

P.O. Box 50820
Midland, Texas 79710
Phone (432) 684-9696



4000 N. Big Spring, Suite 310
Midland, Texas 79705
Fax (432) 686-0600

June 14, 2018

Ms. Olivia Yu
New Mexico Oil Conservation Division - District 1
1625 N. French Drive
Hobbs, New Mexico 88240

Ms. Shelly Tucker
Environmental Protection Division
Bureau of Land Management
620 E. Greene Street
Carlsbad, NM 88220

INFORMATION ONLY

RE: *Release Characterization & Proposed Delineation Plan for Government E SWD #1
Produced Water Spill* **1RP-4980**

Dear Ms. Yu and Ms. Tucker,

As discussed previously, please find our formal characterization and delineation of 1RP-4890 below.

Site Description

The site is located approximately 22 miles west/southwest of Hobbs, New Mexico. The legal location for the sites is Unit Letter N, Section 25, Township 19S, Range 34E in Lea County, New Mexico. The latitude and longitude for the release is 32.625818 °/-103.516315°. Site location and area maps are presented in RP-2586 and a Detailed Site Diagram, both attached. The release was located on the well pad and within existing primary containment berms for Government E SWD #1 (API No. 30-025-23708) on the West side of Marathon Road.

Spill Characterization

Approximately 240 barrels of produced water leaked out of a ruptured 2" connection on the facility's circulating pump and into primary containment berm walls surrounding the SWD facility and well pad. Free water was recovered from within the berm area using a vacuum truck. A water analysis representing typical water chemistry for the Government E SWD #1 is attached for your records.

Spill Delineation

Soil saturated with produced water was delineated horizontally and vertically based on the soil's moisture content.

In accordance with prior written agreements with BLM/NMOCD, contaminated soil was quickly and repeatedly flushed with fresh water until the chloride content of the rinse water was reduced to that of drinking water. In-situ flushing of soil to remove chlorides is a common agricultural practice that works well to remediate produced water spills when remediation activity begins soon after contamination occurs and before leaching begins. Soil that became saturated during the flushing process was hauled off. Removed soil was replaced with fresh caliche then covered with pea gravel.

April 25, 2018

Bruce Madden, Nick Klopp, and Jason Wacker representing BC Operating, Inc.; Shelly Tucker representing BLM; and Olivia Yu representing NMOCD met onsite to review the above release and remediation history. Of utmost concern for all parties was understanding the impact of this and prior produced water releases on underlying groundwater. The five of us agreed to the following go forward plan to affect conditional closure of 1RP-4980:

1. BC Operating will research prior spill delineation and clean up reports to provide historical laboratory sampling analysis demonstrating that prior releases have not affected groundwater.
 - a. BC Operating provided this information to BLM/NMOCD in our letter dated April, 26 2018.
2. BC Operating will drill one borehole and provide chloride soil sample analysis at the agreed location within the facility's primary containment berm (LAT 32.625677°/LON -103.516183°) to demonstrate that the release 1RP-4980 has not impacted groundwater. The location of the borehole was selected based on its proximity within the produced water release area of 1RP-4980 and its accessibility, so as not to interfere with ongoing disposal operations at the facility. Soil samples from the borehole delineating chloride contamination as a result of 1RP-4980 are to be taken every 5 feet with two samples indicating clean soil to a depth of 10 feet below the base of chloride contamination.
 - a. In February 2010, NMOCD determined the depth to groundwater at this location to be 90 feet and laboratory soil sample analysis below a pit revealed a depth of chloride contamination to be 12.7 feet. Chloride contamination relating to this pit was completely remediated in 2010.
 - b. Once vertical delineation of chloride contamination relating to 1RP-4980 is completed within the borehole and analysis shows that groundwater has not been impacted, conditional closure of 1RP-4980 will state the following:

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- i. *IRP-4980 will remain open until the site is decommissioned and delineated.*
- ii. *At Abandonment, delineation will be conducted to ensure proper understanding of historic releases, at which point a new depth of excavation will be determined.*
- iii. *Ensure BLM concurrence/approval.*

Approval

BC Operating, Inc. seeks approval of the delineation plan for IRP-4980 outlined in Section 2 above to be conducted by a third party environmental firm.

Sincerely,

A handwritten signature in blue ink that reads "Jason Wacker".

Jason Wacker
VP of Engineering and Operations

DownHole SAT™ Water Analysis Report



SYSTEM IDENTIFICATION

B.C. OPERATING

GOVERNMENT SWD

CC: L.RODRIGUEZ

Sample ID#: 0

ID:

Sample Date: 08-24-2017 at 1048

Report Date: 08-28-2017

WATER CHEMISTRY

CATIONS

Calcium(as Ca)	6288
Magnesium(as Mg)	1516
Barium(as Ba)	0.00
Sodium(as Na)	51277
Potassium(as K)	0.00
Iron(as Fe)	148.00
Manganese(as Mn)	0.00400

ANIONS

Chloride(as Cl)	93649
Sulfate(as SO ₄)	1100
Bicarbonate(as HCO ₃)	439.20
Carbonate(as CO ₃)	0.00
Phosphate(as PO ₄)	0.00
H ₂ S (as H ₂ S)	5.00

PARAMETERS

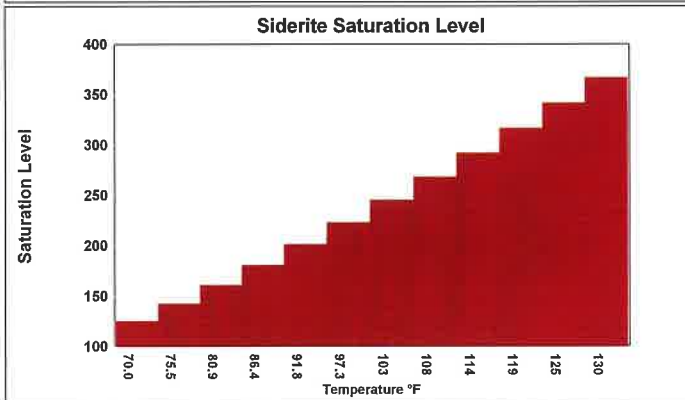
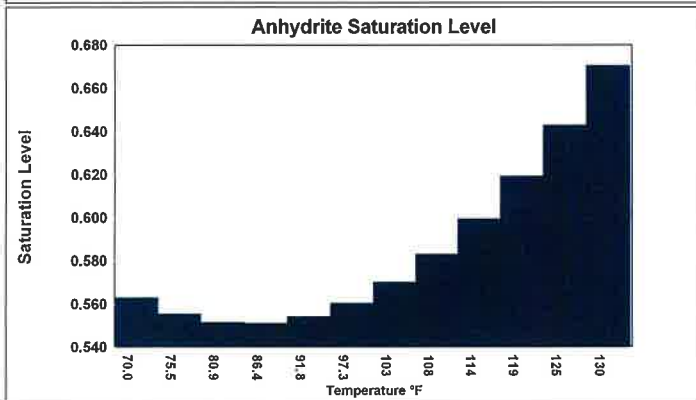
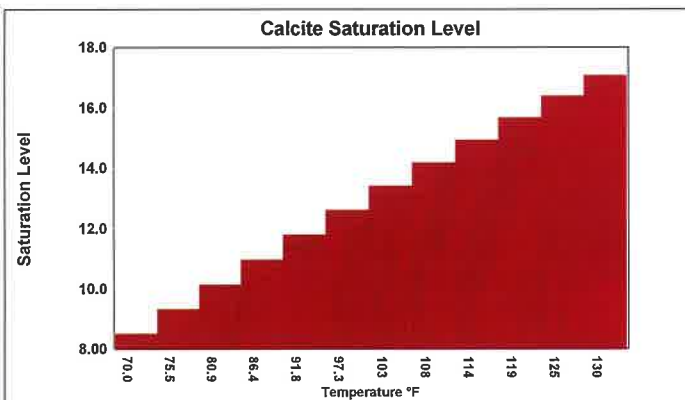
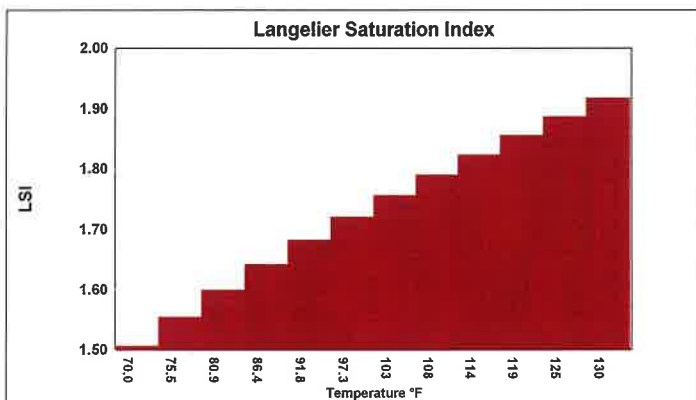
Temperature(°F)	77.00	Sample pH	6.90
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SCALE AND CORROSION POTENTIAL

Temp. (°F)	Press. (atm)	Calcite CaCO ₃		Anhydrite CaSO ₄		Gypsum CaSO ₄ *2H ₂ O		Barite BaSO ₄		Celestite SrSO ₄		Siderite FeCO ₃		Mackawenite FeS		CO ₂ (mpy)	pCO ₂ (atm)
70.00	0.00	8.52	0.103	0.563	-117.70	0.780	-48.95	0.00	-0.156	0.00	-166.61	125.34	0.134	89.40	0.928	0.0428	0.0474
75.45	0.00	9.32	0.110	0.555	-118.93	0.751	-56.31	0.00	-0.182	0.00	-168.29	142.55	0.141	83.82	0.884	0.0488	0.0474
80.91	0.00	10.14	0.116	0.551	-118.42	0.725	-63.10	0.00	-0.211	0.00	-169.39	161.06	0.148	78.58	0.843	0.0548	0.0474
86.36	0.00	10.97	0.122	0.551	-116.31	0.701	-69.34	0.00	-0.242	0.00	-170.04	180.76	0.154	73.66	0.804	0.0608	0.0474
91.82	0.00	11.80	0.128	0.554	-112.74	0.680	-75.02	0.00	-0.276	0.00	-170.31	201.54	0.161	69.06	0.768	0.0668	0.0474
97.27	0.00	12.62	0.133	0.560	-107.89	0.661	-80.17	0.00	-0.313	0.00	-170.30	223.20	0.166	64.76	0.733	0.0727	0.0474
102.73	0.00	13.41	0.137	0.570	-101.92	0.644	-84.79	0.00	-0.352	0.00	-170.06	245.54	0.171	60.74	0.701	0.0787	0.0474
108.18	0.00	14.18	0.141	0.583	-95.00	0.656	-79.16	0.00	-0.395	0.00	-169.75	268.55	0.175	57.01	0.671	0.0776	0.0474
113.64	0.00	14.94	0.145	0.599	-87.31	0.671	-72.73	0.00	-0.442	0.00	-169.53	292.45	0.180	53.57	0.643	0.0740	0.0474
119.09	0.00	15.68	0.149	0.619	-79.02	0.686	-66.88	0.00	-0.495	0.00	-169.41	317.04	0.183	50.39	0.617	0.0699	0.0474
124.55	0.00	16.40	0.152	0.643	-70.26	0.700	-61.55	0.00	-0.552	0.00	-169.37	342.13	0.187	47.45	0.594	0.0655	0.0474
130.00	0.00	17.08	0.155	0.671	-61.21	0.714	-56.69	0.00	-0.616	0.00	-169.42	367.49	0.190	44.71	0.572	0.0606	0.0474
		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 Levels (xSAT) are the ratio of ion activity to solubility, e.g. {Ca}{CO₃}/K_{sp}. pCO₂ (atm) is the partial pressure of CO₂ in the gas phase.

Lbs/1000 Barrels scale is the quantity of precipitation (or dissolution) required to instantaneously bring the water to equilibrium.





GOVERNMENT E SWD #1

BOREHOLE

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Imagery Date: 11/2/2017 lat 32.626101° lon -103.516064° elev 3743 ft eye alt 4179 ft