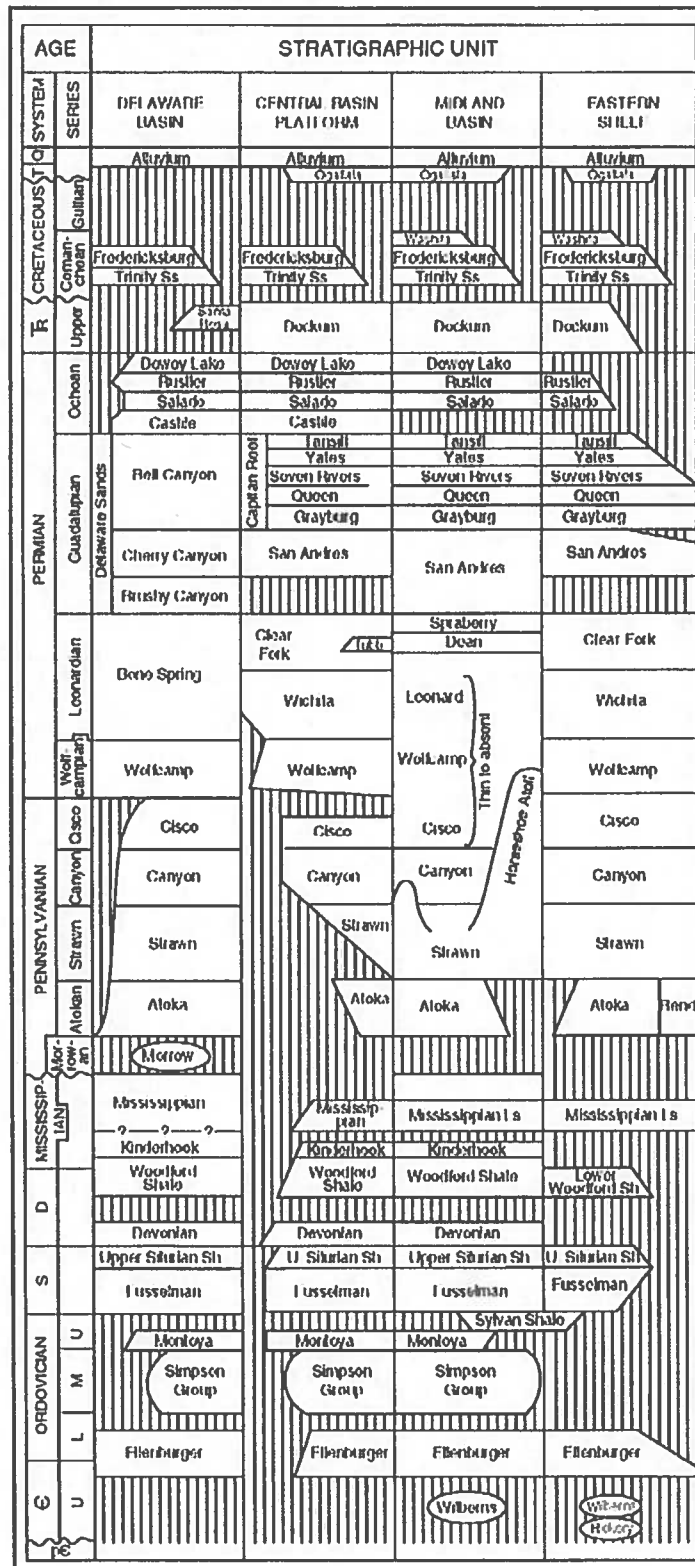


Exhibit 3. Delaware Basin Stratigraphic Chart (Ball 1995)

C-108 ITEM XIII – PROOF OF NOTIFICATION

IDENTIFICATION AND NOTIFICATION OF INTERESTED PARTIES

Exhibits for Section

Affected Parties Map

List of Interested Parties

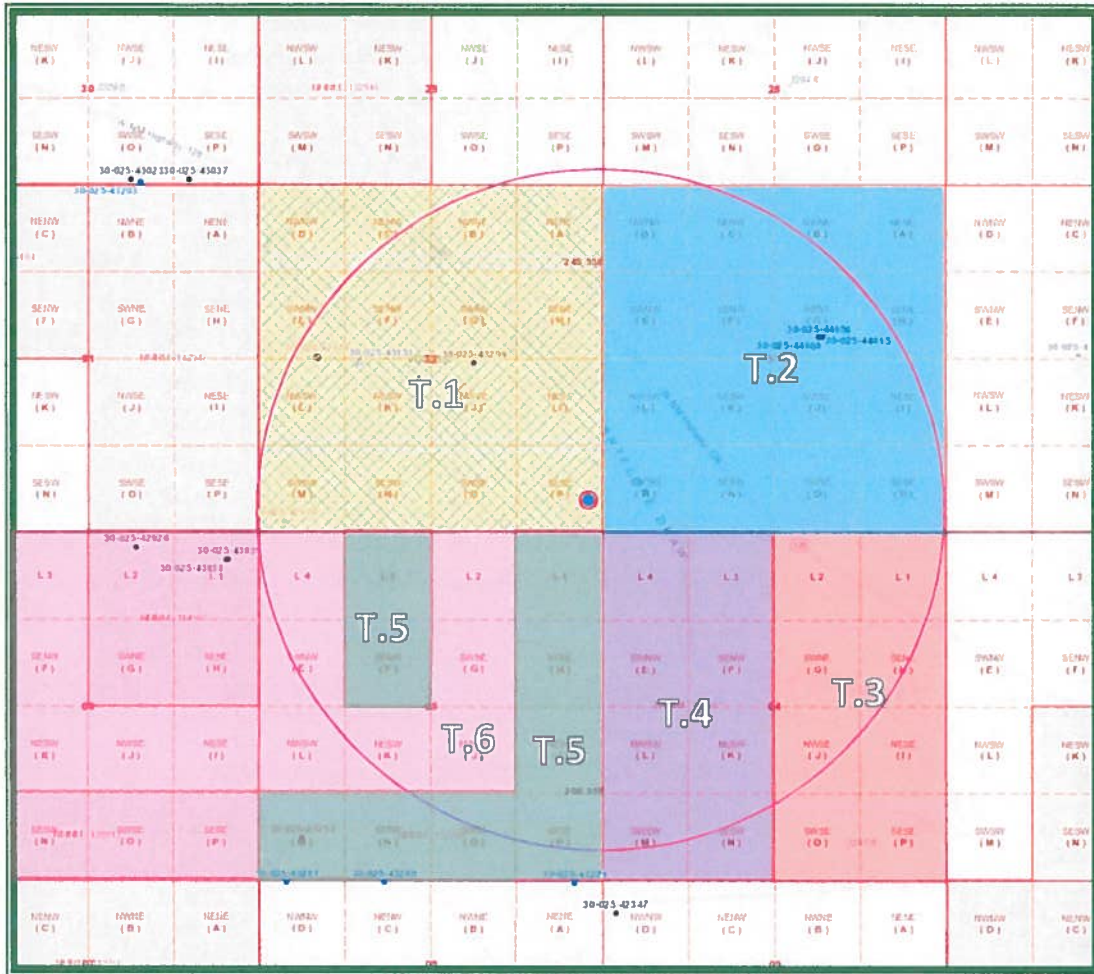
Notification Letter to Interested Parties

Proof of Certified Mailing

Published Legal Notice

Breckenridge State SWD Well No.1 – Affected Parties Plat

(Attachment to NMOCD Form C-108, Application for Authority to Inject.)



LEGEND	
T.1 – V0-9265-0001 – COG Operating, LLC	T.4 – NMNM-125657 – V-F Petroleum, Inc.
T.2 – Private – Tap Rock Operating, LLC	T.5 – NMNM-132948 – COG Operating, LLC <i>Split Estate – Private Surface / BLM Minerals</i>
T.3 – Private – Destiny Management, Inc.	T.6 – Private – Bert Madera

C-108 ITEM XIII – PROOF OF NOTIFICATION AFFECTED PARTIES LIST

SOS Consulting is providing electronic delivery of C-108 applications.
ALL APPLICABLE AFFECTED PARTIES ARE PROVIDED A LINK IN THE NOTICE LETTER
TO A SECURE SOS/ CITRIX SHAREFILE® SITE TO VIEW AND DOWNLOAD
A FULL COPY OF THE SUBJECT C-108 APPLICATION IN PDF FORMAT.

"AFFECTED PERSON" MEANS THE DIVISION DESIGNATED OPERATOR; IN THE ABSENCE OF AN OPERATOR, A LESSEE WHOSE INTEREST IS EVIDENCED BY A WRITTEN CONVEYANCE DOCUMENT EITHER OF RECORD OR KNOWN TO THE APPLICANT AS OF THE DATE THE APPLICANT FILES THE APPLICATION; OR IN THE ABSENCE OF AN OPERATOR OR LESSEE, A MINERAL INTEREST OWNER WHOSE INTEREST IS EVIDENCED BY A WRITTEN CONVEYANCE DOCUMENT EITHER OF RECORD OR KNOWN TO THE APPLICANT AS OF THE DATE THE APPLICANT FILED THE APPLICATION FOR PERMIT TO INJECT.; PER OCD RULES NMAC 19.15.26.7, A. AND 19.15.26.8, B.2.

SURFACE OWNER

- 1 STATE OF NEW MEXICO (Notified via USPS Certified Mail)
Oil, Gas and Minerals Division
310 Old Santa Fe Trail
Santa Fe, NM 87504
Certified: 7018 0360 0001 8569 5951

OFFSET MINERALS LESSEES and OPERATORS (All Notified via USPS Certified Mail)

State Lease V0-9265-0001 and BLM Lease NMNM-132948 (Including Split Estate) **T.1 and T.5 on Map)**

Lessee and Operator

- 2 COG OPERATING, LLC
Attn: Brian Collins
2208 W. Main Street
Artesia, New Mexico 88210-3720
Certified: 7018 0360 0001 8569 5968

BLM Lease NMNM-013996 (T.2 on Map) **Operator**

- 3 TAP ROCK OPERATING, LLC
602 Park Point Drive, Ste. 200
Golden, CO 80401
Certified: 7018 0360 0001 8569 5975

Private Lease (T.3 on Map) **Owner**

- 4 DESTINY MANAGEMENT, INC.
1004 N Big Spring St #220
Midland, TX 79701
Certified: 7018 0360 0001 8569 5982

BLM Lease NMNM-125657 (T.4 Map) **Lessee**

- 5 V-F PETROLEUM INC
P. O. Box 1889
Midland, TX 79702
Certified: 7018 0360 0001 8569 5999

**C-108 ITEM XIII – PROOF OF NOTIFICATION
AFFECTED PARTIES LIST (cont.)**

Private Lease (T.6 on Map)

Owner

- 6 BERT MADERA
125 Bellavia Circle
Ruidoso, New Mexico 88252
Certified: 7018 0360 0001 8569 6002

OFFSET MINERALS OWNERS (Notified via USPS Certified Mail)

- 7 U.S. DEPARTMENT OF INTERIOR
Bureau of Land Management
Oil & Gas Division
620 E. Greene St.
Carlsbad, NM 88220
Certified: 7018 0360 0001 8569 6019

STATE OF NEW MEXICO
Oil, Gas and Minerals Division
310 Old Santa Fe Trail
Santa Fe, NM 87504

REGULATORY

NEW MEXICO OIL CONSERVATION DIVISION (FedEx'ed original and copy)
1220 S. St. Francis Dr.
Santa Fe, NM 87505

NEW MEXICO OIL CONSERVATION DIVISION (FedEx'ed copy)
1625 N. French Drive
Hobbs, NM 88240

STATE OF NEW MEXICO (FedEx'ed copy)
Oil, Gas and Minerals Division
310 Old Santa Fe Trail
Santa Fe, NM 87504



December 19, 2018

NOTIFICATION TO INTERESTED PARTIES
via U.S. Certified Mail – Return Receipt Requested

To Whom It May Concern:

Solaris Water Midstream, LLC, Midland, Texas, has made application to the New Mexico Oil Conservation Division to drill and complete for salt water disposal the Breckenridge State SWD Well No.1. The proposed commercial operation will be for produced water disposal from area operators. As indicated in the notice below, the well is located in Section 32, Township 24 South, Range 35 East in Lea County, New Mexico.

The published notice states that the interval will be from 15,770 feet to 17,150 feet into the Devonian, Silurian and Fusselman formations.

Following is the notice published in the Hobbs News-Sun, Hobbs, New Mexico on or about December 20, 2018.

LEGAL NOTICE

Solaris Water Midstream, LLC, 701 Tradewinds Blvd., Suite C, Midland, TX 79706, is filing Form C-108 (Application for Authority to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well, the Breckenridge State SWD No.1, is located 300' FSL and 500' FEL, Section 32, Township 24 South, Range 35 East, Lea County, New Mexico. The proposed SWD was originally applied for at a different location but is being moved to accommodate offset concerns. Produced water from area production will be commercially disposed into the Devonian, Silurian and Fusselman formations at a depth of 15,770' to 17,150' at a maximum surface pressure of 3154 psi and a rate limited only by such pressure. The proposed SWD well is located approximately 10.7 miles west/ northwest of Jal, NM.

Interested parties wishing to object to the proposed application must file with the New Mexico Oil Conservation Division, 1220 St. Francis Dr., Santa Fe, NM 87505, (505)476-3460 within 15 days of the date of this notice. Additional information may be obtained from the applicant's agent, SOS Consulting, LLC, (903)488-9850 or, email info@sosconsulting.us.

You have been identified as a party who may be interested as an offset lessee or operator.

You are entitled to a full copy of the application. A full copy in PDF format is posted on the SOS Consulting **ShareFile** site and is available for immediate download.

Use the URL link: <https://sosconsulting.sharefile.com/d-sd51a00d622f4bc88>
(Please Note: The ShareFile service is powered by Citrix Systems and is completely secure.*)

The link to this file will be active for 30 days from the date of this letter. Your company can access and download the file a maximum of five (5) times. (One copy may be downloaded and shared as needed among your company.)

If preferred, you may call SOS Consulting, LLC at 903-488-9850, or email info@sosconsulting.us, and the same PDF file copy will be expedited to you via email.

Please use a subject like "**Breckenridge St SWD Dec 2018 PDF Copy Request**".

Thank you for your attention in this matter.

Best regards,



Ben Stone, SOS Consulting, LLC
Agent for Solaris Water Midstream, LLC

Cc: Application File

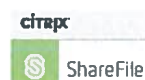
SOS Consulting is committed to providing superior quality work using technology to assist clients and affected parties in obtaining the documentation required. SOS will continue to utilize methods which are less energy and resource intensive including, the reduction of paper copies.

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C-108 - Item XIV

Proof of Notice – Legal Notice Newspaper of General Circulation

LEGAL NOTICE DECEMBER 20, 2018

Solaris Water Midstream, LLC, 701 Tradewinds Blvd., Suite C, Midland, TX 79706, is filing Form C-108 (Application for Authority to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well, the Breckenridge State SWD No.1, is located 300' FSL and 500' FEL, Section 32, Township 24 South, Range 35 East, Lea County, New Mexico. The proposed SWD was originally applied for at a different location but is being moved to accommodate offset concerns. Produced water from area production will be commercially disposed into the Devonian, Silurian and Fusselman formations at a depth of 15,770' to 17,150' at a maximum surface pressure of 3154 psi and a rate limited only by such pressure. The proposed SWD well is located approximately 10.7 miles west/northwest of Jal, NM.

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#33557

The above is the "Proof Copy" sent from the Hobbs News-Sun.
The affidavit of publication will be forwarded as soon as it is received.

Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

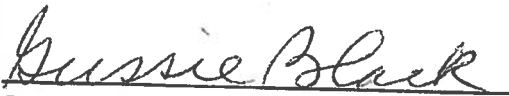
I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was published in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

Beginning with the issue dated
December 20, 2018
and ending with the issue dated
December 20, 2018.



Publisher

Sworn and subscribed to before me this
20th day of December 2018.

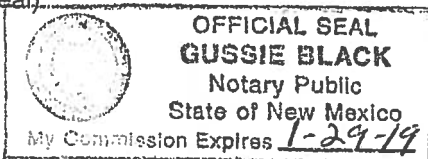


Business Manager

My commission expires

January 29, 2019

(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

LEGALS

LEGAL NOTICE
DECEMBER 20, 2018

Solaris Water Midstream, LLC, 701 Tradewinds Blvd., Suite C, Midland, TX 79706, is filing Form C-108 (Application for Authority to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for a salt water disposal well. The proposed well, the Breckenridge State SWD No. 1, is located 300' FSL and 500' FEL, Section 32, Township 24 South, Range 35 East, Lea County, New Mexico. The proposed SWD was originally applied for at a different location but is being moved to accommodate offset concerns. Produced water from area production will be commercially disposed into the Devonian, Silurian and Fusseiman formations at a depth of 15,770' to 17,150' at a maximum surface pressure of 3154 psi and a rate limited only by such pressure. The proposed SWD well is located approximately 10.7 miles west/northwest of Jal, NM.

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67104420

00222465

BEN STONE
SOS CONSULTING, LLC.
P.O. BOX 300
COMO, TX 75431

C-108 - Item XIV

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Attn: Brian Collins
2208 W. Main Street
Artesia, New Mexico 88210-3720

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Golden, CO 80401

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DESTINY MANAGEMENT, INC.
1004 N Big Spring St #220
Midland, TX 79701

PS Form 3800, October 2016

C-108 - Item XIV

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PS Form 38

V-F PETROLEUM INC
P. O. Box 1889
Midland, TX 79702

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PS Form 380

BERT MADERA
125 Bellavia Circle
Ruidoso, New Mexico 88252

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PS Form 380

Bureau of Land Management
Oil & Gas Division
620 E. Greene St.
Carlsbad, NM 88220

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