Additional Infomation

4/15/2020

Rose-Coss, Dylan H, EMNRD

From: dwhite@geolex.com
Sent: Wednesday, April 15, 2020 3:43 PM
To: Rose-Coss, Dylan H, EMNRD
Cc: 'Alberto A. Gutierrez'; 'Mike Solomon'
Subject: [EXT] Lombard SWD #1 - Requested additional materials
Attachments: 3Bear Lombard SWD - Requested Additional Materials.pdf

Importance: High

Dylan,

Please see attached supplemental materials for the 3Bear Lombard SWD #1 application, which include all additional data and details requested by NMOCD in order to continue the administrative review of the C-108 application. I greatly appreciate all your guidance and efforts in this matter. As always, please let me know if you have any questions or require any additional details. Have a great week and continue to stay safe.

Regards,

David A. White, M.S.
Geolex, Incorporated®
500 Marquette Avenue, NW Suite 1350
Albuquerque, NM 87102
(505)842-8000 Office
(859)967-7231 Cell

Rose-Coss, Dylan H, EMNRD

From: Rose-Coss, Dylan H, EMNRD
Sent: Monday, April 6, 2020 4:45 PM
To: dwhite@geolex.com
Subject: RE: [EXT] FW: C-108 Priority (3Bear Field Services)
Attachments: Lombard SWD No. 1 Admin Review.pdf

David,

I hope you are still doing well. So I was able to open up the admin files for the Lombard, SWD No. 1 well and performed a quick review. The application is overall in good shape and thorough,

But it looks like we still need:

- Tubing/packer description
- Disposal fluid analysis
- FW analysis
    - It isn't a problem if 3Bear or Geolex is unable to collect a freshwater analysis, but an attempt needs to be made.

Additionally, the proposed location penetrates the Capitan Reef and is within the greater R-111P area. It seems as if all the necessary steps have been taken to accommodate those two complications, but sometimes it is nice to have it spelled out for me that they were taken into consideration.

Another thing you might want to consider is reviewing the Administrative Record, for this or the other 3Bear apps. We have been performing administrative reviews to determine completeness on applications as they come in. We don't necessarily notify applicants if their app is incomplete, but we do post the administrative completeness checklist for review which could be helpful.

Here is a link to the OCD Imaging Administrative & Environmental Orders page:

http://ocdimage.emnrd.state.nm.us/imaging/AEOrderCriteria.aspx

I also attached the checklist for this well.

Anyway, once I get those last pieces of information I'll be able to proceed.

Regards,

Dylan Rose-Coss

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

O: (505) 476-3477

From: dwhite@geolex.com <dwhite@geolex.com>
Sent: Thursday, March 26, 2020 11:04 AM
To: Rose-Coss, Dylan H, EMNRD <DylanH.Rose-Coss@state.nm.us>
Subject: [EXT] FW: C-108 Priority (3Bear Field Services)

Good morning Dylan,

I hope you're doing well as we're all adjusting to our, hopefully temporary, new normal routines. I wanted to touch base with you just to confirm receipt of the email included below. I'm sure things are quite chaotic and understand completely if you have not had time to consider this yet. Please let me know if you have any questions and stay safe.

Regards,

David A. White, M.S.
Geolex, Incorporated®
500 Marquette Avenue, NW Suite 1350
Albuquerque, NM 87102
(505)842-8000 Office
(859)967-7231 Cell

From: David A. White <dwhite@geolex.com>
Sent: Thursday, March 12, 2020 8:42 AM
To: Rose-Coss, Dylan H, EMNRD <DylanH.Rose-Coss@state.nm.us>
Subject: C-108 Priority (3Bear Field Services)

Good morning Dylan,

I hope you're doing well and having a great week. We spoke a while back and discussed potentially being able to prioritize one of 3Bear Field Services C-108 applications by swapping its position with an application they had submitted at an earlier time. We are hoping this can be done with our recently submitted Lombard SWD #1 C-108 application. The

application was submitted electronically via the fee portal and the PO# is 3EO6Y-200311-C-1080. When we last spoke, I think you were hoping to be able to identify which previous 3Bear C-108 application was highest in the queue that we could swap position with. After speaking with 3Bear, it would likely be an application for a well named Smith Ranch SWD #1 or Smith Ranch SWD #2, which I believe were submitted to OCD over a year ago. Please let me know if this re-arrangement of review priority is possible and please don't hesitate to contact me if you want to discuss or have any questions. Have a wonderful week.

Regards,

David A. White, M.S.
Geolex, Incorporated®
500 Marquette Avenue, NW Suite 1350
Albuquerque, NM 87102
(505)842-8000 Office
(859)967-7231 Cell

GEOLEX®
INCORPORATED

April 15, 2020 VIA ELECTRONIC MAIL

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

RE: LOMBARD SWD #1 ADDITIONAL REQUESTED MATERIALS

TO WHOM IT MAY CONCERN:

Included in this correspondence you will find additional information requested by the New Mexico Oil Conservation Division for the Lombard SWD #1 C-108, submitted on behalf of 3Bear Field Services, LLC. This submission includes five sections (listed below) that specifically address each of the requests made by NMOCD necessary to complete review of the Lombard SWD #1 application.

- **Section A** – Includes a revised Lombard SWD #1 casing and tubing schedule and description of completion equipment amended to include specific details of the planned injection packer and injection tubing.
- **Section B** – Summarizes available groundwater data in the area of the proposed Lombard SWD #1 and describes efforts made to acquire and analyze freshwater samples from a water well within one mile of the proposed SWD location
- **Section C** – Provides the results of injection-fluid analyses from a nearby operating 3Bear SWD with injectate compositions comparable to the expected injection fluids for Lombard SWD #1 (Attachment 2). Additionally, this section includes a review of available Bone Springs and Wolfcamp formation-fluid analyses, which will be the primary constituent of the Lombard SWD #1 injectate.
- **Section D** – Includes the results of nearby Siluro-Devonian formation-fluid analyses collected from wells located within approximately 20 miles of the proposed Lombard SWD #1 well
- **Section E** – Statement that the injection reservoir is a closed system in the area of the proposed Lombard SWD #1

If you have any questions concerning this application or the additional materials provided in this correspondence, you may contact Alberto Gutiérrez, R.G., or David White at (505)842-8000 at Geolex, Inc.®; 500 Marquette Avenue NW, Suite 1350; Albuquerque, New Mexico.

Sincerely,
Geolex, Inc.®

David A. White, M.S.
Project Manager, Senior Geologist
Consultant to 3Bear Field Services, LLC

Enclosure: Supplementary Sections A-E
Attachments 1-3

3BEAR FIELD SERVICES – LOMBARD SWD #1 SUPPLEMENTAL SECTIONS

SECTION A -- DESCRIPTION AND DETAILS OF PROPOSED INJECTION TUBING AND INJECTION PACKER

Shown in Table 1 below is the amended casing and tubing schedule for Lombard SWD #1 revised to include specifics on the planned injection tubing string.

Table 1. Revised Lombard SWD #1 Casing and Tubing Schedule

String	Hole Size (in)	Tubular Size (in)	Pounds per foot	Grade	Thread	Top (ft)	Bottom (ft)	Length (ft)
Proposed Casing								
Surface	26	20	94	J55	BTC	0	1600	1600
1st Intermediate	17-1/2	13-3/8	68	J55	BTC	0	5650	5650
2nd Intermediate	12-1/4	9-5/8	40	HCL-80	BTC	0	11530	11530
Production Liner	8-3/4	7-5/8	39	P-110	TSH	11330	15535	4205
Injection Tubing								
Tubing	-	5-1/2	20	HCL-80	BTC	0	15535	15535

Lombard SWD #1 will be completed with a permanent injection packer and 5-1/2" injection tubing set at a depth of approximately 15,535 feet. The injection string will utilize 5-1/2, HCN-80, BTC tubulars with Duoline lining material (or equivalent). Design considerations for Lombard SWD #1 include setting a 7-5/8" x 5-1/2" Permanent injection packer with High Temp Elastomer and full Inconel 925 trim, which will provide an effective seal preventing the upward flowback of injectate out of the target reservoir.

SECTION B -- GROUNDWATER HYDROLOGY IN THE VICINITY OF THE PROPOSED INJECTION WELL

Summarized in the following Table 2 are the details of all water wells and points of diversion within two miles of the proposed Lombard SWD #1, as recorded in the files of the New Mexico Office of the State Engineer.

Table 2. Water wells within two miles of the proposed 3Bear Lombard SWD #1 (retrieved from the New Mexico Office of the State Engineer's Files on 04/08/2020)

POD #	Source	Sec.	Twn.	Rng.	Lat. (NAD83)	Long. (NAD83)	Distance (miles)	Depth (feet)
CP 00793 POD 1	Shallow	1	21S	32E	32.514259	-103.627334	0.52	1000
CP 00794 POD 1	Shallow	18	21S	33E	32.483429	-103.616692	1.95	160
CP 00795 POD 1	Shallow	18	21S	33E	32.483429	-103.616692	1.95	170

Files retrieved from the New Mexico Office of the State Engineer for the singular well (CP 00793 POD 1) located within one mile of the proposed Lombard SWD #1 record that, in July 1993, the well was not in operation and had not been operating for several years (Attachment 1 – Declaration of Owner of Underground Water Rights).

Geolex has sent correspondence to the water rights owner of record requesting confirmation of the status of the well and, if possible, permission to collect and analyze fluid samples representative of local groundwater resources underlying the proposed SWD. Efforts to collect fluid samples are continuing and any additional information will be provided to NMOCD, when available. However, it is likely that the only data on nearby water wells are in the public records which we have reviewed and the results of which are provided below.

In lieu of recent groundwater sample collection and chemical analysis, Geolex conducted a review of *Geology and Ground-Water Conditions in Southern Lea County, New Mexico* (Nicholson and Clebsch, 1961) to identify published groundwater data representative of nearby water wells in the area of the proposed Lombard SWD #1. Table 3 below summarizes the four wells identified in this review and the results of those analyses.

Table 3. Chemical-analysis results of samples collected from water wells in the area of the proposed Lombard SWD #1 (Nicholson and Clebsch, 1961 – *Geology and Ground-Water Conditions in Southern Lea County, New Mexico)*

Historical Owner	Location (T-R-S)	Location (Qtr-Qtr)	Depth (ft)	Ca (eq)	Na+K	HCO3	SO4	Cl	NO3	Hardness	pH
Texas Co.	21S-33E-2	SW/4 NE/4	1150	0.44	-	336	95	20	-	22	8.0
DC Berry	21S-33E-2	NE/4 SE/4	120	-	-	116	17	1020	-	-	-
	21S-33E-2	NE/4 SE/4	120	35.40	2.5	115	20	1170	13	1770	7.3
	21S-33E-2	NE/4 SE/4	120	48.00	-	109	43	1640	-	2400	7.1
DC Berry	21S-33E-2	SE/4 SE4	-	6.08	-	345	15	12	-	304	7.4
	21S-33E-2	SE/4 SE/4	-	6.12	-	354	18	7	-	306	7.5
-	21S-35E-27	NE/4 SW/4	-	4.08	-	301	170	44	-	204	8.0

*Underlined concentrations indicate concentration reported in equivalents. Otherwise, concentrations reported as parts per million (ppm)

SECTION C -- INJECTION FLUID SOURCE AND COMPOSITION OF PROPOSED INJECTION FLUIDS

Lombard SWD #1 is proposed in order to properly dispose of produced water from 3Bear activities servicing local producers in the area. The produced water injectate will be primarily be sourced from nearby active and proposed wells producing from Bone Springs and Wolfcamp formation plays in the area.

Included in Attachment 2 are the complete results of injection fluid laboratory analyses for 3Bears north and south inlets to the Libby Berry Fed SWD, reported on July 16, 2019. Characteristics identified in these analyses are summarized below in Table 4 and will be comparable to the injection fluids proposed for Lombard SWD #1.

Table 4. Summary of injection fluid analyses for Libby Berry Fed SWD

FIELD INLET	CONCENTRATION (parts per million)										
	TDS	SG	Resist.	pH	HCO3	Ca	Cl	K	Mg	Na	SO4
North	109319	1.08	6.64	7.10	181.50	4108	67622	674.40	542.90	35388	660.00
South	119313	1.09	5.96	7.09	181.50	3581	74493	685.00	510.30	39835	660.00

Additionally, Table 5 includes the results of produced water analyses of the Bone Springs and Wolfcamp formations from wells within 20 miles of the proposed Lombard SWD #1 location, as reported by the U.S.G.S. Produced Water Geochemical Database.

Table 5. Compilation of produced water analyses from wells within 20 miles of the proposed Lombard SWD #1 (U.S. Geological Survey National Produced Water Geochemical Database v. 2.3)

API	CONCENTRATION (parts per million)										
	TDS	SG	Resist.	pH	HCO3	Ca	Cl	K	Mg	Na	SO4
Bone Springs Formation											
3002520404	142213	1.096	0.073	7.02	769	4440	84200	724	827	48833	2350
3002503126	255451	1.163	0.047	6.72	326.8	14514	156699	-	2600	80469	779
3002500925	4304	-	-	-	647	267	1600	-	78	-	595
3002523267	196805	1.138	0.05	6.3	300	12800	121000	1232	2590	58113	770
3002503156	195200	1.134	0.056	6.6	220	6600	118000	-	170	69200	1030
3002502362	145500	-	-	-	220	2600	87300	-	580	-	1500
3002500922	143221	1.096	0.078	6.8	215	6814	86881	-	1020	47220	1070
Wolfcamp Formation											
3002520173	101057	1.063	0.103	8.3	732	2060	58100	576	321	36092	3050
3002503123	60950	1.046	0.118	7.08	1087	1380	33568	483	432	20946	3049
3002524836	164916	1.118	0.064	5.8	451.5	18328	101031	-	1844	41128	1308
3002502362	130761	-	-	-	230	2600	77800	-	47700	426	2000
3002502408	187065	-	-	-	146	7459	114800	-	62210	2230	220
3002503116	190380	-	0.045	-	-	14800	118000	-	55000	2380	200
3002503124	202925	-	-	-	357	10790	127900	-	60640	2501	737
3002503135	8788	-	0.74	-	550	395	3180	-	2538	125	2000
3002520514	122516	-	-	-	488	13030	74780	-	30660	2080	1478
3002520555	23704	-	-	-	1580	1840	12000	-	5700	744	1840
3002520950	55362	-	-	-	1800	2280	30800	-	17300	912	2270

These analyses identify that Total Dissolved Solids (TDS) range from 4,304 to 255,451 parts per million (ppm) with an average of 127,987 ppm. The primary anion identified in each sample set is chloride, and the concentrations range from 1,600 to 156,699 ppm, with an average of 77,488 ppm.

SECTION D – FORMATION FLUID CHEMISTRY

To ensure compatibility of the proposed injection fluids with the Siluro-Devonian formation fluids, Geolex conducted a review of the U.S.G.S Produced Water Database to retrieve formation-fluid analyses conducted for all available wells within 20 miles of the proposed Lombard SWD #1. The results of these fluid analyses are summarized in the following Table 6.

Table 6. Devonian produced water analyses from wells within 20 miles of the proposed Lombard SWD #1 (U.S. Geological Survey National Produced Water Geochemical Database v. 2.3)

API	CONCENTRATION (parts per million)										
	TDS	SG	Resist.	pH	HCO3	Ca	Cl	K	Mg	Na	SO4
3002503156	25800	1.02	0.346	7.7	830	1170	14100	-	134	8410	1120
3002504270	48300	1.037	0.192	6.7	1150	2080	26700	-	486	15600	2340
3002508483	71078	1.051	0.101	7	500	2400	42200	610	329	24039	1000
3002521082	80187	1.056	0.092	6.9	476	2820	47900	637	378	27076	900
3002521647	25199	1.019	0.244	7	415	1210	14200	250	171	7903	1050
3002520378	39874	1.027	0.152	7.37	545	1529	22440	208	258	13093	1529
3002501735	28079	1.022	0.309	7.03	791	1022	14810	193	185	9127	1885
3002500869	24662	-	0.2	-	284	727	12520	-	-	-	2586
3002500872	26967	-	0.225	-	640	1186	14760	-	206	-	1427
3002500960	28550	-	-	-	818	967	14320	-	385	-	1280
3002501661	21444	-	-	-	881	5090	11400	-	93	-	1537
3002502247	31145	-	0.156	-	183	1520	18200	-	292	-	950
3002502424	29436	-	0.185	-	634	1550	16720	-	496	-	1142
3002502431	33414	-	0.177	-	227	1775	18570	-	151	-	1961
3002503113	30255	-	0.255	-	562	1100	16500	-	73	-	1820
3002503114	28813	-	-	-	1207	1501	16520	-	432	-	362
3002503115	10202	-	-	-	561	812	4060	-	1106	-	2598
3002503118	27719	-	-	-	392	1274	14870	-	148	-	1956
3002503130	28417	-	-	-	560	1306	15910	-	248	-	1244
3002503136	31047	-	-	-	722	1843	17610	-	304	-	1065
3002503137	28173	-	-	-	168	1408	15500	-	245	-	1856
3002503151	27740	-	-	-	247	1720	16180	-	442	-	926
3002520377	44825	-	-	-	761	2590	27970	-	2424	-	-

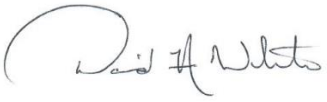
Devonian Formations fluids range from 10,202 to 80,187 ppm TDS, with an average of 33,536 ppm. Similar to proposed injection fluid compositions, the primary anion of the injection reservoir fluid is chloride. Chloride concentrations range from 4,060 to 47,900 ppm, with an average of 18,868 ppm.

Based on the results of these analyses, the proposed injectate fluid composition is compatible with the target injection reservoir fluids. While drilling and completing the proposed Lombard SWD #1, attempts will be made to collect current samples of formation fluid at this location in order to identify site-specific fluid characteristics.

SECTION E – STATEMENT ATTESTING TO CLOSED-SYSTEM INJECTION RESERVOIR

Based on a detailed review of all the available geologic information and well records in the area as described in this supplemental report and in our original C-108 application, I hereby certify that the proposed Siluro-Devonian injection interval is a closed system in the area of Lombard SWD #1.

David A. White M.S.
Senior Geologist – Geolex, Inc.®
Consultant to 3Bear Field Services, LLC

Signature:  Date: 4/15/2020

ATTACHMENT 1

NEW MEXICO OFFICE OF THE STATE ENGINEER
WATER WELL FILES – CP 00793 POD 1

Documents included:

NM Office of the State Engineer Transaction Summary
Declaration of Owner of Underground Water Rights

New Mexico Office of the State Engineer
Transaction Summary

DCL Declaration of a Water Right

Transaction Number: 535940 **Transaction Desc:** CP 00793 **File Date:** 07/21/1993

Primary Status: DCL Declared
Secondary Status: PRC Processed
Person Assigned: *******
Applicant: DANIEL C. BERRY

Events

	Date	Type	Description	Comment	Processed By
get images	07/21/1993	APP	Application Received	*	*******
	07/21/1993	FTN	Finalize non-published Trans.		*******
	12/23/2016	QAT	Quality Assurance Completed	DATA/SQ2	*******
	01/03/2017	QAT	Quality Assurance Completed	IMAGE	*******

Water Right Information

WR File Nbr	Acres	Diversion	Consumptive	Purpose of Use
CP 00793	0	3		PLS NON 72-12-1 LIVESTOCK WATERING

****Point of Diversion**

CP 00793 POD1		628932	3598270*

***An (*) after northing value indicates UTM location was derived from PLSS - see Help**

****Place of Use**

Q 256	Q 64	Q 16	Q 4	Sec	Tws	Rng	Acres	Diversion	Consumptive	Use	Priority	Status	Other Loc Desc
							0	3		PLS	12/31/1960	DCL	NO PLACE OF USE GIVEN

Remarks

"NO POWER. HAS NOT BEEN USED IN RECENT YEARS. PHILLIPS WELL."

Revised December 1975

IMPORTANT — READ INSTRUCTIONS ON BACK BEFORE FILLING OUT THIS FORM.

Declaration of Owner of Underground Water Right

Capitan
BASIN NAME

Declaration No. CP-793 Date received July 21, 1993

STATEMENT

1. Name of Declarant Daniel C. Berry
   Mailing Address Box 160 Eunice
   County of Lea, State of New Mexico
2. Source of water supply shallow
   (artesian or shallow water aquifer)
3. Describe well location under one of the following subheadings:
   a. NW ¼ NW ¼ NE ¼ of Sec. 1 Twp. 21 S Rge. 32 E N.M.P.M., in Lea County.
   b. Tract No. _____ of Map No. _____ of the _____
   c. X = _____ feet, Y = _____ feet, N. M. Coordinate System _____ Zone in the _____ Grant.
   On land owned by Federal
4. Description of well: date drilled 1960's driller Phillips depth 1000' feet. outside diameter of casing 8" inches; original capacity unknown gal. per min.; present capacity 20 gal. per min.; pumping lift _____ feet; static water level _____ feet (above) (below) land surface; make and type of pump _____ make, type, horsepower, etc., of power plant _____ Fractitional or percentage interest claimed in well 100%
5. Quantity of water appropriated and beneficially used 3
   (acre feet per acre) (acre feet per annum)
   for stock watering purposes.
6. Acreage actually irrigated _____ acres, located and described as follows (describe only lands actually irrigated):

Subdivision	Sec.	Twp.	Range	Acres Irrigated	Owner

(Note: location of well and acreage actually irrigated must be shown on plat on reverse side.)

7. Water was first applied to beneficial use _____ (month) _____ (day) 1960's (year) and since that time has been used fully and continuously on all of the above described lands or for the above described purposes except as follows: _____
8. Additional statements or explanations No power. Has not been used in recent years. Phillips Well

_____ being first duly sworn upon my oath, depose and say that the above is a full and complete statement prepared in accordance with the instructions on the reverse side of this form and submitted in evidence of ownership of a valid underground water right, that I have carefully read each and all of the items contained therein and that the same are true to the best of my knowledge and belief.

Daniel C. Berry, declarant.

by: _____

Subscribed and sworn to before me this 20th day of July, A.D. 1993

My commission expires Sept 18, 1993 Notary Public

POD Renumbered
From: CP-793
To: CP-793 POD 1

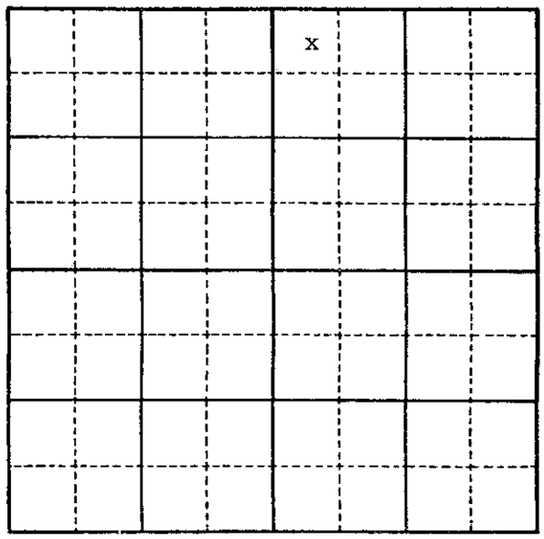
FILED
UNDER NEW MEXICO LAW A DECLARATION IS ONLY A STATEMENT OF DECLARANT'S CLAIM. ACCEPTANCE FOR FILING DOES NOT CONSTITUTE APPROVAL OR REJECTION OF THE CLAIM.

93 JUL 21 PM 4 08

535940

Locate well and areas actually irrigated as accurately as possible on following plat:

Section (s) 1, **Township** 21, **Range** 32 **N. M. P. M.**



INSTRUCTIONS

Declaration shall be executed (preferably typewritten) in triplicate and must be accompanied by a **$1.00 filing** fee. Each of triplicate copies must be properly signed and attested.

A separate declaration must be filed for each well in use.

All blanks shall be filled out fully. Required information which cannot be sworn to by declarant shall be supplied by affidavit of person or persons familiar with the facts and shall be submitted herewith.

Secs. 1-3. Complete all blanks.

Sec. 4. Fill out all blanks applicable as fully as possible.

Sec. 5. Irrigation use shall be stated in acre feet of water per acre per year applied on the land. If used for domestic, municipal. or other purposes, state total quantity in acre feet used annually.

Sec. 6. Describe only the acreage actually irrigated. When necessary to clearly define irrigated acreages, describe to nearest 2½ acre subdivision. If located on unsurveyed lands. describe by legal supdivision "as projected" from the nearest government survey corners, or describe by metes and bounds and tie survey to some permanent, easily-located natural object.

Sec. 7. Explain and give dates as nearly as possible of any years when all or part of acreage claimed was not irrigated.

Sec. 8. If well irrigates or supplies supplemental water to any other land than that described above, or if land is also irrigated from any other source, explain under this section. Give any other data necessary to fully describe water right.

If additional space is necessary, use a separate sheet or sheets and attach securely hereto.

SF

STATE OF NEW MEXICO

STATE ENGINEER OFFICE

ELUID MARTINEZ
STATE ENGINEER

ROSWELL

DISTRICT II
1900 West Second St.
Roswell, New Mexico 88201
(505) 622-6521

July 27, 1993

Files: CP-793; CP-794; CP-795; CP-796;
CP-797; CP-798; CP-799; CP-800;
CP-801; CP-802; CP-803; CP-804

Daniel C. Berry
Box 160
Eunice, NM 88231

Dear Mr. Berry:

Enclosed are your copies of Declarations of Owner of Underground Water Right as numbered above, which have been filed for record in the office of the State Engineer.

Please refer to these numbers in all future correspondence concerning these declarations.

The filing of these declarations does not indicate affirmation or rejection of the statements contained therein.

Yours very truly,

Johnny R. Hernandez
Lea County Basin Supervisor

JRH/fh
Encls.

cc: Santa Fe

ATTACHMENT 2

JACAM LABORATORIES CHEMICAL ANALYSIS
RESULTS OF PROPOSED INJECTION FLUID
(completed 7/16/2019)

JACAM LABORATORIES

DownHole R_x

WATER CHEMISTRY

3 BEAR ENERGY
Jeff Day
EDDY NM

Libby Berry Fed SWD

North field inlet

Report Date: 07-16-2019
Sample #: 5647

Sampled: 07-02-2019
at 0000

Sample ID: 231260

CATIONS		ANIONS	
Calcium (as Ca)	4108	Chloride (as Cl)	67622
Magnesium (as Mg)	542.90	Sulfate (as SO_4)	660.00
Barium (as Ba)	3.22	Bromine (as Br)	0.00
Strontium (as Sr)	394.30	Dissolved CO_2 (as CO_2)	300.00
Sodium (as Na)	35388	Bicarbonate (as HCO_3)	181.50
Potassium (as K)	674.40	Carbonate (as CO_3)	0.00
Lithium (as Li)	0.00	Oxalic acid (as C_2O_4)	0.00
Ammonia (as NH_3)	0.00	Silica (as SiO_2)	0.00
Aluminum (as Al)	0.00	Phosphate(as PO_4)	0.00
Iron (as Fe)	0.277	H_2S (as H_2S)	153.90
Manganese (as Mn)	0.658	Fluoride (as F)	0.00
Zinc (as Zn)	0.00	Nitrate (as NO_3)	0.00
Lead (as Pb)	0.00	Boron (as B)	296.85

PARAMETERS

Calculated T.D.S.	109319
Molar Conductivity	150643
Resistivity	6.64
Sp.Gr.(g/mL)	1.08
Pressure(atm)	1.00
pCO_2(atm)	0.00936
pH_2S(atm)	0.101
Temperature (^oF)	75.00
pH	7.10

COMMENTS

EDDY NM

JACAM LABORATORIES
205 S. Broadway · P.O. Box 96 · Sterling, KS 67579-0096

JACAM LABORATORIES

DownHole R_x

DEPOSITION POTENTIAL INDICATORS

3 BEAR ENERGY
EDDY NM

Libby Berry Fed SWD

Report Date: 07-16-2019 Sampled: 07-02-2019
Sample #: 5647 at 0000

Sample ID: 231260

SATURATION LEVEL	
Calcite ($CaCO_3$)	0.611
Aragonite ($CaCO_3$)	0.533
Witherite ($BaCO_3$)	< 0.001
Strontianite ($SrCO_3$)	0.109
Calcium oxalate (CaC_2O_4)	0.00
Magnesite ($MgCO_3$)	0.0798
Anhydrite ($CaSO_4$)	0.244
Gypsum ($CaSO_4*2H_2O$)	0.359
Barite ($BaSO_4$)	11.31
Celestite ($SrSO_4$)	1.00
Fluorite (CaF_2)	0.00
Calcium phosphate	0.00
Hydroxyapatite	0.00
Silica (SiO_2)	0.00
Brucite ($Mg(OH)_2$)	< 0.001
Magnesium silicate	0.00
Iron hydroxide ($Fe(OH)_3$)	< 0.001
Strengite ($FePO_4*2H_2O$)	0.00
Siderite ($FeCO_3$)	0.0409
Halite (NaCl)	0.0359
Thenardite ($Na2SO_4$)	< 0.001
Iron sulfide (FeS)	8.97

MOMENTARY EXCESS (Lbs/1000 Barrels)	
Calcite ($CaCO_3$)	-0.0126
Aragonite ($CaCO_3$)	-0.0174
Witherite ($BaCO_3$)	-23.62
Strontianite ($SrCO_3$)	-0.240
Calcium oxalate (CaC_2O_4)	-0.0162
Magnesite ($MgCO_3$)	-0.192
Anhydrite ($CaSO_4$)	-405.25
Gypsum ($CaSO_4*2H_2O$)	-272.96
Barite ($BaSO_4$)	1.74
Celestite ($SrSO_4$)	0.412
Fluorite (CaF_2)	-4.24
Calcium phosphate	>-0.001
Hydroxyapatite	-345.29
Silica (SiO_2)	-34.72
Brucite ($Mg(OH)_2$)	0.00373
Magnesium silicate	-103.48
Iron hydroxide ($Fe(OH)_3$)	< 0.001
Strengite ($FePO_4*2H_2O$)	>-0.001
Siderite ($FeCO_3$)	-0.234
Halite (NaCl)	-146156
Thenardite ($Na2SO_4$)	-79311
Iron sulfide (FeS)	0.0231

SIMPLE INDICES	
Langelier	0.113
Ryznar	6.87
Puckorius	7.44
Larson-Skold Index	3900
Stiff Davis Index	-0.556
Oddo-Tomson	-0.958

BOUND IONS	TOTAL	FREE
Calcium	4108	4020
Barium	3.22	3.22
Carbonate	1.23	0.0341
Phosphate	0.00	0.00
Sulfate	660.00	295.00

OPERATING CONDITIONS

Temperature (^oF)	75.00
Time(secs)	0.00

JACAM LABORATORIES
205 S. Broadway · P.O. Box 96 · Sterling, KS 67579-0096

DownHole SAT™ Water Analysis Report

JACAM LABORATORIES

SYSTEM IDENTIFICATION

3 BEAR ENERGY
Libby Berry Fed SWD
EDDY NM

Sample ID#:	5647
ID:	231260
Report Date:	07-16-2019
Sample Date:	07-02-2019
	at 0000

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	4108
Magnesium(as Mg)	542.90
Barium(as Ba)	3.22
Strontium(as Sr)	394.30
Sodium(as Na)	35388
Potassium(as K)	674.40
Lithium(as Li)	0.00
Iron(as Fe)	0.277
Field Iron(as Fe)	0.00
Ammonia(as NH_3)	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	0.658
Zinc(as Zn)	0.00
Lead(as Pb)	0.00

ANIONS

Chloride(as Cl)	67622
Sulfate(as SO_4)	660.00
Bromine(as Br)	0.00
Dissolved CO_2(as CO_2)	300.00
Bicarbonate(as HCO_3)	181.50
Carbonate(as CO_3)	0.00
Silica(as SiO_2)	0.00
Phosphate(as PO_4)	0.00
H_2S (as H_2S)	153.90
Fluoride(as F)	0.00
Nitrate(as NO_3)	0.00
Boron(as B)	296.85

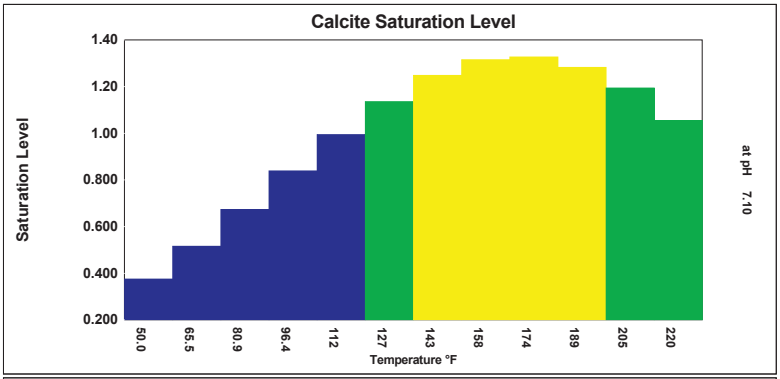
PARAMETERS

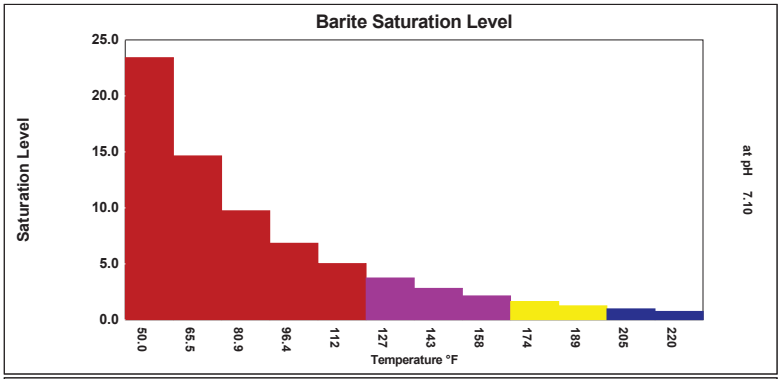
Temperature(°F)	75.00
T.D.S.	109319
Sample pH	7.10
Conductivity:	150643
Resistivity:	6.64

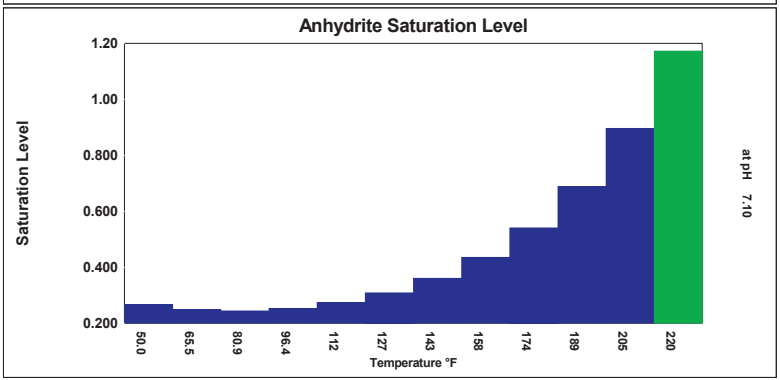
SCALE AND CORROSION POTENTIAL

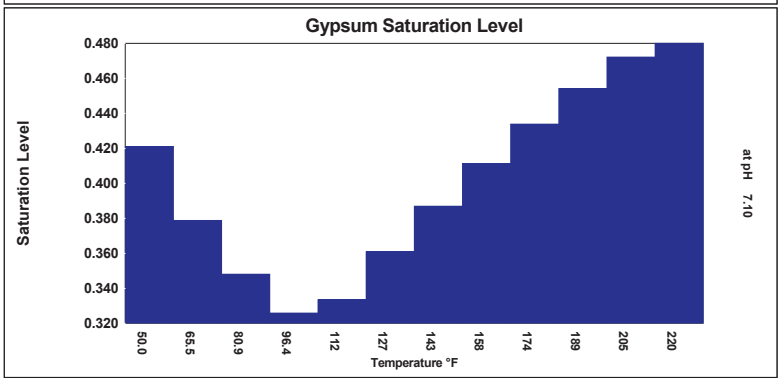
Temp. (°F)	Press. (atm)	Calcite $CaCO_3$		Anhydrite $CaSO_4$		Gypsum $CaSO_4*2H_2O$		Barite $BaSO_4$		Celestite $SrSO_4$		Siderite $FeCO_3$		Mackawenite FeS		CO_2 (mpy)	pCO_2 (atm)
50.00	0.00	0.374	-0.0247	0.266	-384.98	0.421	-225.51	23.41	1.83	1.15	16.53	0.0209	-0.305	45.50	0.0261	0.0360	0.00936
65.45	0.00	0.515	-0.0169	0.248	-405.94	0.379	-256.92	14.64	1.78	1.04	4.20	0.0322	-0.258	37.02	0.0255	0.0675	0.00936
80.91	0.00	0.673	-0.0102	0.244	-399.32	0.348	-281.30	9.74	1.71	0.991	-1.08	0.0469	-0.220	30.16	0.0249	0.0323	0.00936
96.36	0.00	0.838	-0.00455	0.253	-369.76	0.326	-298.85	6.84	1.63	0.979	-2.44	0.0647	-0.188	24.71	0.0241	0.0423	0.00936
111.82	0.00	0.993	>-0.001	0.274	-323.65	0.333	-280.19	5.02	1.53	0.981	-2.14	0.0844	-0.162	20.38	0.0233	0.0444	0.00936
127.27	0.00	1.14	0.00321	0.309	-267.81	0.361	-242.26	3.74	1.39	0.979	-2.29	0.105	-0.141	16.98	0.0225	0.0342	0.00936
142.73	0.00	1.25	0.00549	0.361	-208.47	0.387	-211.84	2.81	1.23	0.972	-3.02	0.126	-0.124	14.24	0.0215	0.0257	0.00936
158.18	0.00	1.31	0.00658	0.435	-150.60	0.411	-187.40	2.13	1.01	0.961	-4.26	0.143	-0.110	11.99	0.0204	0.0255	0.00936
173.64	0.00	1.33	0.00649	0.540	-97.66	0.434	-167.78	1.63	0.733	0.945	-5.96	0.153	-0.100	10.10	0.0192	0.0262	0.00936
189.09	0.00	1.28	0.00540	0.688	-51.61	0.454	-152.13	1.26	0.386	0.926	-8.09	0.157	-0.0927	8.49	0.0178	0.0136	0.00936
204.55	0.00	1.19	0.00359	0.896	-13.15	0.472	-139.76	0.975	-0.0494	0.903	-10.63	0.152	-0.0878	7.09	0.0163	0.0121	0.00936
220.00	0.171	1.05	0.00101	1.17	16.74	0.480	-136.24	0.749	-0.631	0.864	-15.42	0.139	-0.0870	6.61	0.0147	0.0181	0.0110
		xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels		

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. $\{Ca\}\{CO_3\}/K_{sp}$. pCO_2 (atm) is the partial pressure of CO_2 in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.









JACAM LABORATORIES

DownHole R_x

WATER CHEMISTRY

3 BEAR ENERGY
Jeff Day
EDDY NM

Libby Berry Fed SWD

North field inlet

Report Date: 07-16-2019
Sample #: 5647

Sampled: 07-02-2019
at 0000

Sample ID: 231259

CATIONS		ANIONS	
Calcium (as Ca)	3581	Chloride (as Cl)	74493
Magnesium (as Mg)	510.30	Sulfate (as SO_4)	660.00
Barium (as Ba)	2.94	Bromine (as Br)	0.00
Strontium (as Sr)	327.90	Dissolved CO_2 (as CO_2)	280.00
Sodium (as Na)	39835	Bicarbonate (as HCO_3)	181.50
Potassium (as K)	685.00	Carbonate (as CO_3)	0.00
Lithium (as Li)	0.00	Oxalic acid (as C_2O_4)	0.00
Ammonia (as NH_3)	0.00	Silica (as SiO_2)	0.00
Aluminum (as Al)	0.00	Phosphate(as PO_4)	0.00
Iron (as Fe)	0.145	H_2S (as H_2S)	171.00
Manganese (as Mn)	0.636	Fluoride (as F)	0.00
Zinc (as Zn)	0.00	Nitrate (as NO_3)	0.00
Lead (as Pb)	0.00	Boron (as B)	259.31

PARAMETERS

Calculated T.D.S.	119313
Molar Conductivity	167681
Resistivity	5.96
Sp.Gr.(g/mL)	1.09
Pressure(atm)	1.00
pCO_2(atm)	0.00950
pH_2S(atm)	0.112
Temperature (^oF)	75.00
pH	7.09

COMMENTS

EDDY NM

JACAM LABORATORIES
205 S. Broadway · P.O. Box 96 · Sterling, KS 67579-0096

JACAM LABORATORIES

DownHole R_x

DEPOSITION POTENTIAL INDICATORS

3 BEAR ENERGY
Jeff Day
EDDY NM

Libby Berry Fed SWD

Report Date: 07-16-2019
Sample #: 5647

Sampled: 07-02-2019
at 0000

Sample ID: 231259

SATURATION LEVEL	
Calcite ($CaCO_3$)	0.366
Aragonite ($CaCO_3$)	0.319
Witherite ($BaCO_3$)	< 0.001
Strontianite ($SrCO_3$)	0.0584
Calcium oxalate (CaC_2O_4)	0.00
Magnesite ($MgCO_3$)	0.0524
Anhydrite ($CaSO_4$)	0.219
Gypsum ($CaSO_4*2H_2O$)	0.317
Barite ($BaSO_4$)	9.96
Celestite ($SrSO_4$)	0.807
Fluorite (CaF_2)	0.00
Calcium phosphate	0.00
Hydroxyapatite	0.00
Silica (SiO_2)	0.00
Brucite ($Mg(OH)_2$)	< 0.001
Magnesium silicate	0.00
Iron hydroxide ($Fe(OH)_3$)	< 0.001
Strengite ($FePO_4*2H_2O$)	0.00
Siderite ($FeCO_3$)	0.0139
Halite (NaCl)	0.0453
Thenardite ($Na2SO_4$)	< 0.001
Iron sulfide (FeS)	4.84

MOMENTARY EXCESS (Lbs/1000 Barrels)	
Calcite ($CaCO_3$)	-0.0230
Aragonite ($CaCO_3$)	-0.0284
Witherite ($BaCO_3$)	-24.18
Strontianite ($SrCO_3$)	-0.316
Calcium oxalate (CaC_2O_4)	-0.0182
Magnesite ($MgCO_3$)	-0.202
Anhydrite ($CaSO_4$)	-464.07
Gypsum ($CaSO_4*2H_2O$)	-328.51
Barite ($BaSO_4$)	1.56
Celestite ($SrSO_4$)	-24.71
Fluorite (CaF_2)	-4.48
Calcium phosphate	>-0.001
Hydroxyapatite	-341.17
Silica (SiO_2)	-34.14
Brucite ($Mg(OH)_2$)	0.00365
Magnesium silicate	-102.78
Iron hydroxide ($Fe(OH)_3$)	< 0.001
Strengite ($FePO_4*2H_2O$)	>-0.001
Siderite ($FeCO_3$)	-0.282
Halite (NaCl)	-140363
Thenardite ($Na2SO_4$)	-80322
Iron sulfide (FeS)	0.0106

SIMPLE INDICES	
Langelier	-0.0974
Ryznar	7.28
Puckorius	8.08
Larson-Skold Index	6157
Stiff Davis Index	-0.734
Oddo-Tomson	-1.19

BOUND IONS	TOTAL	FREE
Calcium	3581	3504
Barium	2.94	2.94
Carbonate	1.01	0.0229
Phosphate	0.00	0.00
Sulfate	660.00	301.68

OPERATING CONDITIONS

Temperature (^oF)	75.00
Time(secs)	0.00

JACAM LABORATORIES
205 S. Broadway · P.O. Box 96 · Sterling, KS 67579-0096

DownHole SAT™ Water Analysis Report

JACAM LABORATORIES

SYSTEM IDENTIFICATION

3 BEAR ENERGY
Libby Berry Fed SWD
EDDY NM

Sample ID#: 5647
ID: 231259
Report Date: 07-16-2019
Sample Date: 07-02-2019
at 0000

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	3581
Magnesium(as Mg)	510.30
Barium(as Ba)	2.94
Strontium(as Sr)	327.90
Sodium(as Na)	39835
Potassium(as K)	685.00
Lithium(as Li)	0.00
Iron(as Fe)	0.145
Field Iron(as Fe)	0.00
Ammonia(as NH_3)	0.00
Aluminum(as Al)	0.00
Manganese(as Mn)	0.636
Zinc(as Zn)	0.00
Lead(as Pb)	0.00
Sample pH	7.09
Conductivity:	167681

ANIONS

Chloride(as Cl)	74493
Sulfate(as SO_4)	660.00
Bromine(as Br)	0.00
Dissolved CO_2(as CO_2)	280.00
Bicarbonate(as HCO_3)	181.50
Carbonate(as CO_3)	0.00
Silica(as SiO_2)	0.00
Phosphate(as PO_4)	0.00
H_2S (as H_2S)	171.00
Fluoride(as F)	0.00
Nitrate(as NO_3)	0.00
Boron(as B)	259.31

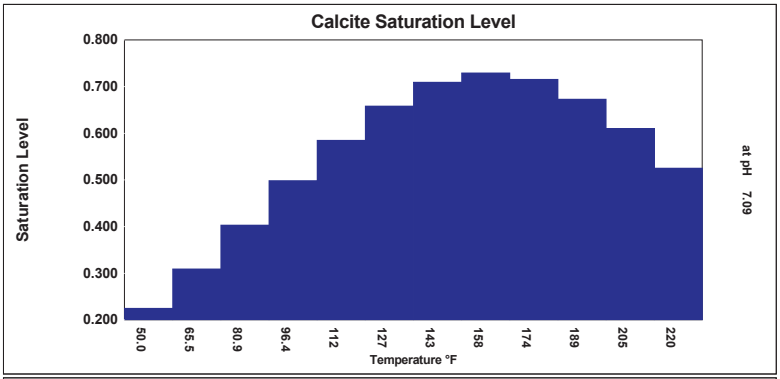
PARAMETERS

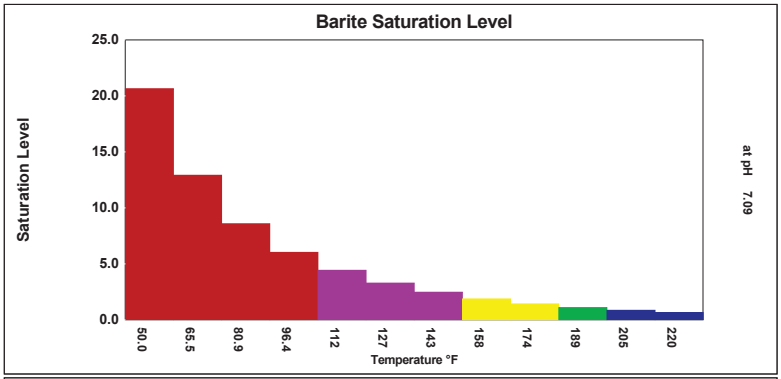
Temperature(°F)	75.00
T.D.S.	119313
Resistivity:	5.96

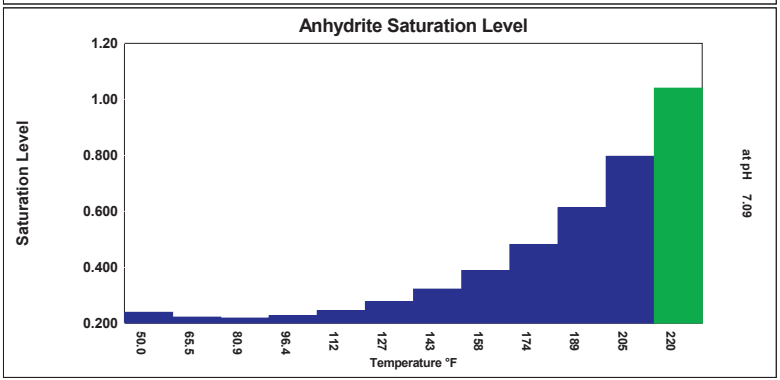
SCALE AND CORROSION POTENTIAL

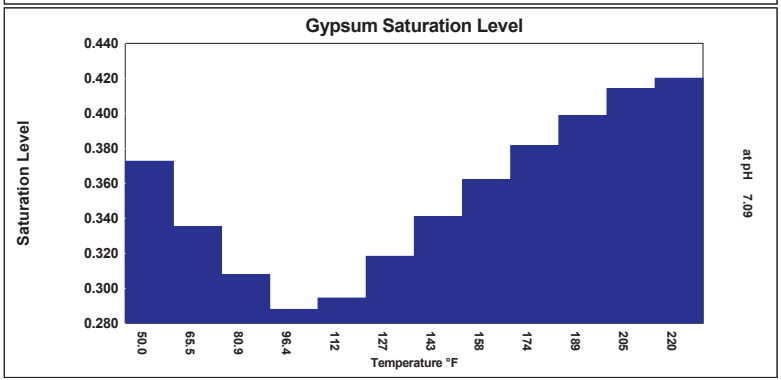
Temp. (°F)	Press. (atm)	Calcite $CaCO_3$		Anhydrite $CaSO_4$		Gypsum $CaSO_4*2H_2O$		Barite $BaSO_4$		Celestite $SrSO_4$		Siderite $FeCO_3$		Mackawenite FeS		CO_2 (mpy)	pCO_2 (atm)
50.00	0.00	0.225	-0.0342	0.239	-442.39	0.373	-276.48	20.64	1.66	0.927	-8.76	0.00710	-0.354	24.40	0.0132	0.0362	0.00950
65.45	0.00	0.309	-0.0269	0.222	-464.88	0.335	-310.89	12.90	1.60	0.834	-21.06	0.0110	-0.307	19.86	0.0128	0.0679	0.00950
80.91	0.00	0.403	-0.0208	0.219	-457.46	0.308	-337.56	8.57	1.54	0.797	-26.09	0.0159	-0.268	16.19	0.0124	0.0326	0.00950
96.36	0.00	0.498	-0.0158	0.226	-425.10	0.288	-356.72	6.02	1.45	0.787	-27.10	0.0218	-0.236	13.26	0.0120	0.0427	0.00950
111.82	0.00	0.585	-0.0120	0.245	-374.59	0.294	-335.65	4.42	1.34	0.788	-26.42	0.0282	-0.209	10.94	0.0115	0.0448	0.00950
127.27	0.00	0.658	-0.00911	0.276	-313.22	0.318	-293.09	3.28	1.21	0.786	-26.26	0.0347	-0.187	9.11	0.0109	0.0376	0.00950
142.73	0.00	0.709	-0.00724	0.322	-247.67	0.341	-258.83	2.47	1.03	0.779	-26.75	0.0405	-0.169	7.64	0.0103	0.0305	0.00950
158.18	0.00	0.729	-0.00637	0.388	-183.39	0.362	-231.24	1.87	0.805	0.769	-27.84	0.0449	-0.155	6.44	0.00966	0.0317	0.00950
173.64	0.00	0.715	-0.00637	0.482	-124.25	0.381	-209.08	1.43	0.517	0.756	-29.46	0.0470	-0.143	5.42	0.00893	0.0328	0.00950
189.09	0.00	0.673	-0.00704	0.612	-72.53	0.399	-191.38	1.10	0.154	0.739	-31.59	0.0468	-0.134	4.56	0.00811	0.0166	0.00950
204.55	0.00	0.610	-0.00815	0.796	-29.12	0.414	-177.43	0.851	-0.302	0.720	-34.22	0.0443	-0.128	3.81	0.00720	0.0139	0.00950
220.00	0.171	0.525	-0.0100	1.04	4.42	0.420	-173.97	0.653	-0.913	0.688	-39.58	0.0394	-0.125	3.56	0.00642	0.0189	0.0111
		xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels	xSAT	Lbs per 1000 Barrels		

Saturation Levels (xSAT) are the ratio of ion activity to solubility, e.g. $\{Ca\}\{CO_3\}/K_{sp}$. pCO_2 (atm) is the partial pressure of CO_2 in the gas phase.
Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.









ATTACHMENT 3

REQUEST FOR PERMISSION TO SAMPLE
GROUNDWATER FROM WATER WELL CP 00793

&

CERTIFIED MAIL PROOF OF SHIPMENT

GEOLEX®
INCORPORATED

April 15, 2020

VIA U.S. POSTAL SERVICE

Daniel C. Berry
P.O. Box 160
Eunice, NM 88231

RE: WATER WELL (CP 00793 POD 1) STATUS INQUIRY AND REQUEST FOR GROUNDWATER SAMPLE

Mr. Daniel Berry or To Whom It May Concern:

On behalf of 3Bear Field Services, we (Geolex, Inc.®) are contacting you in the hopes that you may provide us with information regarding the current operational status of a water well in which Daniel C. Berry is documented as the owner of record. If the current state of the well permits, we respectfully request permission to collect and analyze a groundwater sample from this well.

As recorded in the files of the New Mexico Office of the State Engineer (NMOSE), the well file number is CP 00793 and the well location is recorded as NW/4 NW/4 NE/4 of Section 1, Township 21S, Range 32E (Approx. NAD83 coordinates: 32.514259, -103.627334).

3Bear Field Services is requesting permission to sample and analyze groundwater from this well, in order to provide the New Mexico Oil Conservation Division (NMOCD) with required groundwater data in the area of 3Bear's proposed Lombard SWD #1 well. This saltwater disposal well is to be located in Section 6 of Township 21S, Range 33E.

If you have any questions concerning this inquiry or would like to further discuss our request, you may contact Alberto Gutiérrez R.G., or David White at (505)842-8000 at Geolex, Inc.®; 500 Marquette Avenue NW, Suite 1350; Albuquerque, New Mexico.

Sincerely,
Geolex, Inc.®

David A. White, M.S.
Project Manager, Senior Geologist
Consultant to 3Bear Field Services, LLC

C:\Users\dawhi\OneDrive\Desktop\3Bear Revisions\Attachment 3\Berry Correspondence (3Bear Revisions).docx

phone: 505-842-8000
fax: 505-842-7380

500 Marquette Avenue, NW, Suite 1350
Albuquerque, New Mexico 87102

email: dwhite@geolex.com
web: www.geolex.com