DATE IN	SUSPENSE	ENGINEER	LOGGED IN	TYPE	APP NO.
8/15/2017		PRG	8/15/2017	SWD	pMAM1722746711

ABOVE THIS LINE FOR DIVISION USE ONLY

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

ADMINISTRATIVE APPLICATION CHECKLIST

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

Application Acronyms:

[NSL-Non-Standard Location] [NSP-Non-Standard Proration Unit] [SD-Simultaneous Dedication]
[DHC-Downhole Commingling] [CTB-Lease Commingling] [PLC-Pool/Lease Commingling]
[PC-Pool Commingling] [OLS - Off-Lease Storage] [OLM-Off-Lease Measurement]
[WFX-Waterflood Expansion] [PMX-Pressure Maintenance Expansion]
[SWD-Salt Water Disposal] [IPI-Injection Pressure Increase]
[EOR-Qualified Enhanced Oil Recovery Certification] [PPR-Positive Production Response]

[1] **TYPE OF APPLICATION** - Check Those Which Apply for [A]

-SWD
-Occidental Permian LTD
157984

[A] Location - Spacing Unit - Simultaneous Dedication
☐ NSL ☐ NSP ☐ SD

Check One Only for [B] or [C]

well

[B] Commingling - Storage - Measurement
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM
- Hobbs Clay Storage

SWD #2

[C] Injection - Disposal - Pressure Increase - Enhanced Oil Recovery
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR
30-025-43730

[D] Other: Specify

Pool
-SWD; Devonian
96101

[2] **NOTIFICATION REQUIRED TO:** - Check Those Which Apply, or Does Not Apply

[A] ☒ Working, Royalty or Overriding Royalty Interest Owners

[B] ☒ Offset Operators, Leaseholders or Surface Owner

[C] ☒ Application is One Which Requires Published Legal Notice

[D] ☒ Notification and/or Concurrent Approval by BLM or SLO
U.S. Bureau of Land Management - Commissioner of Public Lands, State Land Office

[E] ☒ For all of the above, Proof of Notification or Publication is Attached, and/or,

[F] ☐ Waivers are Attached

[3] **SUBMIT ACCURATE AND COMPLETE INFORMATION REQUIRED TO PROCESS THE TYPE OF APPLICATION INDICATED ABOVE.**

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

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

April Hood	April Hood	Regulatory Specialist	
Print or Type Name	Signature	Title	Date

April_Hood@Oxy.com
e-mail Address

Occidental Permian LTD.
A subsidiary of Occidental Petroleum Corporation

5 Greenway Plaza, Suite 110, Houston, Texas
77046-0521 P.O. Box 27570, Houston, Texas
77227-7570

July 28, 2017

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

RE: SWD Application
Hobbs Chugalug SWD
Well No. 2
Letter B, Section 26, T-18S, R-37E
Lea County, NM

To Whom it May Concern:

Occidental Permian Ltd. respectfully request administrative approval, without hearing, to dispose produced water into the Devonian formation. In support of this request please find the following documentation:

- Administrative Application Checklist
- Form C-108 with miscellaneous data attached
- An Injection Well Data Sheet with Wellbore Schematic
- Area of Review and Data Table of Surrounding Wells
- Publication
- Service List with Proof of Certified Mailing attached
- Form C-102

If you have any questions regarding this application, please contact me at 713-366-5771 or email april_hood@oxy.com.

Sincerely,

April Hood

April Hood
Regulatory Specialist

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

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

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance ___X___Disposal _____Storage
Application qualifies for administrative approval? ___X___Yes _____No

II. OPERATOR: Occidental Permian LTD

ADDRESS: PO Box 4294 Houston, TX 77210

CONTACT PARTY: April Hood PHONE: 713-366-5771

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 ___X___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. **Attached**

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. **Attached**

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected; **Avg – 20000 BWPD Max – 30000 BWPD**
2. Whether the system is open or closed; **Closed**
3. Proposed average and maximum injection pressure; **Avg – 1200 psi Max – 2000 psi**
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and, **Grayburg / San Andres from the North Hobbs Unit, attached**
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.). **Attached**

*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.

Injection Zone:
Lithologic Description: Devonian-Silurian, naturally fractured limestone and dolomite
Porosity: 7-14%
Sw: 26% - 50%
Injection Interval: 10,100' – 12,500'

Reservoir data is based on nearby analog fields and recently drilled Hobbs Guzzler SWD No. 1. From a review of nearby well data an available Drill Stem Test or IP test below 7500', it is concluded that there are likely no producible hydrocarbons in the formation with little or no gas (too small to measure). Additional review of offset geological and historic seismic data suggests no evidence of open or active faults near the proposed location, or Hobbs field.

IX. Describe the proposed stimulation program, if any. **Acid Stimulation**

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).
Logs will be filed after well has been drilled and completed

*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. **Attached**

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.

I have examined the available geologic and engineering data for the Hobbs Chugalug #2 SWD well and find no evidence of open faults or any hydrologic connection between the disposal zone and any underground sources of drinking water

Dmitri Pistoun, Geologist
713-215-7641

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form. **Attached**

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: April Hood TITLE: Regulatory Specialist

SIGNATURE: April Hood DATE:

E-MAIL ADDRESS: April_Hood@Oxy.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:

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

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.

Side 1

INJECTION WELL DATA SHEET

OPERATOR: Occidental Permian LTD.

WELL NAME & NUMBER: Hobbs Chugalug SWD No. 2

WELL LOCATION: _____

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17 1/2 Casing Size: 13 3/8

Cemented with: 1430 sx. *or* _____ ft^3

Top of Cement: 0 Method Determined: Circulation

Intermediate Casing

Hole Size: 12 1/4 Casing Size: 9 5/8

Cemented with: 1510 sx. *or* _____ ft^3

Top of Cement: 0 Method Determined: Circulation

Production Casing

Hole Size: 8 3/4 Casing Size: 7

Cemented with: 750 sx. *or* _____ ft^3

Top of Cement: 0 Method Determined: Circulation

Total Depth: _____

Injection Interval

10620' feet to 11,500' OH

(Perforated or Open Hole; indicate which)

Side 2

INJECTION WELL DATA SHEET

Tubing Size: 4 1/2 Lining Material: Duoline

Type of Packer: 7 x 4 Optima Seal Bore Packer

Packer Setting Depth: +/- 10,500'

Other Type of Tubing/Casing Seal (if applicable): _____

Additional Data

1. Is this a new well drilled for injection? X Yes _____ No

   If no, for what purpose was the well originally drilled? Disposal

2. Name of the Injection Formation: Siluro-Devonian

3. Name of Field or Pool (if applicable): SWD Silurian-Devonian

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. No

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area: No known producing zones seen at this time. Will test the San Andres and Mississippian for possible production capability.

WELLBORE DIAGRAM

(updated: 07/24/2017 CER)
Revision 0

WELL# Hobbs Chugalug SWD #2
API#
Propety Code#
Zone: Siluro - Devonian
Spud:
RR:

Project # Drilling:
Project # Completion:

KB elev
GL elev

Hobbs Chugalug SWD #2

CEMENT

DEVIATION SURVEYS

DEPTH DEGREE

Conductor pipe

+/- 30" hole w/ 20" pipe set @ 80', cement with concrete mixed w/ pea gravel, dumped in from top after pipe in hole.

17-1/2" hole

Surface Casing
Cement with 1430 sx

CIRC TO SURFACE.

~42 Joints of 13-3/8" J-55 54.5# BTC
set at ~1700'

Intermediate Casing
Cement with 1510 sx

12-1/4" Hole

CIRC TO SURFACE.

~123 Joints of 9-5/8" 36.00# J-55 BTC
set at ~ 5000'

Production Casing
Cement with 750 sx

CIRC TO SURFACE.

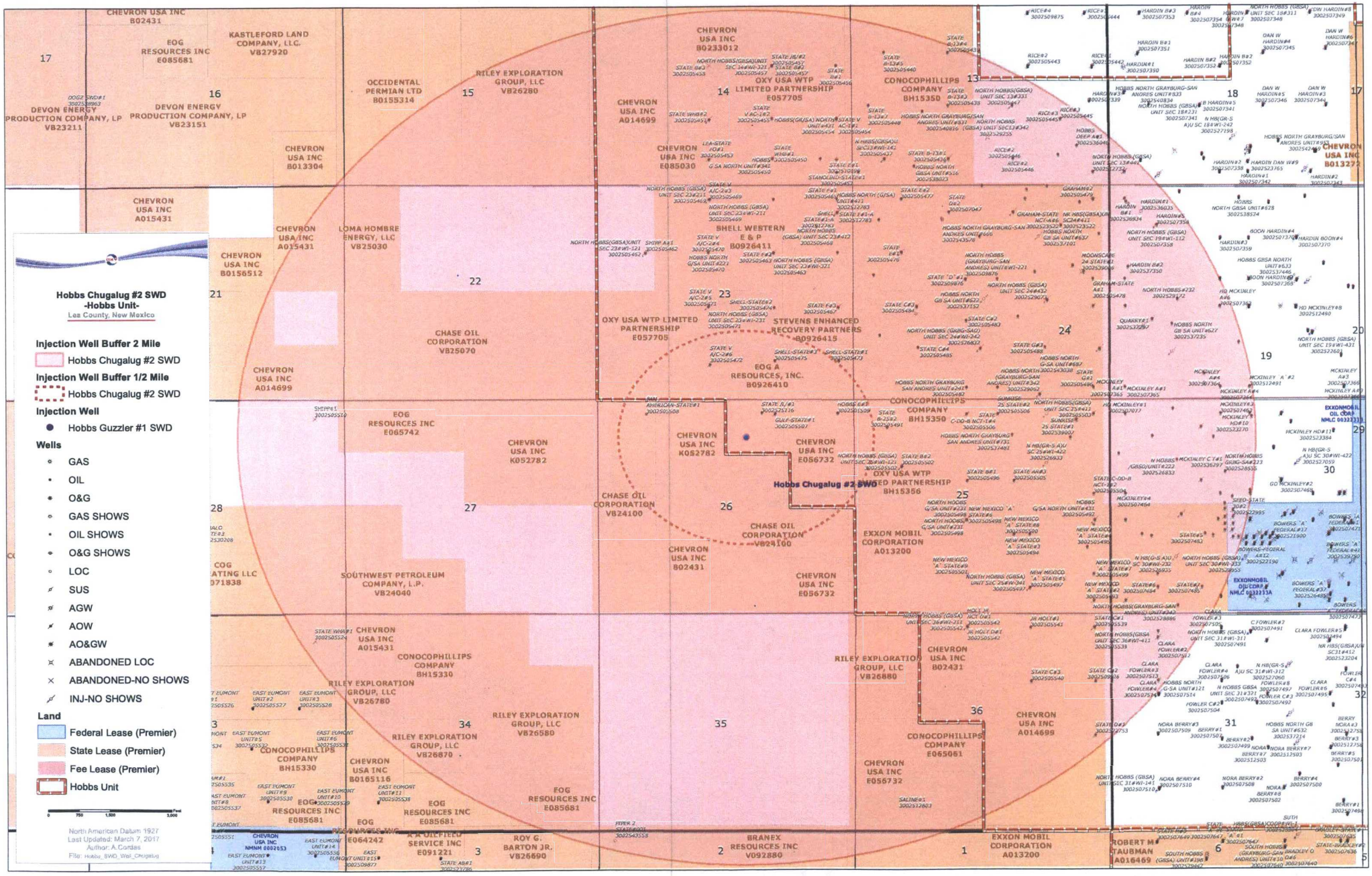
8-3/4" Hole

GUIDE SHOE 10,650'

~ 266 Joints of 7" 26.00# L-80 BTC
set at ~10650'

6-1/8" Hole

TMD 11,500.0'


Hobbs Chugalug #2 SWD
-Hobbs Unit-
Lea County, New Mexico
Injection Well Buffer 2 Mile
Hobbs Chugalug #2 SWD
Injection Well Buffer 1/2 Mile
Hobbs Chugalug #2 SWD
Injection Well
Hobbs Guzzler #1 SWD
Wells
GAS
OIL
O&G
GAS SHOWS
OIL SHOWS
O&G SHOWS
LOC
SUS
AGW
AOW
AO&GW
ABANDONED LOC
ABANDONED-NO SHOWS
INJ-NO SHOWS
Land
Federal Lease (Premier)
State Lease (Premier)
Fee Lease (Premier)
Hobbs Unit
0
750
1,500
3,000
Feet
North American Datum 1927
Last Updated: March 7, 2017
Author: A.Cordas
File: Hobbs_SWD_Well_Chugalug
Hobbs Chugalug #2 SWD
CHEVRON USA INC B02431
EOG RESOURCES INC E085681
KASTLEFORD LAND COMPANY, LLC. V827920
DEVON ENERGY PRODUCTION COMPANY, LP V823211
DEVON ENERGY PRODUCTION COMPANY, LP V823151
CHEVRON USA INC B013304
CHEVRON USA INC A015431
CHEVRON USA INC B0156512
CHEVRON USA INC A015431
LOMA HOMBRE ENERGY, LLC V825030
OCCIDENTAL PERMIAN LTD B0155314
RILEY EXPLORATION GROUP, LLC V826280
CHEVRON USA INC B0233012
CHEVRON USA INC A014699
CHEVRON USA INC E085030
OXY USA WTP LIMITED PARTNERSHIP E057705
CONOCOPHILLIPS COMPANY BH15350
SHELL WESTERN E & P B0926411
CHASE OIL CORPORATION V825070
CHEVRON USA INC A014699
OXY USA WTP LIMITED PARTNERSHIP E057705
STEVENS ENHANCED RECOVERY PARTNERS B0926415
EOG A RESOURCES, INC. B0926410
CONOCOPHILLIPS COMPANY BH15350
EOG RESOURCES INC E065742
CHEVRON USA INC K052782
CHEVRON USA INC K052782
CHEVRON USA INC E056732
OXY USA WTP LIMITED PARTNERSHIP BH15356
CHASE OIL CORPORATION V824100
CHASE OIL CORPORATION V824100
EXXON MOBIL CORPORATION A013200
CHEVRON USA INC B02431
SOUTHWEST PETROLEUM COMPANY, L.P. V824040
CHEVRON USA INC E056732
CHEVRON USA INC A015431
CONOCOPHILLIPS COMPANY BH15330
RILEY EXPLORATION GROUP, LLC V826780
RILEY EXPLORATION GROUP, LLC V826580
RILEY EXPLORATION GROUP, LLC V826870
CONOCOPHILLIPS COMPANY BH15330
CHEVRON USA INC B0165116
EOG RESOURCES INC E085681
EOG RESOURCES INC E085681
EOG RESOURCES INC E064242
R.K. OILFIELD SERVICE INC E091221
ROY G. BARTON JR. V826690
BRANEX RESOURCES INC V092880
RILEY EXPLORATION GROUP, LLC V826880
CHEVRON USA INC B02431
CHEVRON USA INC A014699
CONOCOPHILLIPS COMPANY E065061
CHEVRON USA INC E056732
EXXON MOBIL CORPORATION A013200
ROBERT M. TAUBMAN A016469
CHEVRON USA INC B013272
EXXONMOBIL OIL CORP NMLC 0031213
EXXONMOBIL OIL CORP NMLC 0031213A
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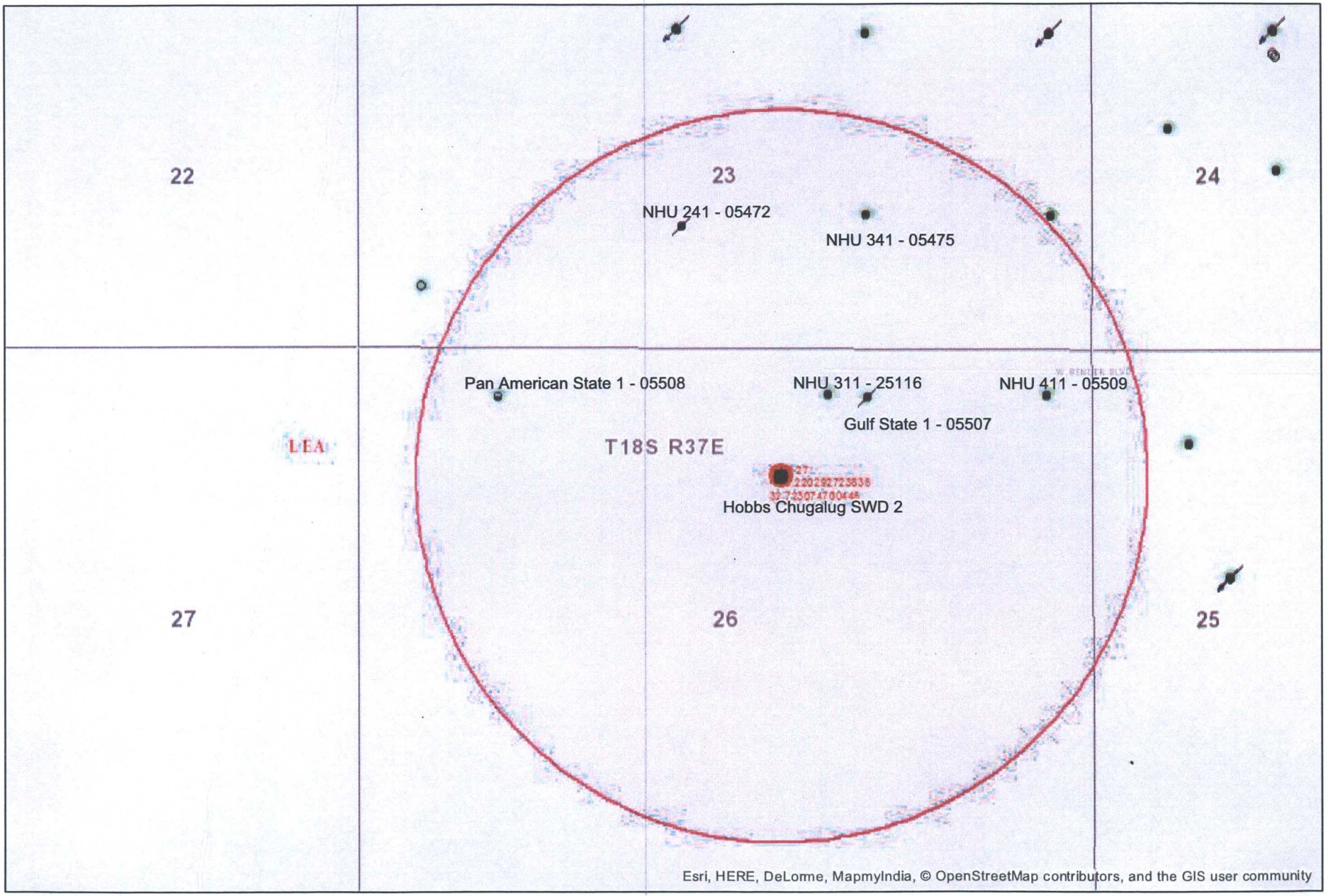


N

1,500 750 0 1,500 Feet

Hobbs Chugalug SWD No 2 AOR Map

Hobbs Chugalug SWD No. 2
Area of Review

MAP LEGEND NUMBER	API NUMBER	OPERATOR	LEASE NAME	WELL NO.	WELL TYPE	STATUS	FTG N/S		FTG E/W		UNIT	SEC	TSHIP.		RNG.		DATE DRILLED	TOTAL TVD	TOTAL MD	HOLE SIZE	CSG SIZE	SET AT	SX CMT	CMT TOP	MTD	CURRENT COMPLETION	REMARKS
1	30-025-05509	Occidental Permian LTD	North Hobbs G/SA Unit	411		PA	2310	S	2310	W	K	23	18	S	37	E	5/20/1959	4500	4500								WELL DOES NOT PENETRATE DEVONIAN
2	30-025-05508	Cactus Drilling Company	Pan American State	1		PA	335	N	990	W	D	26	18	S	37	E	.	4359	4359								WELL DOES NOT PENETRATE DEVONIAN
3	30-025-05472	Occidental Permian LTD	North Hobbs G/SA Unit	241		PA	990	S	2310	W	N	23	18	S	37	E	6/19/1959	4390	4390								WELL DOES NOT PENETRATE DEVONIAN
4	30-025-05475	Occidental Permian LTD	North Hobbs G/SA Unit	341	I	Active	990	S	1650	E	O	23	18	S	37	E	4/27/1956	4302	4302	11 7 7/8	8 5/8 5 1/2	352 4302	180 750	0 0	4302 4302	4144' - 4228'	WELL DOES NOT PENETRATE DEVONIAN
5	30-025-25116	Occidental Permian LTD	North Hobbs G/SA Unit	311		PA	330	N	1900	E	B	26	18	S	37	E	9/18/1975	4329	4329								WELL DOES NOT PENETRATE DEVONIAN
6	30-025-05507	Moran Oil Producing & Drilling Corp	Gulf-State	1		PA	330	N	1650	E	B	26	18	S	37	E	11/4/1959	4268	4268								WELL DOES NOT PENETRATE DEVONIAN

BAKER HUGHES

Permian Basin Area Laboratory
2101 Market Street,
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 3/10/2017

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER:	OCCIDENTAL PERMIAN EOR	ACCOUNT REP:	SHANNON LEE
DISTRICT:	NEW MEXICO	SAMPLE ID:	201603031941
AREA/LEASE:	COMPATIBILITY - WATER - S. LEE	SAMPLE DATE:	3/8/2016
SAMPLE POINT NAME	25% RESERVOIR WATER, 75% INJECTION WATER	ANALYSIS DATE:	7/21/2016
SITE TYPE:	WELL SITES	ANALYST:	SH
SAMPLE POINT DESCRIPTION:	WELL HEAD		

OCCIDENTAL PERMIAN EOR, COMPATIBILITY - WATER - S. LEE, 25% RESERVOIR WATER, 75% INJECTION WATER

FIELD DATA		ANALYSIS OF SAMPLE					
		ANIONS:	mg/L	meq/L	CATIONS:	mg/L	meq/L
Initial Temperature (°F):	250	Chloride (Cl^-):	173368.8	4890.3	Sodium (Na^+):	75182.0	3271.6
Final Temperature (°F):	80	Sulfate (SO_4^{2-}):	742.5	15.5	Potassium (K^+):	ND	
Initial Pressure (psi):	100	Borate ($H_2BO_3^-$):	ND		Magnesium (Mg^{2+}):	4026.5	331.4
Final Pressure (psi):	15	Fluoride (F^-):	ND		Calcium (Ca^{2+}):	25275.0	1261.2
		Bromide (Br^-):	ND		Strontium (Sr^{2+}):	1592.5	36.4
pH:		Nitrite (NO_2^-):	ND		Barium (Ba^{2+}):	8.4	0.1
pH at time of sampling:	6.7	Nitrate (NO_3^-):	ND		Iron (Fe^{2+}):	32.7	1.2
		Phosphate (PO_4^{3-}):	ND		Manganese (Mn^{2+}):	2.1	0.1
		Silica (SiO_2):	ND		Lead (Pb^{2+}):	ND	
					Zinc (Zn^{2+}):	ND	
ALKALINITY BY TITRATION:	mg/L	meq/L					
Bicarbonate (HCO_3^-):	72.9	1.2			Aluminum (Al^{3+}):	ND	
Carbonate (CO_3^{2-}):	ND				Chromium (Cr^{3+}):	ND	
Hydroxide (OH^-):	ND				Cobalt (Co^{2+}):	ND	
		ORGANIC ACIDS:	mg/L	meq/L	Copper (Cu^{2+}):	ND	
aqueous CO_2 (ppm):	ND	Formic Acid:	ND		Molybdenum (Mo^{2+}):	ND	
aqueous H_2S (ppm):	ND	Acetic Acid:	ND		Nickel (Ni^{2+}):	ND	
aqueous O2 (ppb):	ND	Propionic Acid:	ND		Tin (Sn^{2+}):	ND	
		Butyric Acid:	ND		Titanium (Ti^{2+}):	ND	
Calculated TDS (mg/L):	280295	Valeric Acid:	ND		Vanadium (V^{2+}):	ND	
Density/Specific Gravity (g/cm³):	1.1818				Zirconium (Zr^{2+}):	ND	
Measured Specific Gravity	ND				Lithium (Li^+):	ND	
Conductivity (mmhos):	ND						
Resistivity:	ND				Total Hardness:	81598	N/A
MCF/D:	No Data						
BOPD:	No Data						
BWPD:	No Data	Anion/Cation Ratio:		1.00	ND = Not Determined		

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

Conditions		Barite ($BaSO_4$)		Calcite ($CaCO_3$)		Gypsum ($CaSO_4 \cdot 2H_2O$)		Anhydrite ($CaSO_4$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	1.30	4.718	1.93	18.314	0.30	231.409	0.26	166.385
99°F	24 psi	1.18	4.640	1.96	18.417	0.31	236.321	0.35	202.727
118°F	34 psi	1.06	4.540	2.00	18.561	0.31	235.273	0.43	230.661
137°F	43 psi	0.95	4.414	2.03	18.702	0.30	231.928	0.51	253.958
156°F	53 psi	0.85	4.261	2.07	18.828	0.29	227.644	0.59	273.804
174°F	62 psi	0.75	4.077	2.09	18.936	0.29	222.805	0.68	290.641
193°F	72 psi	0.65	3.861	2.11	19.028	0.28	217.267	0.77	304.726
212°F	81 psi	0.57	3.611	2.13	19.116	0.26	210.532	0.85	316.307
231°F	91 psi	0.48	3.320	2.14	19.199	0.25	201.807	0.94	325.667
250°F	100 psi	0.40	2.983	2.14	19.264	0.23	189.998	1.02	333.104

Conditions		Celestite ($SrSO_4$)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate ($FeCO_3$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	0.95	411.840	-0.27	0.000	-8.01	0.000	0.61	8.405
99°F	24 psi	0.97	413.740	-0.29	0.000	-8.14	0.000	0.70	9.419
118°F	34 psi	0.97	414.525	-0.30	0.000	-8.22	0.000	0.79	10.436
137°F	43 psi	0.97	414.899	-0.32	0.000	-8.28	0.000	0.87	11.275
156°F	53 psi	0.97	415.306	-0.34	0.000	-8.33	0.000	0.93	11.913
174°F	62 psi	0.98	416.003	-0.36	0.000	-8.37	0.000	0.97	12.363
193°F	72 psi	0.99	417.099	-0.37	0.000	-8.41	0.000	0.99	12.640
212°F	81 psi	0.99	418.578	-0.39	0.000	-8.44	0.000	0.99	12.803
231°F	91 psi	1.01	420.328	-0.41	0.000	-8.47	0.000	0.98	12.845
250°F	100 psi	1.02	422.166	-0.42	0.000	-8.49	0.000	0.95	12.720

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.

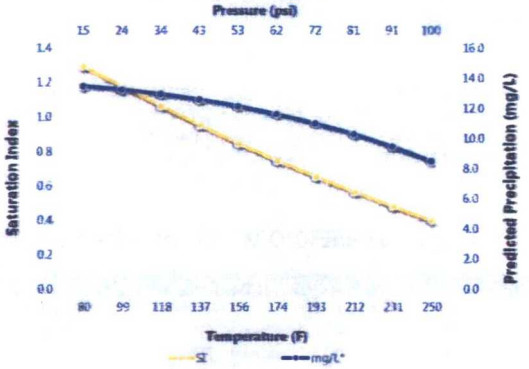
Note 3: Saturation Index predictions on this sheet use pH and alkalinity; $\%CO_2$ is not included in the calculations.

ScaleSoftPitzer™ SSP2010

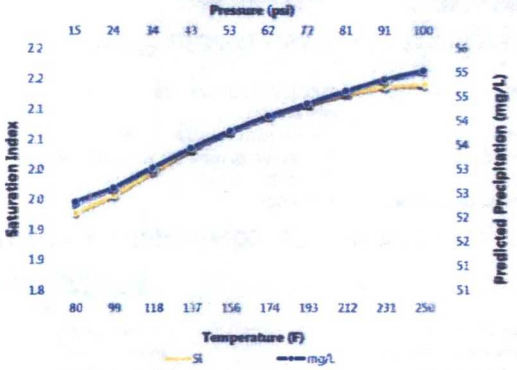
Comments: 25% Reservoir Water, 75% Injection Water

SAMPLE ID: 201601031941 OCCIDENTAL PERMIAN EOR, COMPATIBILITY - WATER - S. LEE, 25% RESERVOIR WATER, 75% INJECTION WATER

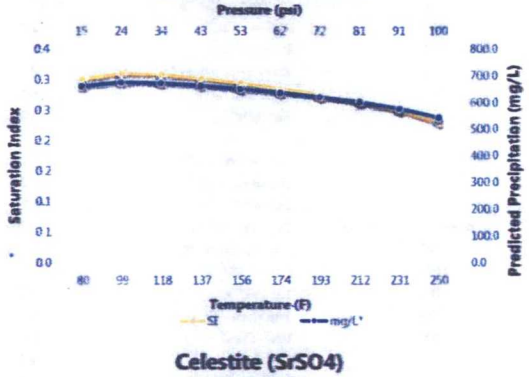
Barite (BaSO4)



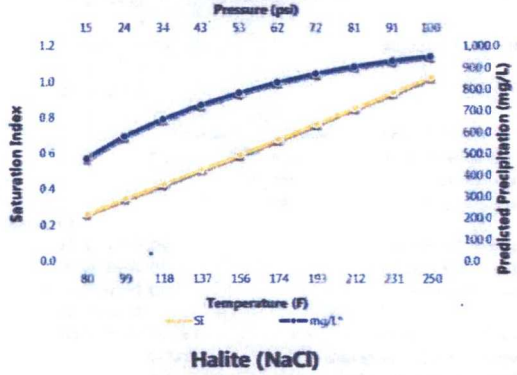
Calcite (CaCO3)



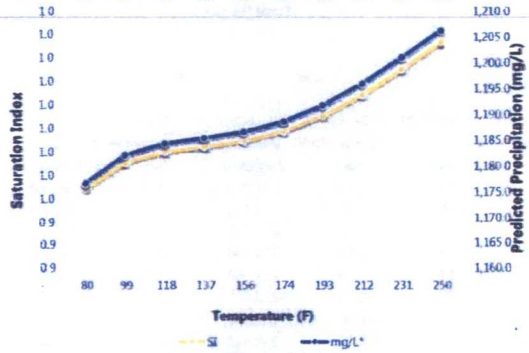
Gypsum (CaSO4-2H2O)



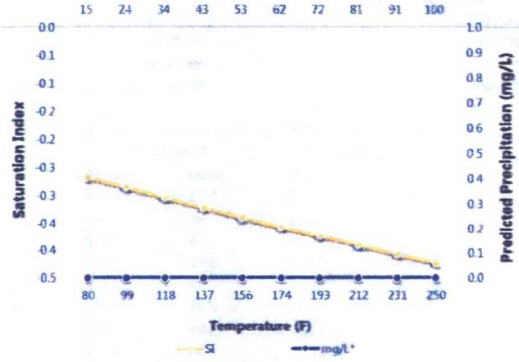
Anhydrite (CaSO4)



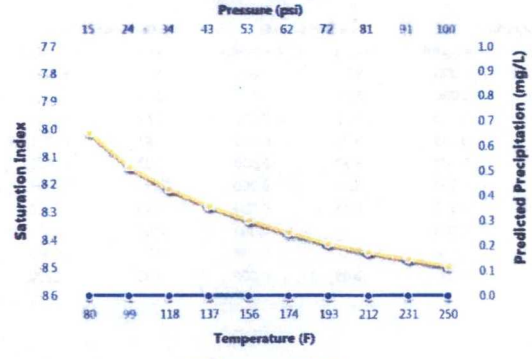
Celestite (SrSO4)



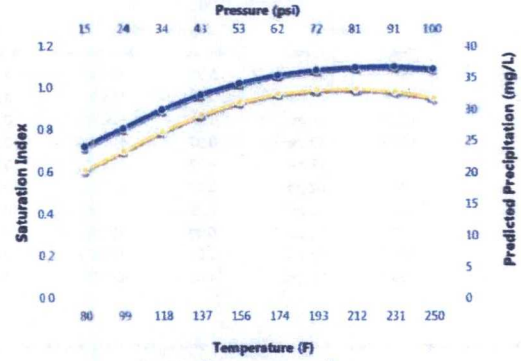
Halite (NaCl)



Iron Sulfide (FeS)



Iron Carbonate (FeCO3)



SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

Catalyst Oilfield Services
11999 E Hwy 158
Gardendale, TX 79758
(432) 563-0727
Fax: (432) 224-1838

Water Analysis Report

Customer:	Paladin Energy	Sample #:	27312
Area:	Permian Basin	Analysis ID #:	25890
Lease:	South Vacuum		
Location:	35-4 (Devonian) 0		
Sample Point:	Wellhead		

Sampling Date:	4/6/2015
Analysis Date:	4/10/2015
Analyst:	Catalyst
TDS (mg/l or g/m3):	44701.1
Density (g/cm3):	1.032
Hydrogen Sulfide:	306
Carbon Dioxide:	80
Comments:	

Anions	mg/l	meq/l
Chloride:	26148.7	737.56
Bicarbonate:	366.0	6.
Carbonate:		
Sulfate:	1020.0	21.24
Borate*:	62.4	0.39

*Calculated based on measured elemental boron.

pH at time of sampling:	6.92
pH at time of analysis:	
pH used in Calculation:	6.92
Temperature @ lab conditions (F):	75

Cations	mg/l	meq/l
Sodium:	13960.0	607.23
Magnesium:	365.4	30.06
Calcium:	2363.0	117.91
Potassium:	350.1	8.95
Strontium:	65.5	1.5
Barium:	0.0	0.
Iron:	0.0	0.
Manganese:	0.000	0.

Conductivity (micro-ohms/cm):	66700
Resistivity (ohm meter):	.1499

Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl

Temp	Calcite $CaCO_3$		Gypsum $CaSO_4 * 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		
°F	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	
80	0.58	27.83	-0.35	0.00	-0.40	0.00	-0.11	0.00	0.00	0.00	
100	0.68	33.20	-0.38	0.00	-0.36	0.00	-0.11	0.00	0.00	0.00	
120	0.78	39.23	-0.39	0.00	-0.30	0.00	-0.10	0.00	0.00	0.00	
140	0.89	45.27	-0.40	0.00	-0.21	0.00	-0.08	0.00	0.00	0.00	
160	0.99	51.30	-0.40	0.00	-0.11	0.00	-0.06	0.00	0.00	0.00	
180	1.10	57.01	-0.40	0.00	0.01	5.70	-0.03	0.00	0.00	0.00	
200	1.20	62.71	-0.39	0.00	0.14	121.05	0.00	0.34	0.00	0.00	
220	1.31	68.07	-0.37	0.00	0.28	216.28	0.04	4.02	0.00	0.00	

BAKER HUGHES

Permian Basin Area Laboratory
2101 Market Street,
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 3/15/2017

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER:	OCCIDENTAL PERMIAN EOR	ACCOUNT REP:	SHANNON LEE
DISTRICT:	NEW MEXICO	SAMPLE ID:	2017010111083
AREA/LEASE:	HOBBS	SAMPLE DATE:	3/9/2017
SAMPLE POINT NAME	NHSAU WINDMILL 1	ANALYSIS DATE:	3/15/2017
SITE TYPE:	FACILITY	ANALYST:	FR
SAMPLE POINT DESCRIPTION:	SEE COMMENTS		

OCCIDENTAL PERMIAN EOR, HOBBS, NHSAU WINDMILL 1

FIELD DATA

Initial Temperature (°F):	135
Final Temperature (°F):	80
Initial Pressure (psi):	1800
Final Pressure (psi):	15
pH:	
pH at time of sampling:	8.8

ALKALINITY BY TITRATION:	mg/L	meq/L
Bicarbonate (HCO_3^-):	61.0	1.0
Carbonate (CO_3^{2-}):	ND	
Hydroxide (OH^-):	ND	

aqueous CO_2 (ppm):	0.0
aqueous H_2S (ppm):	0.0
aqueous O2 (ppb):	ND
Calculated TDS (mg/L):	307
Density/Specific Gravity (g/cm³):	0.9973
Measured Specific Gravity	1.0005
Conductivity (mmhos):	ND
Resistivity:	ND
MCF/D:	No Data
BOPD:	No Data
BWPD:	No Data

ANALYSIS OF SAMPLE

ANIONS:	mg/L	meq/L
Chloride (Cl^-):	53.0	1.5
Sulfate (SO_4^{2-}):	75.0	1.6
Borate ($H_2BO_3^-$):	1.0	0.0
Fluoride (F^-):	ND	
Bromide (Br^-):	ND	
Nitrite (NO_2^-):	ND	
Nitrate (NO_3^-):	ND	
Phosphate (PO_4^{3-}):	ND	
Silica (SiO_2):	ND	

ORGANIC ACIDS:	mg/L	meq/L
Formic Acid:	ND	
Acetic Acid:	ND	
Propionic Acid:	ND	
Butyric Acid:	ND	
Valeric Acid:	ND	

CATIONS:	mg/L	meq/L
Sodium (Na^+):	65.0	2.8
Potassium (K^+):	1.9	0.0
Magnesium (Mg^{2+}):	11.0	0.9
Calcium (Ca^{2+}):	37.9	1.9
Strontium (Sr^{2+}):	0.6	0.0
Barium (Ba^{2+}):	0.1	0.0
Iron (Fe^{2+}):	1.6	0.1
Manganese (Mn^{2+}):	0.0	0.0
Lead (Pb^{2+}):	0.2	0.0
Zinc (Zn^{2+}):	0.4	0.0
Aluminum (Al^{3+}):	0.1	0.0
Chromium (Cr^{3+}):	ND	
Cobalt (Co^{2+}):	ND	
Copper (Cu^{2+}):	0.0	0.0
Molybdenum (Mo^{2+}):	0.2	0.0
Nickel (Ni^{2+}):	ND	
Tin (Sn^{2+}):	ND	
Titanium (Ti^{2+}):	ND	
Vanadium (V^{2+}):	ND	
Zirconium (Zr^{2+}):	ND	
Lithium (Li^+):	ND	
Total Hardness:	141	N/A

Anion/Cation Ratio: 0.71

ND = Not Determined

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

Conditions		Barite ($BaSO_4$)		Calcite ($CaCO_3$)		Gypsum ($CaSO_4 \cdot 2H_2O$)		Anhydrite ($CaSO_4$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	0.13	0.009	0.70	2.537	-1.83	0.000	-2.08	0.000
86°F	213 psi	0.07	0.005	0.67	2.201	-1.84	0.000	-2.07	0.000
92°F	412 psi	0.01	0.001	0.67	2.286	-1.85	0.000	-2.05	0.000
98°F	610 psi	-0.04	0.000	0.67	2.377	-1.85	0.000	-2.03	0.000
104°F	808 psi	-0.09	0.000	0.66	2.475	-1.86	0.000	-2.01	0.000
111°F	1007 psi	-0.14	0.000	0.66	2.580	-1.86	0.000	-1.99	0.000
117°F	1205 psi	-0.19	0.000	0.66	2.692	-1.86	0.000	-1.97	0.000
123°F	1403 psi	-0.23	0.000	0.65	2.810	-1.86	0.000	-1.94	0.000
129°F	1602 psi	-0.27	0.000	0.65	2.935	-1.86	0.000	-1.91	0.000
135°F	1800 psi	-0.30	0.000	0.64	3.066	-1.86	0.000	-1.88	0.000

Conditions		Celestite ($SrSO_4$)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate ($FeCO_3$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	-1.93	0.000	-7.04	0.000	-6.95	0.000	1.08	1.021
86°F	213 psi	-1.93	0.000	-7.05	0.000	-7.03	0.000	1.08	1.012
92°F	412 psi	-1.94	0.000	-7.06	0.000	-7.08	0.000	1.10	1.022
98°F	610 psi	-1.94	0.000	-7.06	0.000	-7.13	0.000	1.12	1.031
104°F	808 psi	-1.95	0.000	-7.07	0.000	-7.18	0.000	1.14	1.039
111°F	1007 psi	-1.95	0.000	-7.08	0.000	-7.22	0.000	1.15	1.046
117°F	1205 psi	-1.95	0.000	-7.08	0.000	-7.26	0.000	1.17	1.053
123°F	1403 psi	-1.94	0.000	-7.09	0.000	-7.30	0.000	1.18	1.058
129°F	1602 psi	-1.94	0.000	-7.09	0.000	-7.33	0.000	1.19	1.063
135°F	1800 psi	-1.93	0.000	-7.10	0.000	-7.37	0.000	1.20	1.068

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales

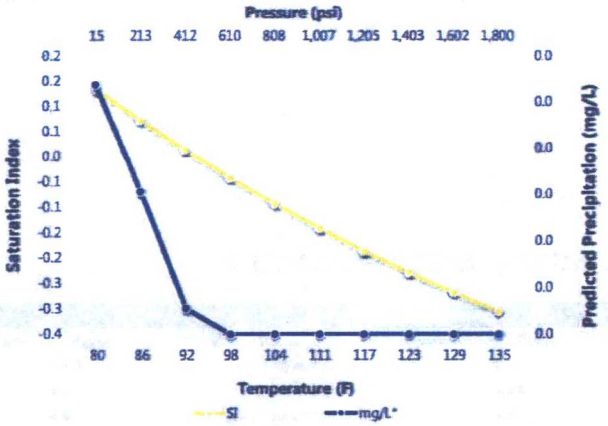
Note 3: Saturation Index predictions on this sheet use pH and alkalinity, $\%CO_2$ is not included in the calculations

ScaleSoftPitzer™
SSP2010

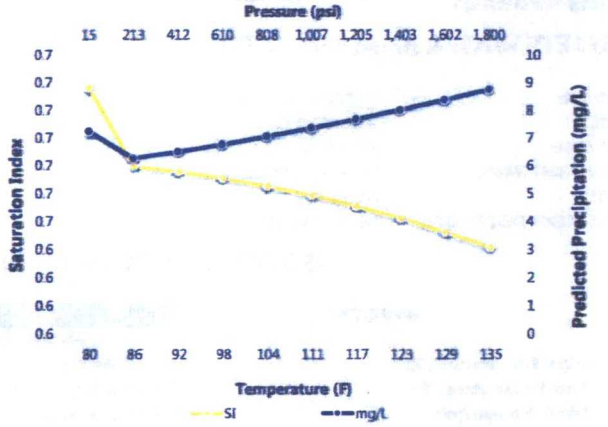
Comments:

SAMPLE ID: 2017701011083 OCCIDENTAL PERMIAN EOR, HOBBS, NHSAU WINDMILL 1

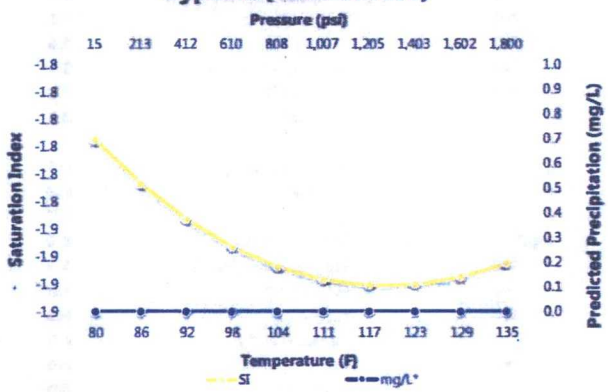
Barite (BaSO4)



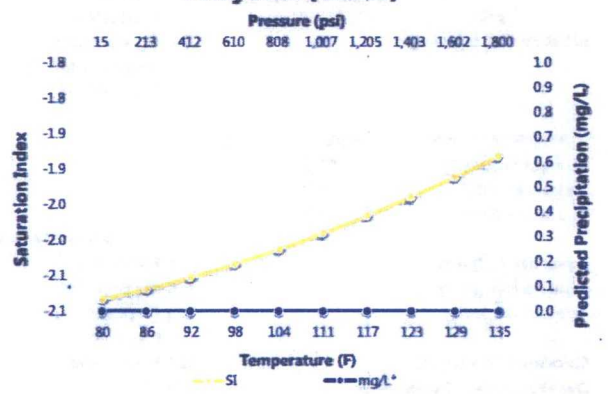
Calcite (CaCO3)



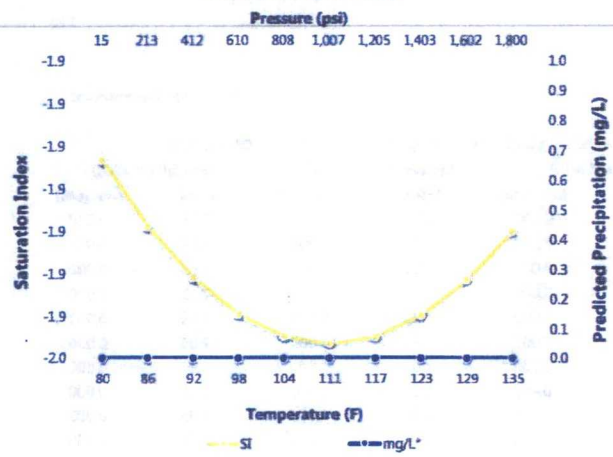
Gypsum (CaSO4·2H2O)



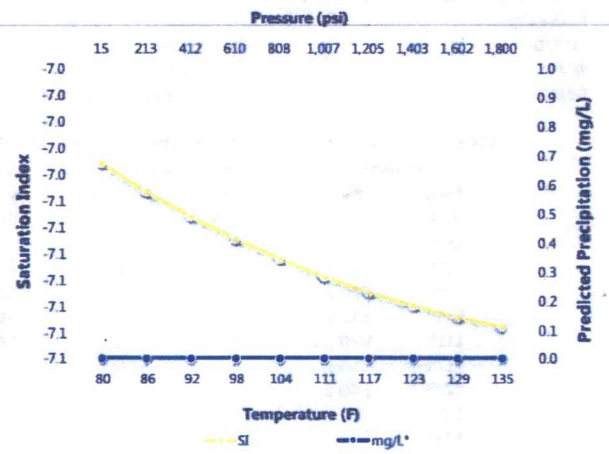
Anhydrite (CaSO4)



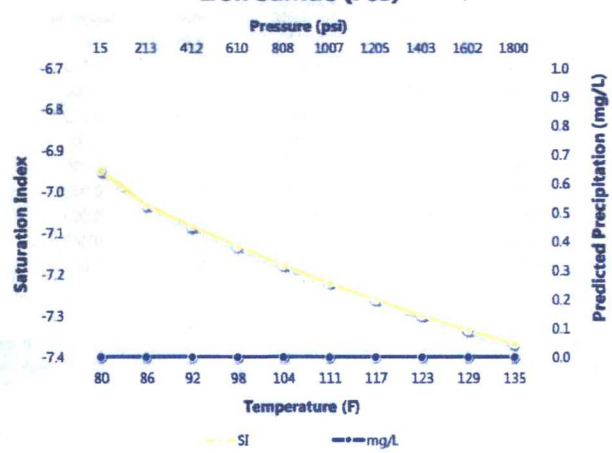
Celestite (SrSO4)



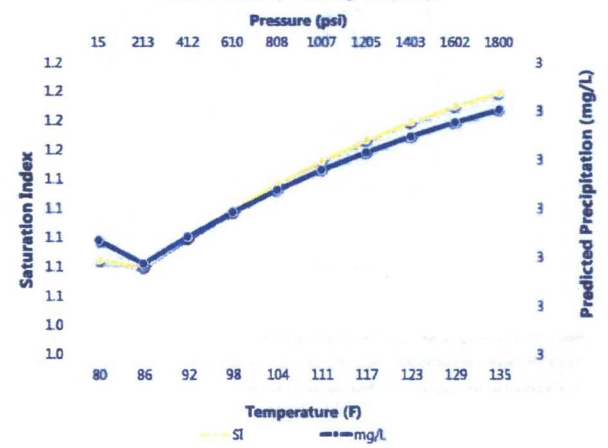
Halite (NaCl)



Iron Sulfide (FeS)



Iron Carbonate (FeCO3)



SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

BAKER HUGHES
Permian Basin Area Laboratory
2101 Market Street,
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 3/15/2017

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER:	OCCIDENTAL PERMIAN EOR	ACCOUNT REP:	SHANNON LEE
DISTRICT:	NEW MEXICO	SAMPLE ID:	2017010011084
AREA/LEASE:	HOBBS	SAMPLE DATE:	3/9/2017
SAMPLE POINT NAME	NHSAU WINDMILL 2	ANALYSIS DATE:	3/15/2017
SITE TYPE:	FACILITY	ANALYST:	FR
SAMPLE POINT DESCRIPTION:	SEE COMMENTS		

OCCIDENTAL PERMIAN EOR, HOBBS, NHSAU WINDMILL 2

FIELD DATA		ANALYSIS OF SAMPLE					
		ANIONS:	mg/L	meq/L	CATIONS:	mg/L	meq/L
Initial Temperature (°F):	135	Chloride (Cl^-):	29.0	0.8	Sodium (Na^+):	65.0	2.8
Final Temperature (°F):	80	Sulfate (SO_4^{2-}):	44.0	0.9	Potassium (K^+):	4.6	0.1
Initial Pressure (psi):	1800	Borate ($H_2BO_3^-$):	0.7	0.0	Magnesium (Mg^{2+}):	8.6	0.7
Final Pressure (psi):	15	Fluoride (F^-):	ND		Calcium (Ca^{2+}):	54.4	2.7
		Bromide (Br^-):	ND		Strontium (Sr^{2+}):	0.6	0.0
pH:		Nitrite (NO_2^-):	ND		Barium (Ba^{2+}):	0.1	0.0
pH at time of sampling:	7.6	Nitrate (NO_3^-):	ND		Iron (Fe^{2+}):	0.6	0.0
		Phosphate (PO_4^{3-}):	ND		Manganese (Mn^{2+}):	0.1	0.0
		Silica (SiO_2):	ND		Lead (Pb^{2+}):	0.0	0.0
					Zinc (Zn^{2+}):	0.1	0.0
ALKALINITY BY TITRATION:	mg/L	meq/L					
Bicarbonate (HCO_3^-):	97.6	1.6			Aluminum (Al^{3+}):	0.0	0.0
Carbonate (CO_3^{2-}):	ND				Chromium (Cr^{3+}):	ND	
Hydroxide (OH^-):	ND				Cobalt (Co^{2+}):	ND	
		ORGANIC ACIDS:	mg/L	meq/L	Copper (Cu^{2+}):	0.0	0.0
aqueous CO_2 (ppm):	10.0	Formic Acid:	ND		Molybdenum (Mo^{2+}):	0.0	0.0
aqueous H_2S (ppm):	0.0	Acetic Acid:	ND		Nickel (Ni^{2+}):	ND	
aqueous O2 (ppb):	ND	Propionic Acid:	ND		Tin (Sn^{2+}):	ND	
		Butyric Acid:	ND		Titanium (Ti^{2+}):	ND	
Calculated TDS (mg/L):	305	Valeric Acid:	ND		Vanadium (V^{2+}):	ND	
Density/Specific Gravity (g/cm³):	0.9973				Zirconium (Zr^{2+}):	ND	
Measured Specific Gravity	1.0005				Lithium (Li^+):	ND	
Conductivity (mmhos):	ND						
Resistivity:	ND				Total Hardness:	172	N/A
MCF/D:	No Data						
BOPD:	No Data						
BWPD:	No Data	Anion/Cation Ratio:		0.52	ND = Not Determined		

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS

Conditions		Barite ($BaSO_4$)		Calcite ($CaCO_3$)		Gypsum ($CaSO_4 \cdot 2H_2O$)		Anhydrite ($CaSO_4$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	-0.10	0.000	-0.08	0.000	-1.91	0.000	-2.16	0.000
86°F	213 psi	-0.16	0.000	-0.21	0.000	-1.92	0.000	-2.14	0.000
92°F	412 psi	-0.22	0.000	-0.17	0.000	-1.92	0.000	-2.13	0.000
98°F	610 psi	-0.27	0.000	-0.13	0.000	-1.93	0.000	-2.11	0.000
104°F	808 psi	-0.32	0.000	-0.09	0.000	-1.93	0.000	-2.09	0.000
111°F	1007 psi	-0.37	0.000	-0.05	0.000	-1.93	0.000	-2.06	0.000
117°F	1205 psi	-0.42	0.000	-0.01	0.000	-1.93	0.000	-2.04	0.000
123°F	1403 psi	-0.46	0.000	0.04	0.462	-1.93	0.000	-2.01	0.000
129°F	1602 psi	-0.50	0.000	0.08	1.010	-1.93	0.000	-1.99	0.000
135°F	1800 psi	-0.53	0.000	0.12	1.570	-1.93	0.000	-1.96	0.000

Conditions		Celestite ($SrSO_4$)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate ($FeCO_3$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	-2.18	0.000	-7.30	0.000	-8.61	0.000	-0.26	0.000
86°F	213 psi	-2.19	0.000	-7.31	0.000	-8.81	0.000	-0.37	0.000
92°F	412 psi	-2.19	0.000	-7.32	0.000	-8.80	0.000	-0.31	0.000
98°F	610 psi	-2.20	0.000	-7.33	0.000	-8.79	0.000	-0.24	0.000
104°F	808 psi	-2.20	0.000	-7.33	0.000	-8.78	0.000	-0.18	0.000
111°F	1007 psi	-2.20	0.000	-7.34	0.000	-8.77	0.000	-0.12	0.000
117°F	1205 psi	-2.20	0.000	-7.35	0.000	-8.75	0.000	-0.06	0.000
123°F	1403 psi	-2.20	0.000	-7.35	0.000	-8.73	0.000	-0.01	0.000
129°F	1602 psi	-2.19	0.000	-7.36	0.000	-8.71	0.000	0.05	0.046
135°F	1800 psi	-2.19	0.000	-7.36	0.000	-8.68	0.000	0.11	0.093

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.

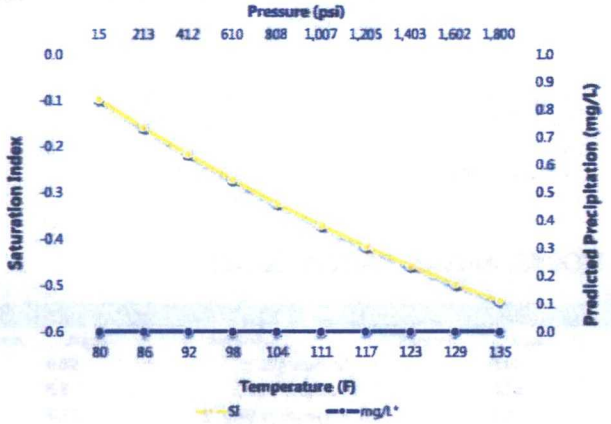
Note 3: Saturation Index predictions on this sheet use pH and alkalinity; $\%CO_2$ is not included in the calculations.

ScaleSoftPitzer™ SSP2010

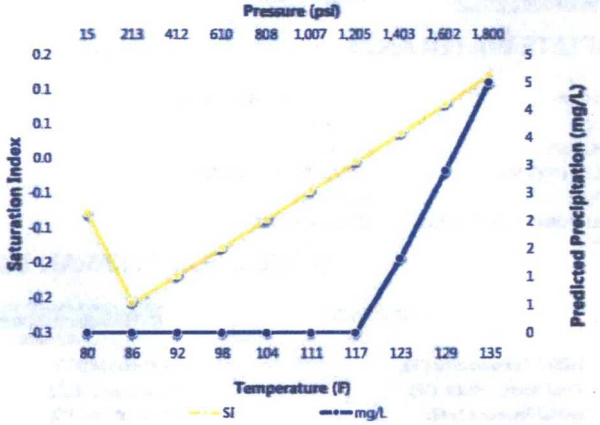
Comments:

SAMPLE ID: 201701011084 OCCIDENTAL PERMIAN EOR, HOBBS, NHSAU WINDMILL 2

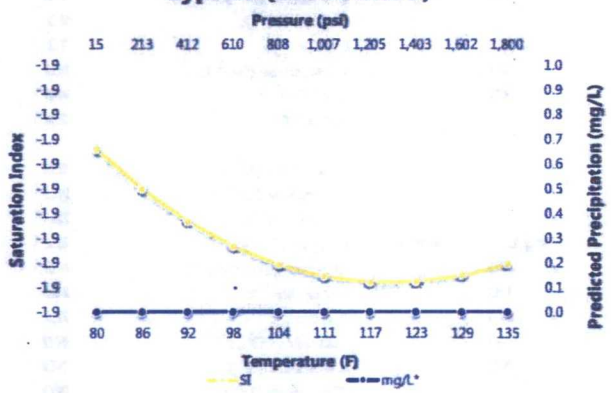
Barite (BaSO4)



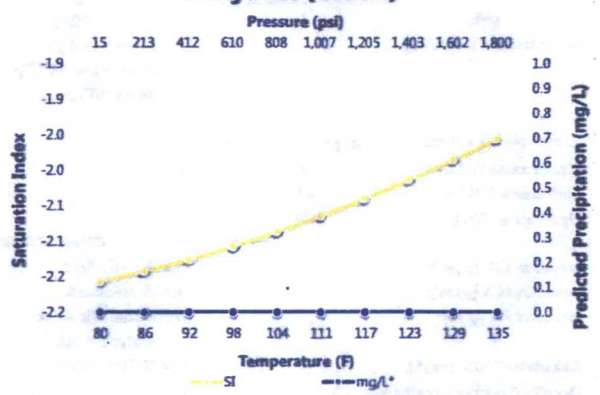
Calcite (CaCO3)



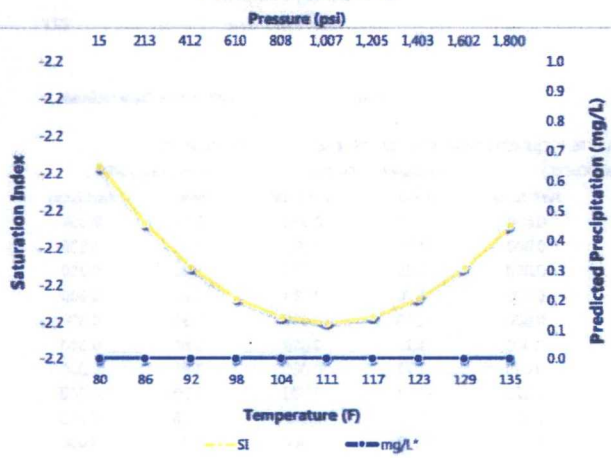
Gypsum (CaSO4·2H2O)



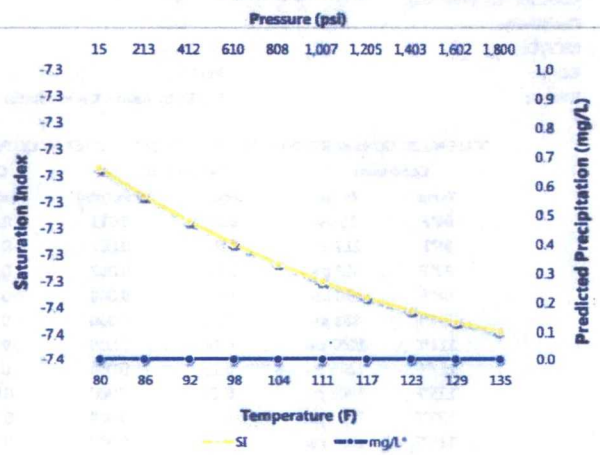
Anhydrite (CaSO4)



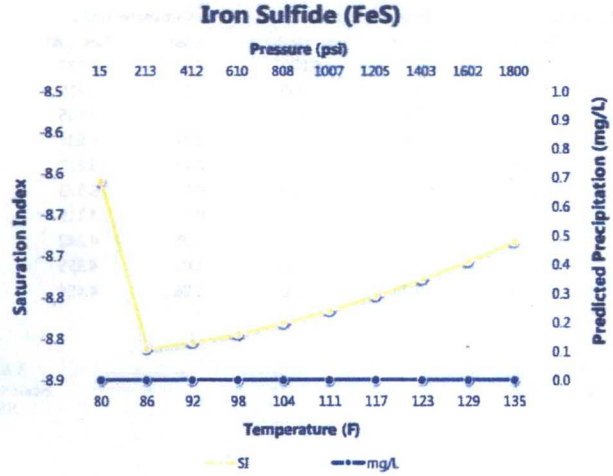
Celestite (SrSO4)



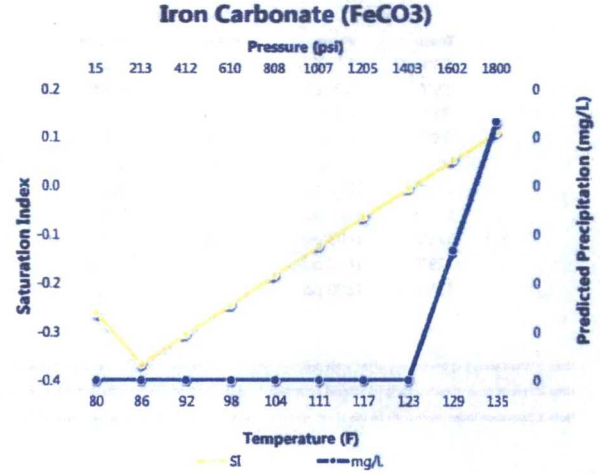
Halite (NaCl)



Iron Sulfide (FeS)



Iron Carbonate (FeCO3)



SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

BAKER HUGHES

Permian Basin Area Laboratory
2101 Market Street,
Midland, Texas 79703

Upstream Chemicals

REPORT DATE: 3/15/2017

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER:	OCCIDENTAL PERMIAN EOR	ACCOUNT REP:	SHANNON LEE
DISTRICT:	NEW MEXICO	SAMPLE ID:	20170101108S
AREA/LEASE:	HOBBS	SAMPLE DATE:	3/9/2017
SAMPLE POINT NAME	NHSAU RANCH HOUSE	ANALYSIS DATE:	3/15/2017
SITE TYPE:	FACILITY	ANALYST:	FR
SAMPLE POINT DESCRIPTION:	SEE COMMENTS		

OCCIDENTAL PERMIAN EOR, HOBBS, NHSAU RANCH HOUSE

FIELD DATA

Initial Temperature (°F):	135
Final Temperature (°F):	80
Initial Pressure (psi):	1800
Final Pressure (psi):	15
pH:	
pH at time of sampling:	7.5

ALKALINITY BY TITRATION:	mg/L	meq/L
Bicarbonate (HCO_3^-):	97.6	1.6
Carbonate (CO_3^{2-}):	ND	
Hydroxide (OH^-):	ND	

aqueous CO_2 (ppm):	28.0
aqueous H_2S (ppm):	0.0
aqueous O2 (ppb):	ND
Calculated TDS (mg/L):	354
Density/Specific Gravity (g/cm³):	0.9974
Measured Specific Gravity	1.0006
Conductivity (mmhos):	ND
Resistivity:	ND
MCF/D:	No Data
BOPD:	No Data
BWPD:	No Data

ANALYSIS OF SAMPLE

ANIONS:	mg/L	meq/L
Chloride (Cl^-):	48.0	1.4
Sulfate (SO_4^{2-}):	62.0	1.3
Borate ($H_2BO_3^-$):	0.7	0.0
Fluoride (F^-):	ND	
Bromide (Br^-):	ND	
Nitrite (NO_2^-):	ND	
Nitrate (NO_3^-):	ND	
Phosphate (PO_4^{3-}):	ND	
Silica (SiO_2):	ND	

ORGANIC ACIDS:	mg/L	meq/L
Formic Acid:	ND	
Acetic Acid:	ND	
Propionic Acid:	ND	
Butyric Acid:	ND	
Valeric Acid:	ND	

CATIONS:	mg/L	meq/L
Sodium (Na^+):	50.0	2.2
Potassium (K^+):	3.3	0.1
Magnesium (Mg^{2+}):	11.7	1.0
Calcium (Ca^{2+}):	71.2	3.6
Strontium (Sr^{2+}):	0.8	0.0
Barium (Ba^{2+}):	0.1	0.0
Iron (Fe^{2+}):	7.2	0.3
Manganese (Mn^{2+}):	0.0	0.0
Lead (Pb^{2+}):	ND	
Zinc (Zn^{2+}):	2.1	0.1
Aluminum (Al^{3+}):	0.0	0.0
Chromium (Cr^{3+}):	ND	
Cobalt (Co^{2+}):	ND	
Copper (Cu^{2+}):	0.2	0.0
Molybdenum (Mo^{2+}):	ND	
Nickel (Ni^{2+}):	ND	
Tin (Sn^{2+}):	ND	
Titanium (Ti^{2+}):	ND	
Vanadium (V^{2+}):	ND	
Zirconium (Zr^{2+}):	ND	
Lithium (Li^+):	ND	
Total Hardness:	227	N/A

Anion/Cation Ratio: 0.60

ND = Not Determined

SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

Conditions		Barite ($BaSO_4$)		Calcite ($CaCO_3$)		Gypsum ($CaSO_4 \cdot 2H_2O$)		Anhydrite ($CaSO_4$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	0.14	0.013	-0.08	0.000	-1.68	0.000	-1.93	0.000
86°F	213 psi	0.07	0.007	-0.21	0.000	-1.69	0.000	-1.91	0.000
92°F	412 psi	0.02	0.002	-0.17	0.000	-1.69	0.000	-1.90	0.000
98°F	610 psi	-0.04	0.000	-0.13	0.000	-1.70	0.000	-1.88	0.000
104°F	808 psi	-0.09	0.000	-0.09	0.000	-1.70	0.000	-1.86	0.000
111°F	1007 psi	-0.14	0.000	-0.05	0.000	-1.71	0.000	-1.84	0.000
117°F	1205 psi	-0.18	0.000	-0.01	0.000	-1.71	0.000	-1.81	0.000
123°F	1403 psi	-0.23	0.000	0.04	0.529	-1.71	0.000	-1.79	0.000
129°F	1602 psi	-0.27	0.000	0.08	1.151	-1.71	0.000	-1.76	0.000
135°F	1800 psi	-0.30	0.000	0.12	1.784	-1.71	0.000	-1.73	0.000

Conditions		Celestite ($SrSO_4$)		Halite (NaCl)		Iron Sulfide (FeS)		Iron Carbonate ($FeCO_3$)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	-1.96	0.000	-7.20	0.000	-7.67	0.000	0.69	3.582
86°F	213 psi	-1.96	0.000	-7.21	0.000	-7.88	0.000	0.59	3.215
92°F	412 psi	-1.97	0.000	-7.22	0.000	-7.87	0.000	0.65	3.435
98°F	610 psi	-1.97	0.000	-7.23	0.000	-7.86	0.000	0.71	3.634
104°F	808 psi	-1.98	0.000	-7.24	0.000	-7.84	0.000	0.77	3.812
111°F	1007 psi	-1.98	0.000	-7.24	0.000	-7.82	0.000	0.83	3.973
117°F	1205 psi	-1.98	0.000	-7.25	0.000	-7.80	0.000	0.89	4.115
123°F	1403 psi	-1.98	0.000	-7.25	0.000	-7.78	0.000	0.95	4.242
129°F	1602 psi	-1.97	0.000	-7.26	0.000	-7.76	0.000	1.01	4.355
135°F	1800 psi	-1.97	0.000	-7.26	0.000	-7.73	0.000	1.06	4.454

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the eight (8) scales.

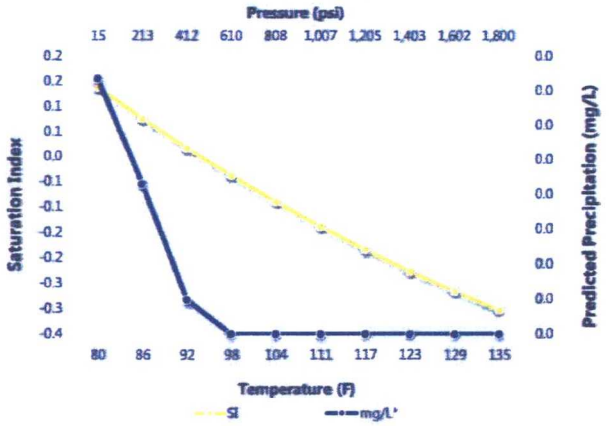
Note 3: Saturation Index predictions on this sheet use pH and alkalinity; $\%CO_2$ is not included in the calculations.

ScaleSoftPitzer™ SSP2010

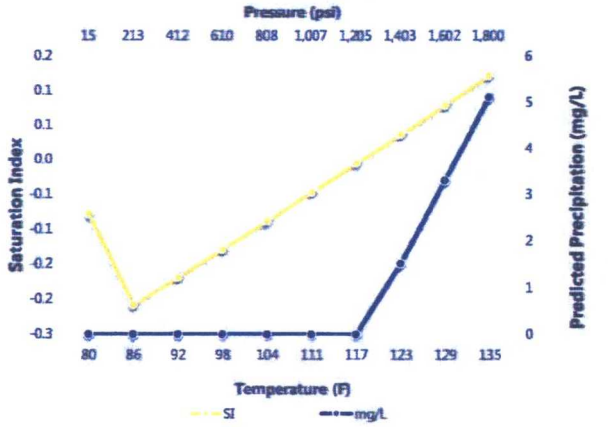
Comments:

SAMPLE ID: 201701011085 OCCIDENTAL PERMIAN EOR, HOBBS, NHSAU RANCH HOUSE

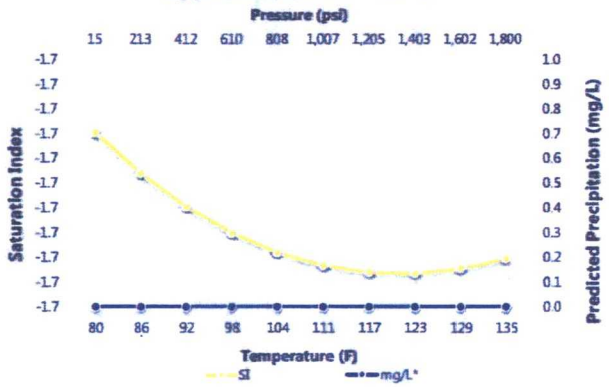
Barite (BaSO4)



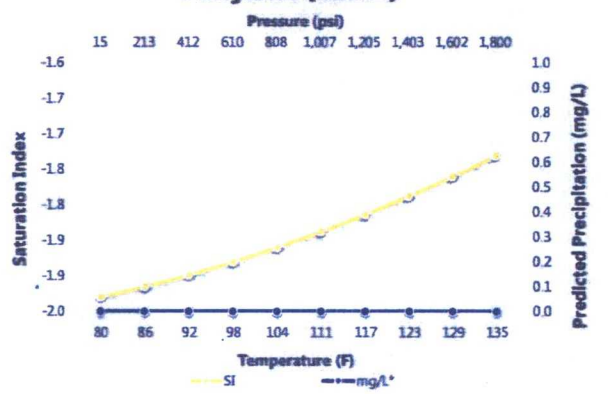
Calcite (CaCO3)



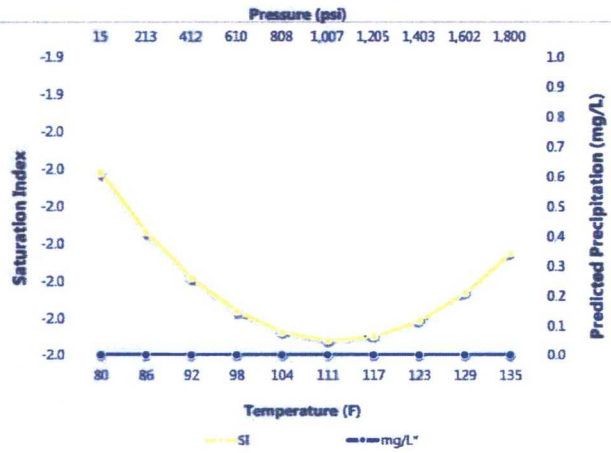
Gypsum (CaSO4-2H2O)



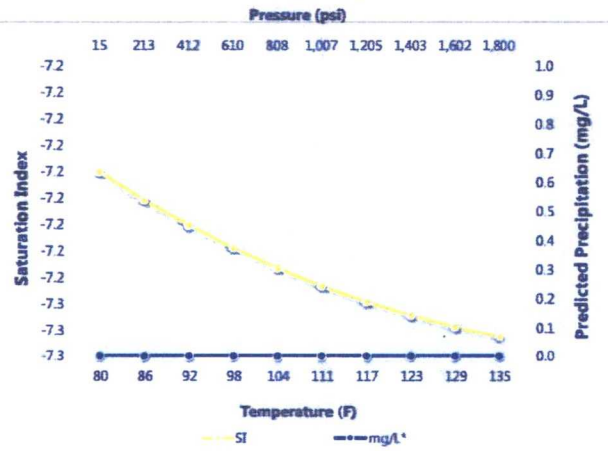
Anhydrite (CaSO4)



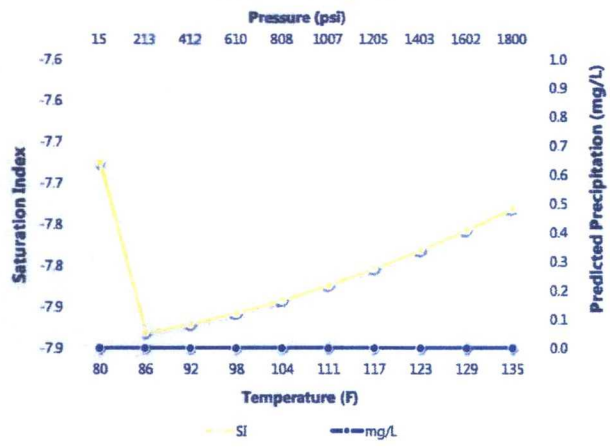
Celestite (SrSO4)



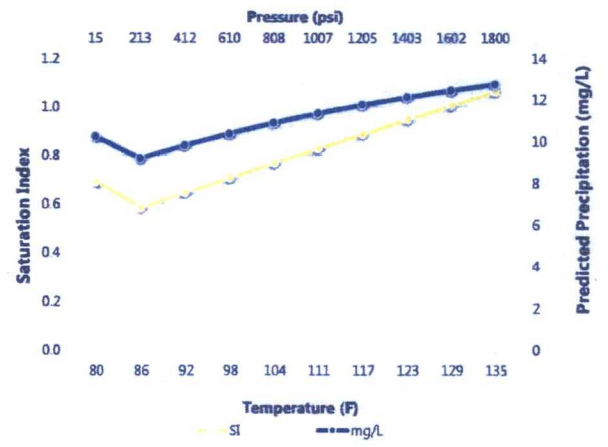
Halite (NaCl)



Iron Sulfide (FeS)



Iron Carbonate (FeCO3)



SCALE PREDICTIONS BASED ON FIELD PROVIDED DATA; FUTHER MODELING MAY BE REQUIRED FOR VALIDATION OF SCALE PREDICTION RESULTS.

Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

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

Beginning with the issue dated
May 24, 2017
and ending with the issue dated
May 24, 2017.

LEGAL NOTICE
May 24, 2017

NOTICE OF APPLICATION FOR FLUID DISPOSAL

Occidental Permian Ltd., P.O. Box 4294, Houston, TX 77210-4294 is applying for a disposal permit of produced water into a zone that is non productive of oil and gas. The applicant proposes to drill the Hobbs Chugalug SWD Well No. 2 located in Section 26, Township 18 South, Range 37 East, 943' FNL and 2253' FEL in Lea County NM. Disposal will be in the Devonian formation from 10,100' – 11500' with a maximum injection rate of 30,000 BWPD and maximum injection pressure of 2000 PSI.

Interested parties must file objections or requests of hearings with the NM Oil Conservation Division, 1220 South Saint Francis Dr., Santa Fe, NM 87505 within 15 days of this application. Additional information may be obtained by contacting Mr. Scott Hodges, Occidental Permian Ltd., at (575) 397-8211, 1017 W. Stanolind Rd. Hobbs, NM 88240
#31797

Daniel Russell
Publisher

Sworn and subscribed to before me this
24th day of May 2017.

Gussie Black
Business Manager

My commission expires
January 29, 2019
(Seal)

OFFICIAL SEAL
GUSSIE BLACK
Notary Public
State of New Mexico
My Commission Expires 1-29-19

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said

67111848 00193848

TALENT ACQUISITION
OCCIDENTAL PERMIAN
5 GREENWAY PLAZA, STE 110
HOUSTON, TX 77046

Occidental Permian LTD
A subsidiary of Occidental Petroleum Corporation

5 Greenway Plaza, Suite 110, Houston, Texas 77046-0521
P.O. Box 27570, Houston, Texas 77227-7570
Phone 713.215.7000

Service List – C108 Application
Hobbs Chugalug SWD No. 2

Surface Owner Clerk:

State Land Office
PO Box 1148
Santa Fe, NM 87504

District Office:
NMOCD District 1
1625 N. French Drive
Hobbs, NM 88240

Working Interest Owners and Lessees:

Chase Oil Corporation
PO Box 1767
Artesia, NM 88211-1767

Conoco Phillips Company
3401 E. 30th Street
Farmington, NM 87402

Stevens Enhanced Recovery Partners
PO Box 3087
Roswell, NM 88202

Chevron USA Inc.
PO Box 1635
Houston, TX 77251

I certify that the above listed parties were mailed copies of C-108, Application of Fluid Disposal.

April Hood
Regulatory Specialist

08/02/17
Date

- Provide delivery instructions, so your carrier knows where to leave packages

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26tLc%3D11%26text28777%

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252C70170660000051970029%

252C70170660000051975017%

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Hobbs, NM 88240

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Santa Fe, NM 87504

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Farmington, NM 87402

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P.O. Box 3087
Roswell, NM 88202

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Chesa Oil Corp
PO Box 1767
Artesia, NM 88211

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Chevron USA Inc.
P.O. Box 1635
Houston, TX 77251-1635

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Delivered

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Tracking Number: 70170660000051970029

8/15/2017

C-108 Review Checklist: Received _____ Add. Request: _____ Reply Date: _____ Suspended _____ [Ver 15]

ORDER TYPE: WFX / PMX / SWD Number: _____ Order Date: _____ Legacy Permits/Orders: _____

Well No. X Well Name(s): Hobbs Chg ALG SWD

API : 30-0 25-43730 Spud Date: TBD New or Old: N (UIC Class II Primacy 03/07/1982)

Footages 943 FNL 2253 FEL Lot ___ or Unit B Sec 26 Tsp 18S Rge 37E County Lea

General Location: 7 Smiles w/ Hobbs Pool: SWD; Devonian Pool No.: 96101

BLM 100K Map: Hobbs Operator: Occidental Permian, LTD OGRID: 157984 Contact: April Hood

COMPLIANCE RULE 5.9: Total Wells: 678 Inactive: 0 Fincl Assur: OK Compl. Order? NA IS 5.9 OK? Y Date: [redacted]

WELL FILE REVIEWED ◯ Current Status: Proposed

WELL DIAGRAMS: NEW: Proposed ◯ or RE-ENTER: Before Conv. ◯ After Conv. ◯ Logs in Imaging: N/A

Planned Rehab Work to Well: _____

Well Construction Details	Sizes (in) Borehole / Pipe	Setting Depths (ft)	Stage Tool	Cement (Sx) or Cf	Cement Top and Determination Method
Planned __or Existing __ Surface	17 1/2 / 13 3/8	1680		1430	Surface/visual
Planned __or Existing __ Interm/Prod	12 1/4 / 9 5/8	5650		1510	Surface/visual
Planned __or Existing __ Interm/Prod	8 3/4 / 7	10620		750	Surface/visual
Planned __or Existing __ Prod/Liner					
Planned __or Existing __ Liner	~~10620/11500~~	10620/11500			
Planned __or Existing __ OH / PERF	~~11000/12500~~	~~11500~~	Inj Length		

Injection Lithostratigraphic Units:	Depths (ft)	Injection or Confining Units	Tops
Adjacent Unit: Litho. Struc. Por.			
Confining Unit: Litho. Struc. Por.			
Proposed Inj Interval TOP:			
Proposed Inj Interval BOTTOM:			
Confining Unit: Litho. Struc. Por.			
Adjacent Unit: Litho. Struc. Por.			

Completion/Operation Details:

Drilled TD ~~10600~~ 11500 PBTD _____

NEW TD _____ NEW PBTD _____

NEW Open Hole ✓ or NEW Perfs ◯

Tubing Size 4 1/2 in. Inter Coated? _____

Proposed Packer Depth _____ ft

Min. Packer Depth 10520 (100-ft limit)

Proposed Max. Surface Press. 1050 psi

Admin. Inj. Press. ~~2024~~ 2024 (0.2 psi per ft)

AOR: Hydrologic and Geologic Information

POTASH: R-111-P NA Noticed? ___ BLM Sec Ord ◯ WIPP ◯ Noticed? ___ Salt/Salado T: 1750 B: 2713 NW: Cliff House fm ___

FRESH WATER: Aquifer Quaternary Max Depth 70' HYDRO AFFIRM STATEMENT By Qualified Person ✓

NMOSE Basin: Lea CAPITAN REEF: thru adj NA No. Wells within 1-Mile Radius? _____ FW Analysis

Disposal Fluid: Formation Source(s) Grayburg/S.A. Analysis? _____ On Lease ✓ Operator Only ◯ or Commercial ◯

Disposal Int: Inject Rate (Avg/Max BWPD): 20K/30K Protectable Waters? _____ Source: _____ System: Closed or Open

HC Potential: Producing Interval? NA Formerly Producing? _____ Method: Logs/DST/P&A/Other ~~Regional~~ 1-Mile Radius Pool Map ◯

AOR Wells: 1/2-M Radius Map? Y Well List? _____ Total No. Wells Penetrating Interval: 0 Horizontals? _____

Penetrating Wells: No. Active Wells 0 Num Repairs? ___ on which well(s)? _____ Diagrams? NA

Penetrating Wells: No. P&A Wells 0 Num Repairs? ___ on which well(s)? _____ Diagrams? NA

NOTICE: Newspaper Date May 3, 4, 2017 Mineral Owner NMSLO Surface Owner NMSLO N. Date 8-08-2017

RULE 26.7(A): Identified Tracts? _____ Affected Persons: ConocoPhillips, Chevron N. Date 08-08-2017

Order Conditions: Issues: ~~NA~~. Operator set casing shoe for

Add Order Cond: Production casing no shallower than bone