# **AE Order Number Banner**

**Application Number:** pMSG2325246506

SWD-2565

Silverback Operating II, LLC [330968]



19707 IH 10 West SUITE 201 SAN ANTONIO, TEXAS 78257

210-585-3316 WWW.SILVERBACKEXP.COM



New Mexico State Lands Office Attn: Michael McMillan 310 Old Santa Fe Trail Santa Fe NM 87501

RE: Silverback Operating II, LLC

C-108 Application for Saltwater Disposal Well Clayton BFO State Com 1 API: 30-015-33733

Dear Mr. McMillan:

Silverback Operating II, LLC. is filing an application to convert the Clayton BFO State Com 1 well API: 30-015-33733, into a saltwater disposal well (SWD). We believe this well will be more economical for the state as an SWD than as a gas well. It is currently producing low gas volumes for the 2023 year. As an SWD, we expect this well to take somewhere in the range of 5,000 to 10,000 barrels of water per day.

With this range of injections and \$10,000/yr. rental payment, this would result in the SLO getting around \$85,000 to \$160,000 per year. Economically speaking, this conversion would be very beneficial for the SLO rather than maintaining a low gas producer. We are requesting your cooperation not to protest our application to convert the well into an SWD well.

Please feel free to contact me if you have any questions or concerns at fabdallah@silverbackexp.com

Sincerely,

Fatma Abdallah

Fatma Abdallah Regulatory Manager Silverback Operating II, LLC.

RECEIVED:	REVIEWER:	TYPE:	APP NO:	
NEGETVED.	NEVIEWER.		162(5)44 1694(5)36(	
		ABOVE THIS TABLE FOR OCD		OF NEW CO.
		CO OIL CONSERV		ON STATES
		cal & Engineerin		•
	1220 South St. Fr	ancis Drive, San	ta Fe, NIVI 8750	05
	ΤΡΙΙΛΙΙΝΙΟΛ	RATIVE APPLICAT	ION CHECKIR	т н
THIS	CHECKLIST IS MANDATORY FOR A	LL ADMINISTRATIVE APPLIC	CATIONS FOR EXCEPTIO	ns to division rules and
	REGULATIONS WHICH RE	EQUIRE PROCESSING AT TH	E DIVISION LEVEL IN SAI	NTA FE
Applicant: Silverb	ack Operating II. I.C		00	GRID Number: 330968
Vell Name: Clay	ton BFO State Com 1			: 30-015-33733
Pool: SWD; Canyon				ol Code: 96184
SUBMIT ACCUI	RATE AND COMPLETE IN	FORMATION REQU	IRED TO PROCES	SS THE TYPE OF APPLICATION
		INDICATED BEL	OW	
1) TYPE OF APP	LICATION: Check those	which apply for [/	4]	
	n – Spacing Unit – Simul <sup>,</sup>			
	NSL □ NSP <sub>(PF</sub>	ROJECT AREA)	SP(proration unit)	□SD
5 0				
	one only for [1] or [11]	loosuromont		
[1] COI	nmingling – Storage – W □DHC □CTB □P		ols Dolm	
	ection - Disposal - Pressu			overy
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				FOR OCD ONLY
	N REQUIRED TO: Check		у.	Notice Complete
	et operators or lease hol alty, overriding royalty o		Mnors	
	lication requires publish		VVIICIS	Application
	ication and/or concurr		LO	Content Complete
	ication and/or concurr	ent approval by B	ILM	Complete
	ice owner	5 15		
	all of the above, proof o	of notification or p	ublication is atta	ached, and/or,
H. ☐ Non	otice required			
3) CERTIFICATIO	N: I hereby certify that	the information su	ubmitted with th	nis application for
	e approval is accurate			
			ation until the re	equired information and
notifications	are submitted to the Div	vision.		
ï	Note: Statement must be comple	eted by an individual wit	th managerial and/or	supervisory capacity.
			8-3-23	
Brian Wood			Date	
Print or Type Name				
	IN / kegent		505 466-8120	
	SALASI		Phone Num	ber
C			brian@permi	tewest com
Signature			e-mail Addre	

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

	AFFLICATION FOR AUTHORIZATION TO INJECT
I.	PURPOSE: Secondary Recovery Pressure Maintenance XXX Disposal Storage Application qualifies for administrative approval? XXX Yes No
II.	OPERATOR: SILVERBACK OPERATING II, LLLC
	ADDRESS: IH 10 WEST, SUITE 201, SAN ANTONIO TX 78257
	CONTACT PARTY: BRIAN WOOD (PERMITS WEST, INC.) PHONE: 505 466-8120
III.	WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection.  Additional sheets may be attached if necessary.
IV.	Is this an expansion of an existing project? Yes XXX No  If yes, give the Division order number authorizing the project:
V.	Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
VI.	Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
VII.	Attach data on the proposed operation, including:  CLAYTON BFO STATE COM 1  30-015-33733
	1. Proposed average and maximum daily rate and volume of fluids to be injected;
	<ol> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,</li> <li>If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).</li> </ol>
*VIII.	Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
IX.	Describe the proposed stimulation program, if any.
*X.	Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).
*XI.	Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
XII.	Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.
XIII.	Applicants must complete the "Proof of Notice" section on the reverse side of this form.
XIV.	Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
	NAME: BRIAN WOODTITLE: CONSULTANT
	SIGNATURE: DATE: AUGUST 2, 2023
*	E-MAIL ADDRESS: brian@permitswest.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:

Side 2

#### 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

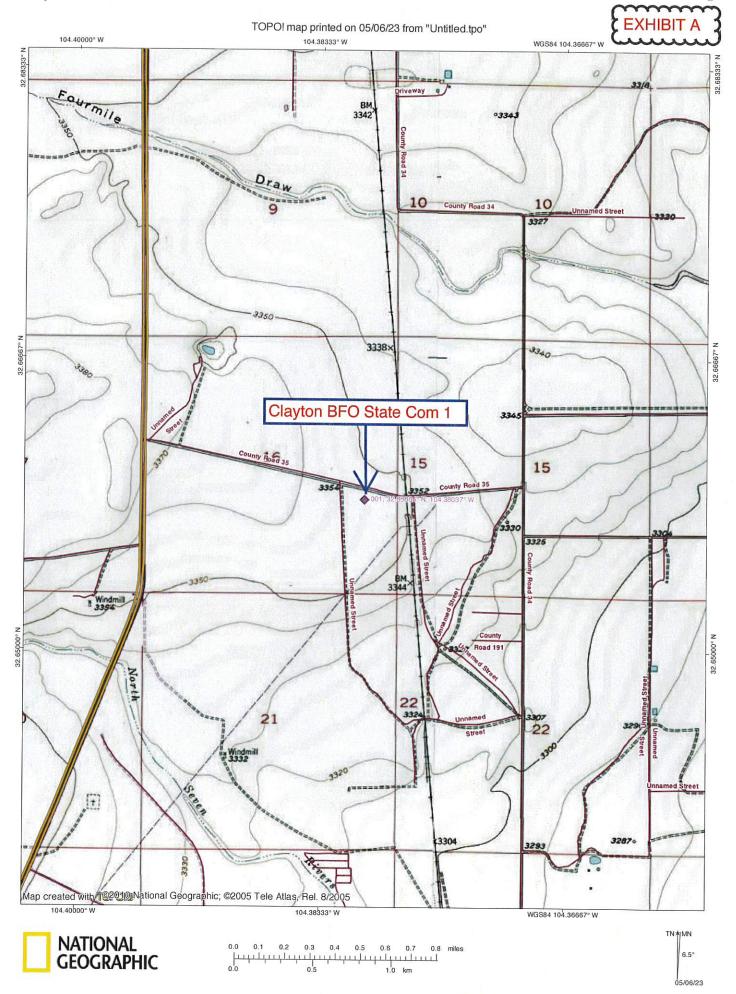
All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

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.



District I

1625 N. French Dr., Hobbs, NM 88240

District II

1301 W. Grand Ave., Artesia, NM 88210

District III

1000 Rio Brazos Rd., Aztec, NM 87410

District IV

1220 S. St Francis Dr., Santa Fe, NM

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

Form C-102 Permit 2889



#### WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-33733	Pool Name Wildcat Chester	Pool Code
Property Code 34426	Property Name CLAYTON BFO STATE COM.	Well No.
0GRID No. 25575	Operator Name  VATES PETROLEUM CORPORATION	Elevation 3354

#### Surface And Bottom Hole Location

IL or Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
	16	19S	26E	I	1980	S	660	E	Eddy
Dedicate 32	ed Acres	Joint or	Infill	Consoli	dation Code		Order	No.	

mere a final de la companya de la co		acoustic come amount a state of the court
	294, 715s.	×

#### OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Electronically Signed By: Debbie Caffall

Title: Regulatory Technician

Date: 11/22/2004

#### SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Surveyed By: Herchel Jones Date of Survey: 11/19/2004 Certificate Number: 3640

1625 N. French Dr., Hobbs, NM 88240 Phone: (575) 393-6161 Fax: (575) 393-0720 811 S. First St., Artesia, NM 88210 Phone: (575) 748-1283 Fax: (575) 748-9720 1000 Rio Brazos Road, Aztec, NM 87410 Phone: (505) 334-6178 Fax: (505) 334-6170

#### State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION 1220 South St. Francis Dr. Santa Ea NIM 07505

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

AMENDED REPORT
(mmm)
EXHIBIT A

District IV 1220 S. St. Francis Dr	Santa Fe. NN	1 87505					Santa Fe, Ni	M 8/303				☐ AM	IENDED I	REPORT
Phone: (505) 476-346			WEI	LL LO	CA	ΓΙΟΙ	N AND ACR	REAGE DEDIC	CATION	PI.A	т	E E	EXHIBI	ГА }
	API Numbe 015-33				<sup>2</sup> Poo	Code	2		<sup>3</sup> I	Pool Na				
4 Property	Code		•		С	LAY	TON BFO	Name STATE COM				6 ,	Well Number	
<sup>7</sup> 0GRID 3309	(1,5,0,5)						8 Operator					3354	<sup>9</sup> Elevation	
							Surface 1	Location						
UL or lot no.	Section 16	Townshi 19 S	.	Range B E	Lo	t Idn	Feet from the 1980	North/South line SOUTH	Feet fro	100000000000000000000000000000000000000	EAST	t/West line	EDDY	County
e <sup>2</sup>				" Bot	tom	Hol	e Location If	Different From	n Surface					
UL or lot no.	16	19 S		Range E		t Idn	Feet from the 1980	North/South line SOUTH	Feet fro	om the	EAST	/West line	EDDY	County
<sup>2</sup> Dedicated Acres	<sup>13</sup> Joint or	r Infill	14 Conso	lidation C	ode	<sup>15</sup> Or	der No.	-						*
lo allowable v ivision.	vill be ass	igned to	this co	ompletio	on un	til al	l interests have l	been consolidated	or a non-st	tandar	d unit has	s been ap	proved by	the
10									to the owns o the pro	by certify best of m a working oposed be	that the inform y knowledge an interest or unli ottom hole loca	ation containe ad belief, and the eased mineral tion or has a ri	TIFICATI  d herein is true of that this organiza interest in the lai ight to drill this w  r of such a miner	and complete tion either nd including well at this

#### INJECTION WELL DATA SHEET

OPERATOR:	SILV	ERBAC	K OPERATING II, LLC				
WELL NAME	& NUME	BER:	CLAYTON BFO STATE COM	1			
WELL LOCAT		ORE SCI	SL & 660' FEL AGE LOCATION HEMATIC	I UNIT LETTER	<u>WELI</u>		
	.875" prod. tbg. @ 8895'		13.375" 48# in 17.5" hole @ 900' TOC (1160 sx) = GL (circ.) 5.5" 15.5# & 17# in 8.75" hole @ 9900' TOC (1925 sx) = GL (circ.)	Cemented with:	1160 s	x. <i>or</i>	ize: 13.375" ft <sup>3</sup> Determined: CIRC.
	packer & 2.8			Cemented with:	\$2	x. <i>or</i>	ize:ft <sup>3</sup> Determined:
			Atoka perfs 9142' - 9292'  Morrow perfs 9694' - 9702'	Cemented with:	GL Injecti	X. or Method I  on Interval	ize: 5.5"  ft <sup>3</sup> Determined: CIRC.
N	TD 9900' OT TO SCAL	E			(Perforated or Oper	n Hole; indicate	which)

Side 1 INJECTION WELL DATA SHEET

OPERATOR: SILVERBACK OPERATING II, LLC				
WELL NAME & NUMBER: CLAYTON BFO STATE O	COM 1			
WELL LOCATION: 1980' FSL & 660' FEL	I	16	19 S	26 E
FOOTAGE LOCATION	UNIT LETTER	<b>SECTION</b>	TOWNSHIP	<b>RANGE</b>

#### **WELLBORE SCHEMATIC**

## WELL CONSTRUCTION DATA Surface Casing

"PROPOSE	ED"				
100 100	13.375" 48# in	Hole Size:	17.5"	Casing Size: 13.375"	
@ 7808'	17.5" hole @ 900' TOC (1160 sx) = GL (circ.)	Cemented with:	1160 sx.	or	ft <sup>3</sup>
tpg.	1000 MAA	Top of Cement:	SURFACE	Method Determined: CIRC.	
2.875" IPC inj.	5.5" 15.5# & 17# in 8.75" hole @ 9900' TOC (1925 sx) = GL (circ.)		Intermedia	ate Casing	
		Hole Size:		Casing Size:	
packer &		Cemented with:	SX.	or	ft <sup>3</sup>
		Top of Cement:		Method Determined:	
			Production	on Casing	
Conven ports		Hole Size:	8.75"	Casing Size: 5.5"	
7858' - 8220'	000 000 000	Cemented with:	sx.	or	ft <sup>3</sup>
TOC @ 8265'		Top of Cement:	GL	Method Determined: CIRC.	
CIBP @ 8300'	Atoka perfs 9142' - 9292'	Total Depth: 9900 '	t		
	Morrow perfs 9694' - 9702'		Injection	<u>Interval</u>	
	9694 - 9702		7858 fee	et to <u>8220'</u>	
TD 9900 NOT TO SC			(Perforated or Open I	Hole; indicate which)	

Page 10 of 5

#### **INJECTION WELL DATA SHEET**

Γub	oing Size: 2.875", 6.5", J-55 or L-80 Lining Material:IPC						
	be of Packer: NICKEL PLATED OR STAINLESS STEEL ASI-X						
Pac	ker Setting Depth: _7808 '						
Oth	ner Type of Tubing/Casing Seal (if applicable):						
	Additional Data						
1.	Is this a new well drilled for injection? Yes <u>XXX</u> No						
	If no, for what purpose was the well originally drilled? NOT NEW						
	DRILLED IN 2005 AS AN ATOKA MORROW GAS WELL.						
2.	Name of the Injection Formation: CANYON						
3.	Name of Field or Pool (if applicable): SWD; CANYON (POOL CODE 96184)						
4.							
5.	Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:						
	OVER: SAN ANDRES (1238'), GLORIETA (2905'), YESO (3005'),						
	BONE SPRING (6558'), & WOLFCAMP (6932')						
	UNDER: ATOKA (9071') & MORROW (9455')						

## **Affidavit of Publication**

No. 26533

State of New Mexico

County of Eddy: **Danny Scott/** 

being duly sworn sayes that he is the

Publisher

of the Artesia Daily Press, a daily newspaper of General circulation, published in English at Artesia, said county and state, and that the hereto attached

#### Legal Ad

was published in a regular and entire issue of the said Artesia Daily Press, a daily newspaper duly qualified for that purpose within the meaning of Chapter 167 of the 1937 Session Laws of the state of New Mexico for

Consecutive weeks/day on the same day as follows:

Second Publication

May 11, 2023

Third Publication

First Publication

Fourth Publication

Fifth Publication

Sixth Publication

Seventh Publication

Subscribed and sworn before me this

11th

day of

May

2023

LATISHA ROMINE
Notary Public, State of New Mexico
Commission No. 1076338
My Commission Expires

05-12-2027

Latisha Romine

Notary Public, Eddy County, New Mexico

Released to Imaging: 9/9/2023 12:59:57 PM

## **Copy of Publication:**

EXHIBIT K

Legal Notice

Silverback Operating II, LLC will apply to convert its Clayton BFO State Com 1 gas well to a saltwater disposal well. The well will dispose into the Canyon from 7858' to 8220'. It is located 12 miles south of Artesia at 1980' FSL & 660' FEL Sec. 16, T. 19 S., R. 26 E., Eddy County. Maximum disposal rate will be 7,500 bwpd. Maximum injection pressure will be 1,571 psi. Interested parties must file objections or requests for hearing with the NM Oil Conservation Division, 1220 South Saint Francis Dr., Santa Fe, NM 87505, or OCD.Engineer@emnrd.nm.gov, within 15 days. Additional information can be obtained by contacting: Brian Wood, Permits West, Inc., 37 Verano Loop, Santa Fe, NM 87508. Phone number is (505) 466-8120.

Published in the Artesia Daily Press, Artesia, N.M., May 11, 2023 Legal No. 26533.





August 2, 2023

BLM 620 E. Greene St. Carlsbad NM 88220

Silverback Operating II, LLC is applying (see attached application) to convert its Clayton BFO State Com 1 gas well to a saltwater disposal well. As required by NM Oil Conservation Division (NMOCD) rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions, protests, or objections.

Well: Clayton BFO State Com 1

TD = 9,900'

<u>Disposal Zone:</u> Canyon (7,858' - 8,220')

Location: 1980' FSL & 660' FEL Sec. 16, T. 19 S., R. 26 E, Eddy County, NM

Approximate Location: 12 miles south of Artesia, NM

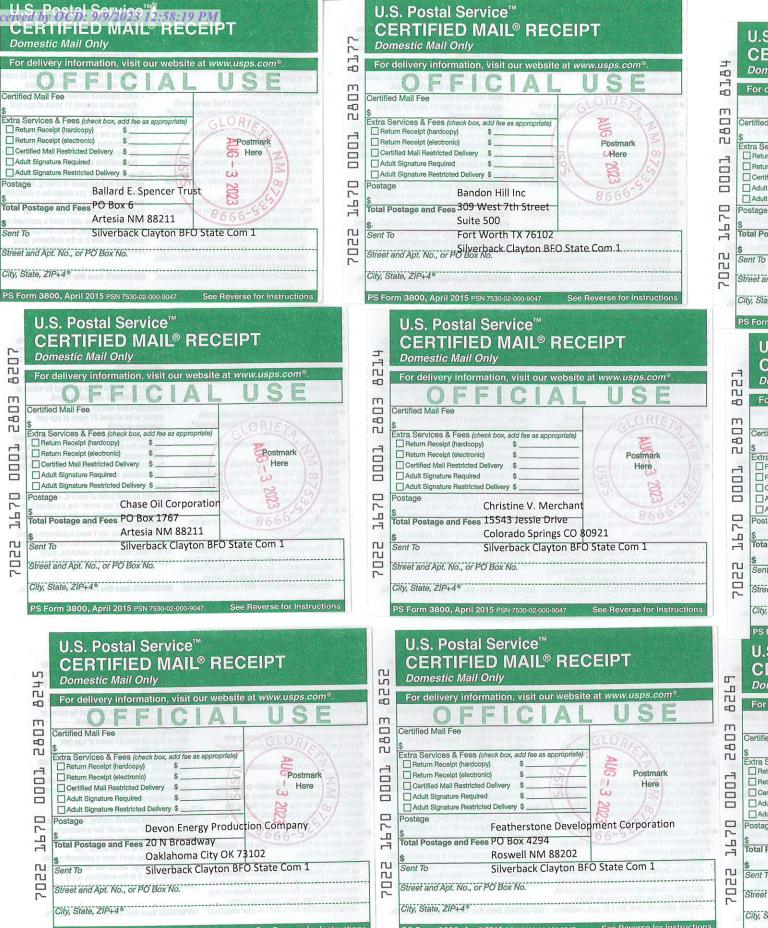
<u>Applicant Name:</u> Silverback Operating II, LLC (210) 585-3316 <u>Applicant's Address:</u> IH 10 West, Suite 201, San Antonio TX 78257

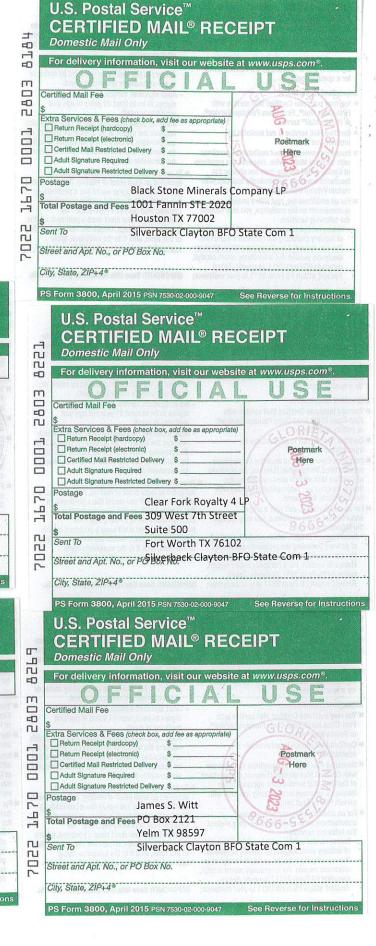
<u>Submittal Information:</u> Application for a saltwater disposal well will be filed with the NMOCD. If you have an objection, protest, or wish to request a hearing, then it must be filed with the NMOCD within 15 days of receipt of this letter. The New Mexico Oil Conservation Division address is 1220 South St. Francis Dr., Santa Fe, NM 87505. NMOCD phone number is (505) 476-3441. E-mail address is: OCD.Engineer@emnrd.nm.gov

Please call me if you have any questions.

Sincerely,

Brian Wood

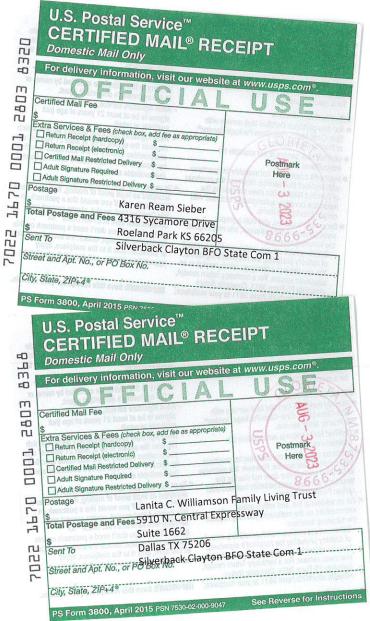


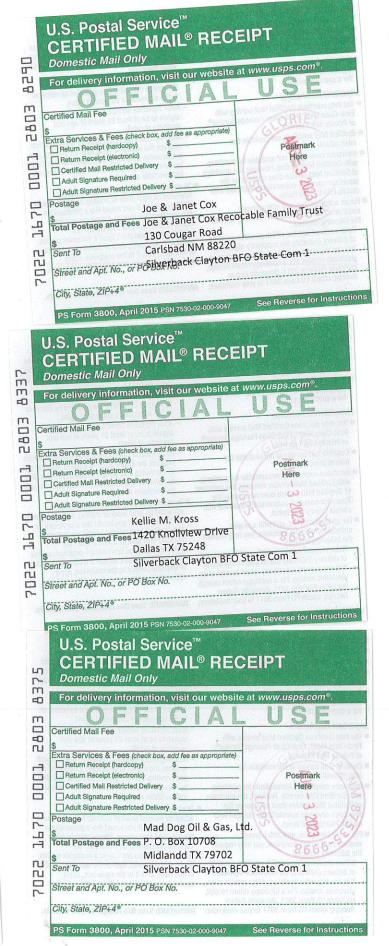


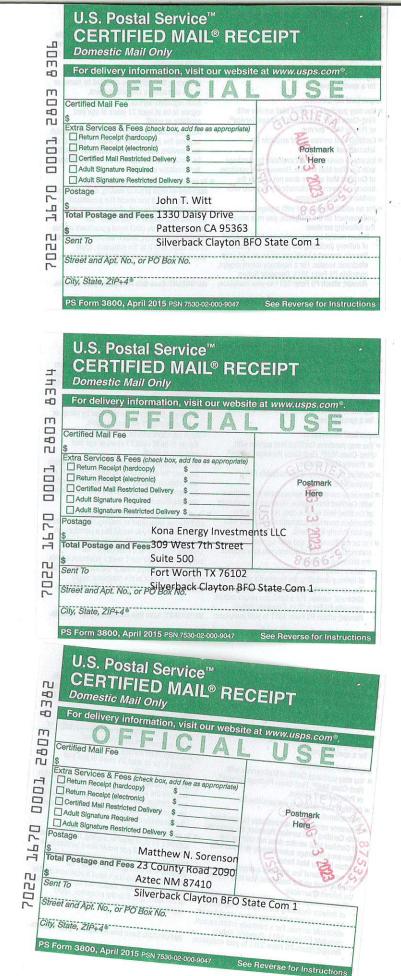


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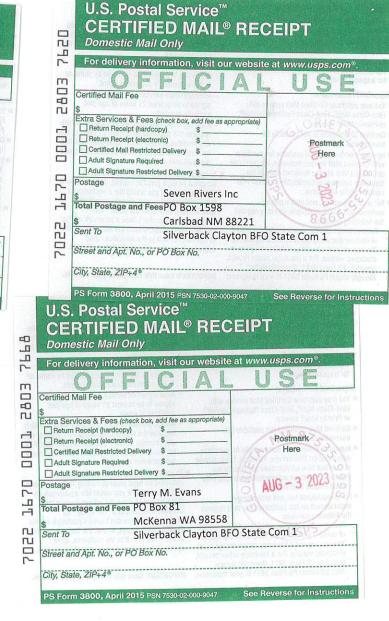


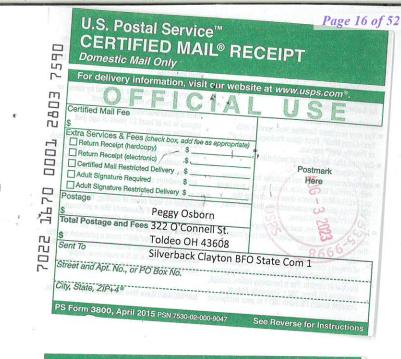


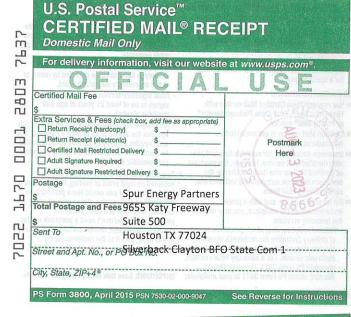


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Certified Mall Fee \$ Extra Services & Fees (check box, add fee as appropriate)   Return Receipt (hardcopy)	For de	elivery informatio	n, visit our website	at www.usps.com®
* Total Postage and Fees PO Box 134  * Amarillo TX 79105  Sent To Silverback Clayton BFO State Com 1  Street and Apt. No., or PO Box No.  City, State, ZIP-48	Certified \$ Extra Ser Return Return Certifie Adult S Postage	Mail Fee  vices & Fees (check bo) Receipt (hardcopy) Receipt (electronic) d Mail Restricted Delivery ignature Required ggnature Restricted Deliver	x, add fee as appropriate) \$ \$ \$ \$ \$ y \$  yy \$	AUC Here 2023
\$ Amarillo TX 79105  Sent To Silverback Clayton BFO State Com 1  Street and Apt. No., or PO Box No.  City, State, ZIP148	Total Pos		STOCKED COMMENT	or five an additional (no, and with a prop
Silverback Clayton BFO State Com 1 Street and Apt. No., or PO Box No.	4		TO SERVICE A PRINCIPAL TO A PARTY OF THE PARTY OF T	
	Street and	Silve	rback Clayton BFO	State Com 1

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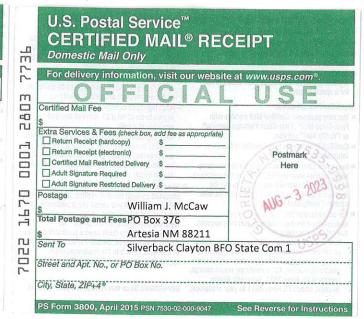








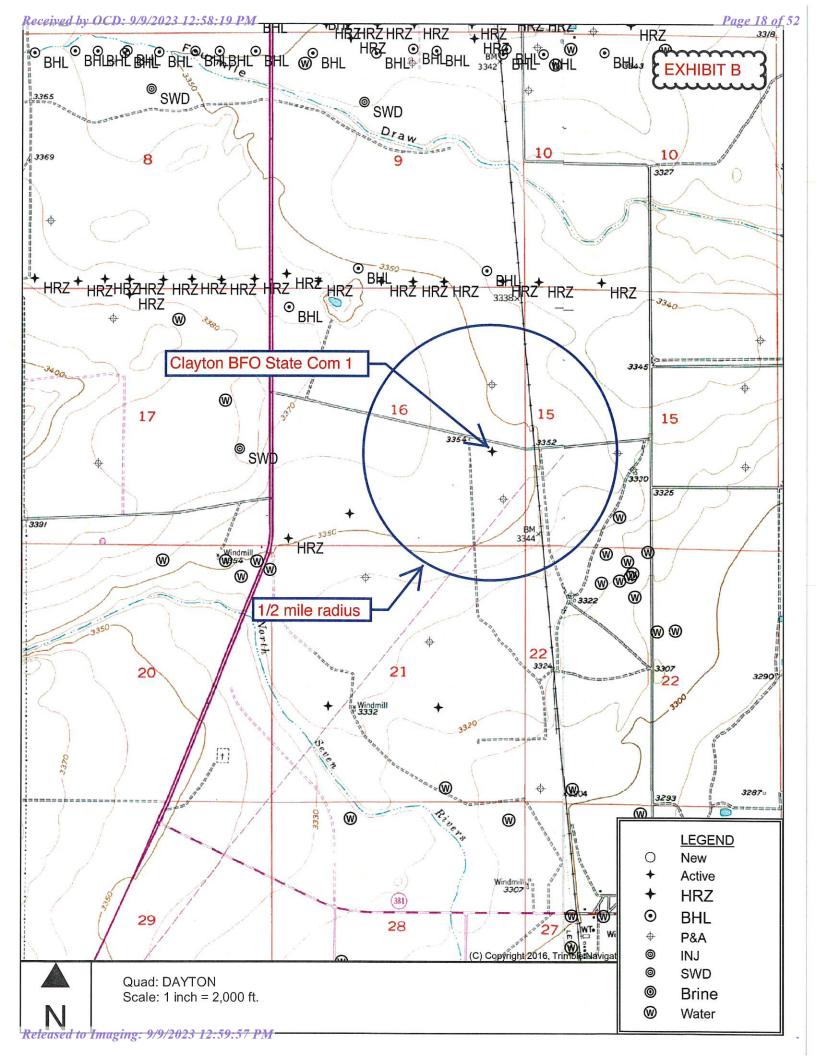
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	Sent To Silverback Clayton BFO Street and Apt. No., or PO Box No.	State Com 1



U.S. Postal Service™ CERTIFIED MAIL® RECEIPT Domestic Mail Only Certified Mail Fee П Extra Services & Fees (check box, add fee as appropriate)

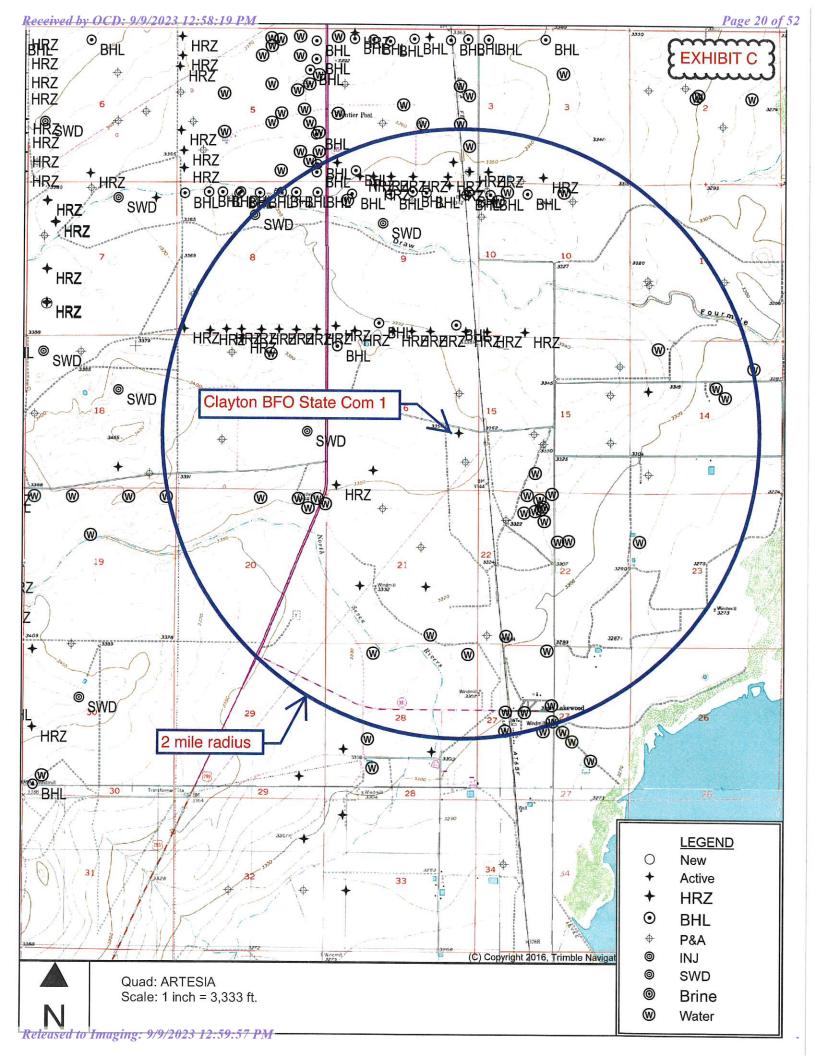
Return Receipt (hardcopy) 000 Return Receipt (electronic) Postmark Certified Mail Restricted Delivery \$ Here Adult Signature Required Adult Signature Restricted Delivery \$\_ WHM Energy LLC Total Postage and Fees PO Box 2378 Midland TX 79702 Silverback Clayton BFO State Com 1 П Street and Apt. No., or PO Box No.





#### SORTED BY DISTANCE FROM CLAYTON BFO STATE COM 1

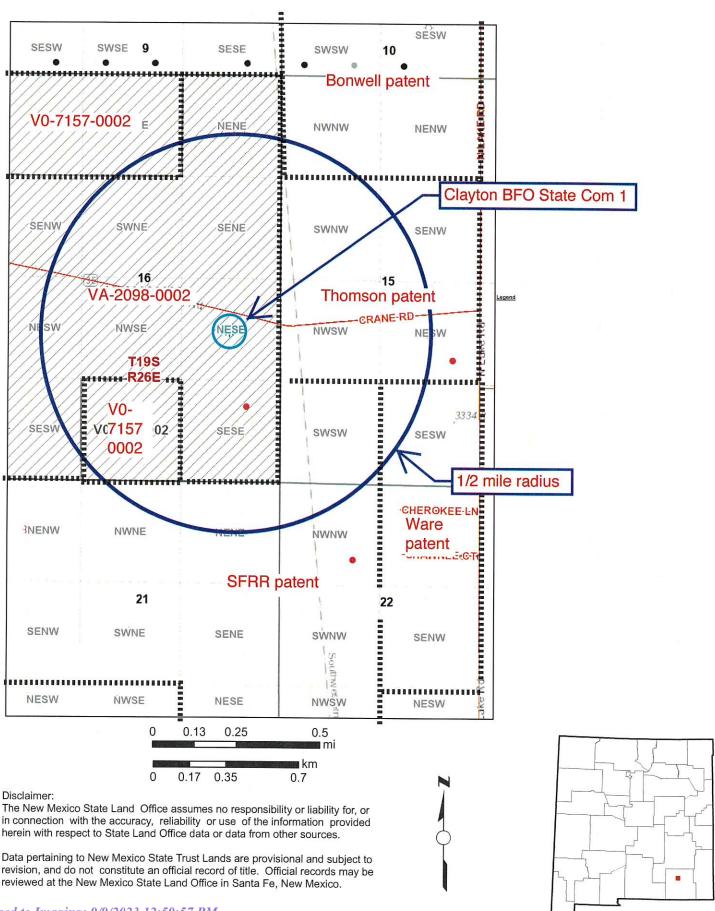
API	OPERATOR	WELL	WELL STATUS	UNIT- SECTION- T19S-R26E	TVD	ZONE @ TD	FEET FROM CLAYTON BFO STATE 1
3001521872	LaRue & Muncy	P V State 001	P&A	P-16	2203	San Andres	1017
3001533728	Yates	Clayton BFO State Com 002	P&A	H-16	85	Quaternary	1320
3001523593	Mack	McMillan Fee 1 (re-entry of Spencer Trust 1)	P&A	K-15	8300	Canyon	2531
	American Public Energy	Spencer Trust 1	P&A	K-15	9830	Morrow	2331





#### New Mexico State Land Office





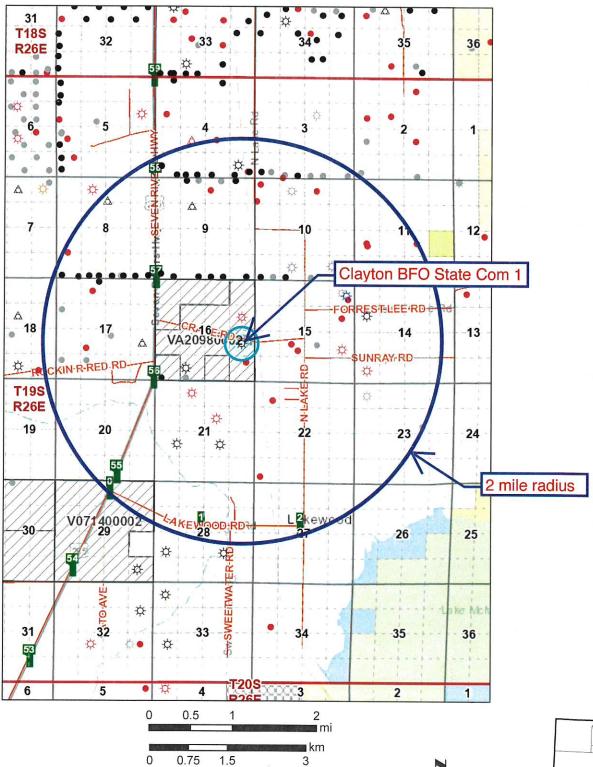
#### CLAYTON BFO STATE COM 1 AREA OF REVIEW LEASES

Aliquot Parts in Area of Review	Lessor	Lease	Mineral Owner or	Well Operators
(T. 19 S., R. 26 E.)	Lessoi	Lease	Lessee(s) of Record	(all zones)
NWNW Sec. 15	fee	Bonwell patent	Sorenson et al	none
S2NW4 & N2SW4 Sec. 15	fee	Thomson patent	Ollie Energy et al	none
SWSW Sec. 15	fee	SFRR patent	Newmont Realty	none
SESW Sec. 15	fee	Ware patent	Spencer Trust et al	none
E2E2, SENW, SWNE, NWSE,	NMSL	VA-2098-0002	Silverback	Cilvanlaaal
W2SW4 Sec. 16	0	VA-2036-0002	Silverback	Silverback
NWNE Sec. 16	NMSL	V0-7157-0002	OXY USA	none
SWSE Sec. 16	NMSL	V0-7157-0002	OXY USA	Silverback
N2NE4 Sec. 21	fee	SFRR patent	Catellus et al	none
NWNW Sec. 22	fee	SFRR patent	Catellus et al	none



#### **New Mexico State Land Office**





Disclaimer:

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Data pertaining to New Mexico State Trust Lands are provisional and subject to revision, and do not constitute an official record of title. Official records may be reviewed at the New Mexico State Land Office in Santa Fe, New Mexico.



# Page 24 of 52

#### WELL CONSTRUCTION DETAILS OF CANYON PENETRATOR

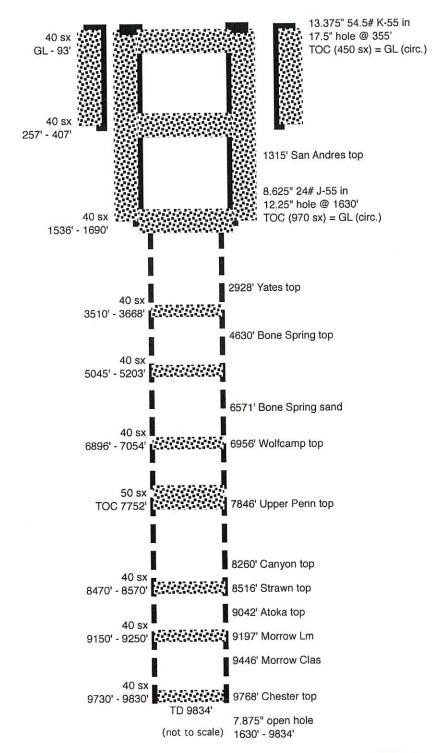
WELL	SPUD	TVD	FORMATION @ TD	WELL STATUS	HOLE O.D.	CASING O.D.	SET @	CEMENT	тос	HOW TOC DETERMINED
Spencer Trust 001	7/31/1981	9834	Chester	P&A	17.5	13.375	355	450 sx	Surface	Circ 25 sx
3001523593*					12.25	8.625	1630	970 sx	Surface	Circ
K-15-19S-26E					7.875	none run	N/A	N/A	N/A	N/A
McMillan Fee 1	5/8/2022	8300	Canyon	P&A	17.5	13.375	355	450 sx	Surface	Circ 25 sx
3001523593*					12.25	8.625	1630	970 sx	Surface	Circ
K-15-19S-26E	9				7.875	none run	N/A	N/A	N/A	N/A
*same well										

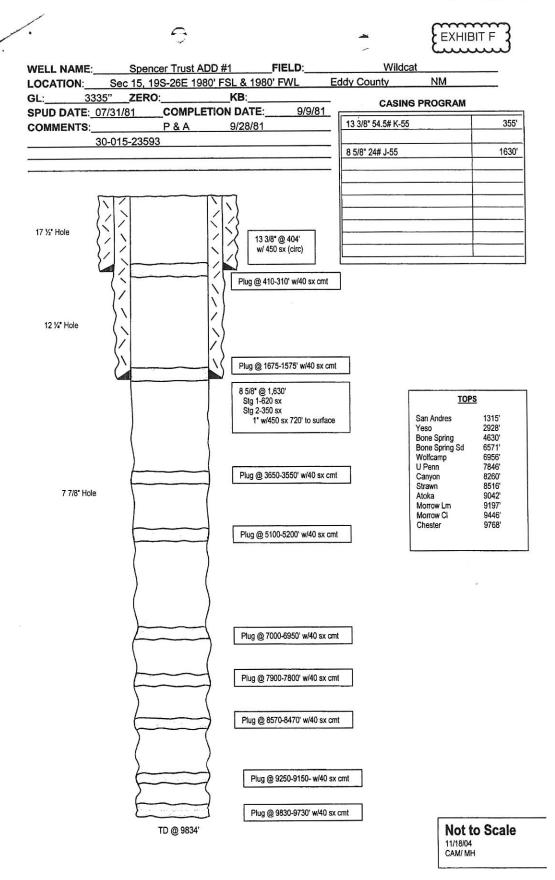
Americsan Public Energy's Spencer Trust 1 spud 7-31-81 and P&A 9-28-81

&

Mack Energy's McMillan Fee 1 spud 5-8-22 and P&A 5-14-22 K-15-19s-26e Eddy County, NM 30-015-23593







Received by OCD: 6/24/2022 2:43:14 PM



Page 2 of 3

	McMillan Fee #1		44000000	2.00 Sept. (25.00 Sept. )					5/12/202
Operator: Location: GL Elevation:	Mack Energy Cor 15-T19S-R26E	poration			1	A CONTRACTOR OF THE CONTRACTOR	Drlg. Contractor: Rig No.: Objective:	5	m Drilling fcamp
Deviation Survey	Sand Tops & Markers	Depth	Hole Size & Cement		Plug Detail	Casing Detail	Perfs & Completion	Max Dog Leg Severity	Artificial Lift
None	None	120	Pre-Set			20° Conductor	None	None	None
	Queen 657'		17 1/2" hole 450sx Class C TOC @ 0' Circ		15 sx Class C plug	13 3/8"-55.5#-J-55		<1°/100	Pumping Unit
		355			40 sx Class C plug				Tubing
					407-256'	8 5/8"-24#-J-55			
	Grayburg 910'								Rods
	San Andres 1315							<2°/100	
		1630'	12 1/4" hole 620sx Class C Circ		40 sx Class C plug	#REF!			Pump
	Yeso 2928'				1690-1536'	Open Hole			
	Bone Spring 4630	,			40 sx Class C plug 3668-3510				
					40 sx Class C plug 5203-5045'			<2°/100	
Во	ne Spring Sand 5	571'	=						
	3.				1				
	Wolfcamp 6956'				40 sx Class C plug 7054-6896'				
	U Penn 7846'				50sx Class H plug 7900-7752'				
	Canyon 8260'	8300'							

Released to Imaging: 7/19/2022 9:51:48 AM

## **DownHole SAT** Mater Analysis Report



#### SYSTEM IDENTIFICATION

SILVERBACK OPERATING II ARTESIA SANTA FE SWD 1 TRANSFER PUMP B. MATHEWS

Sample ID#:

0

ID:

19509

Sample Date: Report Date: 05-09-2022 at 1352

05-16-2022

#### WATER CHEMISTRY

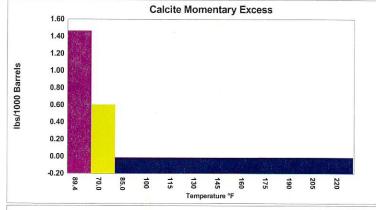
EXHIBIT G

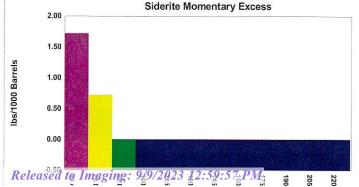
CATIONS		ANIONS	
Calcium(as Ca)	4626	Chloride(as CI)	68000
Magnesium(as Mg)	1311	Sulfate(as SO <sub>4</sub> )	1643
Barium(as Ba)	0.0200	Dissolved CO <sub>2</sub> (as CO <sub>2</sub> )	40.00
Strontium(as Sr)	87.09	Bicarbonate(as HCO <sub>3</sub> )	939.40
Sodium(as Na)	38066	H <sub>2</sub> S (as H <sub>2</sub> S)	2565
Potassium(as K)	370.16		
Lithium(as Li)	12.79		
Iron(as Fe)	27.18		
Manganese(as Mn)	1.13		
Zinc(as Zn)	0.722		
PARAMETERS			
Temperature(OF)	89.40	Sample pH	7.60
Conductivity	149642	Sp.Gr.(g/mL)	1.08
Resistivity	6.68	T.D.S.	122944

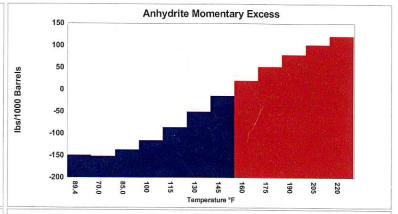
#### **SCALE AND CORROSION POTENTIAL**

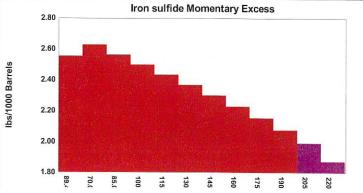
Temp.	Press.	Ca	alcite	Anl	hydrite	Gy	/psum	В	arite	Ce	lestite	Sic	derite	Macl	kinawite	CO <sub>2</sub>	pCO <sub>2</sub>	
(OF)	(psia)	Ca	aCO <sub>3</sub>	C	aSO <sub>4</sub>	CaSC	04*2H2O	Ва	sO <sub>4</sub>	S	rSO <sub>4</sub>	Fe	eCO3		FeS	(mpy)	(psia)	
89.40	15.00	63.32	1.46	0.657	-149.53	0.872	-48.43	0.107	-0.106	0.472	-58.67	374.40	1.72	43928	2.55	0.0351	0.266	
70.00	15.00	23.54	0.601	0.667	-151.97	0.982	-6.65	0.177	-0.0594	0.497	-54.28	121.27	0.720	29456	2.62	0.0234	0.266	
85.00	163.50	0.241	-0. <mark>0</mark> 171	0.671	-137.62	0.896	-37.61	0.116	-0.0969	0.463	-60.28	1.34	0.00158	930.08	2.56	0.314	2.90	
100.00	312.00	0.0907	-0.0181	0.694	-115.85	0.823	-64.98	0.0809	-0.145	0.446	-63.20	0.552	-0.00170	439.36	2.50	0.699	5.53	
115.00	460.50	0.0519	-0.0171	0.743	-85.94	0.843	-52.89	0.0583	-0.206	0.432	-65.33	0.346	-0.00205	268.51	2.43	0.895	8.16	
130.00	609.00	0.0349	-0.0161	0.822	-51.21	0.882	-36.01	0.0425	-0.287	0.417	-68.03	0.255	-0.00197	180.33	2.37	1.08	10.80	
145.00	757.50	0.0254	-0.0152	0.938	-15.02	0.915	-23.94	0.0312	-0.395	0.400	-71.26	0.203	-0.00181	127.01	2.30	1.28	13.43	
160.00	906.00	0.0193	-0.0145	1.10	19.77	0.941	-15.53	0.0231	-0.537	0.383	-75.00	0.168	-0.00164	91.82	2.23	1.45	16.06	
175.00	1054.50	0.0150	-0.0140	1.32	51.33	0.960	-9.82	0.0173	-0.722	0.364	-79,23	0.142	-0.00149	67.48	2.15	1.67	18.70	
190.00	1203.00	0.0118	-0.0137	1.63	78.57	0.973	-6.36	0.0130	-0.962	0.345	-83.99	0.122	-0.00137	50.09	2.07	1.36	21.33	
205.00	1351.50	0.00937	-0.0135	2.05	101.17	0.979	-4.75	0.00988	-1.27	0.326	-89.32	0.105	-0.00126	37.40	1.99	1.42	23.96	
220.00	1500.00	0.00725	-0.0139	2.60	121.16	0.968	-7.28	0.00744	-1.69	0.304	-97.23	0.0883	-0.00121	26.77	1.87	1.64	26.60	
			Lbs per		Lbs per		Lbs per		Lbs per		Lbs per		Lbs per		Lbs per			
		xSAT	1000	xSAT	1000	xSAT	1000	xSAT	1000	xSAT	1000	xSAT	1000	xSAT	1000			
			Barrels		Barrels		Barrels		Barrels		Barrels		Barrels		Barrels			

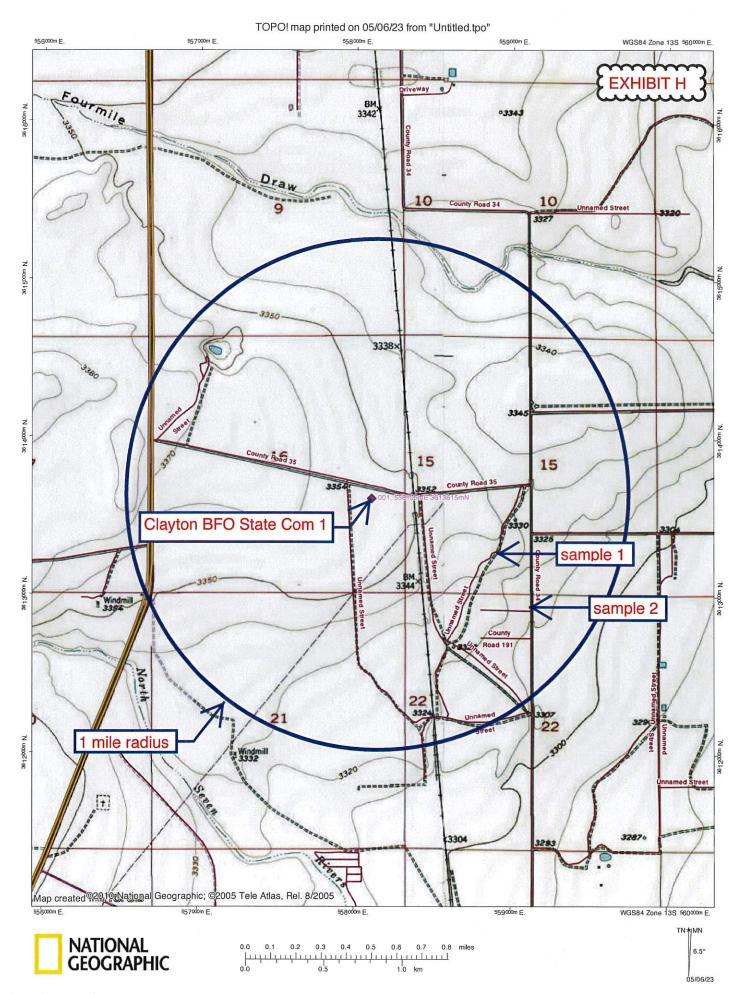
Saturation Ratios (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO<sub>3</sub>}/K<sub>sp</sub>. pCO<sub>2</sub> (psia) is the partial pressure of CO<sub>2</sub> in the gas phase. Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.













## New Mexico Office of the State Engineer EXHIBIT H

## Water Column/Average Depth to Water

(A CLW#### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is

closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

	F	POD Sub-		QQ	. 0								W	ater
POD Number	Code		County				Tws	Rng	X	Y	DistanceDe	pthWellDept		
RA 04425		RA	ED	4	3	15	19S	26E	558923	3613208*	913	117	80	37
RA 12362 POD1		RA	ED	1 2	. 1	22	19S	26E	558838	3612975	972	140	79	61
RA 12156 POD1		RA	ED	1 2	. 1	22	19S	26E	558808	3612789	1084	160	85	75
RA 12555 POD1		RA	ED	2 2	. 1	22	19S	26E	558975	3612926	1109	126	98	28
RA 07503		RA	ED	2	1	22	19S	26E	558925	3612804*	1153	118	83	35
RA 12206 POD1		RA	ED	2 2	1	22	19S	26E	559105	3612988	1180	160	67	93
RA 12145 POD1		RA	ED	2 2	1	22	198	26E	559008	3612852	1181	200	75	125
RA 12176 POD1		RA	ED	2 2	1	22	19S	26E	558994	3612829	1186	160	76	84
RA 01215		RA	ED	4 3	3	10	19S	26E	558603	3614739*	1229	1192		
RA 09950		RA	ED	4 2	2 1	22	19S	26E	559024	3612703*	1294	145	72	73
RA 12928 POD1		RA	ED	1 3	3 2	22	19S	26E	559166	3612487	1548	118	96	22
RA 01589 D	1 mile =	RA	ED	2 2	2 2	20	19S	26E	556688	3612860	1604	218	90	128
RA 12339 POD1	1610 m	RA	ED	1 3	3 2	22	19S	26E	559283	3612494 🌍	1626	120	72	48
RA 01982		RA	ED	2 2	2 2	20	19S	26E	556604	3612913*	1657	110	45	65
RA 08074		RA	ED	2 2	2 2	20	19S	26E	556604	3612913*	1657	218		
RA 11018 POD1		RA	ED	3 4	1 2	17	19S	26E	556396	3613928*	1737	260	100	160
RA 05916		RA	ED	į	2 2	20	19S	26E	556505	3612814*	1789	102	25	77
RA 07128		RA	ED	1	2 2	20	19S	26E	556404	3612913*	1840	134	100	34
RA 00797		RA	ED	3	3 3	14	19S	26E	560038	3613097*	2001			
RA 02391		RA	ED	2	4 3	21	19S	26E	557416	3611696* 🌑	2038	200		
RA 10531		RA	ED	4	3 4	21	19S	26E	557820	3611493* 🌑	2141	140	90	50
RA 05037		RA	ED		1 2	17	19S	26E	556091	3614436*	2174	475	132	343
RA 09317		RA	ED	4	3 3	22	19S	26E	558629	3611489* 🍑	2189	175	70	105
RA 09050		RA	ED	1	1 2	20	19S	26E	556001	3612916*	2217	160	105	55
RA 01149		RA	ED	1	3 1	23	19S	26E	560043	3612494* 🌑	2238	702	80	622
RA 01958		RA	ED	1	3 1	23	19S	26E	560043	3612494* 🌑	2238	920		
RA 02249		RA	ED	1	3 1	23	19S	26E	560043	3612494* 🌑	2238	920	72	848
RA 02249 CLW3166	.34 O	RA	ED	1	3 1	23	19S	26E	560043	3612494*	2238	1090		
RA 01728		RA	ED	2	1	. 14	19S	26E	560223	3614525*	2305	70		
RA 07148		RA	ED	2	2 2	2 28	19S	26E	558224	3611292*	2326	160	115	45

Red	ceived by OCD: 9/9/2023 1.	2:58:1	<b>9_PM</b> RA	ED	3	2	1	14	19S	26E	560428	3614328*	2429	175	Pa	ige 31 of 52
	RA 12679 POD1		RA	ED	2	2	1	27	19S	26E	559066	3611338	2471	160	80	80
	RA 03564		RA	ED		1	1	10	19S	26E	558491	3616060*	2475	200	70	130
	RA 08858		RA	ED	1	2	1	28	19S	26E	557216	3611294*	2485	197	80	117
	RA 01343 -S	O	RA	СН		2	1	14	19S	26E	560529	3614429*	2557	108	67	41
	RA 01215 CLW		RA	ED	2	1	1	10	19S	26E	558590	3616159*	2589	880	50	830
	<u>RA 01215 CLWPU</u>		RA	ED	2	1	1	10	19S	26E	558590	3616159*	2589	1000		
	<u>RA 03118</u>		RA	ED	2	1	1	10	19S	26E	558590	3616159*	2589	195		
	RA 01343 -CLW-2	O	RA	СН				14	19S	26E	560742	3613801*	2643	190		
	RA 01343 CLW-2	О	RA	СН				14	19S	26E	560742	3613801*	2643	190		
	RA 06813		RA	СН		1	1	09	19S	26E	556883	3616056*	2729	171	97	74
	RA 01312		RA	ED	1	3	4	14	19S	26E	560847	3613309*	2759	109		
	RA 09549		RA	ED	1	1	2	10	19S	26E	559195	3616159*	2767	189	90	99
	RA 04141		RA	ED	1	3	2	14	19S	26E	560838	3614124*	2779	200		
	RA 07667		RA	ED	1	3	2	14	19S	26E	560838	3614124*	2779	150	95	55
	RA 03176		RA	ED	1	2	2	27	19S	26E	559642	3611290*	2787	1000		
	RA 09451		RA	ED	1	3	4	20	19S	26E	556006	3611701*	2840	200		
	RA 03333		RA	ED		3	2	14	19S	26E	560939	3614025*	2863	115		
	RA 09838		RA	ED		4	1	27	19S	26E	558934	3610792*	2942	150		
	RA 04799		RA	ED	4	3	1	27	19S	26E	558628	3610692*	2969	106	52	54
	RA 04421		RA	ED	3	4	1	27	19S	26E	558833	3610691*	3013	150	49	101
	RA 12238 POD1		RA	ED	2	4 4	4	04	19S	26E	558180	3616638	3024	171	103	68
	RA 11482 POD1		RA	ED	4	4	1	27	19S	26E	559121	3610765	3025	159	138	21
	RA 03810		RA	ED	2	1	3	27	19S	26E	558628	3610493*	3165	128	45	83
	RA 04581		RA	ED				27	19S	26E	559132	3610598*	3187	70	20	50
	RA 10262		RA	ED	2	2 2	2	19	19S	26E	554994	3612917*	3188	200	85	115
	RA 01343 -S3	0	RA	ED	3	2 2	2	14	19S	26E	561239	3614334*	3215	214	50	164

Average Depth to Water:

78 feet

Minimum Depth:

20 feet

Maximum Depth:

138 feet

Record Count: 57

UTMNAD83 Radius Search (in meters):

Easting (X): 558105

**Northing (Y):** 3613615

Radius: 3220

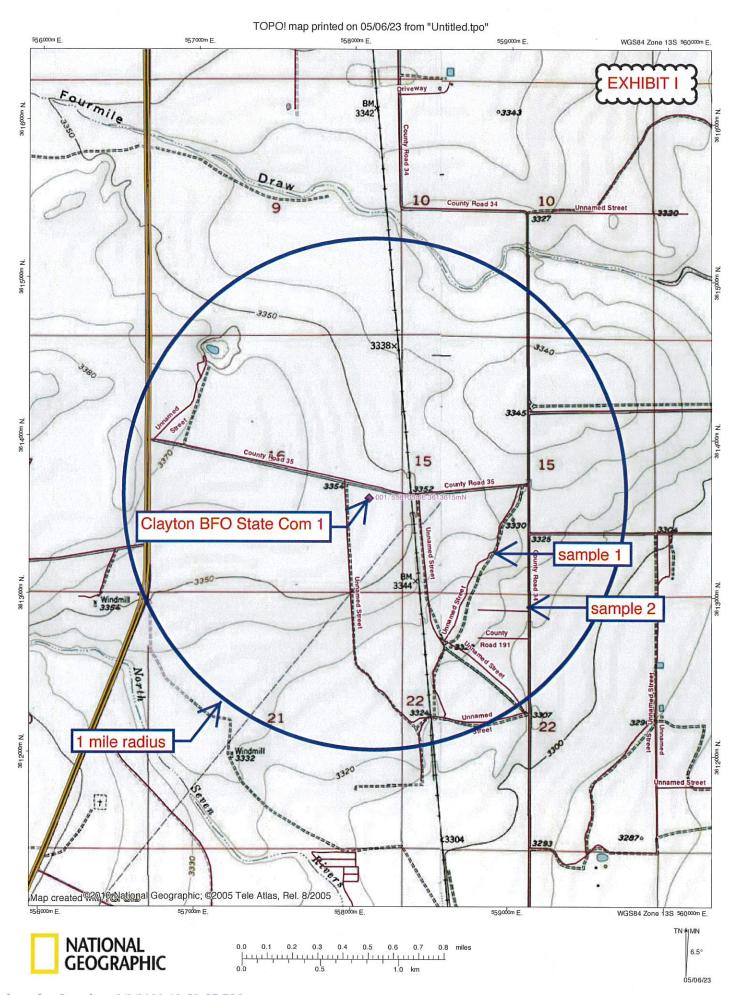


\*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

5/6/23 2:14 PM

WATER COLUMN/ AVERAGE DEPTH TO WATER







Hall Environmental Analysis Laboratory 4901 Hawkins NE Albuquerque, NM 87109 TEL: 505-345-3975 FAX: 505-345-4107 Website: www.hallenvironmental.com

#### **Case Narrative**

WO#:

2306024

Date:

6/12/2023

CLIENT: Permits West
Project: Silver Clay

Analytical Notes Regarding EPA Method 1664:

A LCS and LCSD were performed. A matrix spike was not performed.

## EXHIBIT I

### Analytical Report

Lab Order 2306024

Date Reported: 6/12/2023

#### Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** Permits West

Project: Silver Clay

Lab ID:

2306024-001

Client Sample ID: #1

Collection Date: 5/31/2023 2:15:00 PM

Received Date: 6/1/2023 9:40:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 1664B		endun sternes				Analys	t: SMS
N-Hexane Extractable Material	ND	9.45		mg/L	1	6/8/2023 7:19:00 PM	75375
EPA METHOD 300.0: ANIONS						Analys	t: NAI
Chloride	22	2.5		mg/L	5	6/1/2023 9:30:06 PM	A97170
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analys	t: <b>KS</b>
Total Dissolved Solids	1580	100	*D	mg/L	1	6/6/2023 2:46:00 PM	75349

Matrix: AQUEOUS

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

- \* Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- PQL Practical Quanitative Limit
- S % Recovery outside of standard limits. If undiluted results may be estimated.
- B Analyte detected in the associated Method Blank
- E Above Quantitation Range/Estimated Value
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Page 2 of 6

**Analytical Report** Lab Order 2306024

Date Reported: 6/12/2023

#### Hall Environmental Analysis Laboratory, Inc.

**CLIENT:** Permits West

Project: Silver Clay

Lab ID:

2306024-002

Matrix: AQUEOUS

Client Sample ID: #2

Collection Date: 5/31/2023 2:30:00 PM

Received Date: 6/1/2023 9:40:00 AM

Analyses	Result	RL Q	ual Units	DF	Date Analyzed	Batch
EPA METHOD 1664B					Analyst:	SMS
N-Hexane Extractable Material	ND	11.9	mg/L	1	6/8/2023 7:19:00 PM	75375
EPA METHOD 300.0: ANIONS					Analyst:	NAI
Chloride	23	10	mg/L	20	6/1/2023 10:34:22 PM	A97170
SM2540C MOD: TOTAL DISSOLVED SOLIDS		48			Analyst:	KS
Total Dissolved Solids	1540	100	*D mg/L	1	6/6/2023 2:46:00 PM	75349

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

#### Qualifiers:

- Value exceeds Maximum Contaminant Level.
- Sample Diluted Due to Matrix
- Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- Practical Quanitative Limit PQL
- % Recovery outside of standard limits. If undiluted results may be estimated.
- Analyte detected in the associated Method Blank
- Above Quantitation Range/Estimated Value
- Analyte detected below quantitation limits
- Sample pH Not In Range
- Reporting Limit

Page 3 of 6

## **QC SUMMARY REPORT**

### Hall Environmental Analysis Laboratory, Inc.



WO#:

2306024

12-Jun-23

Client:

Permits West

Project:

Prep Date:

Silver Clay

Sample ID: MB-75375

SampType: MBLK

TestCode: EPA Method 1664B

LowLimit

LowLimit

Client ID: **PBW** 

6/6/2023

Batch ID: 75375

RunNo: 97302

Analysis Date: 6/8/2023

SeqNo: 3534607

Units: mg/L

%RPD

Analyte Result N-Hexane Extractable Material

PQL SPK value SPK Ref Val 10.0

%REC

HighLimit

**RPDLimit** Qual

Sample ID: LCS-75375 Client ID:

LCSW

SampType: LCS Batch ID: 75375

TestCode: EPA Method 1664B RunNo: 97302

Prep Date: 6/6/2023

Analysis Date: 6/8/2023

SeqNo: 3534608

Units: mg/L **HighLimit** 

%RPD **RPDLimit** Qual

Analyte Result PQL SPK value SPK Ref Val N-Hexane Extractable Material 72.4 10.0 80.00

%REC 90.5

78 114

Sample ID: LCSD-75375

TestCode: EPA Method 1664B RunNo: 97302

Prep Date: 6/6/2023

LCSS02

Batch ID: 75375

SampType: LCSD

SeqNo: 3534609

Units: mg/L

Client ID:

Analysis Date: 6/8/2023 Result

**RPDLimit** Qual

Analyte SPK value SPK Ref Val %REC LowLimit HighLimit %RPD N-Hexane Extractable Material 67.2 10.0 80.00 84.0 78 114 7.45 20

#### Qualifiers:

ND

- Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix H Holding times for preparation or analysis exceeded
- Not Detected at the Reporting Limit PQL
- % Recovery outside of standard limits. If undiluted results may be estimated.
- Analyte detected in the associated Method Blank
- E Above Quantitation Range/Estimated Value
- Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Limit

Page 4 of 6

# **QC SUMMARY REPORT**

# Hall Environmental Analysis Laboratory, Inc.

WO#:

2306024

12-Jun-23

Client:

Permits West

Project:

Silver Clay

Sample ID: MB

SampType: mblk

TestCode: EPA Method 300.0: Anions

LowLimit

Client ID:

**PBW** 

LCSW

Batch ID: A97170 Analysis Date: 6/1/2023

PQL

Batch ID: A97170

Analysis Date: 6/1/2023

RunNo: 97170

SeqNo: 3528961

Units: mg/L

Prep Date: Analyte

Client ID:

Prep Date:

Result

SPK value SPK Ref Val %REC HighLimit

%RPD **RPDLimit** 

Qual

Chloride

ND 0.50

SampType: Ics

TestCode: EPA Method 300.0: Anions

RunNo: 97170

Units: mg/L

SeqNo: 3528962 SPK value SPK Ref Val %REC

LowLimit

HighLimit

**RPDLimit** %RPD

PQL Result

5.000

91.2

110

Chloride

Sample ID: LCS

4.6

0.50

Qual

Analyte

Qualifiers:

Value exceeds Maximum Contaminant Level. Sample Diluted Due to Matrix

Н Holding times for preparation or analysis exceeded Not Detected at the Reporting Limit ND

Practical Ouanitative Limit POL % Recovery outside of standard limits. If undiluted results may be estimated.

Analyte detected in the associated Method Blank Above Quantitation Range/Estimated Value

Analyte detected below quantitation limits Sample pH Not In Range

RI. Reporting Limit Page 5 of 6

# **QC SUMMARY REPORT**

# Hall Environmental Analysis Laboratory, Inc.

WO#:

2306024

12-Jun-23

Client:

Permits West

Project:

Silver Clay

Sample ID: MB-75349

SampType: MBLK

TestCode: SM2540C MOD: Total Dissolved Solids

Client ID: **PBW** 

Batch ID: 75349

PQL

RunNo: 97232

SeqNo: 3531386

Units: mg/L

Prep Date: 6/5/2023 Analyte

Analysis Date: 6/6/2023 SPK value SPK Ref Val

%REC

LowLimit HighLimit %RPD

**RPDLimit** 

Qual

Total Dissolved Solids

Client ID:

ND 50.0

Sample ID: LCS-75349

SampType: LCS

TestCode: SM2540C MOD: Total Dissolved Solids

%REC

LCSW

Batch ID: 75349

RunNo: 97232

Prep Date:

6/5/2023

Analysis Date: 6/6/2023

SeqNo: 3531387

Units: mg/L HighLimit

%RPD **RPDLimit** 

Qual

Total Dissolved Solids

1000

0

101

Analyte

1010

Result

PQL 50.0

SPK value SPK Ref Val

LowLimit

120

Qualifiers:

Value exceeds Maximum Contaminant Level

D Sample Diluted Due to Matrix

H Holding times for preparation or analysis exceeded ND Not Detected at the Reporting Limit

PQL Practical Quanitative Limit

% Recovery outside of standard limits. If undiluted results may be estimated

Analyte detected in the associated Method Blank

Above Quantitation Range/Estimated Value

Analyte detected below quantitation limits

Sample pH Not In Range

Reporting Limit RL

Page 6 of 6



37 Verano Loop, Santa Fe, New Mexico 87508 505-466-8120



NM Oil Conservation Division 1220 S. St. Francis Dr. Santa Fe, NM 87505

> Re: Geology Statement Silverback Operating II, LLC Clayton BFO State Com #1 Section 16, T. 19S, R. 26E Eddy County, New Mexico

To whom it may concern:

Publicly available geologic and engineering data related to the proposed well have been thoroughly reviewed, and no evidence for open faults or any other hydrologic connection between the proposed Canyon formation disposal zone and any underground sources of drinking water has been found. Please see the attached seismic risk assessment for additional information.

Sincerely,

Cory Walk Geologist



Seismic Risk Assessment
Silverback Operating II, LLC
Clayton BFO State Com #1
Section 16, Township 19 South, Range 26 East
Eddy County, New Mexico

Cory Walk, M.S.

Geologist

Cory Walk

Permits West Inc.

June 30, 2023

# **SEISMIC RISK ASSESSMENT PAGE 1**



#### GENERAL INFORMATION

Clayton BFO State Com #1 is located in the SE ¼, section 16, T19S, R26E, about 12 miles south of Artesia, NM in the Delaware Basin of the greater Permian Basin. Silverback Operating II, LLC proposes to dispose produced water within the Canyon Formation through perforations from 7,858'-8,220' below ground surface. The Canyon formation is primarily a dolomitic limestone. This report assesses any potential concerns relating to induced seismicity along deep penetrating Precambrian faults or the connection between the injection zone and known underground potable water sources.

#### SEISMIC RISK ASSESSMENT

## Historical Seismicity

Searching the USGS earthquake catalog resulted in one (1) earthquake above a magnitude 2.5 within 6 miles (9.7 km) of the proposed injection site since 1970 (Fig 1). According to this dataset, the nearest historical earthquake occurred May 15, 2022 about 5.0 miles (~8 km) northwest and had a magnitude of 3.2.

# Basement Faults and Subsurface Conditions

A structure contour map (Fig. 1) of the Precambrian basement shows the Clayton BFO State Com #1 is approximately 17.0 miles from the nearest basement-penetrating fault inferred by Ewing et al (1990) and about 25.8 miles from the nearest surface fault.

Snee and Zoback (2018) state, "In the western part of Eddy County, New Mexico,  $S_{Hmax}$  is ~north—south (consistent with the state of stress in the Rio Grande Rift; Zoback and Zoback, 1980) but rotates to ~east-northeast—west-southwest in southern Lea County, New Mexico, and the northernmost parts of Culberson and Reeves counties, Texas." Around the Clayton BFO State Com #1 site, Snee and Zoback indicate a  $S_{Hmax}$  direction of N010°E and an  $A_{\phi}$  of 0.57, indicating a normal faulting stress regime.

Induced seismicity is a growing concern of deep injection wells. Snee and Zoback (2018) show that the nearest Precambrian fault has a fault slip potential of 20-30% (Fig. 2). However, the proposed injection zone is shallower in the Canyon Formation and therefore would be unlikely to affect the deep Precambrian faults. The vertical (approx. 3500') and horizontal (17.0 miles) separation between the proposed SWD injection zone and any deep Precambrian faults is large enough to infer that induced seismicity as a result from this injection well is unlikely.

### **GROUNDWATER SOURCES**

There are two principal aquifers (Permian Aquifer System & Pecos Valley Alluvial Aquifer) used for potable ground water near the Clayton BFO State Com #1 location (Cikoski et. al., 2020). The Permian Aquifer System includes the San Andres and Yeso formations. Cikoski et al (2020) show the base of the Permian Aquifer System to be approximately 2500' above sea level based on water quality data shown in their report (Fig. 3). Around the Clayton BFO State Com #1 well, this elevation would be at a depth of approximately 850' TVD. This depth is the interpreted base of potable water in this area.



# **SEISMIC RISK ASSESSMENT PAGE 2**



### **STRATIGRAPHY**

Several thick permeability barriers (primarily dolomite, shale and anhydrite) exist above the targeted Canyon injection zone. Well data indicates ~7,000 ft of rock separating the top of the injection zone from the previously stated lower limit of potable water at the base of the Permian Aquifer System.

## CONCLUDING STATEMENT

All available geologic and engineering data evaluated around the Clayton BFO State Com #1 well show no potential structural or stratigraphic connection between the Canyon injection zone and any subsurface potable water sources.



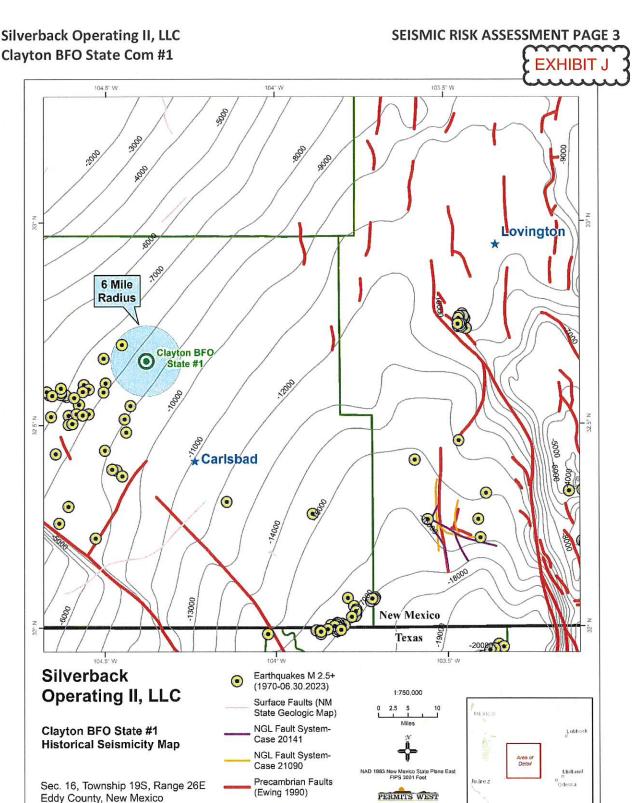


Figure 1. Structural contour map of the Precambrian basement in feet below sea level. Red lines represent the locations of Precambrian basement-penetrating faults (Ewing et al., 1990). The Clayton BFO State Com #1 well lies ~17.0 miles north of the closest deeply penetrating fault, ~25.8 miles from the nearest surface fault and ~5.0 miles from the closest historic earthquake.

Precambrian Structure

Contours



SEISMIC RISK ASSESSMENT PAGE 4

# Silverback Operating II, LLC Clayton BFO State Com #1

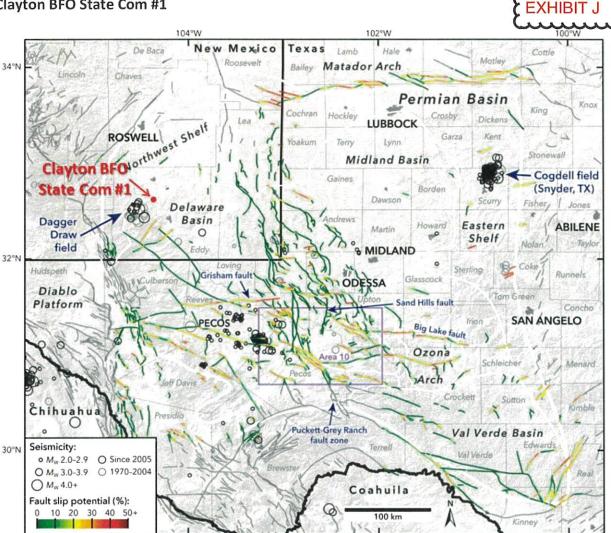


Figure 2. Modified from Snee and Zoback (2018). The nearest deep Precambrian fault lies ~17.0 miles south of the proposed SWD well. Also, the proposed injection zone is shallower in the Canyon and therefore reduces the possibility of inducing seismicity on any known fault.



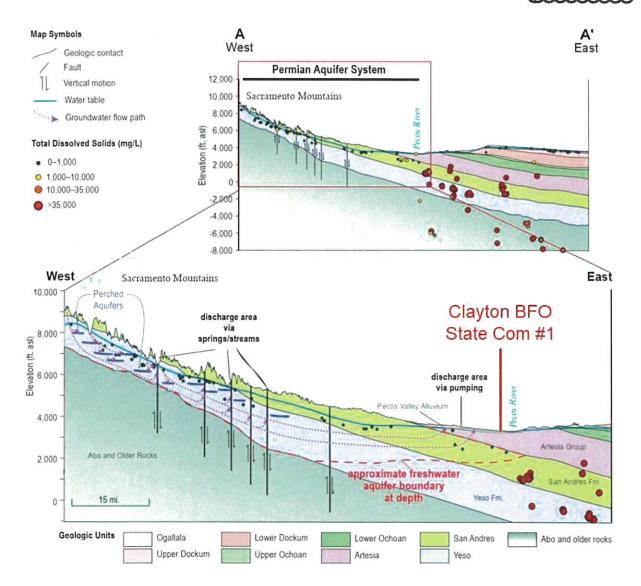


Figure 3. Modified from Cikoski et al. (2020). The base of the Permian Aquifer System is estimated by Cikoski et al. based on TDS levels down stratigraphic dip. This shows the approximate freshwater aquifer boundary depth at the Clayton BFO State Com #1 is at approximately 2500' above sea level.



## SEISMIC RISK ASSESSMENT PAGE 6



#### References Cited

- Cikoski, C., Fichera, M., Mamer, E., Sturgis, L., 2020, A Three-Dimensional Hydrogeologic Model from the Pecos Slop to the Southern High Plains, Southeastern New Mexico: New Mexico Bureau of Geology and Mineral Resources, Open-File Report 614, 145 pp., 29 plates.
- Ewing, T. E., 1990, The tectonic map of Texas: Austin, Bureau of Economic Geology, The University of Texas at Austin.
- Geologic Map of New Mexico, New Mexico Bureau of Geology and Mineral Resources, 2003, Scale 1:500,000.
- Snee, J.-E.L., Zoback, M.D., 2018, State of stress in the Permian Basin, Texas and New Mexico: Implications for induced seismicity: Leading Edge, v. 37, p. 127–134.
- Zoback, M. L., and M. D. Zoback, 1980, State of stress in the conterminous United States: Journal of Geophysical Research, 85, no. B11, 6113–6156, https://doi.org/10.1029/JB085iB11p06113.



PAGE 1

I. Goal is to convert an existing 9900' deep low producing (16 Mcfd in January - April 2023) Atoka and Morrow gas well into a saltwater disposal well. Disposal will be in the Canyon formation (SWD; Canyon (96184)) at a depth of 7858' to 8220'. See Exhibit A for map, C-102 forms, and economic analysis. The well is on NM State Land Office (NMSLO) surface and NMSLO minerals.

II. Operator: Silverback Operating II, LLC [OGRID 330968]

Operator phone number: (210) 585-3316

Operator address: IH 10 West, Suite 201, San Antonio, TX 78257

Contact for Application: Brian Wood (Permits West, Inc.)

Phone: (505) 466-8120

III. A. (1) Lease: NMSLO VA-2098-0002

Lease Size: 400.00 acres

Lease Area: NENE, S2NE4, SENW, N2S2, SESW, & SESE 16-19s-26e

Well name and number: Clayton BFO State Com 1

Location: 1980' FSL & 660' FEL Section 16, T. 19 S., R. 26 E.

A. (2) Well was drilled in 2005. Surface casing (13.375", 48#) is set at 900' in a 17.5" hole and cemented to surface with ≥1,160 sacks. Cement circulated after a top job was performed.

Production casing (5.5", 15.5# & 17#) is set at 9900' in an 8.75" hole and cemented to surface with 1,925 sacks. Cement circulated.

- A. (3) Tubing will be internally plastic coated, EUE 8rd, 2.875", 6.5#, J-55 or L-80 set at ≈7808'. (Disposal interval will be 7858' 8220'.)
- A. (4) A nickel-plated or stainless-steel injection packer will be set at ≈7808', or at least within 100' of the highest perforation. (Disposal interval will be 7858' – 8220'.)



PAGE 2

- B. (1) Disposal zone will be the Canyon (SWD; Canyon (96184)).
- B. (2) Disposal interval will be via perforations from 7858' to 8220'.
- B. (3) Well was originally drilled and completed in 2005 as a Morrow gas well. It was subsequently completed in 2007 as an Atoka gas well. The Morrow and Atoka are downhole commingled. They will be isolated with a CIBP set at ≈8300' topped with 35' of cement (TOC = 8265').
- B. (4) Atoka perforations are 9142' 9292'. Morrow perforations are 9694' 9702'.
- B. (5) Currently, no producing zones are above the Canyon and in the area of review. Potential producing zones above the Canyon are the San Andres (1238'), Glorieta (2905'), Yeso (3005'), Bone Spring (6558'), and Wolfcamp (6932'). Atoka (9071') and Morrow (9455') are producing zones below the Canyon and in the area of review.
- IV. This is not an expansion of an existing injection project. It is disposal only.
- V. Exhibit B shows and tabulates the 3 existing wells (all P&A) within a 1-mile radius. One of the wells penetrated the Canyon.

Exhibit C shows all 127 existing wells (43 producers + 24 P&A + 3 SWD + 57 water) within a 2-mile radius. The SWD wells are Cisco or Canyon and are 1.00 mile west, 1.43 mile north-northwest, and 1.93 mile northwest.

All leases within a half-mile radius are fee or NMSLO. Exhibit D shows and tabulates all leases within a half-mile radius. Two-mile radius leases (Exhibit E) are fee or NMSLO.

VI. One Canyon penetrator is within a mile. Its well construction details and P&A diagrams are in Exhibit F.



PAGE 3

- VII. 1. Average injection rate will be ≈5,000 bwpd. Maximum injection rate will be 7,500 bwpd.
  - 2. System will be open and closed. Water will both be trucked and piped.
  - Average injection pressure will be ≈1,000 psi.
     Maximum injection pressure will be 1571 psi (= 0.2 psi/foot x 7858' (highest perforation)).
  - 4. Disposal water will be produced water from the Dayton and Dagger Draw Fields. An analysis of such disposal water is in Exhibit G. The "Artesia Santa Fe SWD 1" referenced in Exhibit G is Silverback's Santa Fe Land SWD 1 (30-015-20501). It is 1 mile west in I-17-19s-26e. At least 7,474,576 barrels have been disposed to date. No compatibility problems have been reported.
  - 5. Closest Canyon (Upper Penn) producer is Silverback's Hooper AMP Com 4 (30-015-28374). It is 1.11 miles southwest in A-20-19s-26e. The Canyon was tested in 30-015-23593 (2531' east) and found to be dry.

VIII. The Canyon (491' thick) is a dolomitic limestone. Formation tops are:

Quaternary = 0'

San Andres = 1237'

Glorieta = 2924'

Upper Yeso = 3050'

Bone Spring = 3475'

Second Bone Spring = 3940'

Third Bone Spring = 6563'

Wolfcamp = 6926'

Canyon (aka, Upper Penn) = 7839'

disposal interval = 7858' - 8220'

proposed CIBP + 35' cement = 8265'

Strawn = 8734'

Atoka = 9071'

Morrow = 9435'

Chester = 9775'

TD = 9900'



PAGE 4

Closest possible underground source of drinking water above the proposed disposal interval is the Quaternary. Water was reported at 354', 610', 727', 788', 832', and 870' in 30-105-21872, 10177' south of the Clayton BFO State Com 1. Quaternary base is 1237' (top of the San Andres). Deepest water well within a 2-mile radius is 1192'. The Capitan Reef is 9 miles southeast.

According to State Engineer records (Exhibit G), closest water well is 0.56-mile east. Twelve existing water wells are within 1-mile, deepest of which is 1192'. There will be 6602' of vertical separation, including confining shales, between the bottom of the Quaternary and the top of the Canyon.

No underground source of drinking water is below the proposed disposal interval.

- IX. Well will be cleaned and stimulated with acid as needed. Based on Silverback's experience with nearby wells, treatment will be 50-100 gallons of 15% HCl per foot of perforation.
- X. CNL, high resolution laterolog array, and cement bond logs are on file with the NMOCD.
- XI. According to State Engineer records (Exhibit H), twelve existing water wells are within a 1-mile radius. Two water wells (RA 04425 and RA 12206 POD1) within a mile were sampled May 31, 2022. Analyses are in Exhibit I.
- XII. Silverback Operating II, LLC (Exhibit J) is not aware of any geologic or engineering data that may indicate the Canyon is in hydrologic connection with any underground sources of water. Deepest water well within a 2-mile radius is 1192'. There are 11 active Canyon SWD wells and 13 active Cisco-Canyon SWD wells in New Mexico.



PAGE 5

XIII. Legal ad (Exhibit K) was published on May 11, 2023. Notice (Exhibit L) and this application has been sent to the surface owner (NMSLO), all well operators regardless of depth, government lessors (only NMSLO), lessees, operating right holders, working interests, and mineral interest owners within a mile.



District I
1625 N. French Dr., Hobbs, NM 88240
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 Rd., Aztec, NM 87410

Phone:(505) 334-6178 Fax:(505) 334-6170 1220 S. St Francis Dr., Santa Fe, NM 87505 Phone:(505) 476-3470 Fax:(505) 476-3462

**State of New Mexico Energy, Minerals and Natural Resources Oil Conservation Division** 1220 S. St Francis Dr. **Santa Fe, NM 87505** 

CONDITIONS

Action 263487

## **CONDITIONS**

Operator:	OGRID:
Silverback Operating II, LLC	330968
19707 IH10 West, Suite 201	Action Number:
San Antonio, TX 78256	263487
	Action Type:
	[IM-SD] Admin Order Support Doc (ENG) (IM-AAO)

#### CONDITIONS

Created By		Condition Date
mgebremichael	None	9/9/2023