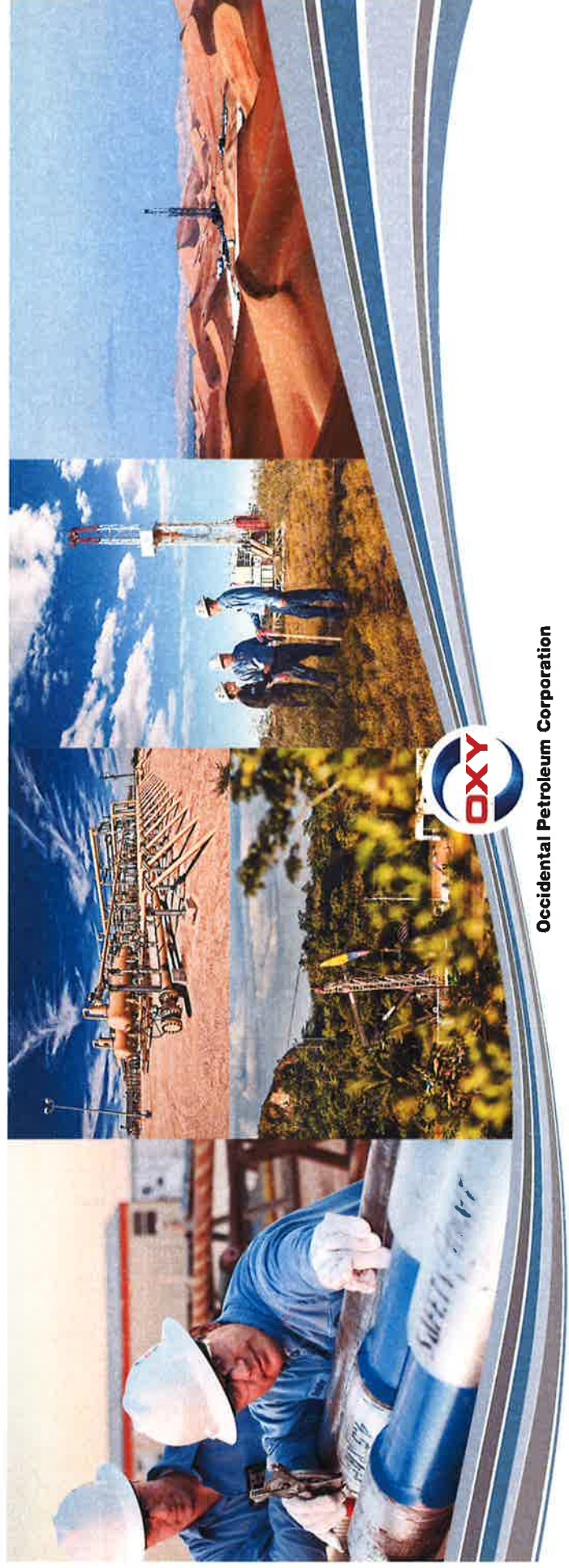


CEDAR CANYON 23 FEDERAL 4H GAS INJECTION

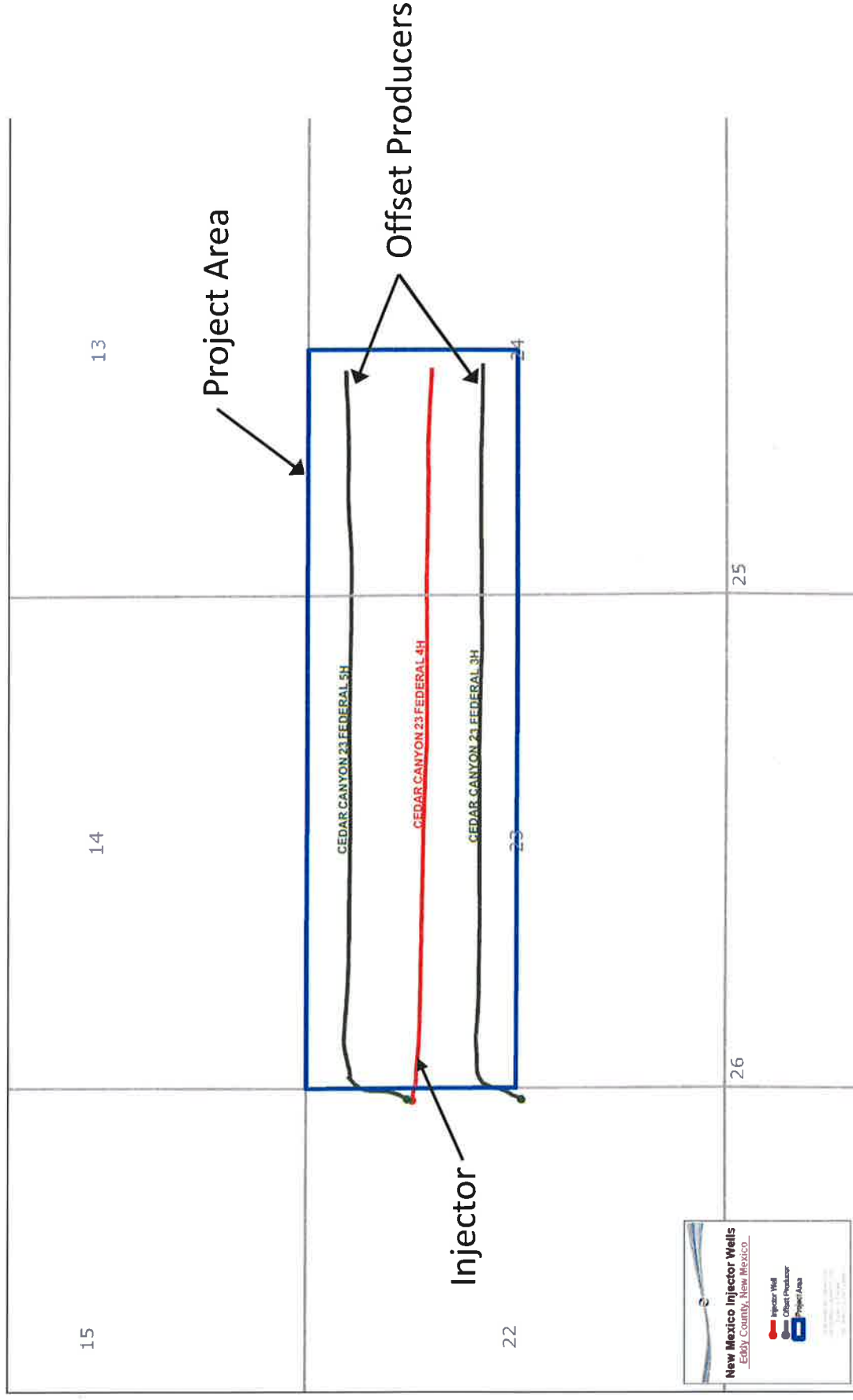


Occidental Petroleum



Occidental Petroleum Corporation

Cedar Canyon 23 Federal 4H Project Map



District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (505) 393-6161 Fax: (505) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (505) 748-1283 Fax: (505) 748-9720
District III
1000 Rio Grande Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

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

☒ AMENDED REPORT
(As-Drilled)

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-43290	Pool Code 96473	Pool Name Pierce Crossing Bone Spring, East
Property Code 315098	Property Name CEDAR CANYON "23" FEDERAL	Well Number 3H
OGRID No. 16696	Operator Name OXY USA INC.	Elevation 2957.1'

Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	22	24 SOUTH	29 EAST, N.M.P.M.		2540'	SOUTH	200'	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
F	24	24 SOUTH	29 EAST, N.M.P.M.		2250' 2151'	NORTH	2175' 2165'	WEST	EDDY
Dedicated Acres 240	Joint or Infill Yes	Consolidation Code	Order No.	BP - 2149 FNL 2320 FNL TP - 2124 FNL 359 FEL					

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or undivided mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. <i>[Signature]</i> 2/1/17 Date Jana Mendiola Printed Name jana.mendiola@oxy.com E-mail Address		SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from the actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. ERRY J. ASH 15079 OCTOBER 27 2015 Date of Survey Signature and Seal of Professional Land Surveyor	
BEFORE THE OIL CONSERVATION DIVISION Santa Fe, New Mexico Exhibit No. 2 Submitted by: OXY USA INC Hearing Date: January 10, 2019 Case Nos. 20193		<i>[Signature]</i> 10/28/2015 Certificate Number 15079 WO# 151027WL-a-XY (KA)	

NM OIL CONSERVATION
ARTESIA DISTRICT

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

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District I
1621 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6141 Fax: (575) 393-0720
District II
111 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Ray Branch Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1210 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-43281	Pool Code 96473	Pool Name Pierce Crossing Bone Spring, East
Property Code 315098	Property Name CEDAR CANYON "23" FEDERAL	Well Number 4H
OGRID No. 16696	Operator Name OXY USA INC.	Elevation 2942.4'

Surface Location

U/L or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	22	24 SOUTH	29 EAST, N.M.P.M.		1352'	NORTH	195'	EAST	EDDY

Bottom Hole Location If Different From Surface

U/L or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
F	24	24 SOUTH	29 EAST, N.M.P.M.		1415' 1343'	NORTH	2439' 2439'	WEST	EDDY
Dedicated Acres 240	Joint or Infill Y	Consolidation Code	Order No. NSL # 7356	TD - 1393 FNL 2439 FNL BP - 1340 FNL 2308 FNL TP - 1415 FNL 500 FEL					

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

				OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature: <i>[Signature]</i> Date: 1/20/16 Printed Name: Jana Mendiola E-mail Address: jana.mendiola@oxy.com
SURFACE LOCATION NEW MEXICO EAST NAD 1927 Y=439002.03 US FT X=614267.05 US FT LAT.: N 32.206393° LONG.: W 103.963894°	TOP PERF. NEW MEXICO EAST NAD 1927 Y=438941.23 US FT X=614797.20 US FT LAT.: N 32.206221° LONG.: W 103.962181°	BOTTOM PERF. NEW MEXICO EAST NAD 1927 Y=438965.77 US FT X=622070.10 US FT LAT.: N 32.206218° LONG.: W 103.938667°	BOTTOM HOLE LOCATION NEW MEXICO EAST NAD 1927 Y=438966.27 US FT X=622215.17 US FT LAT.: N 32.206217° LONG.: W 103.938198°	SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. Date of Survey: OCTOBER 12, 2015 Signature and Seal of Professional Land Surveyor: <i>[Signature]</i> Certificate No. 15079 10/20/2015 15079

NM OIL CONSERVATION

ARTESTA DISTRICT

Form C-102

State of New Mexico
Energy, Minerals & Natural Resources Department

JAN 25 2016

Revised August 1, 2011

OIL CONSERVATION DIVISION

Submit one copy to appropriate

1220 South St. Francis Dr.

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District Office

Santa Fe, NM 87505

☒ AMENDED REPORT
(As Drilled)

District I
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District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3480 Fax: (505) 476-3462

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-43282	Pool Code 96473	Pool Name Pierce Crossing Bone Spring, East
Property Code 315098	Property Name CEDAR CANYON "23" FEDERAL	Well Number 5H
OGRID No. 16696	Operator Name OXY USA INC.	Elevation 2942.4'

Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	22	24 SOUTH	29 EAST, N.M.P.M.		1317'	NORTH	195'	EAST	EDDY

Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	24	24 SOUTH	29 EAST, N.M.P.M.		595' 471'	NORTH	2406' 2406'	WEST	EDDY
Dedicated Acres 240	Joint or Infill N	Consolidation Code	Order No.	TD - 471 FNL 2406 FNL BP - 475 FNL 2284 FNL TP - 479 FNL 475 FEL					

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

TOP PERF. NEW MEXICO EAST NAD 1927 Y=439821.23 US FT X=614794.82 US FT LAT.: N 32.2086409° LONG.: W 103.9821794°		BOTTOM PERF. NEW MEXICO EAST NAD 1927 Y=439845.77 US FT X=622063.53 US FT LAT.: N 32.2086371° LONG.: W 103.9386719°	
SURFACE LOCATION NEW MEXICO EAST NAD 1927 Y=439037.02 US FT X=614266.83 US FT LAT.: N 32.2064901° LONG.: W 103.9638947°		BOTTOM HOLE LOCATION NEW MEXICO EAST NAD 1927 Y=439846.26 US FT X=622211.12 US FT LAT.: N 32.2086370° LONG.: W 103.9382012°	
GRID AZ = 89°48'24" 7416.39' IN ALL		GRID AZ = 33°56'38" 945.32'	
PROJECT AREA PRODUCING AREA		2406 2284	

OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or undivided mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order.

Authorized person by this division

[Signature] 1/20/16
Jana Mendida
jaramenmendia@oxy.com

SURVEYOR CERTIFICATION

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

[Stamp: JERRY LAS, 15079, OCTOBER 12 2015, PROFESSIONAL LAND SURVEYOR]

Date of Survey

[Signature] 10/13/2015
Certificate number 15079

WO# 151012WL-b (KA)

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: Secondary Recovery ☒ Pressure Maintenance ☐ Disposal ☐ Storage
Application qualifies for administrative approval? ☐ Yes ☒ No

II. OPERATOR: Oxy USA Inc

ADDRESS: P.O. Box 4294 Houston, TX 77210

CONTACT PARTY: Kelley Montgomery PHONE: 713-366-5714

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 ☒ No
If yes, give the Division order number authorizing the project: _____

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

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

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

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

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Kelley Montgomery TITLE: Regulatory Mgr.

SIGNATURE: Kelley Montgomery DATE: 11/30/18

E-MAIL ADDRESS: Kelley-montgomery@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 Off

BEFORE THE OIL CONSERVATION DIVISION
Santa Fe, New Mexico
Exhibit No. 3
Submitted by: **OXY USA INC**
Hearing Date: January 10, 2019
Case Nos. 20193

C-108 Application
OXY USA Inc.
Cedar Canyon 23 Federal 4H
Eddy County, NM

- I. This is a pressure maintenance injection project.
- II. OXY USA Inc.
P.O. Box 4294
Houston, TX 77210
Contact Party: Kelley Montgomery, Oxy (713) 366-5716
- III. Injection well data sheet and wellbore schematic diagram has been attached for the injection well covered by this application.
- IV. This is not an expansion of an existing project.
- V. The map with a two-mile radius surrounding this injection well and a one-half mile radius for area of review is attached.
- VI. The tabular format of the area of review is attached.
- VII. The proposed operations data sheet is attached.
- VIII. Please see attached signed statement on geologic data for the Bone Spring formation.
- IX. The injection well is an existing horizontal producing well that was hydraulically fractured with 1,540,218 gal of slick water, 41,800 gal of 7.5% HCL and 3,757,478 gal of 15# BXL with 10,578,900# of sand.
- X. Logs were filed for the existing well at the time of drilling.

Well Name	Date Submitted
Cedar Canyon 23 Federal 4H	01/20/2016
- XI. Per our field personnel, no fresh water wells were found within one-mile of this well.
- XII. N/A. This is not a disposal well.
- XIII. Attached please find the Proof of Notice.

INJECTION WELL DATA SHEET

OPERATOR: OXY USA Inc.WELL NAME & NUMBER: Cedar Canyon 23 Federal 4HWELL LOCATION: 1352' FNL 195' FEL
FOOTAGE LOCATIONUNIT LETTER H SECTION 22 TOWNSHIP 24S RANGE 29EWELLBORE SCHEMATICWELL CONSTRUCTION DATASurface CasingCedar Canyon 23 Federal 4H Proposed Wellbore Diagram

Elevation: 61,294.24' x 62,968.9'
 API: 30-015-43281
 Surface location: 1,352' FNL & 195' FEL
 Sec 22 T24S R29E
 Eddy County, NM

10-3/4" Set @ 444'
 550 SX C/C

7-5/8" Set @ 7490'
 4000 SX C/C

5-1/2" from 0- 8945'
 4-1/2" from 8945'-16,509'
 1090 SX, TOC 6330' CBL

*Note: Diagram not to scale

KOP - 8,170' MD
 P8TD - 16,463' MD
 TD - 16,535' MD

Hole Size: 14 3/4" Casing Size: 10 3/4"Cemented with: 550 SX. or ft³Top of Cement: Surface Method Determined: CirculatedIntermediate CasingHole Size: 9 7/8" Casing Size: 7 5/8"Cemented with: 4000 SX. or ft³Top of Cement: Surface Method Determined: CirculatedProduction CasingHole Size: 6 3/4" Casing Size: 5 1/2" 1/4 1/2"Cemented with: 1090 SX. or ft³Top of Cement: 6330' Method Determined: CBLTotal Depth: 16535' MD_9006' TVD_Injection Interval9312' MD/8850' TVD feet To 16403' MD/9002' TVD_

(Perforated)

INJECTION WELL DATA SHEET

Tubing Size: 2 7/8" PH6 7.90# L-80 tubing Lining Material: None

Type of Packer: 5-1/2" Weatherford 10k AS1X Nickel coated retrievable packer

Packer Setting Depth: 8100' (In vertical section of wellbore)

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

Additional Data

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

If no, for what purpose was the well originally drilled? Producer-Oil

2. Name of the Injection Formation: Bone Spring

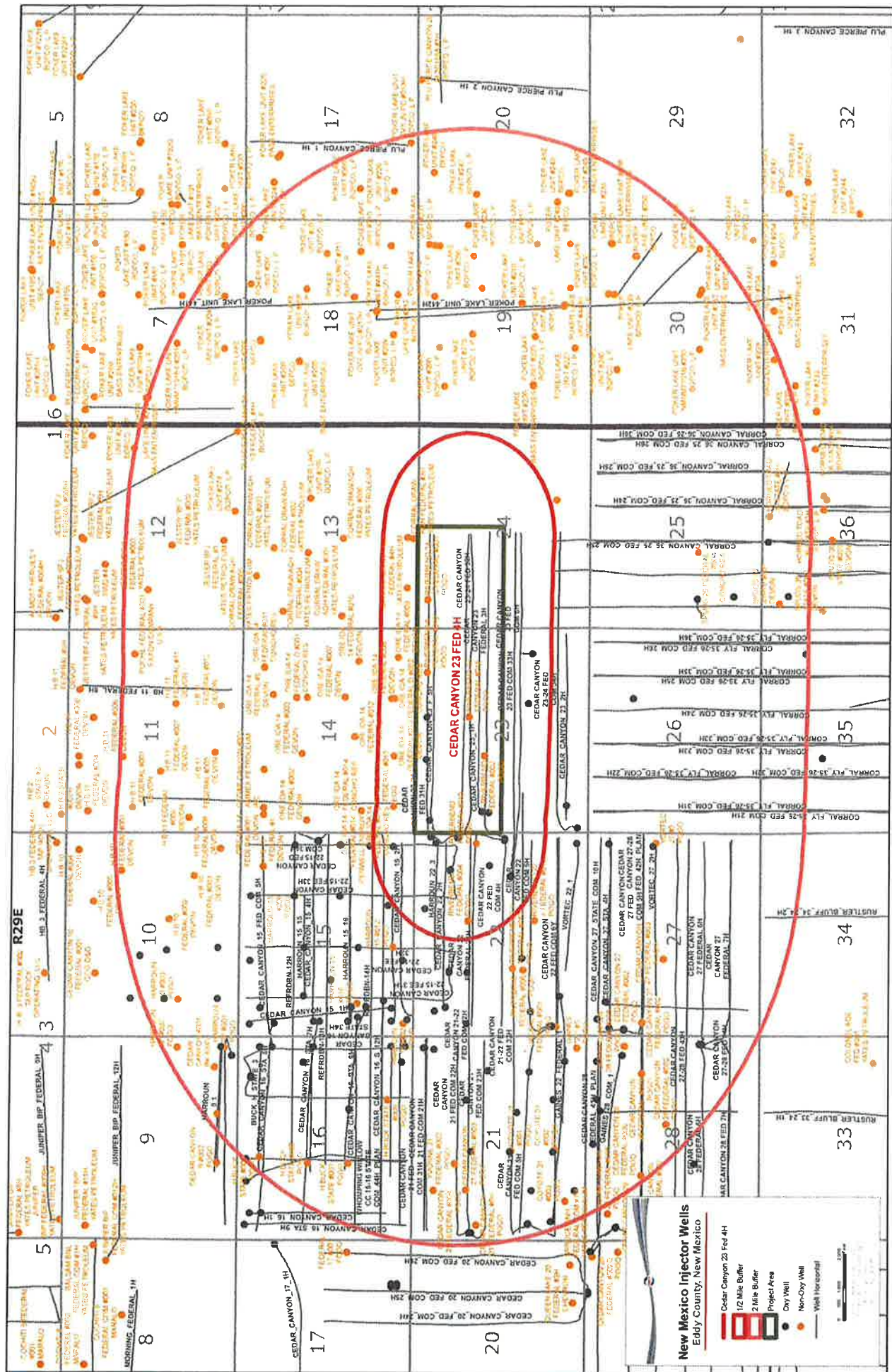
3. Name of Field or Pool (if applicable): Pierce Crossing Bone Spring, East

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

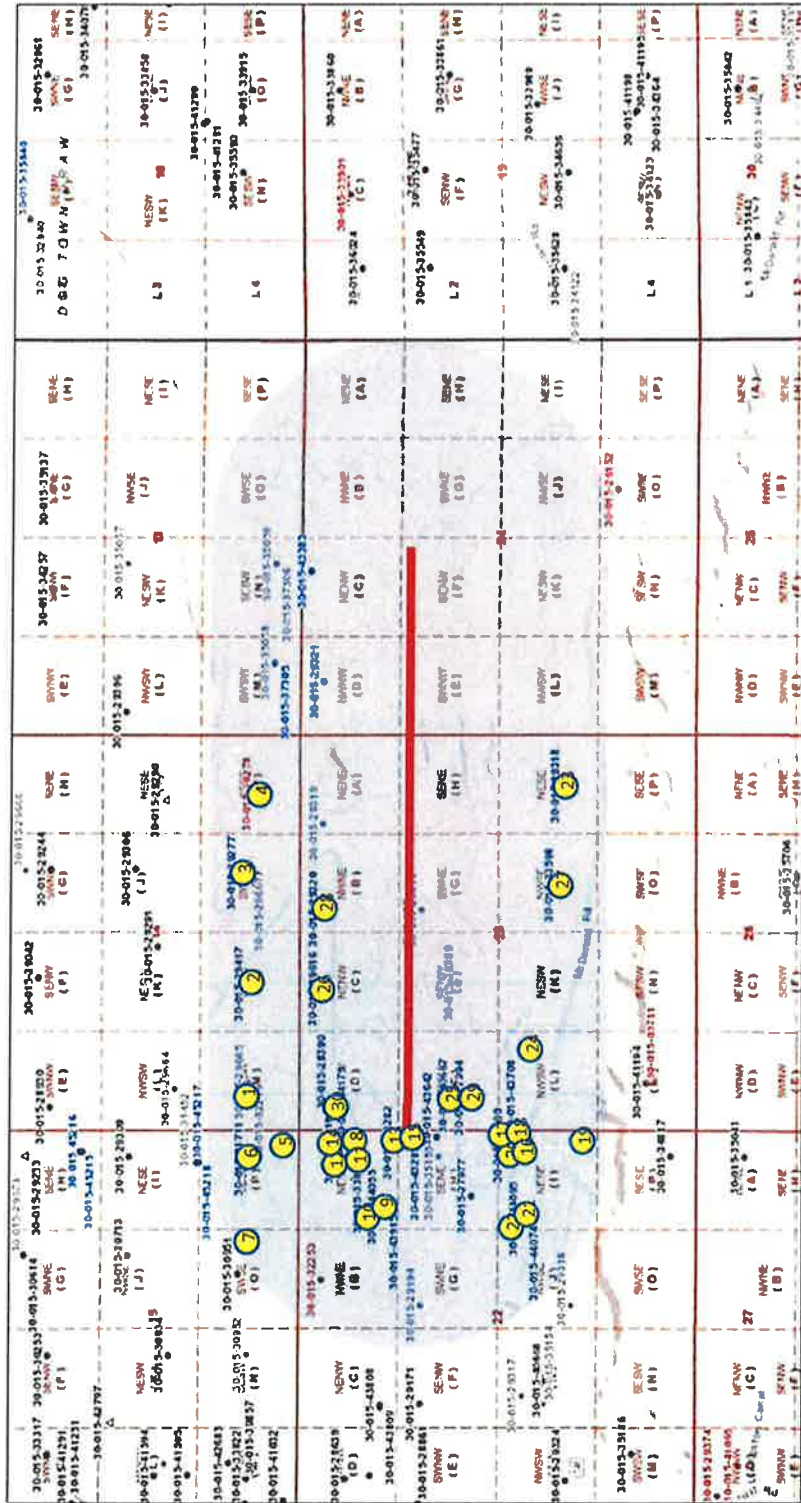
5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:

Brushy Canyon Formation (Delaware) (overlying) (5190')

Wolfcamp Formation (underlying) (10,141')



CEDAR CANYON 23 FED #4H AOR MAP



1/2 Mile Area of Review Well ID on AOR Table Cedar Canyon 23 Fed #4H

- Overide 1
- Overide 1
- Well Locations - Large Scale
- Well Locations - Small Scale
- Active
- New
- Plugged
- Cancelled
- Temporarily Abandoned
- Gas Active
- Gas Cancelled, Never Drilled
- CO2 Active
- CO2 Cancelled
- CO2 New
- CO2 Plugged
- Injection, Active
- Injection, Cancelled
- Injection, New
- Injection, Plugged
- Injection, Temporarily Abandoned
- Gas, Temporarily Abandoned
- Gas, Active
- Oil Cancelled
- Oil New
- Oil Plugged
- Oil Temporarily Abandoned
- Salt Water Injection, Active
- Salt Water Injection, Cancelled
- Salt Water Injection, New
- Salt Water Injection, Plugged
- Salt Water Injection, Temporarily Abandoned
- Water, Active
- Water, Cancelled
- Water, New

New Mexico Oil Conservation Division
New Mexico Oil Conservation Division

Item VII
Proposed Operations

The Cedar Canyon 23 Federal #4H will inject into the 2nd Bone Spring.

Gas Injection

1.

Well Name	Average Daily Rate of Gas to be Injected	Maximum Daily Rate of Gas to be Injected
Cedar Canyon 23 Federal 004H	13,500 MCFD	20,000 MCFD

2. This will be a closed system

3.

Well Name	Average Injection Pressure	Maximum Injection Pressure
Cedar Canyon 23 Federal 004H	4000 psi	4350 psi

4. The source of the injected gas will be produced gas from the Cedar Canyon Central Delivery Point integration system which is comprised of nearby Delaware, 1st and 2nd Bone Spring wells. Please see the attached gas analysis.

5. N/A

Water Injection

1.

Well Name	Average Daily Rate of Water to be Injected	Maximum Daily Rate of Water to be Injected
Cedar Canyon 23 Federal 004H	7,500 BWIPD	15,000 BWIPD

2. This will be a closed system

3.

Well Name	Average Injection Pressure	Maximum Injection Pressure
Cedar Canyon 23 Federal 004H	1450 psi	1770 psi

4. Water used for injection will be treated produced water from wells drilled in the Bone Springs and Delaware Formations. Please see the attached water compatibility study.

5. N/A

CO2 Injection

1.

Well Name	Average Daily Rate of Water to be Injected	Maximum Daily Rate of Water to be Injected
Cedar Canyon 23 Federal 004H	13,500 MCFD	20,000 MCFD

2. This will be a closed system

Item VII
Proposed Operations

3.

Well Name	Average Injection Pressure	Maximum Injection Pressure
Cedar Canyon 23 Federal 004H	2000 psi	2300 psi

4. Oxy currently does not have a source for CO2 for this project area. However, Oxy would like to have the ability to inject CO2 when a source becomes available.

5. N/A

Calculation for Surface Injection Pressure Limits

For Water Injection:

Calculation for surface pressure limit:

- $0.2 \text{ psi/ft} * 8850 \text{ ft (TVD of first perf)} = 1770 \text{ psi}$

Produced Gas and CO2 Injection:

Based on the surface pressure limit for water and assuming a fresh water gradient of 0.433 psi/ft. The bottom hole pressure (BHP) limit is:

- $1770 + 0.433 * 8850 = 5602 \text{ psi (or } 0.633 \text{ psi/ft)}$

A Petroleum Expert Prosper Model was used to calculate the surface pressure with 2.875" tubing, reservoir depth, injection gas composition and the BHP limit shown above.

*Prosper Model is an industrial standard nodal analysis software for pressure calculation and includes phase behavior change and friction loss.

Atchafalaya Measurement, Inc.416 East Main Street
Artesia, NM 88210 575-746-3481*Injection Gas
Sample***Sample Information**

Sample Information	
Sample Name	OXY__Cedar Canyon 16 State 12H LP__GC1-110117-06
Station Number	14910TD
Lease Name	Cedar Canyon 16 State 12H LP
Analysis for	OXY USA
Producer	OXY USA
Field Name	NM South
County	Eddy
State	NM
Frequency	Spot
Sample Deg F	52
Atmos Deg F	46
Flow Rate	2155.9
LinePSIG	123
Date Sampled	10/31/17
Sampled By	Jacob Marquez
Analysis By	Chris Myers
Report Date	2017-11-01 10:13:39

Component Results

Component Name	Ret. Time	Peak Area	Norm%	PPMV	GPM (Dry) (Gal. / 1000 cu.ft.)
Nitrogen	21.960	8052.1	1.62059	16205.900	0.178
H2S	46.000	0.0	0.00000	0.000	0.000
Methane	22.780	299373.1	77.19299	771929.900	13.058
Carbon Dioxide	26.480	1127.8	0.18594	1859.400	0.032
Ethane	36.800	81412.7	12.57474	125747.400	3.356
Propane	79.140	48829.2	5.73143	57314.300	1.576
i-Butane	28.720	41559.0	0.58209	5820.900	0.190
n-Butane	30.320	97200.6	1.33268	13326.800	0.419
i-Pentane	35.360	20267.2	0.24488	2448.800	0.089
n-Pentane	37.420	20835.3	0.24103	2410.300	0.087
Hexanes Plus	120.000	27727.0	0.29363	2936.300	0.127
Total:			100.00000	1000000.000	19.112

Results Summary

Result	Dry	Sat. (Base)
Total Raw Mole% (Dry)	101.22347	
Pressure Base (psia)	14.650	
Temperature Base	60.0	
Gross Heating Value (BTU / Ideal cu.ft.)	1239.4	1217.7
Gross Heating Value (BTU / Real cu.ft.)	1243.8	1222.5
Relative Density (G), Ideal	0.7239	0.7221
Relative Density (G), Real	0.7261	0.7246
Compressibility (Z) Factor	0.9965	0.9961

Water Compatibility Analysis

Scale precipitation due to incompatibility of mixing different waters is simulated using ScaleSoftPitzer™ (SSP) developed by Rice University Brine Chemistry Consortium. Compatibility simulations between (a) 1st Bone Spring (BS) formation water and treated produced water (TPW) from Cedar Canyon Water Treatment Facility (CC WTF), (b) 2nd BS formation water and TPW, and (c) 3rd BS formation water and TPW were performed. Table 1 shows the water analysis from the 4 waters.

Table 1. Water analysis from 1st, 2nd and 3rd BS water and TPW from CC WTF

Cations / Anions (mg/L)	1 st BS	2 nd BS	3 rd BS	CC15 SWD Treatment Facility
Na ⁺	62,308	53,400	38,000	46,315
Mg ²⁺	360	1,320	767	1,399
Ca ²⁺	1,098	9,220	4,970	9,569
Sr ²⁺	267	688	1,030	893
Ba ²⁺	0.84	1.15	3.45	2.6
Fe ²⁺	15.9	40.6	19.1	25.3
Cl ⁻	90,167	98,451	74,630	97,632
SO ₄ ²⁻	531	417	236	389
HCO ₃ ⁻	561.2	146.4	109.8	119
TDS	155,309	165,620	119,767	157,193
pH	7	7	6.8	5.3

The various waters are input into SSP at different ratios to calculate scaling index (SI) and potential precipitation (ppt) in pound per thousand barrels (ptb). Bottom hole temperature of 122 F and bottom hole pressures of 5,000 psi were used in the modeling. Results are summarized in Tables 2 to 4.

1st BS + Treated Produced Water:

In general, there is a slight, inherent calcite scaling tendency with the 1st BS water itself. The predicted SI is 0.87 as shown in Table 2. Any scaling index above zero indicates a supersaturation condition of the scale. By mixing TPW with the 1st BS formation it is observed that the scaling index of calcite became slightly higher first at 25% TPW and 75% 1st BS and then becoming smaller as the ratio of TPW increases. However, the maximum, predicted precipitation is less than 50 ptb. Therefore, a slight amount of scale inhibitor is recommended for the injection of the TWP into the 1st BS. The exact amount of scale inhibitor can be determined by lab tests. Both Barite and Celestite are not expected to precipitate at all ratios of mixing.

Table 2. Prediction of Scaling Index (SI) and potential precipitation (PPT) of 3 common oilfield scales by mixing the 1st BS water and TPW at different ratios

% treated PW	Cypress 33-3H % 1 st BS	Calcite		Barite		Celestite	
		SI	ppt (ptb)	SI	ppt (ptb)	SI	ppt (ptb)
100	0	-1.49	0.0	-0.28	0.0	-0.54	0.0
75	25	0.13	4.2	-0.22	0.0	-0.44	0.0
50	50	0.66	29.8	-0.18	0.0	-0.36	0.0
25	75	0.95	49.1	-0.18	0.0	-0.30	0.0
0	100	0.87	41.8	-0.22	0.0	-0.25	0.0

Water Compatibility Analysis

2nd BS + Treated Produced Water:

In general, there is an inherent calcite scaling tendency with the 2nd BS water itself. The predicted SI is 1.21 and the predicted precipitation is 18.6 ptb as shown in Table 3. By mixing TPW with the 2nd BS formation it is observed that the scaling index of calcite becomes smaller as the ratio of TPW increases. In other words, by injecting TPW we expect a reduction of incompatibility between the two waters. Both Barite and Celestite are not expected to precipitate at all ratios of mixing.

Table 3. Prediction of SI and potential PPT of 3 common oilfield scales by mixing the 2nd BS water and TPW at different ratios

% treated PW	CC20-25H % 2nd BS	Calcite		Barite		Celestite	
		SI	ppt (ptb)	SI	ppt (ptb)	SI	ppt (ptb)
100	0	-1.49	0.0	-0.28	0.0	-0.54	0.0
75	25	-0.69	0.0	-0.56	0.0	-0.39	0.0
50	50	-0.15	0.0	-0.55	0.0	-0.26	0.0
25	75	0.43	7.7	-0.54	0.0	-0.15	0.0
0	100	1.21	18.6	-0.53	0.0	-0.05	0.0

3rd BS + Treated Produced Water:

In general, there is a slight, inherent calcite scaling tendency with the 3rd BS water itself. The predicted SI is 0.59 and the predicted precipitation is 8.8 ptb as shown in Table 4. By mixing TPW with the 3rd BS formation it is observed that the scaling index of calcite becomes smaller as the ratio of TPW increases. In other words, by injecting TPW we expect a reduction of incompatibility between the two waters. Both Barite and Celestite are not expected to precipitate at all ratios of mixing.

Table 4. Prediction of SI and potential PPT of 3 common oilfield scales by mixing the 3rd BS water and TPW at different ratios

% treated PW	CC22-15 32H % 3rd BS	Calcite		Barite		Celestite	
		SI	ppt (ptb)	SI	ppt (ptb)	SI	ppt (ptb)
100	0	-1.49	0.0	-0.28	0.0	-0.54	0.0
75	25	-0.88	0.0	-0.56	0.0	-0.39	0.0
50	50	-0.44	0.0	-0.12	0.0	-0.28	0.0
25	75	0.02	0.3	-0.04	0.0	-0.18	0.0
0	100	0.59	8.8	0.05	0.2	-0.08	0.0



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

Treated Produced Water
for Injection Upstream Chemicals

REPORT DATE: 2/8/2017

COMPLETE WATER ANALYSIS REPORT SSP v.2010

CUSTOMER: OXY USA INCORPORATED ACCOUNT REP: LARRY G HINES
DISTRICT: WATER MANAGEMENT - PERMIAN SAMPLE ID: 201701004772
AREA/LEASE: CC SAMPLE DATE: 2/2/2017
SAMPLE POINT NAME: CC15SWD ANALYSIS DATE: 2/8/2017
SITE TYPE: FACILITY ANALYST: JK
SAMPLE POINT DESCRIPTION: NOT PROVIDED

OXY USA INCORPORATED, CC, CC15SWD

FIELD DATA			ANALYSIS OF SAMPLE					
			ANIONS:		mg/L		CATIONS:	
					meq/L			
Initial Temperature (°F):	250	Chloride (Cl ⁻):	97631.8	2754.1	Sodium (Na ⁺):	46314.8	2015.4	
Final Temperature (°F):	80	Sulfate (SO ₄ ²⁻):	389.2	8.1	Potassium (K ⁺):	846.2	21.6	
Initial Pressure (psi):	100	Borate (H ₃ BO ₃):	319.4	5.2	Magnesium (Mg ²⁺):	1399.5	115.2	
Final Pressure (psi):	15	Fluoride (F ⁻):	ND		Calcium (Ca ²⁺):	9568.9	477.5	
pH:		Bromide (Br ⁻):	ND		Strontium (Sr ²⁺):	893.0	20.4	
pH at time of sampling:	5.3	Nitrite (NO ₂ ⁻):	ND		Barium (Ba ²⁺):	2.6	0.0	
		Nitrate (NO ₃ ⁻):	ND		Iron (Fe ²⁺):	25.3	0.9	
		Phosphate (PO ₄ ³⁻):	ND		Manganese (Mn ²⁺):	2.4	0.1	
		Silica (SiO ₂):	ND		Lead (Pb ²⁺):	0.0	0.0	
					Zinc (Zn ²⁺):	0.0	0.0	
ALKALINITY BY TITRATION:	mg/L	meq/L						
Bicarbonate (HCO ₃ ⁻):	119.4	2.0			Aluminum (Al ³⁺):	0.0	0.0	
Carbonate (CO ₃ ²⁻):	ND				Chromium (Cr ³⁺):	ND		
Hydroxide (OH ⁻):	ND				Cobalt (Co ²⁺):	ND		
					Copper (Cu ²⁺):	0.0	0.0	
aqueous CO ₂ (ppm):	ND	Formic Acid:	ND		Molybdenum (Mo ²⁺):	0.0	0.0	
aqueous H ₂ S (ppm):	ND	Acetic Acid:	ND		Nickel (Ni ²⁺):	ND		
aqueous O ₂ (ppb):	ND	Propionic Acid:	ND		Tin (Sn ²⁺):	ND		
		Butyric Acid:	ND		Titanium (Ti ²⁺):	ND		
Calculated TDS (mg/L):	157193	Valeric Acid:	ND		Vanadium (V ²⁺):	ND		
Density/Specific Gravity (g/cm ³):	1.1015				Zirconium (Zr ²⁺):	ND		
Measured Specific Gravity	1.1114							
Conductivity (mmhos):	ND				Total Hardness:	30708	N/A	
Resistivity:	ND							
MCF/D:	No Data							
BOPD:	No Data							
BWPD:	No Data							
		Anion/Cation Ratio:	1.04					

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

Conditions		Barite (BaSO ₄)		Calcite (CaCO ₃)		Gypsum (CaSO ₄ ·2H ₂ O)		Anhydrite (CaSO ₄)	
Temp	Press.	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)	Index	Amt (ptb)
80°F	15 psi	0.48	1.023	-0.24	0.000	-0.49	0.000	-0.65	0.000
99°F	24 psi	0.35	0.854	-0.19	0.000	-0.48	0.000	-0.56	0.000
118°F	34 psi	0.24	0.650	-0.12	0.000	-0.47	0.000	-0.46	0.000
137°F	43 psi	0.14	0.415	-0.03	0.000	-0.46	0.000	-0.36	0.000
156°F	53 psi	0.04	0.150	0.06	2.244	-0.45	0.000	-0.26	0.000
174°F	62 psi	-0.04	0.000	0.15	5.282	-0.44	0.000	-0.16	0.000
193°F	72 psi	-0.11	0.000	0.24	8.298	-0.43	0.000	-0.05	0.000
212°F	81 psi	-0.18	0.000	0.34	11.016	-0.43	0.000	0.06	23.450
231°F	91 psi	-0.24	0.000	0.43	13.409	-0.42	0.000	0.17	60.325
250°F	100 psi	-0.29	0.000	0.53	15.533	-0.42	0.000	0.27	88.895

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	0.22	82.616	-1.07	0.000	-10.65	0.000	-1.19	0.000
99°F	24 psi	0.24	86.393	-1.08	0.000	-10.71	0.000	-1.09	0.000
118°F	34 psi	0.25	89.399	-1.09	0.000	-10.69	0.000	-0.96	0.000
137°F	43 psi	0.26	92.391	-1.10	0.000	-10.66	0.000	-0.84	0.000
156°F	53 psi	0.27	95.852	-1.11	0.000	-10.61	0.000	-0.74	0.000
174°F	62 psi	0.28	100.037	-1.11	0.000	-10.55	0.000	-0.65	0.000
193°F	72 psi	0.30	105.016	-1.12	0.000	-10.48	0.000	-0.56	0.000
212°F	81 psi	0.32	110.708	-1.12	0.000	-10.41	0.000	-0.48	0.000
231°F	91 psi	0.34	116.922	-1.12	0.000	-10.34	0.000	-0.42	0.000
250°F	100 psi	0.37	123.390	-1.13	0.000	-10.27	0.000	-0.37	0.000

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; %CO₂ is not included in the calculations

ScaleSoft Pirzer™
SSP2010

Comments:

W2C3

13/18

1st B.S.
Native Water

NALCO Champion

An Ecolab Company

Water Analysis Report

Attention: ljsandmann@ecolab.com

Location Code: 374553

Sample ID: AK17198

Login Batch: 2018-02-05-001_ACC

Collection Date: 01/29/2018

Receive Date: 02/02/2018

Report Date: 02/07/2018

Customer: OXY USA WTP LP

Region: Carlsbad NM

Location: Cypress 33 Federal Lease

System: Production System

Equipment: Well 003H

Lab ID: ABU-1031

Sample Point: Well Head

Analyses	Result	Unit
Calculated pH	7.00	
Dissolved CO2	270	mg/L
Dissolved H2S	0	mg/L
Gas per Day	169	Mcf/D
Oil per Day	31	B/D
Pressure	500	psi
Temperature	61	° F
Water per Day	37	B/D

Analyses	Result	Unit
Bicarbonate	561.2	mg/L
Conductivity (Calculated)	242645	µS - cm3
Ionic Strength	2.73	
Resistivity	0.041	ohms - m
Specific Gravity	1.110	
Total Dissolved Solids	155309.3	mg/L

Cations	Result	Unit
Iron	15.89	mg/L
Manganese	0.38	mg/L
Barium	0.84	mg/L
Strontium	266.6	mg/L
Calcium	1097.65	mg/L
Magnesium	360.47	mg/L
Sodium	62308.26	mg/L
Potassium	1273.71	mg/L
Boron	13.92	mg/L
Lithium	92.65	mg/L
Copper	0.05	mg/L
Zinc	0.01	mg/L
Lead	0.09	mg/L
Cobalt	0.03	mg/L
Chromium	0.03	mg/L
Silicon	8.07	mg/L
Aluminum	0.05	mg/L
Molybdenum	0.04	mg/L
Phosphorus	0.06	mg/L

Anions	Result	Unit
Bromide	879	mg/L
Chloride	90167	mg/L
Sulfate	531	mg/L

Scaling predictions calculated using Scale Soft Pilzer 2017

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02/12/2018

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2nd B.S.
Native Water

NALCO Champion

An Ecolab Company

Water Analysis Report

Attention: Ramon.Artalejo@ecolab.com

Location Code: 395860

Sample ID: AL86756

Login Batch: 2018-10-30-001 GC

Collection Date: 10/18/2018

Receive Date: 10/30/2018

Report Date: 10/31/2018

Customer: OXY PERMIAN RES - NEW MEXICO

Region: Delaware Basin

Location: Cedar Canyon 20 Lease

System: Production System

Equipment: Cedar Canyon 20-25H

Lab ID: ABU-1031

Sample Point: Wellhead

Analyses	Result	Unit
Dissolved CO2	400	mg/L
Dissolved H2S	0.1	mg/L
pH	7.0	
Pressure	160	psi
Temperature	54	° F

Analyses	Result	Unit
Bicarbonate	146.4	mg/L
Conductivity (Calculated)	255694	µS - cm3
Ionic Strength	3.14	
Resistivity	0.039	ohms - m
Specific Gravity	1.119	
Total Dissolved Solids	165620	mg/L

Cations	Result	Unit
Iron	40.6	mg/L
Manganese	0.972	mg/L
Barium	1.15	mg/L
Strontium	688	mg/L
Calcium	9220	mg/L
Magnesium	1320	mg/L
Sodium	53400.00	mg/L
Potassium	890	mg/L
Boron	41.8	mg/L
Lithium	29.3	mg/L
Copper	0.042	mg/L
Zinc	0.171	mg/L
Lead	0.128	mg/L
Cobalt	0.022	mg/L
Chromium	0.014	mg/L
Silicon	6.44	mg/L
Aluminum	Not Detected	mg/L
Molybdenum	0.03	mg/L
Phosphorus	Not Detected	mg/L

Anions	Result	Unit
Bromide	964.15	mg/L
Chloride	98451.27	mg/L
Fluoride	2.4470	mg/L
Sulfate	417.39	mg/L

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10/31/2018

Page 1 of 2

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Complete Water Analysis Report

3rd B.S.
Native Water

Customer: OXY USA WTP LP
Region: Delaware Basin
Location: Cedar Canyon 22 Lease
System: Production System

Equipment: Cedar Canyon 22-15 Fee 32H
Sample Point: Wellhead
Sample ID: AL71401
Acct Rep Email: Ramon.Artalejo@ecolab.com

Collection Date: 10/03/2018
Receive Date: 10/04/2018
Report Date: 10/12/2018
Location Code: 394555

Field Analysis

Bicarbonate	109.8 mg/L	Dissolved CO2	280 mg/L	Dissolved H2S	8.55 mg/L
Pressure Surface	200 psi	Temperature	83 ° F	pH of Water	6.8

Sample Analysis

Calculated Gaseous CO2	0.62%	Calculated pH	6.80	Conductivity (Calculated)	187104 µS - cm3
Ionic Strength	2.22	Resistivity	0.053 ohms - m	Specific Gravity	1.085
Total Dissolved Solids	119766.6 mg/L				

Iron	19.1 mg/L	Manganese	0.899 mg/L	Barium	3.45 mg/L
Strontium	1030 mg/L	Calcium	4970 mg/L	Magnesium	767 mg/L
Sodium	38000.00 mg/L	Potassium	664 mg/L	Boron	87.3 mg/L
Lithium	20.6 mg/L	Copper	0.328 mg/L	Nickel	0.042 mg/L
Zinc	0.396 mg/L	Lead	0.144 mg/L	Cobalt	0.021 mg/L
Chromium	0.004 mg/L	Silicon	10.2 mg/L	Aluminum	Not Detected mg/L
Molybdenum	0.012 mg/L	Phosphorus	0.1 mg/L		

Bromide	575.661 mg/L	Chloride	74630 mg/L	Sulfate	236.327 mg/L
---------	--------------	----------	------------	---------	--------------

PTB Value

	Barite PTB	Calcite PTB	Celestite PTB	Gypsum PTB	Halite PTB	Iron Carbonate PTB	Iron Sulfide PTB
50°	1.74	7.35	16.12	0.00	0.00	0.00	7.70
75°	1.51	10.25	17.01	0.00	0.00	0.00	7.70
100°	1.19	12.64	23.75	0.00	0.00	0.00	7.83
125°	0.78	14.64	33.70	0.00	0.00	0.00	8.02
150°	0.29	16.35	45.15	0.00	0.00	0.00	8.25
175°	0.00	17.85	58.88	0.00	0.00	1.84	8.48
200°	0.00	19.20	68.07	0.00	0.00	3.48	8.72
225°	0.00	20.42	78.34	0.00	0.00	4.76	8.95
250°	0.00	21.54	87.50	0.00	0.00	5.76	9.17
275°	0.00	22.59	95.55	0.00	0.00	6.51	9.37
300°	0.00	23.55	102.58	0.00	0.00	7.03	9.55
325°	0.00	24.43	108.73	0.00	0.00	7.35	9.70
350°	0.00	25.22	114.10	0.00	0.00	7.46	9.83
375°	0.00	25.92	118.76	0.00	0.00	7.34	9.93
400°	0.00	26.86	122.72	0.00	0.00	7.76	9.89

Saturation Index

	Barite SI	Calcite SI	Celestite SI	Gypsum SI	Halite SI	Iron Carbonate SI	Iron Sulfide SI
50°	0.82	0.31	0.06	-0.91	-1.32	-0.78	1.45
75°	0.58	0.44	0.06	-0.93	-1.34	-0.55	1.39
100°	0.38	0.56	0.06	-0.93	-1.35	-0.35	1.37
125°	0.21	0.67	0.12	-0.92	-1.36	-0.17	1.38
150°	0.07	0.78	0.17	-0.91	-1.37	-0.02	1.40
175°	-0.05	0.89	0.23	-0.92	-1.38	0.12	1.44
200°	-0.14	1.00	0.23	-0.94	-1.38	0.24	1.60
225°	-0.22	1.11	0.34	-0.97	-1.38	0.35	1.55
250°	-0.30	1.22	0.40	-1.01	-1.38	0.43	1.64
275°	-0.36	1.33	0.46	-1.06	-1.37	0.50	1.72
300°	-0.42	1.43	0.62	-1.08	-1.37	0.55	1.80
325°	-0.48	1.53	0.57	-1.08	-1.36	0.58	1.88
350°	-0.55	1.63	0.62	-1.04	-1.35	0.58	1.96
375°	-0.62	1.71	0.68	-0.93	-1.33	0.56	2.03
400°	-0.70	1.86	0.72	-0.73	-1.32	0.60	2.16

Scaling predictions calculated using Scale Soft Pitzer 2017
Scaling predictions dependent on provided field data. Incomplete/partial field data may impact results generated by scaling software.

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10/12/2018

16048

Part VIII- Geologic Information for Cedar Canyon 23 Fed 4H

The Cedar Canyon 23 Fed 4H will be injecting into the 2nd Bone Spring Sandstone of the Bone Spring Formation. The well has a TVD of approximately 8,982 ft. with a lateral length of approximately 7,553 ft. It will be injecting into a reservoir composed of tight siltstone. Core data indicates that the grain sizes range from coarse siltstone to very-fine-grained subarkose (Folk, 1980) sandstone. Samples show evidence of moderate compaction. Minor amounts of illite and smectite clays are found throughout the samples ranging from 5% to 15%. Cements are Fe-calcite, Fe-dolomite, with some quartz overgrowths. Minor amounts of pyrite (<1%) are present. The resulting reservoir rock has porosity of 8-18% with an average porosity of 11.7%. Permeability measured by injection fall-off tests conducted within the reservoir ranges from 0.02 millidarcies to 0.001 millidarcies.

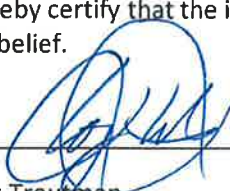
The injection area for this well is bounded by two producing wells in the same reservoir interval that is 330 ft. thick. Low-permeability barriers act as seals above and below the reservoir. These barriers consist of carbonate mudstone and dolomudstone that are 520 ft. thick above and 715 ft. thick below. Laterally the injection will be primarily contained by the reservoir volume that has been previously and partially depleted by the adjacent producing wells. The tight low-permeability reservoir and the production from the adjacent wells will be the primary constraints on the conformance of the injection to the project area and are expected to contain the injected gas.

The top of the Bone Spring Formation is at 6,733 ft. (log depth) with over 2,000 ft. of carbonate mudstones and shales acting as permeability barriers to upward migration of injected gas. Above that the Delaware Mountain Group consists of connate-water bearing and hydrocarbon-bearing sands, with minor limestone and shale intervals and is 3,700 ft. thick. Above that is the Castile Formation consisting of very low permeability anhydrite, gypsum, and calcite that acts as another 1,500 ft. thick barrier to upward movement of fluids. The Salado overlies the Castile and forms a 1,000 ft. thick barrier of salt. The top of the Salado is at 510 ft. and the deep aquifers found just above the Salado at the base of the Rustler are saline water. The top of Rustler Formation is at 440 ft. The Rustler top is a continuous anhydrite layer that acts as another permeability barrier creating a perched aquifer above it that is the lowest level where fresh water is known in the area. Water wells drilled in the area typically have not reached this depth. Because of the thickness of multiple impermeable rock layers above the injection reservoir there is no possible path for migration upward into freshwater aquifers where they exist.

Locate freshwater wells within two miles:

An investigation of existing shallow water wells has not found any freshwater wells within a one-mile radius of this injector.

I hereby certify that the information presented above is true and correct to the best of my knowledge and belief.



Tony Troutman
Geological Advisor

11/30/2018

Date

**C-108 Injection Application
Item XIII - Proof of Notice
OXY USA Inc.
Cedar Canyon 23 Federal 4H**

New Mexico Oil Conservation Division
811 S. First St.
Artesia, NM 88210

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

United State Dept of Interior
Bureau of Land Management
620 E. Greene Street
Carlsbad, NM 88220

GD McKinney Investments LP
300 N Marienfeld, Ste 1100
Midland, TX 79701

Leopard Petroleum LP
P.O. Box 51440
Midland, TX 79710

Beryl Oil and Gas, LP
P.O. Box 51440
Midland, TX 79710

B. Jack Reed
506 Charismatic
Midland, TX 79705

DRW Energy, LLC
400 W. Illinois, Suite 970
Midland, TX 79701

M'lissa M. Schoening
300 N. Marienfeld, Ste 1100
Midland, TX 79701

EOG Y Resources Inc.
5509 Champions Drive
Midland, TX 79706

EOG A Resources Inc.
5509 Champions Drive
Midland, TX 79706

EOG M Resources Inc.
5509 Champions Drive
Midland, TX 79706

Devon Energy Production CO LP
6100 N. Western
Oklahoma City, OK 73118

BOPCO LP
201 Main Street, Ste. 2700
Ft. Worth, TX 76102

[illegible]

**STATE OF NEW MEXICO
DEPARTMENT OF ENERGY, MINERALS AND NATURAL RESOURCES
OIL CONSERVATION DIVISION**

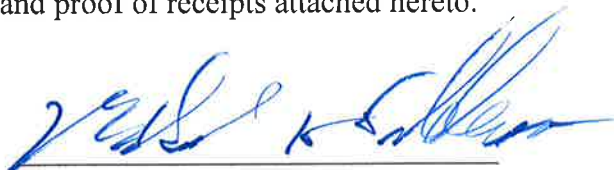
**APPLICATION OF OXY USA INC. FOR APPROVAL
OF A PRESSURE MAINTENANCE PROJECT,
EDDY COUNTY, NEW MEXICO.**

CASE NO. 20193

AFFIDAVIT

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

Michael Feldewert, attorney in fact and authorized representative of **OXY USA, INC.**, the Applicant herein, being first duly sworn, upon oath, states that the above-referenced Applications have been provided under the notice letters and proof of receipts attached hereto.

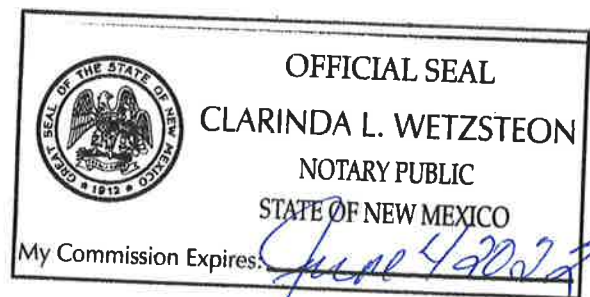


Michael H. Feldewert

SUBSCRIBED AND SWORN to before me this 10th day of January 2019 by Michael H. Feldewert.



Notary Public





December 21, 2018

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

TO: AFFECTED PARTIES

**Re: Application of OXY USA Inc. for Approval of a Pressure
Maintenance Project, Eddy County, New Mexico**
[Cedar Canyon 23 Federal 4H well in the N/2 of Section 23 and the
NW/4 of Section 24, T24S, R29E]

Ladies and Gentlemen:

This letter is to advise you that OXY USA Inc. has filed the enclosed application with the New Mexico Oil Conservation Division. A hearing has been requested before a Division Examiner on January 10, 2019, and the status of the hearing can be monitored through the Division's website. Division hearings will commence at 8:15 a.m. in Porter Hall at the Oil Conservation Division's Santa Fe Offices located at 1220 South Saint Francis Drive, Santa Fe, New Mexico 87505. You are not required to attend this hearing, but as an owner of an interest that may be affected by this application, you may appear and present testimony. Failure to appear at that time and become a party of record will preclude you from challenging the matter at a later date.

Parties appearing in cases are required by Division Rule 19.15.4.13.B to file a Pre-Hearing Statement with the Oil Conservation Division's Santa Fe office, four business days in advance of a scheduled hearing, but at least on the Thursday preceding the hearing. This statement must be filed at the Division's Santa Fe office at the above specified address and should include: the names of the parties and their attorneys; a concise statement of the case; the names of all witnesses the party will call to testify at the hearing; the approximate time the party will need to present its case; and identification of any procedural matters that are to be resolved prior to the hearing.

If you have any questions regarding this application, please contact Kelley Montgomery at (713) 366-5716 or Kelley_Montgomery@oxy.com

Sincerely,

Michael H. Feldewert
ATTORNEY FOR OXY USA, INC.

Enclosures



Shipment Confirmation Acceptance Notice

A. Mailer Action

Note to Mailer: The labels and volume associated to this form online, **must** match the labeled packages being presented to the USPS® employee with this form.

OXY - Cedar Canyon 4H
CM# 44506.0005
notice List

Shipment Date: 12/17/2018

Shipped From:

Name: HOLLAND & HART LLP

Address: 110 N GUADALUPE ST # 1

City: SANTA FE

State: NM ZIP+4® 87501

Type of Mail	Volume
Priority Mail Express®	
Priority Mail®	0
First-Class Package Service®	
Returns	
International*	
Other	15
Total	15

*Start time for products with service guarantees will begin when mail arrives at the local Post Office™ and items receive individual processing and acceptance scans.

B. USPS Action

Note to RSS Clerk:

1. Home screen > Mailing/Shipping > More
2. Select Shipment Confirm
3. Scan or enter the barcode/label number from PS Form 5630
4. Confirm the volume count message by selecting Yes or No
5. Select Pay and End Visit to complete transaction

USPS EMPLOYEE: Please scan upon pickup or receipt of mail.
Leave form with customer or in customer's mail receptacle.

USPS SCAN AT ACCEPTANCE



9275 0901 1935 6200 0011 7978 99



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USPS Tracking/Article Number	Addressee (Name, Street, City, State, & ZIP Code™)			Postage	(Extra Service) Fee	Handling Charge	Actual Value if Registered	Insured Value	Due Sender if COD	ASR Fee	ASRD Fee	RD Fee	RR Fee	SC Fee	SCRD Fee	SH Fee
1. 9214 8901 9403 8376 4963 86	New Mexico Oil Conservation Division 611 S First St Artesia NM 88210			2.26	3.45	Handling Charge - if Registered and over \$50,000 in value							1.50			
2. 9214 8901 9403 8376 4963 93	EOG Y Resources Inc 104 S Fourth Street Artesia NM 88210			2.26	3.45								1.50			
3. 9214 8901 9403 8376 4964 09	Devon Energy Production CO LP 6100 N Western Oklahoma City OK 73118			2.26	3.45								1.50			
4. 9214 8901 9403 8376 4964 16	New Mexico Oil Conservation Division 1220 South St Francis Dr Santa Fe NM 87507			2.26	3.45								1.50			
5. 9214 8901 9403 8376 4964 23	EOG A Resources Inc 104 S Fourth Street Artesia NM 88210			2.26	3.45								1.50			
6. 9214 8901 9403 8376 4964 30	EOG M Resources Inc 104 S Fourth Street Artesia NM 88210			2.26	3.45							1.50				
7. 9214 8901 9403 8376 4964 47	United States Dept of Interior Bureau of Land Management 620 E Greene Street Carlsbad NM 88220			2.26	3.45								1.50			
8. 9214 8901 9403 8376 4964 54	GD McKinney Investments LP 300 N Mainfield Suite 1100 Midland TX 79701			2.26	3.45								1.50			
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USPS Tracking/Article Number		Addressee (Name, Street, City, State, & ZIP Code™)		Postage	(Extra Service) Fee	Handling Charge	Actual Value if Registered	Insured Value	Due Sender if COD	ASR Fee	ASRD Fee	RD Fee	RR Fee	SC Fee	SCRD Fee	SH Fee					
9.	9214 8901 9403 8376 4964 61	Leopard Petroleum LP PO BOX 51440 Midland TX 79710		2.26	3.45	Handling Charge - if Registered and over \$50,000 in value							1.50								
10.	9214 8901 9403 8376 4964 78	Beryl Oil and Gas LP PO BOX 51440 Midland TX 79710		2.26	3.45									1.50							
11.	9214 8901 9403 8376 4964 85	B Jack Reed 506 Charismatic Midland TX 79705		2.26	3.45									1.50							
12.	9214 8901 9403 8376 4964 92	DRW Energy LLC 400 W Illinois Suite 970 Midland TX 79701		2.26	3.45						Adult Signature Required	Adult Signature Restricted Delivery	Restricted Delivery	Return Receipt	Signature Confirmation	Signature Confirmation Restricted Delivery	Special Handling				
13.	9214 8901 9403 8376 4965 08	Mfissa W Schoening 300 N Marlandfield Suite 1100 Midland TX 79701		2.26	3.45									1.50							
14.	9214 8901 9403 8376 4965 15	Devon Energy Production CO LP 6100 N Western Oklahoma City OK 73118		2.26	3.45								1.50								
15.	9214 8901 9403 8376 4965 22	BOPCO LP 201 Main Street Suite 2700 Ft Worth TX 76102		2.26	3.45								1.50								
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9214 8901 9403 8376 4965 22	BOPCO LP 201 Main Street Suite 2700 Ft Worth TX 76102	Delivered Signature Received	No	
9214 8901 9403 8376 4965 15	Devon Energy Production CO LP 6100 N Western Oklahoma City OK 73118	In-Transit	No	
9214 8901 9403 8376 4965 08	M'lissa M Schoening 300 N Mariendeld Suite 1100 Midland TX 79701	Delivered Signature Received	No	
9214 8901 9403 8376 4964 92	DRW Energy LLC 400 W Illinois Suite 970 Midland TX 79701	Delivered Signature Received	No	
9214 8901 9403 8376 4964 85	B Jack Reed 506 Charismatic Midland TX 79705	In-Transit	No	
9214 8901 9403 8376 4964 78	Beryl Oil and Gas LP PO BOX 51440 Midland TX 79710	Delivered Signature Received	No	
9214 8901 9403 8376 4964 61	Leopard Petroleum LP PO BOX 51440 Midland TX 79710	In-Transit	No	
9214 8901 9403 8376 4964 54	GD McKinney Investments LP 300 N Mariendeld Suite 1100 Midland TX 79701	Delivered Signature Received	No	
9214 8901 9403 8376 4964 47	United States Dept of Interior Bureau of Land Management 620 E Greene Street Carlsbad NM 88220	In-Transit	No	
9214 8901 9403 8376 4964 30	EOG M Resources Inc 104 S Fourth Street Artesia NM 88210	Delivered Signature Received	No	
9214 8901 9403 8376 4964 23	EOG A Resources Inc 104 S Fourth Street Artesia NM 88210	Delivered Signature Received	No	
9214 8901 9403 8376 4964 16	New Mexico Oil Conservation Division 1220 South St Francis Dr Santa FE NM 87507	Delivered Signature Received	No	
9214 8901 9403 8376 4964 09	Devon Energy Production CO LP 6100 N Western Oklahoma City OK 73118	In-Transit	No	
9214 8901 9403 8376 4963 93			No	

Barcode	Recipient	Status	DL	Custom
9214 89019403 83764963 86	EOG Y Resources Inc	Delivered		
	104 S Fourth Street	Signature		
	Artesia NM 88210	Received		
	New Mexico Oil Conservation	Delivered		
	Division	Signature	No	
	811 S First St	Received		
	Artesia NM 88210			
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Recipient

Devon Energy Production CO LP
6100 N Western
Oklahoma City OK 73118

Date & Time	Event	Event Location
01/05/2019 12:02	AVAILABLE FOR PICKUP	SANTA FE,NM, 87501
01/05/2019 11:20	ARRIVAL AT UNIT	SANTA FE,NM, 87501
01/02/2019 13:22	PROCESSED THROUGH USPS FACILITY	ALBUQUERQUE,NM, 87101
12/30/2018 23:05	PROCESSED THROUGH USPS FACILITY	OKLAHOMA CITY,OK, 73107
12/28/2018 06:50	ADDRESSEE UNKNOWN	OKLAHOMA CITY,OK, 73154
12/28/2018 06:50	UNABLE TO DELIVER PROBLEM WITH ADDRESS	OKLAHOMA CITY,OK, 73154

12/28/2018 01:20	PROCESSED THROUGH USPS FACILITY	OKLAHOMA CITY,OK, 73107
12/27/2018 15:31	PROCESSED THROUGH USPS FACILITY	OKLAHOMA CITY,OK, 73107
12/23/2018 22:55	DEPART USPS FACILITY	OKLAHOMA CITY,OK, 73107
12/23/2018 16:58	PROCESSED THROUGH USPS FACILITY	OKLAHOMA CITY,OK, 73107
12/21/2018 22:36	DEPART USPS FACILITY	ALBUQUERQUE,NM, 87101
12/21/2018 20:50	PROCESSED THROUGH USPS FACILITY	ALBUQUERQUE,NM, 87101
12/21/2018 20:39	SHIPMENT RECEIVED ACCEPTANCE PENDING	SANTA FE,NM, 87501
12/21/2018 19:35	ORIGIN ACCEPTANCE	SANTA FE,NM, 87501
12/17/2018 14:26	PRE-SHIPMENT INFO SENT USPS AWAITS ITEM	SANTA FE,NM, 87501

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Mail Piece Tracking Number: **9214 8901 9403 8376 4964 85**

Recipient

B Jack Reed
506 Charismatic
Midland TX 79705

Date & Time	Event	Event Location
12/24/2018 22:55	AWAITING DELIVERY SCAN	MIDLAND, TX, 79705
12/24/2018 08:55	OUT FOR DELIVERY	MIDLAND, TX, 79705
12/24/2018 08:45	SORTING/PROCESS... COMPLETE	MIDLAND, TX, 79705
12/24/2018 06:36	ARRIVAL AT UNIT	MIDLAND, TX, 79705
12/24/2018 04:31	DEPART USPS FACILITY	MIDLAND, TX, 79711
12/23/2018 21:19	PROCESSED THROUGH USPS FACILITY	MIDLAND, TX, 79711
12/21/2018 22:36	DEPART USPS FACILITY	ALBUQUERQUE, NM, 87101

12/21/2018 20:50	PROCESSED THROUGH USPS FACILITY	ALBUQUERQUE,NM, 87101
12/21/2018 20:39	SHIPMENT RECEIVED ACCEPTANCE PENDING	SANTA FE,NM, 87501
12/21/2018 19:35	ORIGIN ACCEPTANCE	SANTA FE,NM, 87501
12/17/2018 14:26	PRE-SHIPMENT INFO SENT USPS AWAITS ITEM	SANTA FE,NM, 87501

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Mail Piece Tracking Number: **9214 8901 9403 8376 4964 61**

Recipient

Leopard Petroleum LP
PO BOX 51440
Midland TX 79710

Date & Time	Event	Event Location
12/29/2018 05:02	REMINDER TO SCHEDULE REDELIVERY	MIDLAND,TX, 79710
12/24/2018 14:13	AVAILABLE FOR PICKUP	MIDLAND,TX, 79710
12/24/2018 04:31	DEPART USPS FACILITY	MIDLAND,TX, 79711
12/24/2018 00:36	PROCESSED THROUGH USPS FACILITY	MIDLAND,TX, 79711
12/23/2018 21:19	PROCESSED THROUGH USPS FACILITY	MIDLAND,TX, 79711
12/21/2018 22:36		

	DEPART USPS FACILITY	ALBUQUERQUE,NM, 87101
12/21/2018 20:50	PROCESSED THROUGH USPS FACILITY	ALBUQUERQUE,NM, 87101
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12/21/2018 19:35	ORIGIN ACCEPTANCE	SANTA FE,NM, 87501
12/17/2018 14:26	PRE-SHIPMENT INFO SENT USPS AWAITS ITEM	SANTA FE,NM, 87501

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Mail Piece Tracking Number: **9214 8901 9403 8376 4964 47**

Recipient

United States Dept of Interior Bureau of Land Management
620 E Greene Street
Carlsbad NM 88220

Date & Time	Event	Event Location
12/26/2018 08:51	NO ACCESS	CARLSBAD,NM, 88220
12/26/2018 06:22	ARRIVAL AT UNIT	CARLSBAD,NM, 88221
12/24/2018 17:40	PROCESSED THROUGH USPS FACILITY	LUBBOCK,TX, 79402
12/24/2018 06:14	DEPART USPS FACILITY	LUBBOCK,TX, 79402
12/23/2018 17:33	PROCESSED THROUGH USPS FACILITY	LUBBOCK,TX, 79402
12/21/2018 22:36	DEPART USPS FACILITY	ALBUQUERQUE,NM, 87101

12/21/2018 20:50	PROCESSED THROUGH USPS FACILITY	ALBUQUERQUE,NM, 87101
12/21/2018 20:39	SHIPMENT RECEIVED ACCEPTANCE PENDING	SANTA FE,NM, 87501
12/21/2018 19:35	ORIGIN ACCEPTANCE	SANTA FE,NM, 87501
12/17/2018 14:26	PRE-SHIPMENT INFO SENT USPS AWAITS ITEM	SANTA FE,NM, 87501

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Mail Piece Tracking Number: **9214 8901 9403 8376 4964 09**

Recipient

Devon Energy Production CO LP
6100 N Western
Oklahoma City OK 73118

Date & Time	Event	Event Location
01/06/2019 12:12	PROCESSED THROUGH USPS FACILITY	OKLAHOMA CITY,OK, 73107
01/04/2019 06:39	ADDRESSEE UNKNOWN	OKLAHOMA CITY,OK, 73154
01/04/2019 01:10	PROCESSED THROUGH USPS FACILITY	OKLAHOMA CITY,OK, 73107
01/03/2019 14:49	PROCESSED THROUGH USPS FACILITY	OKLAHOMA CITY,OK, 73107
12/29/2018 20:06	PROCESSED THROUGH USPS FACILITY	ALBUQUERQUE,NM, 87101

12/27/2018 15:31	PROCESSED THROUGH USPS FACILITY	OKLAHOMA CITY,OK, 73107
12/23/2018 22:55	DEPART USPS FACILITY	OKLAHOMA CITY,OK, 73107
12/23/2018 16:58	PROCESSED THROUGH USPS FACILITY	OKLAHOMA CITY,OK, 73107
12/21/2018 22:36	DEPART USPS FACILITY	ALBUQUERQUE,NM, 87101
12/21/2018 20:50	PROCESSED THROUGH USPS FACILITY	ALBUQUERQUE,NM, 87101
12/21/2018 20:39	SHIPMENT RECEIVED ACCEPTANCE PENDING	SANTA FE,NM, 87501
12/21/2018 19:35	ORIGIN ACCEPTANCE	SANTA FE,NM, 87501
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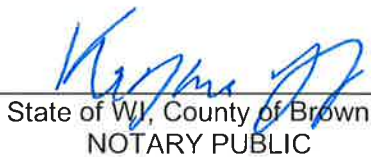
DAVID WASHINGTON
110 NORTH GUADALUPE, SUITE 1 PO BOX 2208
SANTA FE NM 87504

I, a legal clerk of the **Carlsbad Current-Argus**, a newspaper published daily at the City of Carlsbad, in said county of Eddy, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof on the date as follows, to wit:

12/22/18


Legal Clerk

Subscribed and sworn before me the
24th of December 2018.


State of WI, County of Brown
NOTARY PUBLIC

11/9/22
My Commission Expires

BEFORE THE OIL CONSERVATION DIVISION

Santa Fe, New Mexico

Exhibit No. 5

Submitted by: OXY USA INC

Hearing Date: January 10, 2019

Case Nos. 20193

STATE OF NEW MEXICO ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT OIL CONSERVATION DIVISION SANTA FE, NEW MEXICO

The State of New Mexico through its Oil Conservation Division hereby gives notice pursuant to law and the Rules and Regulations of the Division of the following public hearing to be held at 8:15 A.M. on **January 10, 2019**, in the Oil Conservation Division Hearing Room at 1220 South St. Francis, Santa Fe, New Mexico, before an examiner duly appoint for the hearing. If you are an individual with a disability who is in need of a reader, amplifier, qualified sign language interpreter, or any other form of auxiliary aid or service to attend or participate in the hearing, please contact: Florene Davidson at 505-476-3458 or through the New Mexico Relay Network, 1-800-659-1779 by **December 31, 2018**. Public documents, including the agenda and minutes, can be provided in various accessible forms. Please contact Florene Davidson if a summary or other type of accessible form is needed.

STATE OF NEW MEXICO TO: All named parties and persons having any right, title, interest or claim in the following case and notice to the public.

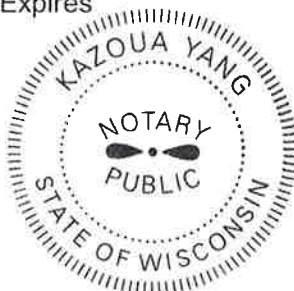
(NOTE: All land descriptions herein refer to the New Mexico Principal Meridian whether or not so stated.)

TO: All overriding royalty interest owners and pooled parties, including: New Mexico Oil Conservation Division; United States Dept of Interior, Bureau of Land Management; GD McKinney Investments LP; Leopard Petroleum LP; Beryl Oil and Gas, LP; B. Jack Reed, his heirs and devisees; DRW Energy, LLC; M'lissa M. Schoening, her heirs and devisees; EOG Y Resources Inc.; EOG A Resources Inc.; EOG M Resources Inc.; Devon Energy Production CO LP; BOPCO LP.

Case No. 20193 Application of OXY USA Inc. for Approval of a Pressure Maintenance Project, Eddy County, New Mexico. Applicant in the above-styled cause seeks an order approving a pressure maintenance project in the Bone Spring formation (Pierce Crossing, Bone Spring, East Pool (96473)) underlying a project area comprised of the N/2 of Section 23 and the NW/4 of Section 24, Township 24 South, Range 29 East, NMPM, Eddy County, New Mexico. Produced gas, produced water and carbon dioxide may be injected into the Second Bone Spring interval through the **Cedar Canyon 23 Federal 4H well** (API No. 30-015-43281) at a total vertical depth of approximately 8850 feet to approximately 9002 feet along the horizontal portion of the wellbore. Oxy seeks approval to inject at the following surface injection pressures:

Produced gas: 4,350 psi
Produced water: 1,770 psi

Ad#: 0001272205
P O : 0001272205
of Affidavits : 0.00



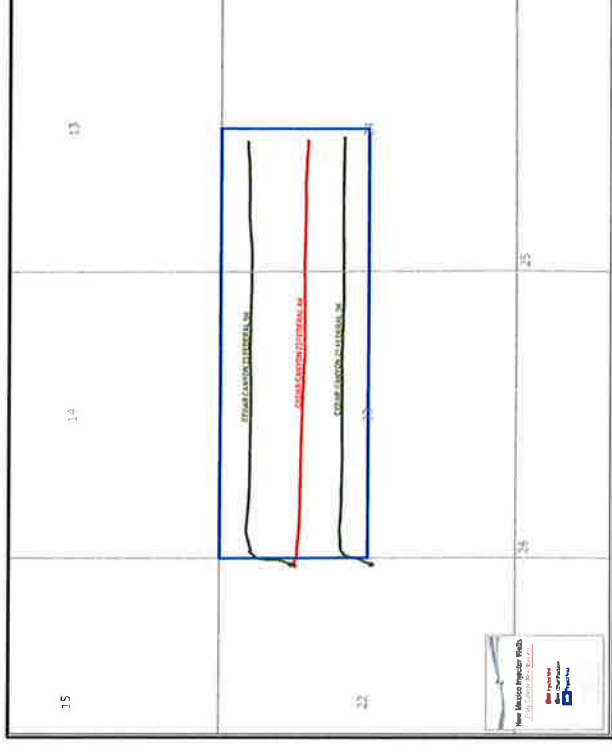
Carbon dioxide: 2,300 psi

The source of the produced gas and produced water will be the Bone Spring and Delaware formations. The source of the carbon dioxide is unknown. Oxy also seeks an exception to the packer setting depth for this injection well and for allowance to use unlined tubing. The proposed project is located approximately ten miles southeast of Loving, New Mexico.

Pub: December 22, 2018 #1272205

C-108 Overview – Cedar Canyon Gas Injection

- Oxy is proposing to inject produced field gas, CO₂, and water into existing 2nd BS lateral – the Cedar 23 Fed 4H
- The field gas will reach miscible pressure at bottom hole conditions and mobilize incremental oil
- Oxy plans to continuously inject produced gas into the Cedar Canyon 23 Fed 4H. Oxy plans to inject water if necessary and CO₂ when available
- Produced gas injection could provide an effective alternative to flaring in a highly constrained gas market



Calculation for Surface Injection Pressure Limit

For Water Injection: 1770 psi

The calculation for surface pressure limit: $0.2 \text{ (psi/ft)} * \text{TVD (ft)}$ of shallowest perforation. This is based on "The permitted injection pressure is limited to 0.2 psi/ft. to the uppermost perforation" (NMOCD UIC Manual Section III.A.2)

Well	TVD (ft)	Max Water Injection THP, psi
Cedar Canyon 23 Federal 4H	8850	1770

For Produced Gas: 4350 psi

For CO2: 2300 psi

The calculation procedure is shown below:

1. Based on the surface pressure limit for water and assuming fresh water gradient (0.433 psi/ft). The Bottom Hole Pressure Limit is $(0.2 + 0.433) * \text{TVD (ft)}$ of shallowest perforation (or 0.63 psi/ft)
2. The composition for the proposed injection produced gas is shown in the table. While CO2 injection case composition is only CO2.

Component	%
Nitrogen	1.62
H2S	0.00
Methane	77.19
CO2	0.19
Ethane	12.58
Propane	5.73
i-Butane	0.58
n-Butane	1.33
i-Pentane	0.25
n-Pentane	0.24
Hexanes+	0.29
Total	100.00

3. A Petroleum Expert Prosper[®] Model was used to calculate the surface pressure with tubing ID (2.323"), reservoir depth, injection gas composition and the BHP limit calculated in the step 1.

* Prosper Model is industrial standard nodal analysis software for pressure calculation includes phase behavior change, friction loss.

Well	TVD (ft)	Max Inj BHP	Max Gas Inj THP, psi	Max CO2 Inj THP, psi
Cedar Canyon 23 Federal 4H	8850	5602	4350	2300

BEFORE THE OIL CONSERVATION DIVISION

Santa Fe, New Mexico

Exhibit No. 7

Submitted by: OXY USA INC

Hearing Date: January 10, 2019

Case Nos. 20193



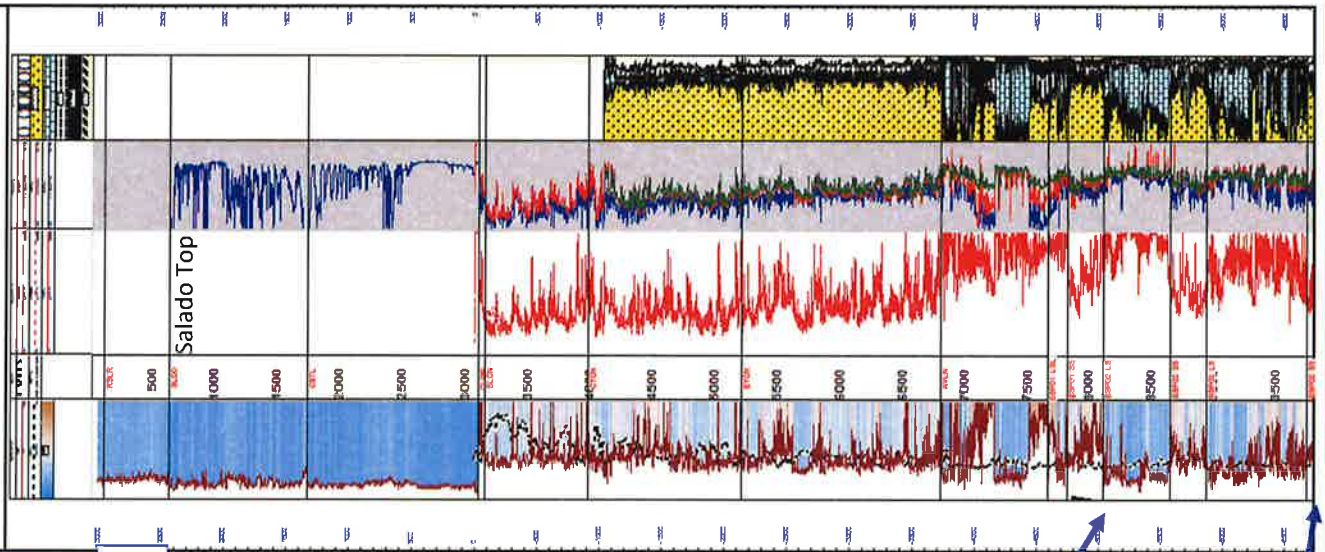
Cedar Canyon 23 Fed 4H 2nd Bone Spring Type Log

- Gamma Ray, Depth, Resistivity, Porosity, Lithology
- Formation tops in red
- Low porosity limestone above and below the 2nd Bone Spring Sand acting as a seal
- Upper barriers protecting fresh water: Salado Salt (1300' thick); Castile anhydrite (1500' thick); low porosity/low permeability 2nd BS lime (500' thick)
- Lower barrier 3rd BS Lime (700' thick)

Lowest fresh water
near base of Rustler

TYPE LOG 2nd BONE SPRING SAND

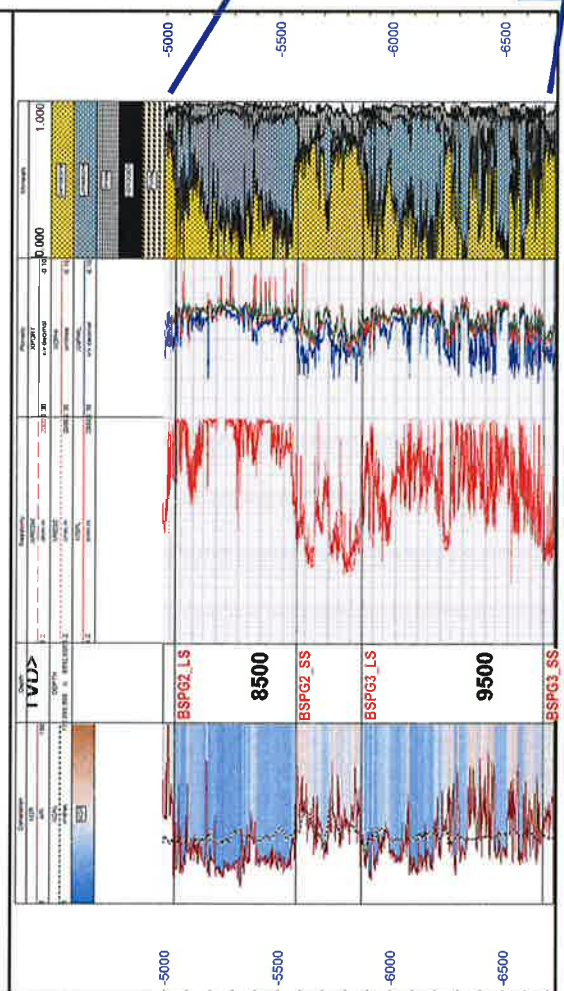
30015257960000
TAP ROCK OPER LLC
H B 3 FEDERAL 1



TYPE LOG 2nd BONE SPRING SAND

30015257960000

TAP ROCK OPER LLC
H B 3 FEDERAL 1



BEFORE THE OIL CONSERVATION DIVISION

Santa Fe, New Mexico

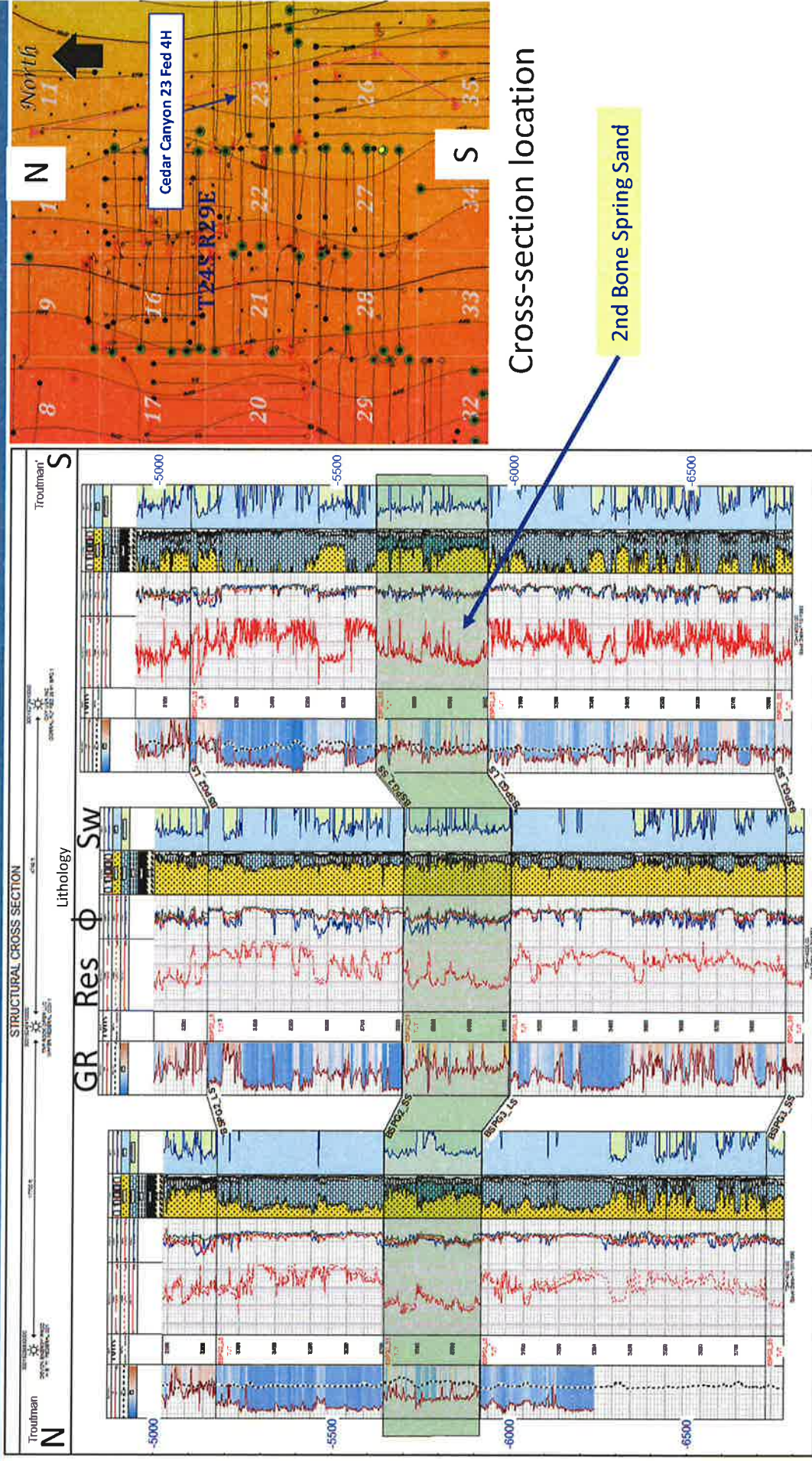
Exhibit No. 8

Submitted by: OXY USA INC

Hearing Date: January 10, 2019

Case Nos. 20193

Cedar Canyon 23 Fed 4H Cross-section



BEFORE THE OIL CONSERVATION DIVISION

Santa Fe, New Mexico

Exhibit No. 9

Submitted by: OXY USA INC

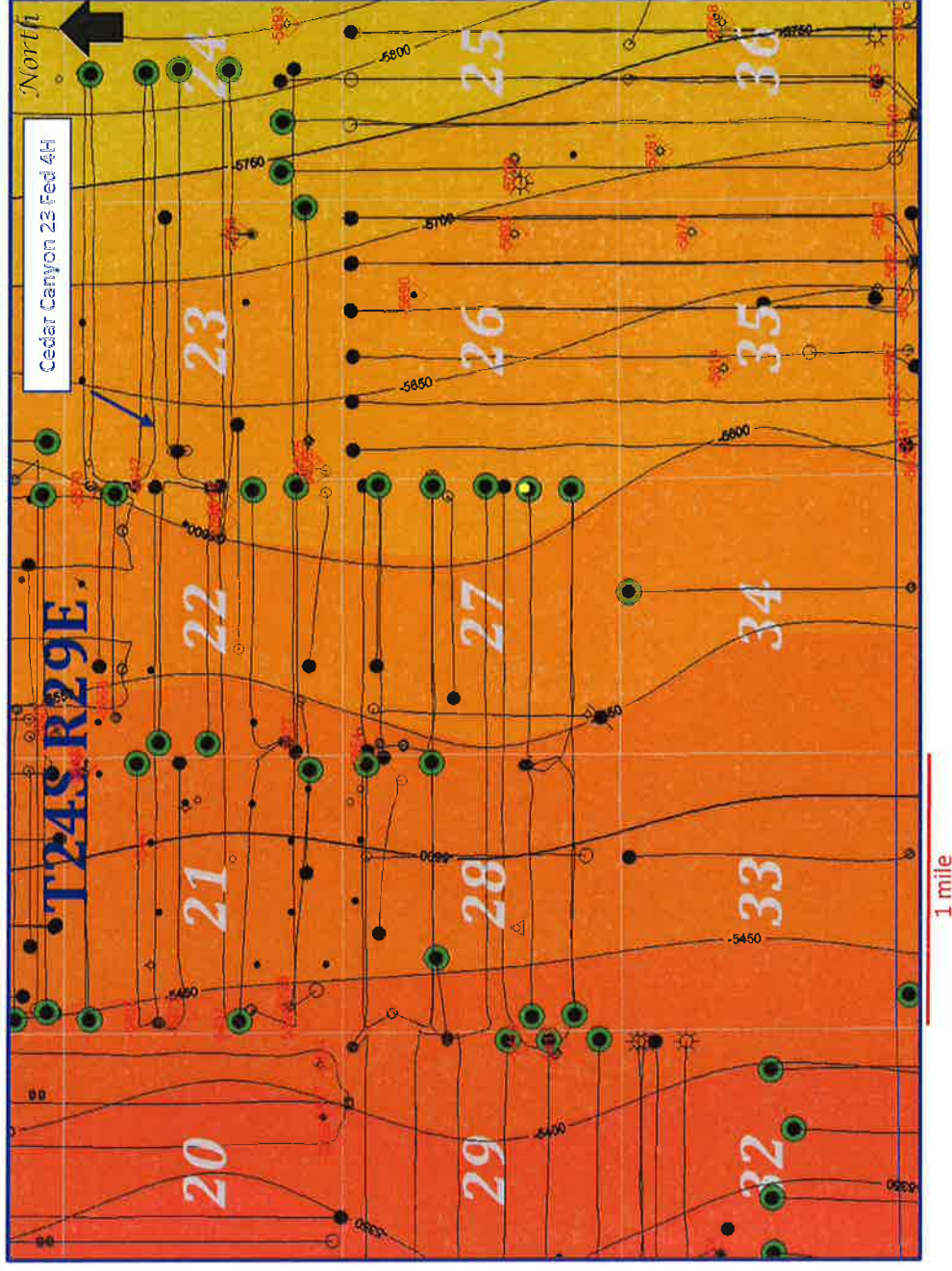
Hearing Date: January 10, 2019

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Cedar Canyon 23 Fed 4H 2nd Bone Spring Sand Top Structure

- Posted depths show well control
- Depths are TVD subsea, contour interval 50 ft
- 2nd Bone Spring wells marked by green highlights
- Sections 20, 21, 22, 23, 29, 28, 27, 26, 25, 35, 36 are Oxy operated



BEFORE THE OIL CONSERVATION DIVISION

Santa Fe, New Mexico

Exhibit No. 10

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Hearing Date: January 10, 2019

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